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Woods Hole Oceanographic Institution

LFASE Borehole Array Data Acquisition and Reduction Summary

by

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Technical Memorandum

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Abstract

On the Low Frequency Acoustic - Seismic Experiment (LFASE), carried out at DSDP hole 534A in August, 1989, WHOI was responsible for acquiring data from a twelve channel borehole seismic array. Data were acquired both on-board while tethered to the array and autonomously in a seafloor package. Seismic source data (explosives and airguns) and ambient noise data were recorded. This report describes the nature of data acquired, reviews the data reduction procedure from field format to ROSE data format, and includes examples of the data. A total of 918.6 Mbytes of data were acquired (769 Mbytes in the shipboard recording mode and 149.6 Mbytes in the seafloor recording mode). Approximately 85 explosive shots, 2000 airgun shots, and 10 hours of ambient noise data were recorded.

Introduction

Between August 10, 1989, and August 28, 1989, a seismometer array from Woods Hole Oceanographic Institution (WHOI) was deployed in Deep Sea Drilling Project (DSDP) Hole 534A (Figure 1). This deployment was part of the multi-institution Low Frequency Acoustic Seismic Experiment (LFASE). The purpose of LFASE was to study sound propagation and ambient noise at the seafloor. During LFASE the first successful recordings of ambient noise were simultaneously made by three component seismometers at more than one depth below the seafloor. Other receivers deployed near the borehole included ocean bottom seismometers (OBS) and a vertical hydrophone array.

Participating institutions in LFASE were the Institute of Geophysics and Planetary Sciences at Scripps Institute of Oceanography (SCRIPPS), John Hopkins University Applied Physics Laboratory (APL), Marine Physics Laboratory (MPL) of SCRIPPS, Massachusetts Institute of Technology Earth Resources Laboratory, Naval Oceanographic and Atmospheric Research Laboratory (NOARL), Science Applications International Corporation, and WHOI. The R/V Melville from SCRIPPS deployed the OBS's and deployed and retrieved the borehole array. The USNS Lynch deployed the vertical hydrophone array and shot explosive and airgun seismic sources. The OBS's and Vertical Hydrophone Array were retrieved by the R/V Melville.

Borehole Seismometer

The seismometer array was built by Compagnie Generale de Geophysique (CGG) and WHOI. Twelve channels of data from four nodes were recorded. The four nodes were deployed at 10, 40, 70, and 100 m below the seafloor (Koelsch et al, 1990; Figure 2). The 10 m node had a vertical and two horizontal geophones and a hydrophone. The 40 m node had a vertical and two horizontal geophones. The 70 m node had a vertical and one horizontal geophone. The 100 m node had a vertical and two horizontal geophones. The 40 m deep node was not securely clamped to the side of the hole due to a malfunction of the clamping mechanism. As a result, the data for the 40 m deep node is contaminated by a lot of ringing and is of only limited usage.

Recording Methods

Data from the borehole array were acquired by two methods. While the ship remained tethered to the array, data were telemetered via a co-axial cable tether to a PC/XT on the R/V Melville and written to an optical disk drive. After release of the tether, data were written directly to optical disks in an autonomous recording package emplaced in the DSDP re-entry cone on the seafloor. Data were written in a format provided by CGG.

The experiment had two operational phases. In the first phase seismic signals shot by the USNS Lynch were recorded. In the second phase, after the two ships departed the experiment site, ambient noise was recorded. The active phase was acquired by both the surface and bottom recording methods. From 16:04 GMT on August 11th to 14:00 GMT on August 13th, the active source phase was recorded on board the R/V Melville. On the 13th of August the telemetry connection between the ship and the seafloor package failed. On acoustic command the cable was severed above the bottom recording unit by a built in cable cutter. The R/V Melville stayed over the hole, serving as a navigational aid for the USNS Lynch, until around 10:00 GMT on August 15th, when it returned to Miami. The remaining portion of the active seismic phase was recorded on the

bottom recording unit from 20:00 GMT on August 13th until 10:06 GMT on August 17th. The bottom unit recorded only ambient noise between 11:00 GMT on August 17th, when the USNS Lynch left the experiment site, and 03:00 GMT on August 28th, when the borehole array was retrieved.

All data (both shipboard and seafloor) were acquired in field format (CGG format) on optical disks. The duration of the files on the optical disks varied considerably throughout the experiment. Table 1 lists all optical disk files and window lengths obtained during LFASE. The data were transcribed from field format to ROSE format (LaTraille, 1983) for processing and exchange. At this stage, the large field records were broken down into smaller more manageable files. Table 2 lists the ROSE formatted files created from the optical disks. Until the telemetry link failed the data from the seismic array were continuously recorded on the ship with breaks only to close and open new files on the optical disk. After the telemetry link went down, the data were recorded in preprogramed windows of varying lengths. During the seafloor recording of the active sources the window lengths used were six minutes long and started at the beginning of every hour.

Amplitude Variance

A convenient way to summarize all the data recoded is to plot the root-mean square of the amplitude (RMS) as a function of time. The RMS value (in dB) was calculated on the first 10 seconds every minute after the removal of the mean for all of the data in LFASE. Figure 3 shows the RMS value in each file for the 10 meter deep vertical component for all of LFASE plotted as a function of the date when the 10 second window started. Signal levels during the shooting and ambient noise phases varied by about 70 dB. On the same figure we show when explosive and airgun sources were recorded, when ambient noise was recorded, when the vertical hydrophone array was operational, and when earthquakes occurred that may have been detectable.

The method used to compute RMS introduces variation into the time histories in Figure 3. The window over which RMS was computed was always a 10 second interval every minute starting at the beginning of each file. However the time delay between the start of the file and the arrival of high amplitude events varied during the experiment due to changes in the distance between source and receiver and to changes in the time delay from shot instant to start of file. The RMS value is larger when high amplitude arrivals fall within the window than when such arrivals fall outside the window. A large but unknown portion of the variation in RMS amplitude with time in Figure 3 is due to this effect.

Shooting Patterns

The seismic source phase had the objective of shooting 8 lines radiating out from the borehole at bearings 45 degrees apart for both explosives and airguns (Figure 4). The explosive lines were to be shot to a range of 50 km with the size of the charge varying from 0.23 Kg to 25 Kg (Table 2). The airgun lines were to be shot to a range of 25 km. An airgun circle around the borehole with a 10 km radius was also planned. The actual lines shot for which data were recorded by the borehole array are shown in Figure 5. Explosive and airgun shot locations are shown in Figures 6 and 7, respectively.

The airgun circle was shot twice to improve azimuthal coverage because the borehole package was recording data only every 6 minutes on the hour.

Line A5A was created in the WHOI data set to accommodate the fact that airgun shots were

fired north of the borehole on a bearing of 20 to 30 degrees prior to and after shooting line A5 along a bearing of 180 degrees from the borehole (Figures 7f and 7g). Since line A5A is about 22 degrees different in azimuth from lines A1 and A2, line A5A shots were not included in either of those lines.

Shot Instants

Shot instants were obtained on the USNS Lynch for each shot by picking the time of the outgoing pulse from a screen plot of the source waveform measured by a towed hydrophone. Clocks on both the USNS Lynch and the R/V Melville were compared to a time standard provided by the GOES satellite. The WHOI Webb clock lagged the GOES clock standard by 0.251 seconds and the clock on the USNS Lynch preceded the GOES standard by 2.048 seconds. As a result of this comparison the start of file times recorded by the borehole recording units lagged the NOARL shot instants by 2.299 seconds. Comparisons of the USNS Lynch and the WHOI Webb clocks to the GOES standard before and after the experiment showed that neither clock drifted. Times used in the WHOI ROSE files are the times from the USNS Lynch clock.

Navigation

Shot locations were determined from Loran navigation recorded on board the USNS Lynch. We used the latitude and longitude and the computed range from the borehole of each shot location determined by NOARL (D. Bibee, personal communication, 1989). Azimuths were calculated at WHOI, using the event source latitude and longitude and the drill hole location by means of a great circle equation (Bowditch, 1977, p. 1258).

Eight shots in line A2 had erroneous latitude, longitude, and range data. We redetermined the range and bearing of these events by linear interpolation.

Creation of ROSE Files

Optical disk files, written in CGG format, were transcribed at WHOI to ROSE format using the program CGG2ROSE2 (Little et al., 1990). The optical files contained data recorded for up to one hour. The WHOI ROSE processing package (Little et al., 1990) has array dimensions that limit the size of LFASE data to a maximum of 10 minutes and to a separate ROSE file for each shot. As a result, CGG2ROSE2 was specifically written to generate multiple ROSE files from one optical file.

The program TIMESORT was run to determine the times at which each ROSE file should begin. This program took shot times, range from shot to borehole, start time and duration of the optical files, and the clock correction value to create a table of the ROSE file start times. This table of times was used by the program CGG2ROSE2 to create ROSE files from the optical files.

A ROSE file was created for each active source event that was acquired by the borehole array. In each ROSE file we sought to have at least a two second window prior to the first arrival of the seismic event. A velocity of 5 km/s was used to calculate the time elapsed between the shot and the arrival of the first body wave at the borehole receivers. An additional two seconds were removed to ensure that there was an adequate quiet window preceding the first body wave arrival. The beginning of each ROSE file was determined from the equation:

start time of file = shot instant + (range / 5 km/sec) - 2 seconds.

After plotting all the data, we are confident that we included in each ROSE file as much of the

source signal and coda as possible without loss of data. In some cases the optical file started recording data too close to the first arrival to use this formula. In these cases a ROSE file was created but the window before the shot was not the full 2 seconds.

The length of the ROSE files created for the active phase was dictated by the time interval between shots. Explosive shots were made into files not longer than two minutes duration. The two minute durations were used in the hope of being able to see some multiples in the data and still have shorter files to speed up processing. The airgun firing rate limited ROSE files to 30 seconds in duration. At extreme ranges (50 to 60 km) water column multiples move into the "quiet" time of the next shot and the full seismic signal from the event could not be included in the ROSE file. During the second part of shooting line A8, the airgun fired every 10 seconds, and the ROSE files contain little useful information since signals from up to three shots arrived simultaneously.

When no shots were being fired or the length of time after a shot became longer than two minutes, a new ROSE file was created. These files were designated as ambient noise files and can have a duration of up to ten minutes.

After transcription of the data by CGG2ROSE2, the ROSE files were stored either on magnetic disks or on nine track tape. For exchange purposes the data can be put into the ROSE exchange format on foreign tape by the program ROSETOUT (LaTraille, 1983; Little et al, 1990).

Table 3 shows the channel numbers used to store data from the different satellites of the borehole tool. Due to engineering constraints, data from the hydrophone in the 10 meter deep satellite used channel 9 to pass data to and store data on the optical disks.

ROSE format used at WHOI

The ROSE files created at WHOI closely follow the format on pages 6 to 9 in LaTraille (1983). WHOI uses 4 byte words to store data values. WHOI takes advantage of unused words (42 to 59) in the file header to pass the bearing in true degrees of the shot from the receiver. Word 42 contains the integer part and word 43 contains the fractional portion (hundredths of a degree) of the bearing. Header words for which we do not have a measured value are assigned a zero value: estimate of error in range (14), normal incidence travel time from the surface to the instrument (20), estimate of the error in the event location (25), and file number within the tape (41). In the channel headers word 1 gives the channel number and not the component type. The only other words in the channel headers used are word 11 for the number of 2048-sample blocks used and word 12 for the number of samples in the last block.

Event Numbering

Event numbering for the WHOI ROSE files differs from the shot numbering system used by NOARL. The data contained in the ROSE files increase chronologically and have increasing event numbers assigned to them. Noise files are intermixed with active files in the order in which they occur. Between each optical file the numbering sequence increases by 11. This gap allows the data in any one optical file to be reformatted into a larger number of ROSE files without changing the numbering of previous and subsequent ROSE files. There are some increases in shot numbers larger than 11 due to uncertainty at the time of processing about the NOARL shot numbers and the possibility that new shot instants could become available. The gaps allowed flexibility in breaking up the optical files and in numbering the ROSE files.

Data Recording Errors

While at sea, a data checking program found errors in the borehole data recorded on optical disk. These errors ranged from simple errors in scan count to blocks of duplicated data scans. At WHOI the program CGGEDIT was run to find and correct, if possible, errors in the optical data files. Minor corrections were applied to most of the optical files. Those files which could not be fixed are noted in Table 1.

The program CGGEDIT edited the optical files with an operator making choices depending on the errors found by the program. If a scan line was a duplicate of the scan line before, the second scan line was deleted. If data did not appear in the correct format then the data in that scan was set to zero. If the scan counter showed missing scans, scans with data set to zero were added to fill the gap. If the scan count was unreadable but the scan data appeared good, then the scan counter was corrected. When whole blocks of data repeated themselves, the second block was replaced with scans that contained data set to zero. Many files only had the first scan count missing. In these cases a scan was added at the start of the file with data set to zero.

Pulse Tests and BCU Hangups

The borehole tool has a self-test function referred to, here, as a "pulse test". Each pulse test examines three aspects of the borehole unit in which response of the sensors to an impulse signal or lack of a signal is monitored and recorded. The 12-channel output of the borehole sensors during each part of the pulse test are recorded in a preprogrammed sequence in one optical file. Figure 12 shows time series from a pulse test file. The output is also processed and a summary of the results is displayed on a video screen in the deck control unit, but these data are not recorded. To save the data a Polaroid picture was taken of the video screen.

Pulse test data were collected sporadically by engineers while the R/V Melville remained tethered to the borehole package to check the status of the equipment. Optical files in Table 1 which contain pulse test data are annotated in the comment column.

The first part of the pulse test checks sensor response. An electrical impulse is applied to each geophone. After the pulse is stopped the geophone's return to "normal" output is seen as a pulse. The pulse is applied in two groups of channels, 1 to 6 and 7 to 12, with each channel getting the pulse 400 ms after the previous channel in it's group. This geophone test checks the impedance of the input line and the proper wiring of each geophone. A 512 ms long signal is used to compute in microvolts the signal read at the preamplifier. The geophone test is meaningless for the hydrophone in channel 9 which shows an electronic artifact of the test trying to affect the hydrophone. The total test takes 3.2 seconds.

The pulse test also checks the cutoff frequencies of the filters. A pulse is applied to the preamplifiers for each channel. A spectrum is computed on 512 ms (64 samples) of the output from the preamplifier for each channel and the values shown on the deck control unit. This test also groups channels 1 to 6 and 7 to 12 with 400 ms between each channel's start time. The first pulse occurs 4 seconds after the beginning of the pulse test. The geophones and the hydrophone have different preamplifier and amplifier gains. At 8 seconds, an electronic noise test samples data at the input to the preamplifier when the input is closed by resistors. Spectra in nannovolts are computed over 4096 ms and displayed on the deck control unit for each channel.

As noted in Table 1, the Bottom Control Unit (BCU) "hung up" several times. At these times several programed recording time windows were missed. Time is missed when code built into the

BCU was activated to fix some continuous problem calling for attention. After this fix the program went back to the normal operating sequence and the planned recording schedule. When data stopped coming up the coaxial tether to the R/V Melville, the BCU had code in it to start up by itself if contact had been lost with the surface. The BCU "hang up" in this case was the time needed for the automatic recording program to start after it recognized that BCU was no longer connected to the surface.

Record Sections

Figures 8 and 9 show seismograms of seismic source data recorded by the 10 meter deep vertical geophone plotted versus range or azimuth. The plots were created by the program LFAZO using CalComp graphics software. In LFAZO each channel in a ROSE file is processed and plotted individually. The program can convert to physical units, apply filters, range weight, apply a reduction velocity, plot filled or simple wiggles, sub-sample shots, and sub-sample the time series so that a different digitization rate can be used. A different amplitude scaling factor can be input for each trace. Data can be plotted by time versus range, azimuth, depth, sequence number, channel number, and an input ordinate value. There is an option for plotting all 12 channels in a single plot grouped by satellite.

For the simple wiggle plots in Figures 8 and 9 we subsampled shots on most airgun lines, because close shot spacing forces adjacent traces to overwrite each other. Where the shots were fired close together, every third to tenth shot was plotted. All shots are plotted for explosive lines. The traces were not bandpass filtered. No reduction velocity was applied to the times. The amplitude of each trace has been scaled by setting the maximum amplitude for the window to be plotted to a fixed length scale (equal maximum amplitude scaling). No range weighting was applied to the data. In some record sections large gaps occur between groups of data. These gaps occur at times when no data was recorded by the borehole array (see Tables 1 and 2). The data have been plotted at different range and time scales for clarity.

For the ten kilometer circle, two azimuthal sections were plotted so features in the data can be seen more clearly. For the circle, seismograms acquired during the shooting of radial lines were added to the plot if their range from the hole was within 250 meters of the 10 kilometer range of the circle. By adding these line traces, we were able to improve coverage of the circle despite the intermittent recording schedule of the borehole array.

Four explosive lines had only one or two shots recorded in them. For these lines all twelve channels of data were plotted for each shot (Figures 8b, 8c, 8g, and 8h).

Lines A2, the first part of A5, and A6 are shown in Figure 10. All shots in these lines are shown in the seismogram. These seismograms were created by LFAZO using Uniras software to create filled wiggle traces. These seismograms are included to show full lines with all shots plotted. The data shown in Figure 10 are from the 10 meter deep vertical geophone and use equal maximum amplitude scaling.

Amplitude Clipping

The signal amplitudes of many files recorded during the shooting phase of the experiment were clipped. The data value recorded in the optical disk file for these clipped values is the largest or smallest value possible to write in the CGG format (Appendix A). These values are + 4,192,256 and -4,194,304 in the WHOI ROSE files. The program CLIPPCHECK was run on all ROSE files

to find out which ROSE files had clipped data. The program checked all data in all channels for values greater than or equal to the largest CGG value possible and smaller than or equal to the most negative CGG value possible. Table 2 includes a column summarizing the total number of clipped values per WHOI ROSE file. Table 5 shows the number of clipped values per channel for each WHOI ROSE file that had clipped values in it during the seismic shooting part of LFASE. Clipping did not occur during ambient noise windows.

The number of clipped values per shot decreases in explosive lines out to a range of 60 km whereas clipping occurs out to a range of only about 10 km for airguns. The occurrence of clipping is related to range of the source from the receiver and size of the source. No clipping occurred when 0.23 kg charges were used. Figure 11 shows the number of clipped values per file versus range for each type of source. For the airgun data only the vertical component in satellite 2 (channel 4) and the hydrophone in satellite 1 (channel 9) clipped data (Figure 11c). The major portion of clipped data points in the explosive shots are also in channels 4 and 9 (compare Figures 11a and 11b). Data are clipped only during arrival of the direct water wave or water column multiples.

Conclusions

During LFASE WHOI recorded 918.6 megabytes of data on optical disks. This data included 85 explosive shots and 2000 airgun shots. Over a period of 10 days and 14 hours, about 10 hours and 19 minutes of ambient noise data were recorded. Approximately 1,371 megabytes of ROSE formatted data was created from the optical disks.

Acknowledgements

We would like to thank the crew of the R/V Melville for great work in deploying and retrieving the borehole array. Special thanks goes to Fred Speiss's group from MPL for getting the array into the borehole, keeping the R/V Melville tethered to the array during the active phase of the experiment and retrieval of the array at the experiment's end. Thanks goes to Nan Galbraith, Skip Little, and Cleo Zani for software development needed to transcribe the optical data to ROSE format. We thank Michelle Engemann for her support in keeping the data organized and for plotting the navigation.

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Shipboard Scientific Party, 1983, Site 534: Blake-Bahama Basin. In Sheridan, R. E., Gradstein, F. M., et al., Initial Reports DSDP, 76: Washington (U. S. Government Printing Office), 141-240

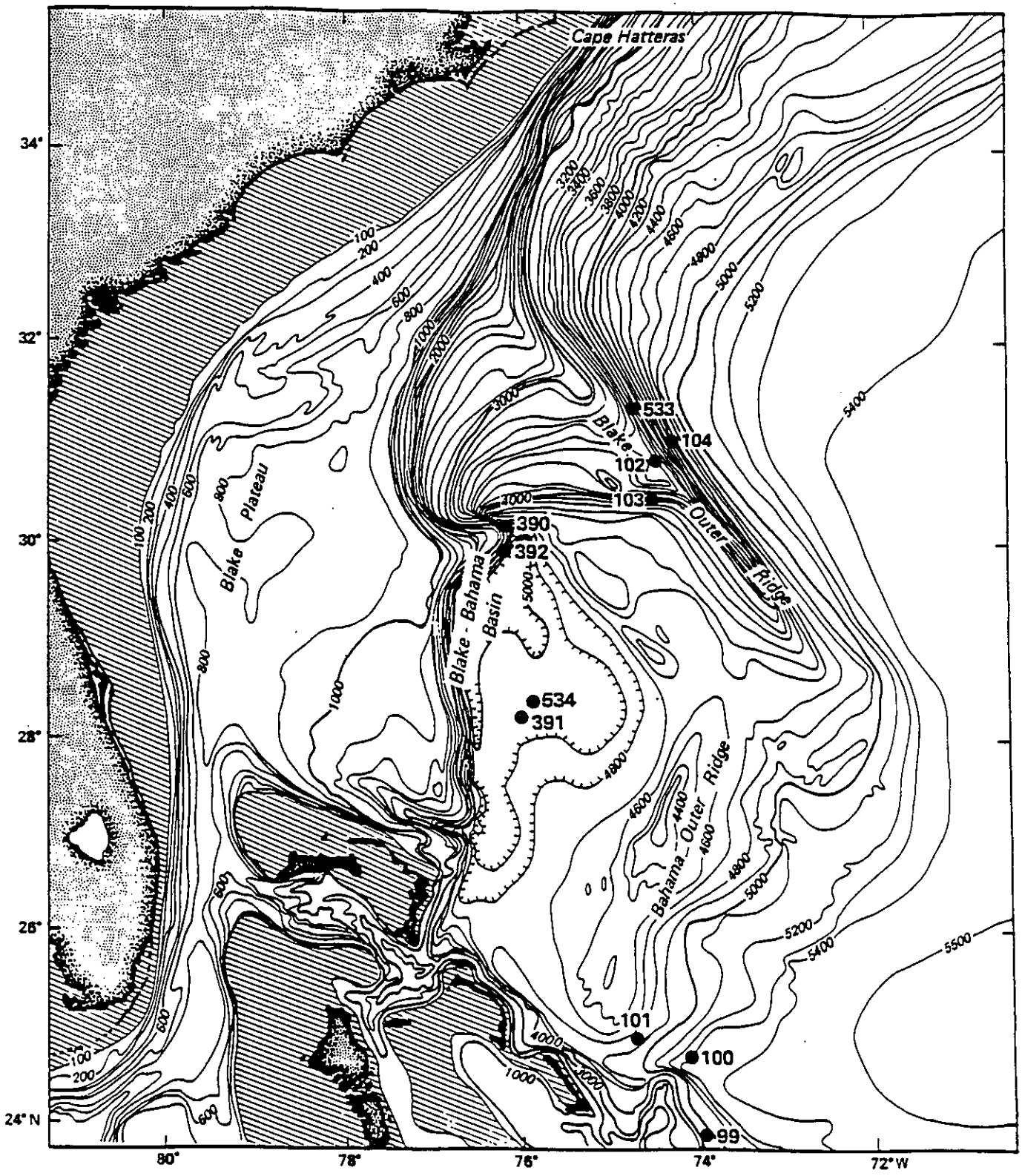


Figure 1. The general area for LFASE operations was near site 534A off the coast of Florida (from Shipboard Scientific Party, 1983).

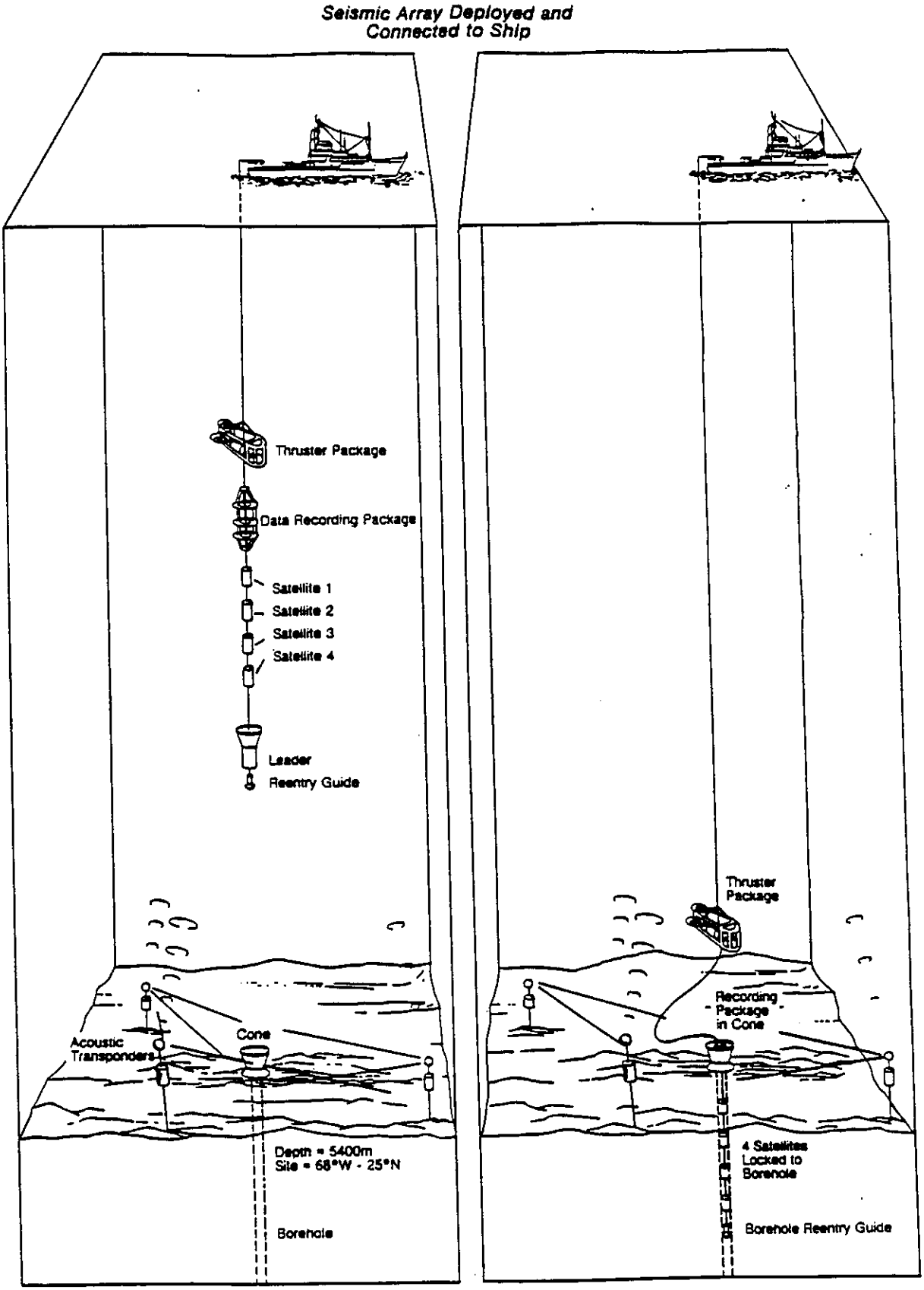


Figure 2. The configuration of the borehole array in the borehole.

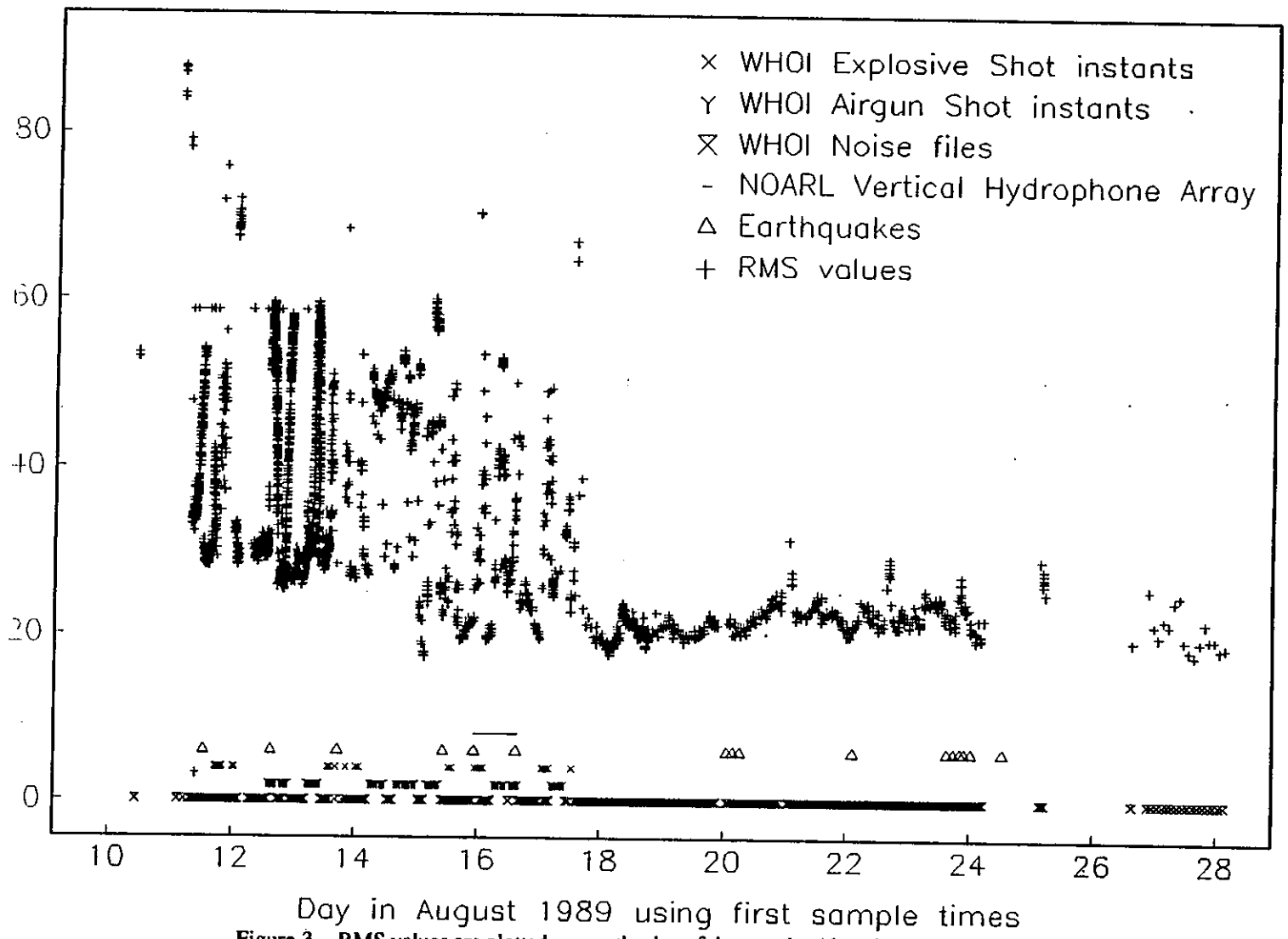


Figure 3. RMS values are plotted versus the day of the month. Also plotted are the type of source, time that the NOARL vertical hydrophone was recording, and time of earthquakes during the LFASE deployment. "Noise" files prior to 17:16 GMT on August 11 are contaminated by.shooting of a reflection profile by the USNS Lynch.

Figure 3a. RMS values are plotted versus time for all files collected during LFASE.

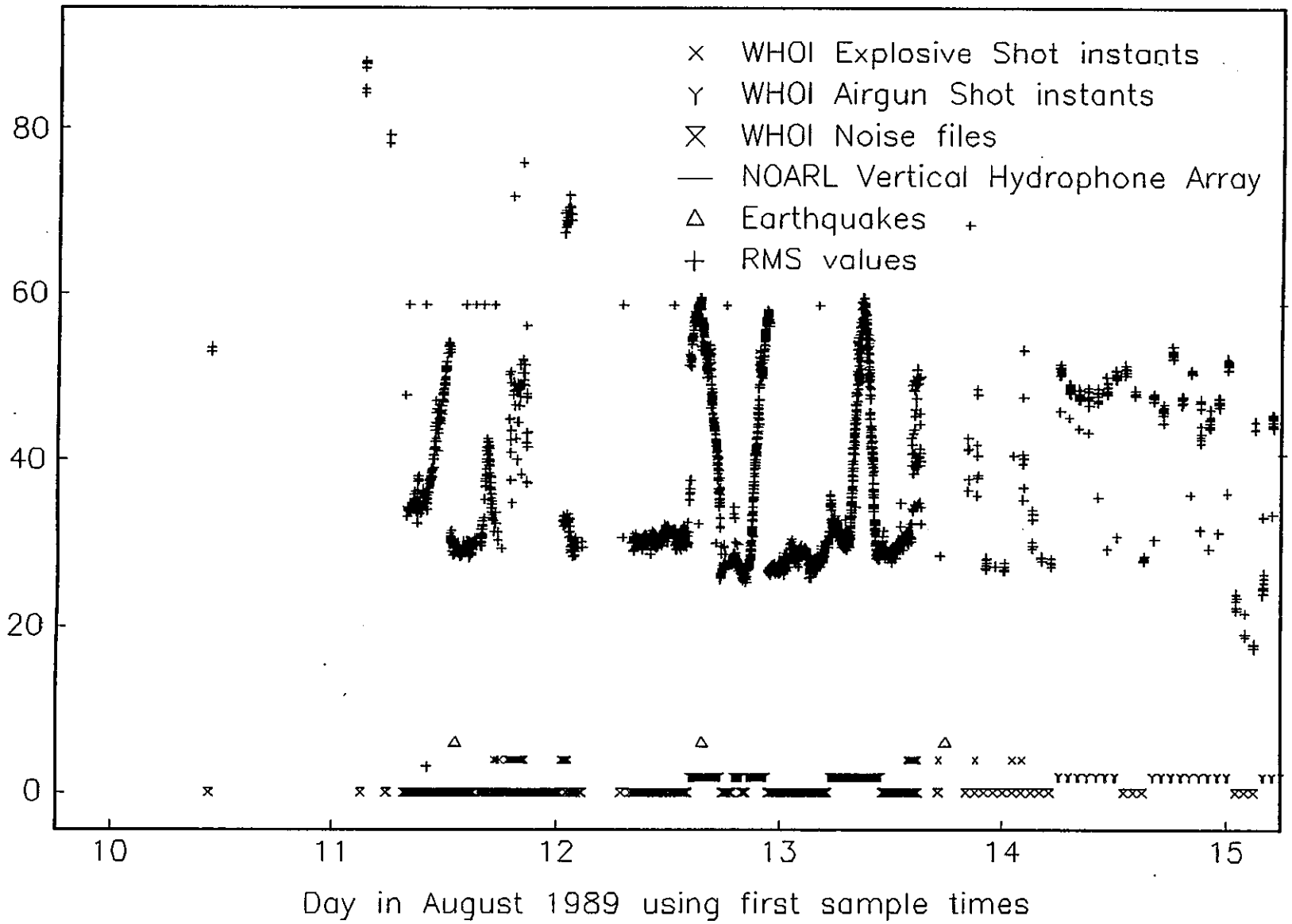


Figure 3b. RMS values are plotted versus time for a 5 day window.

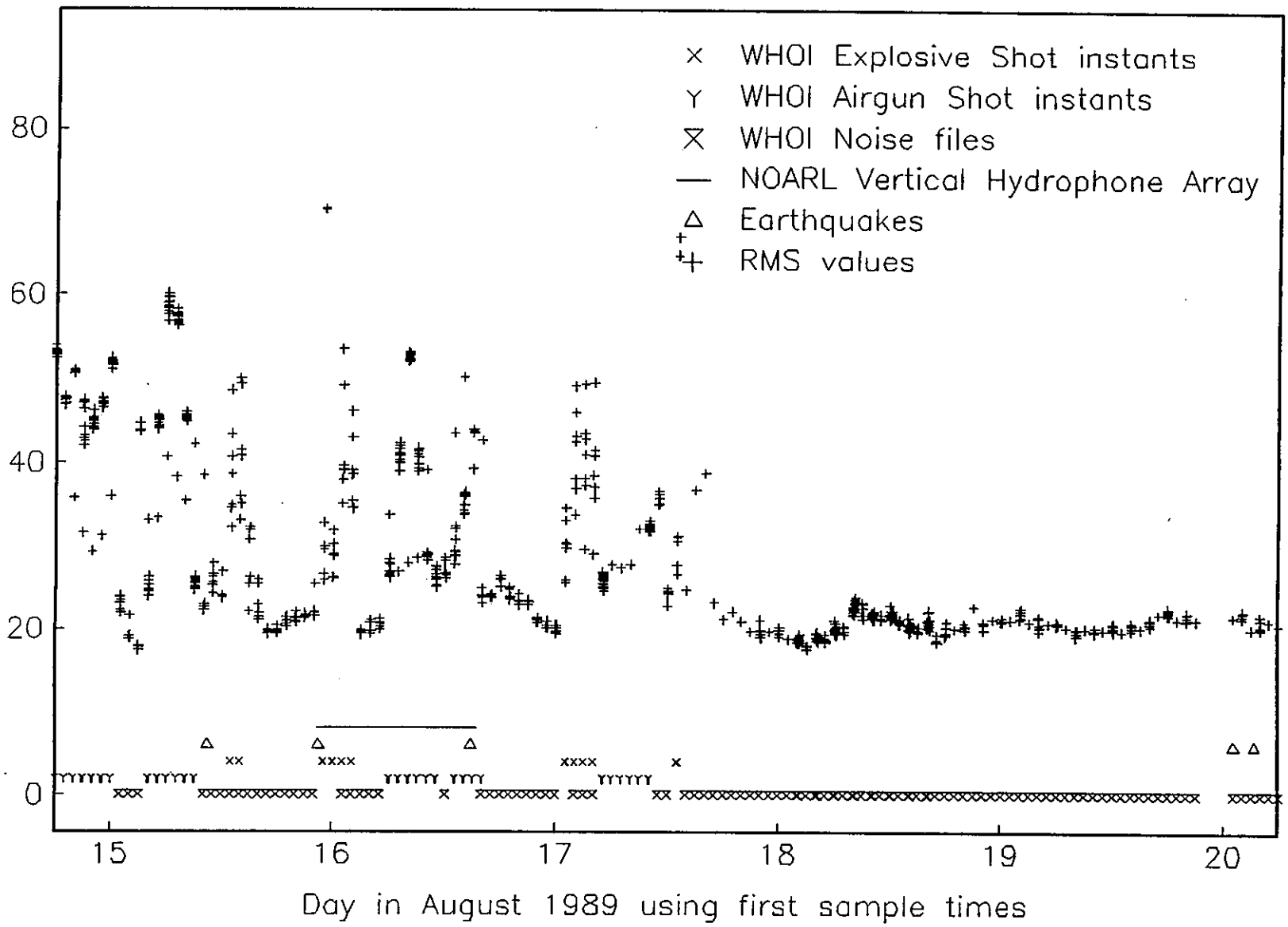


Figure 3c. RMS values are plotted versus time for a 5 day window.

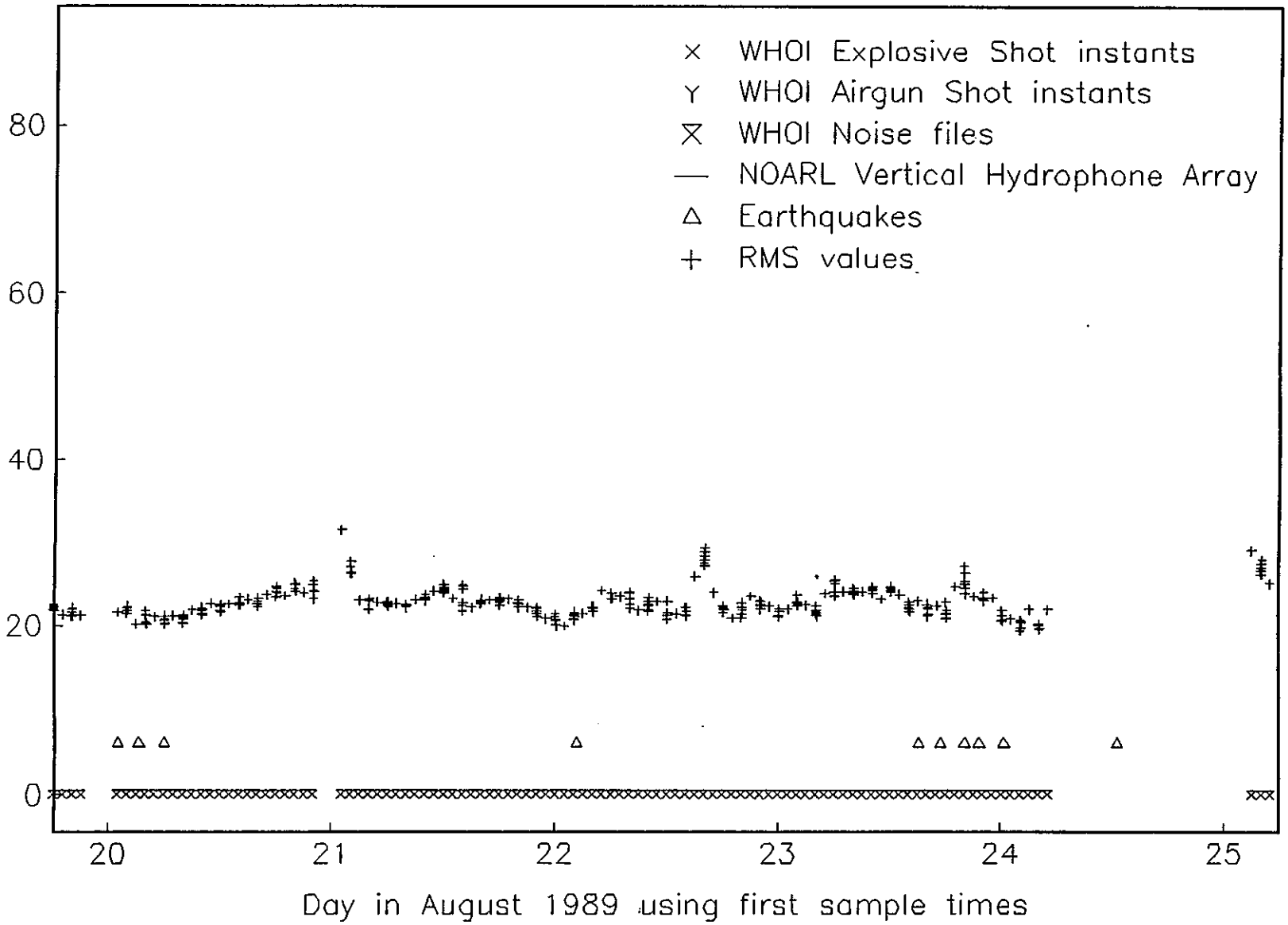


Figure 3d. RMS values are plotted versus time for a 5 day window.

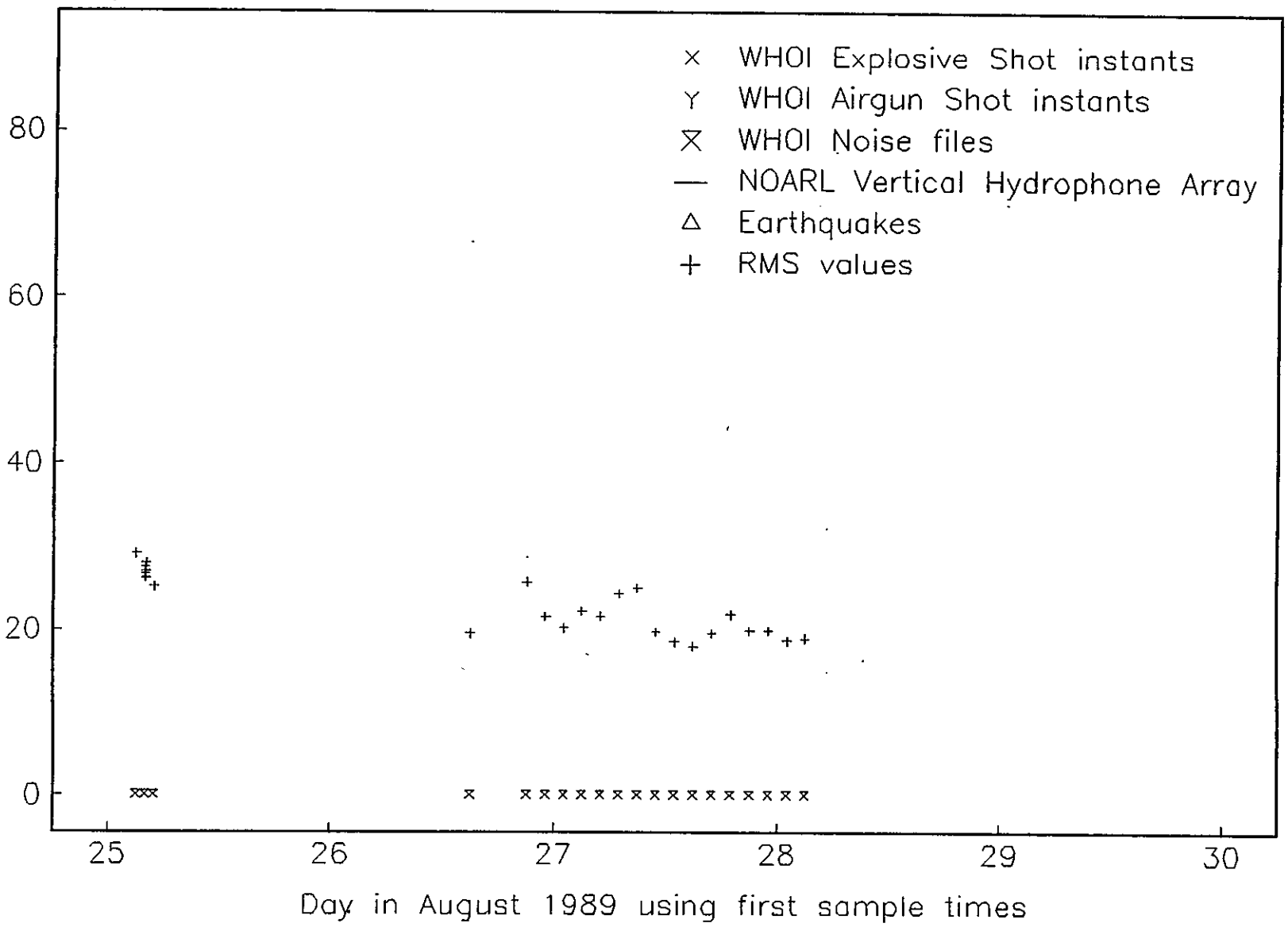
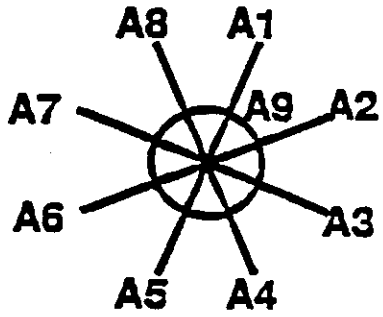


Figure 3e. RMS values are plotted versus time for a 5 day window.

SHOOTING PATTERNS

AIRGUN LINES
25 KM RADIALS
10 KM CIRCLE

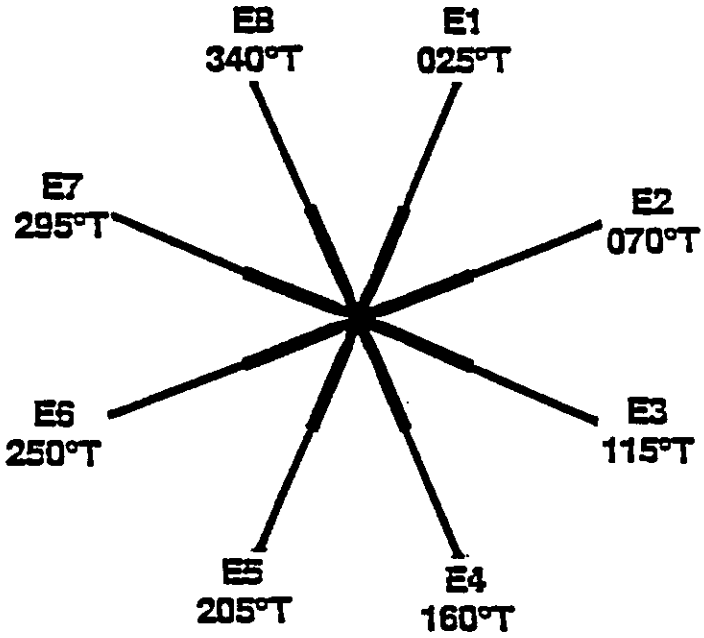
3 Airguns (1300 cu. in. total)
62 Meter Separation
254 dB Peak Output



EXPLOSIVE LINES
50 KM RADIALS

MK82 SUS
430 Meter Separation
274 dB Peak Output

MO39 (40 lb)
1080 Meter Separation
283 dB Peak Output



NOTE:
PATTERNS CENTERED ON BOREHOLE (28° 20.6'N, 75° 22.9'W)

Figure 4. The planned shooting pattern for LFASE is shown here. WHOI was only able to record a part of this shooting plan. (From LSAP Test Plan, APL)

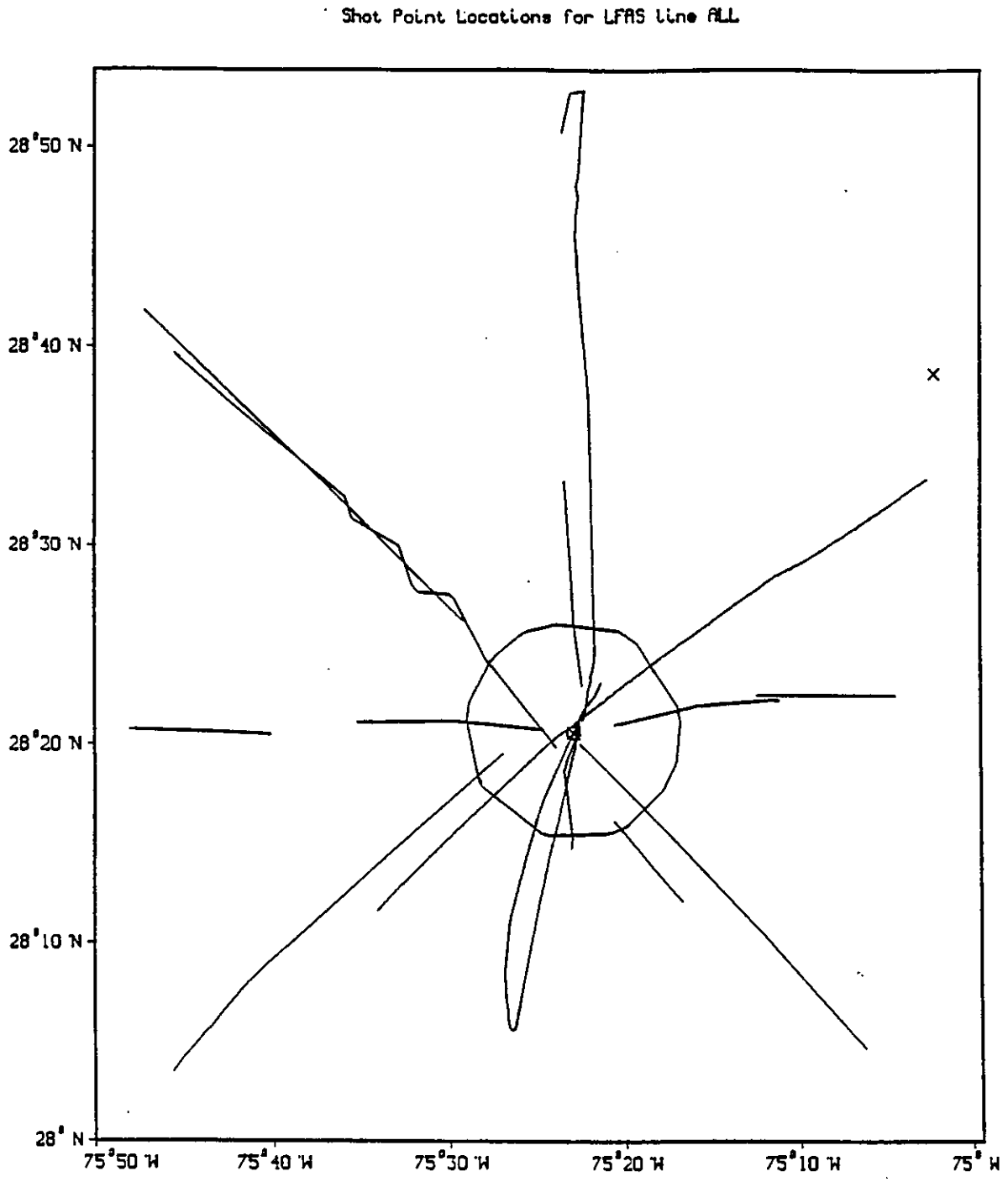


Figure 5. The actual lines for which WHOI recorded data are shown for both airgun and explosive sources.

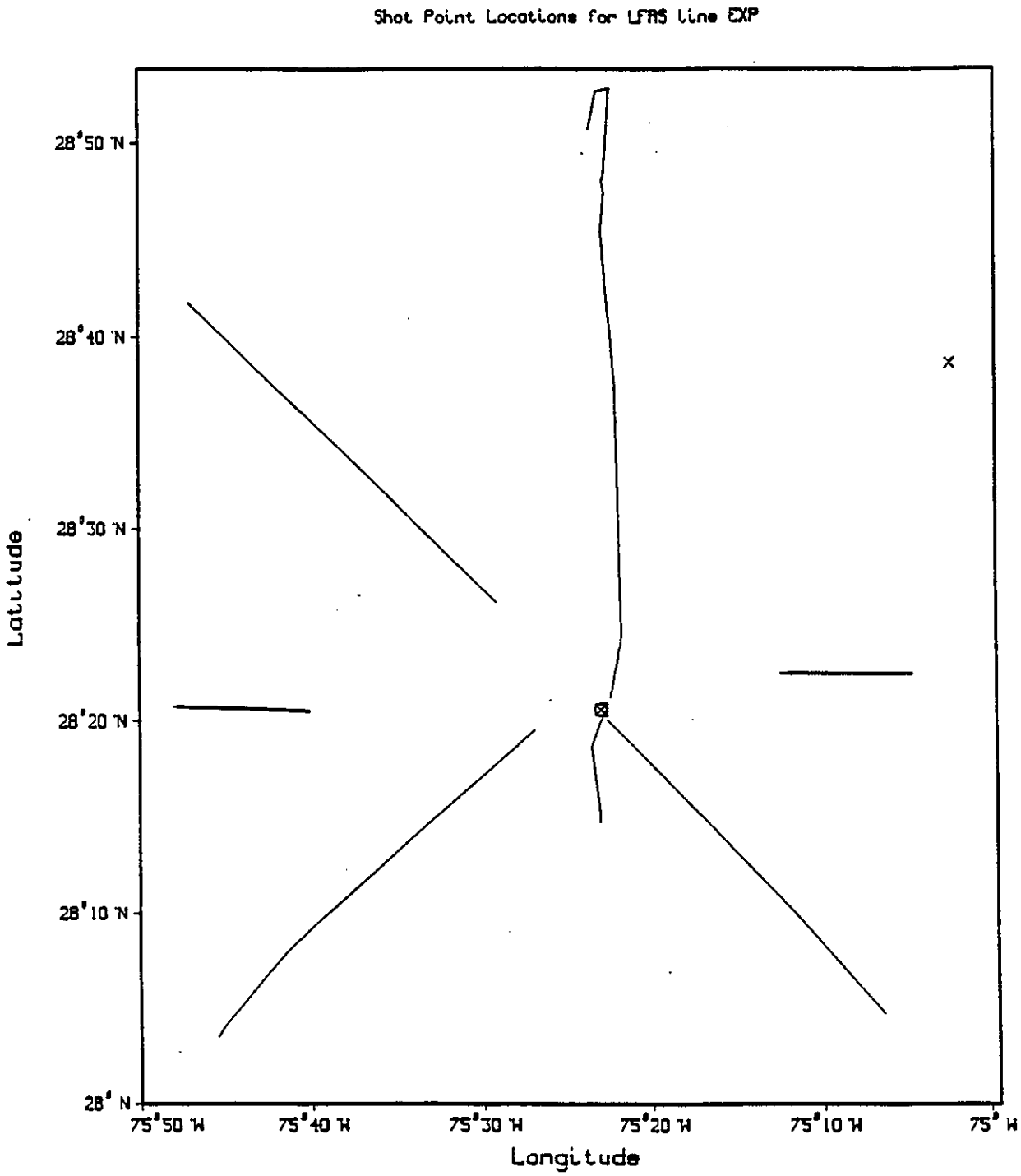


Figure 6. The explosive shot locations are shown for each line relative to all of the explosive data recorded.

Figure 6a. All of the explosive shots are shown with all shot points connected.

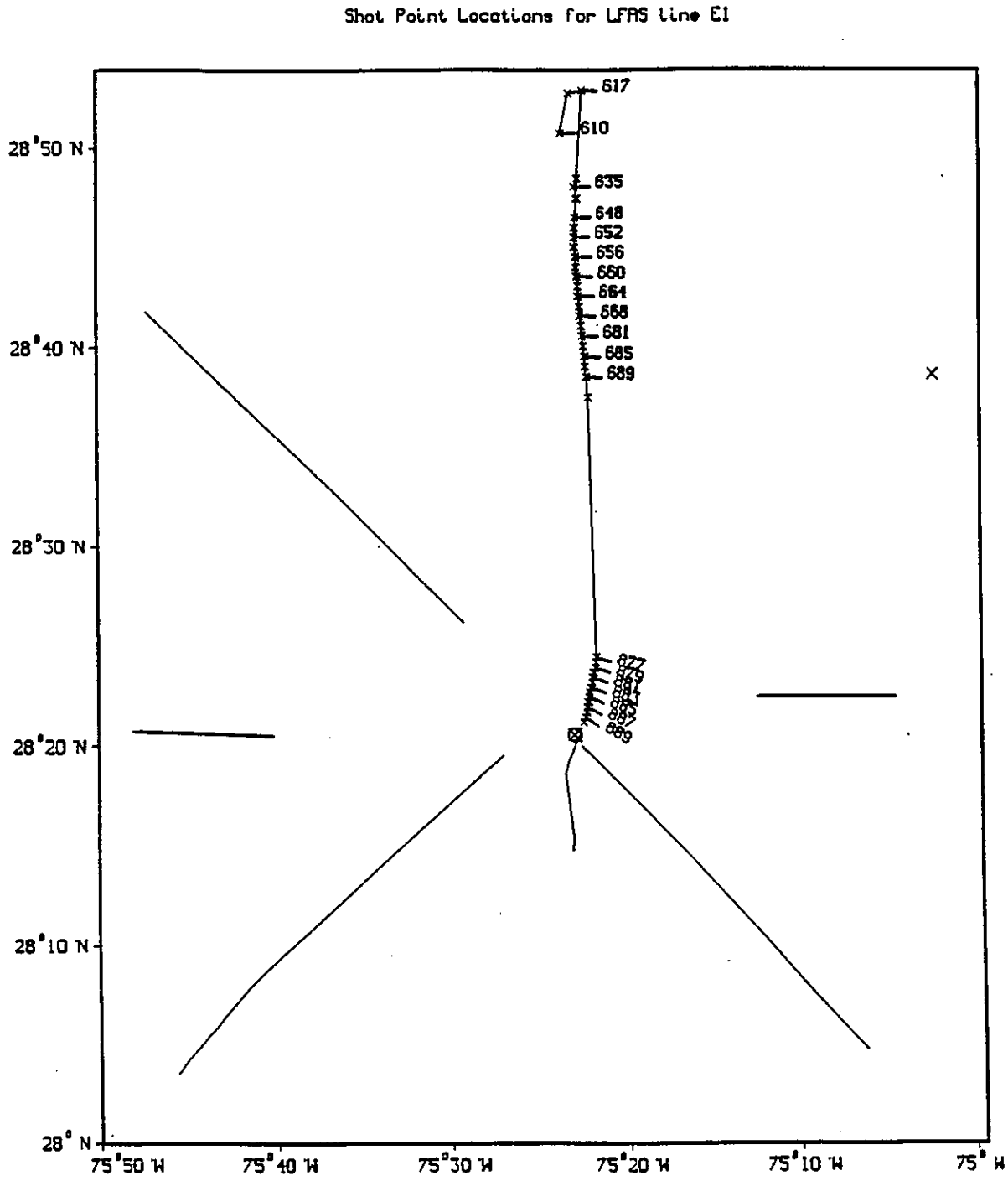


Figure 6b. All shots for line E1 are plotted and every other shot is annotated.

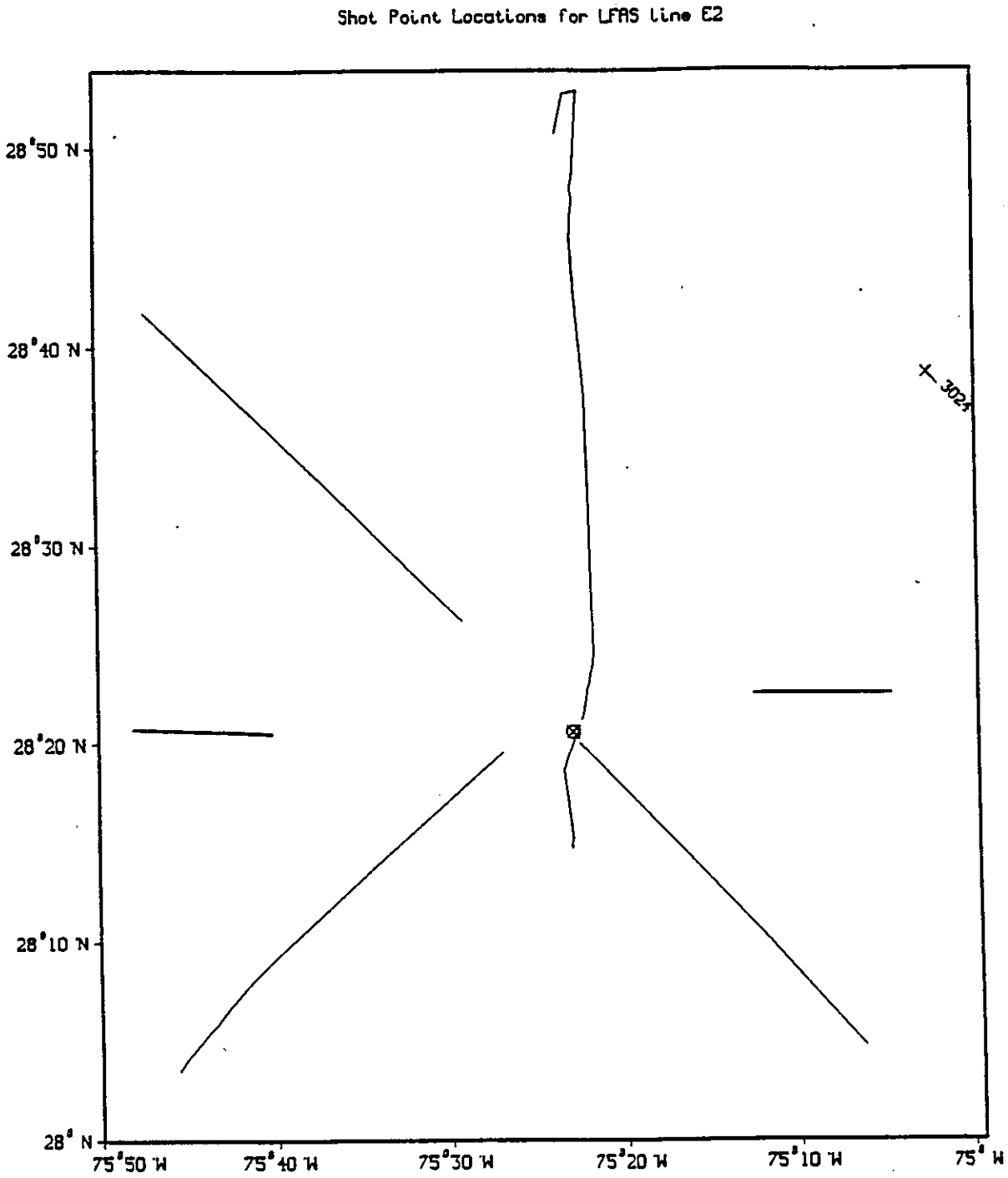


Figure 6c. For line E2 only one shot is shown using an X.

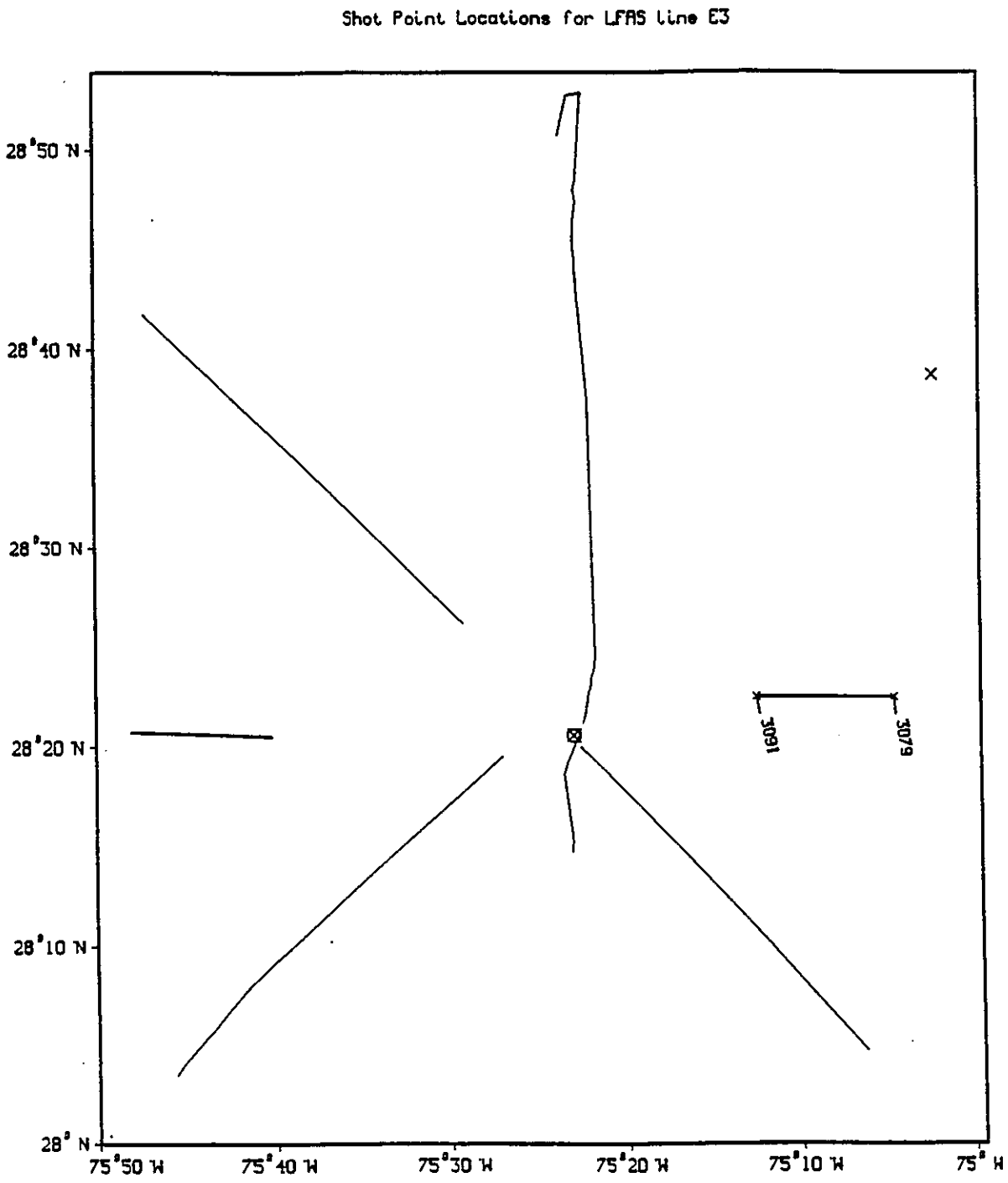


Figure 6d. For line E3 only two shots are shown.

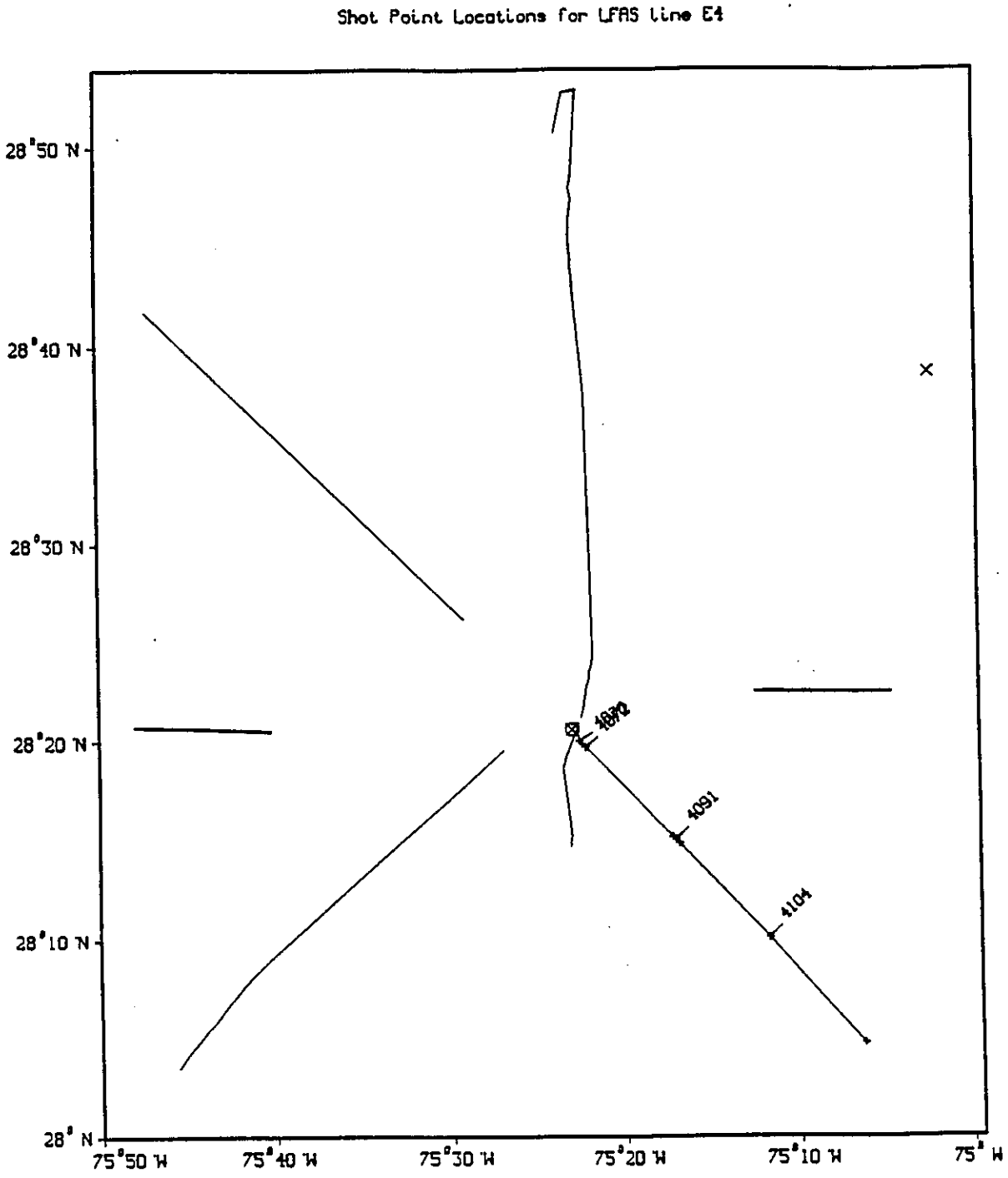


Figure 6e. For line E4 all shots are plotted and annotated.

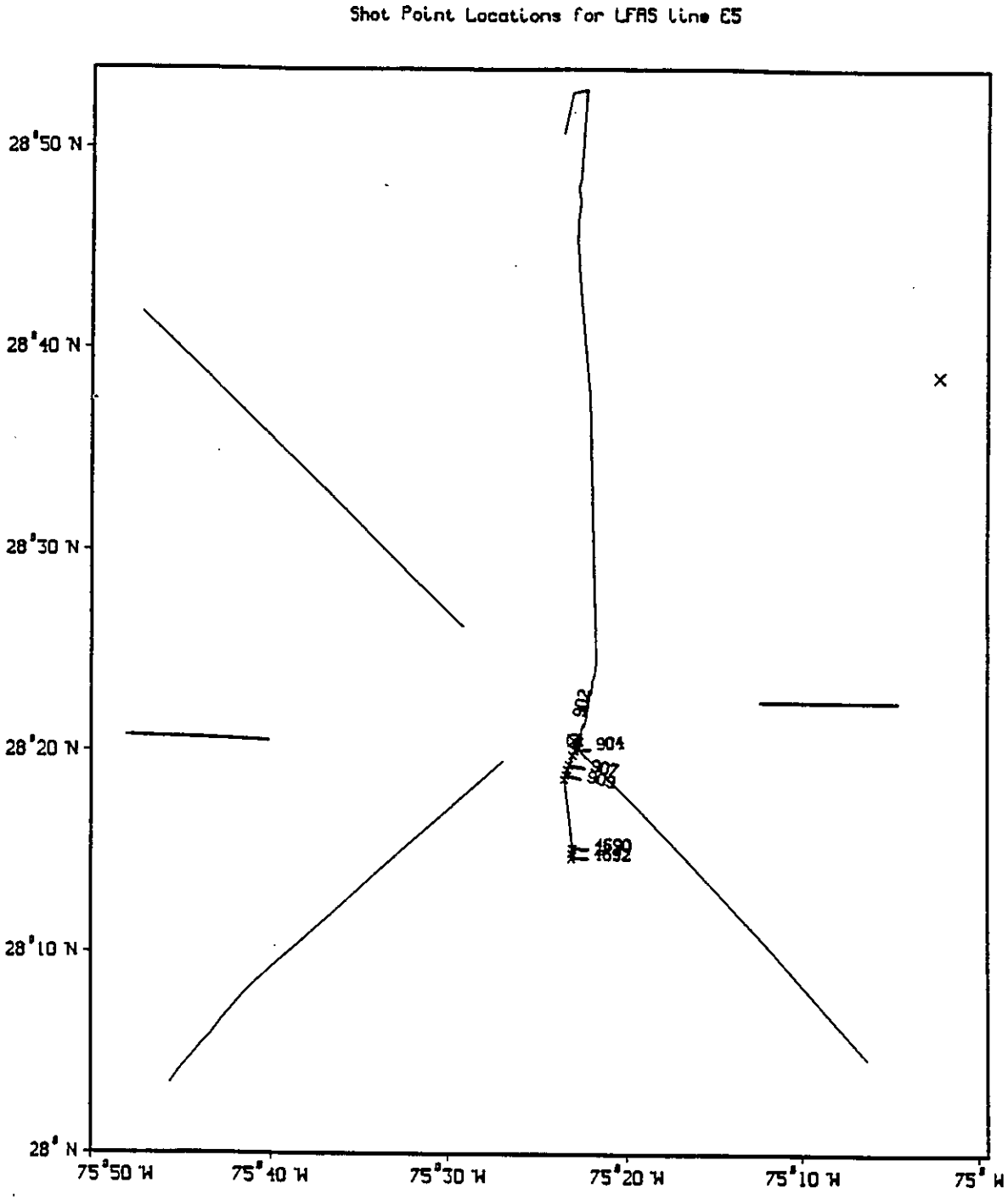


Figure 6f. For line E5 all shots are plotted and every other shot is annotated.

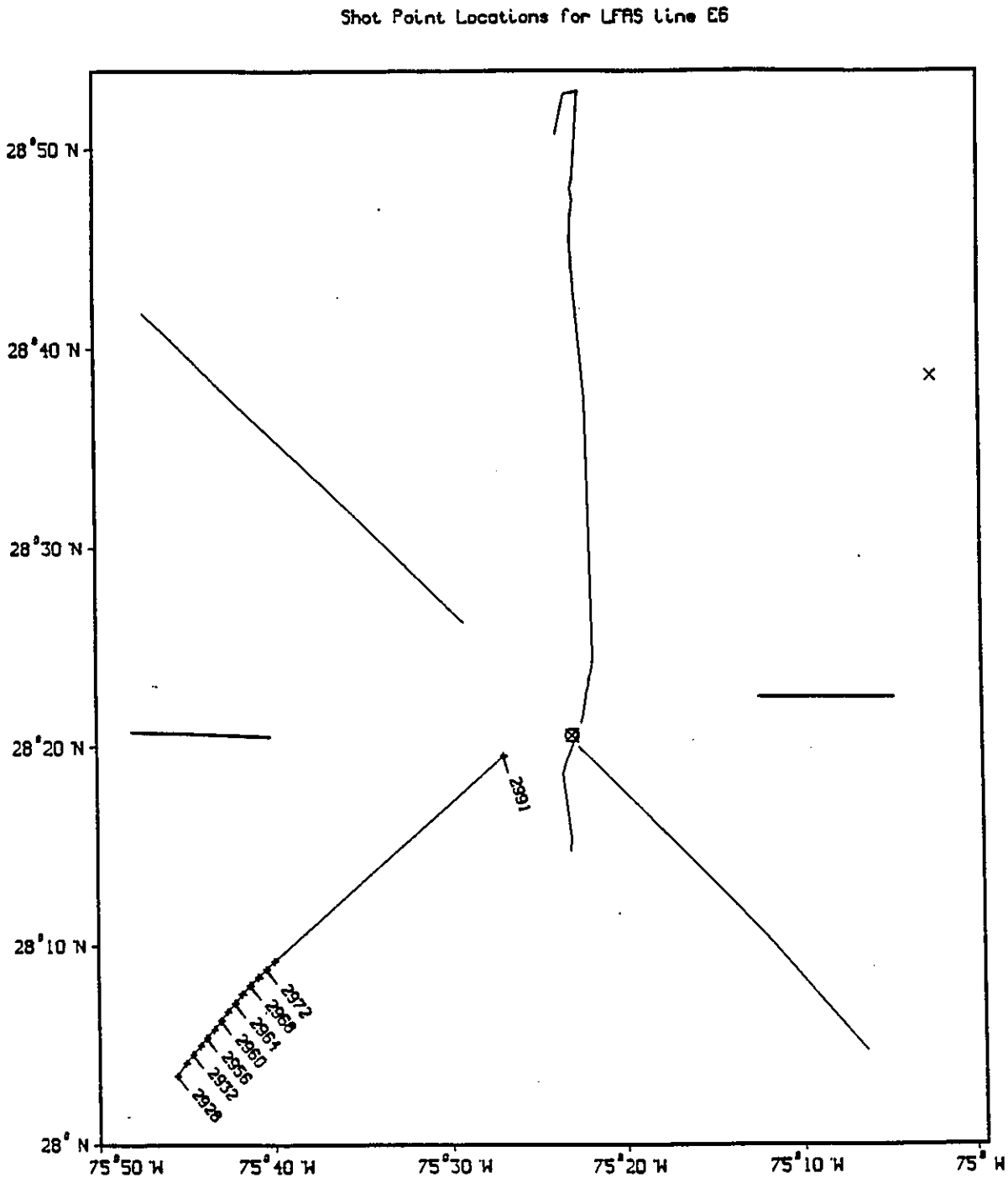


Figure 6g. For line E6 all shots are plotted and annotated.

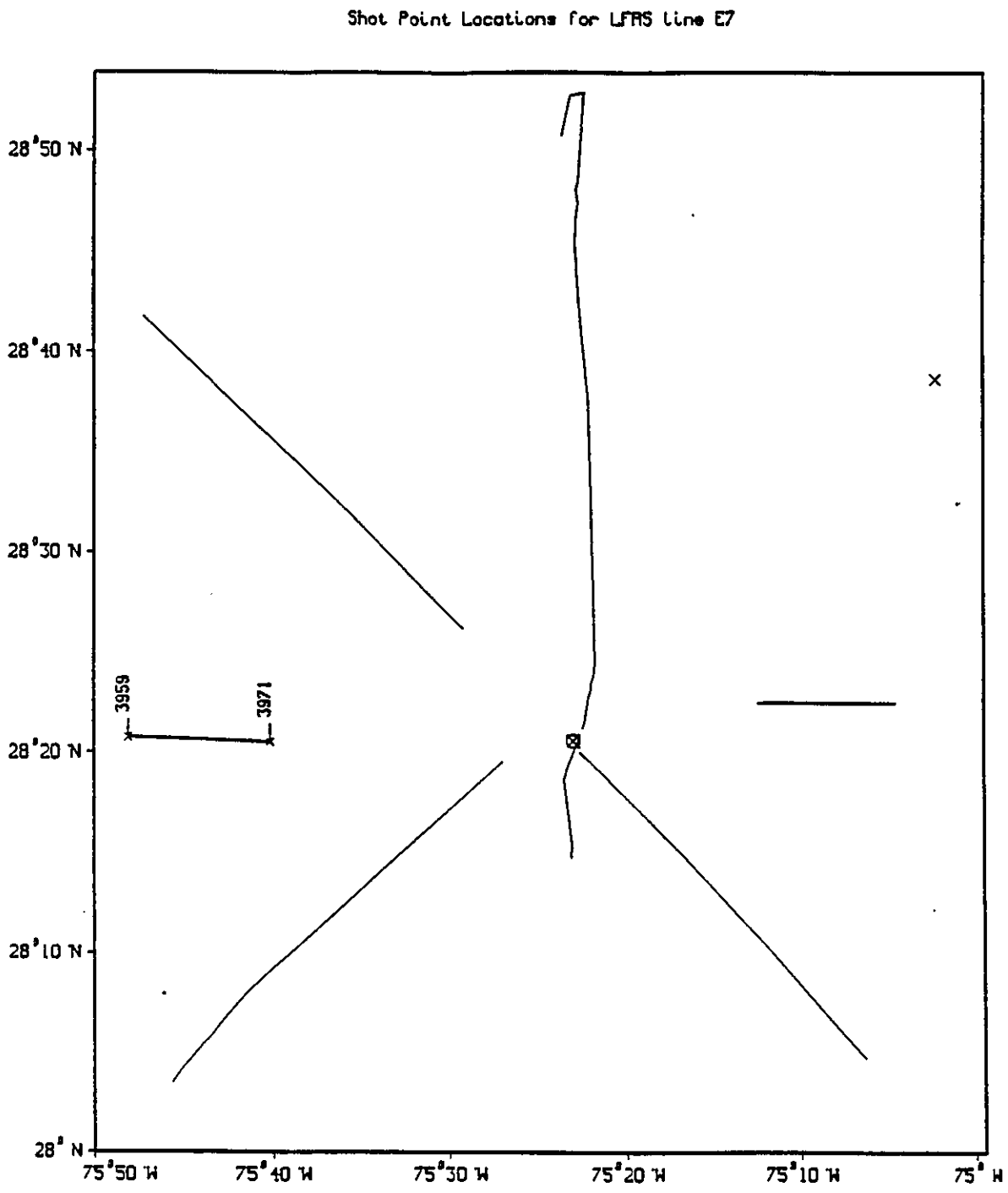


Figure 6h. For line E7 only two shots are shown.

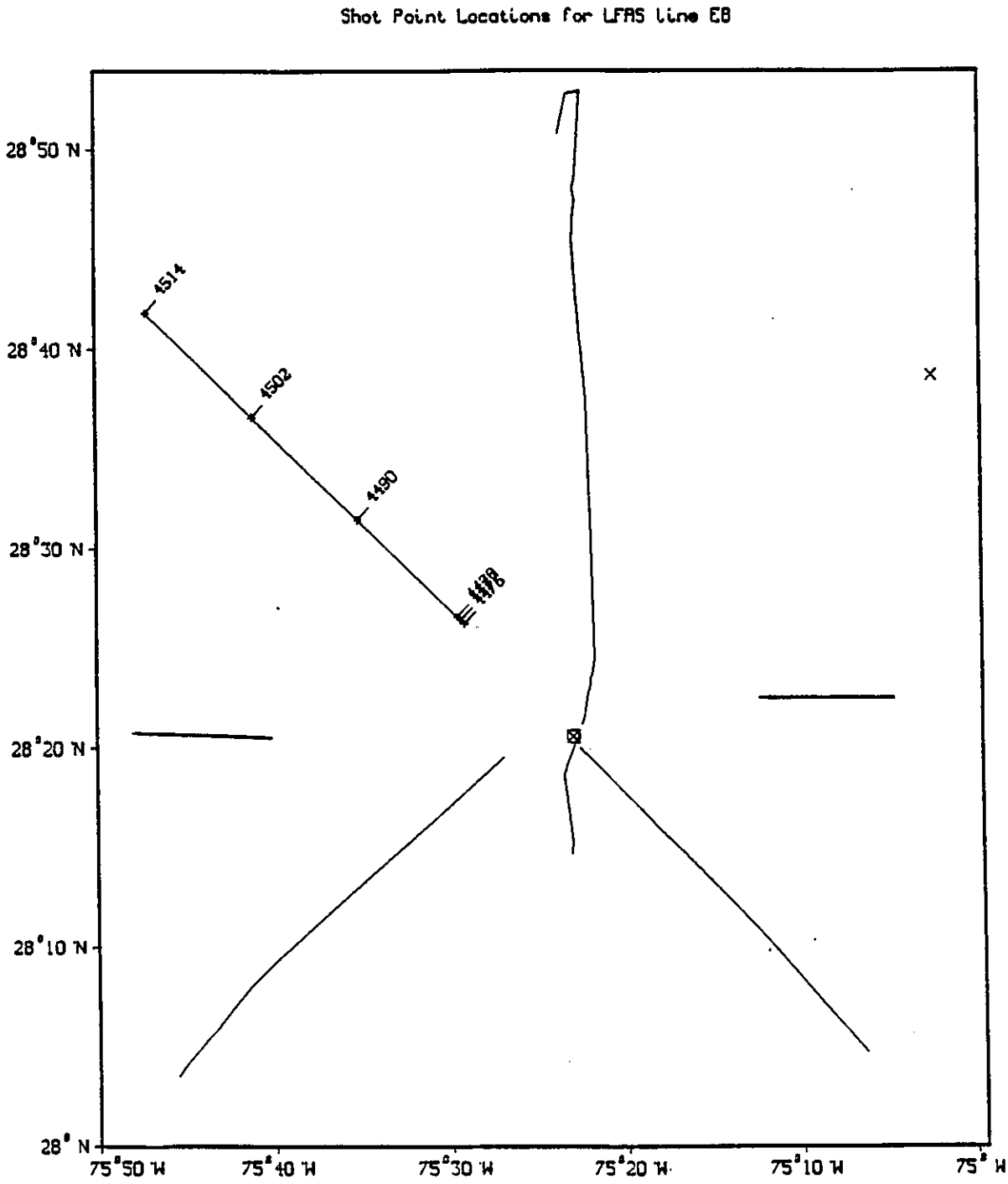


Figure 6i. For line E8 all shots are plotted and annotated.

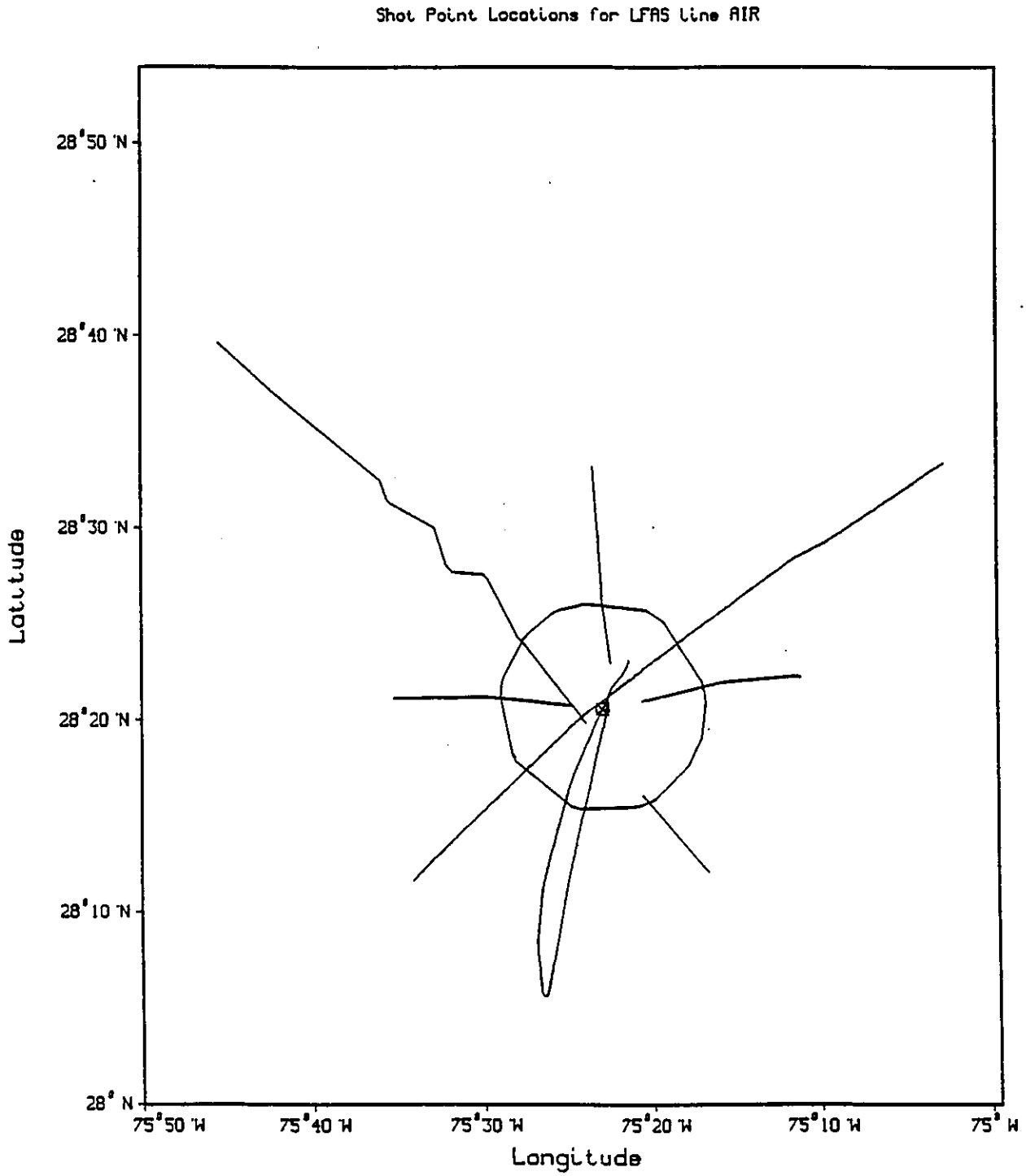


Figure 7. The airgun shot locations are shown for each line relative to all of the airgun data recorded.

Figure 7a. All shot points are connected for each airgun line.

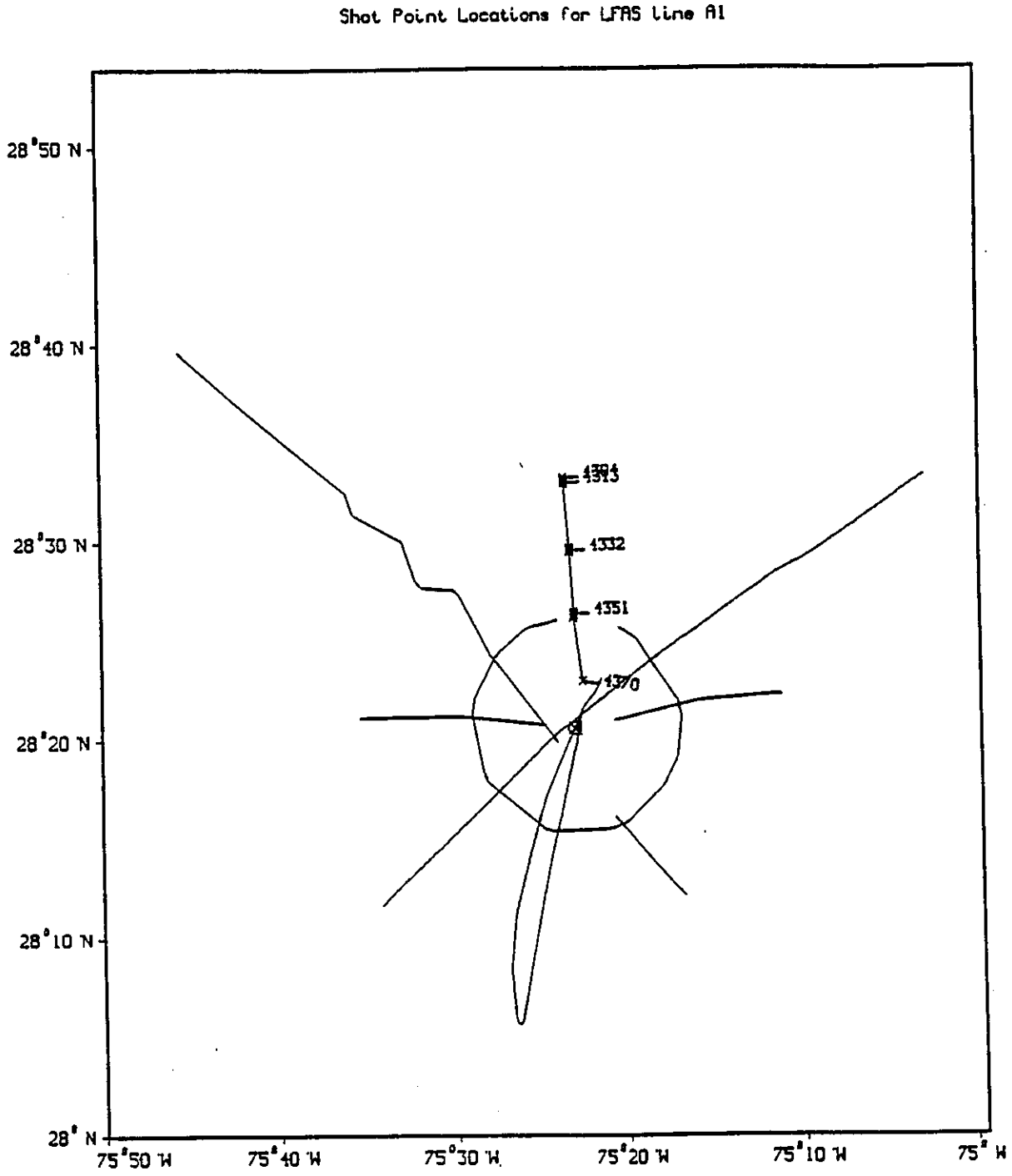


Figure 7b. For line A1 all shots are plotted but only every ninth shot is annotated.

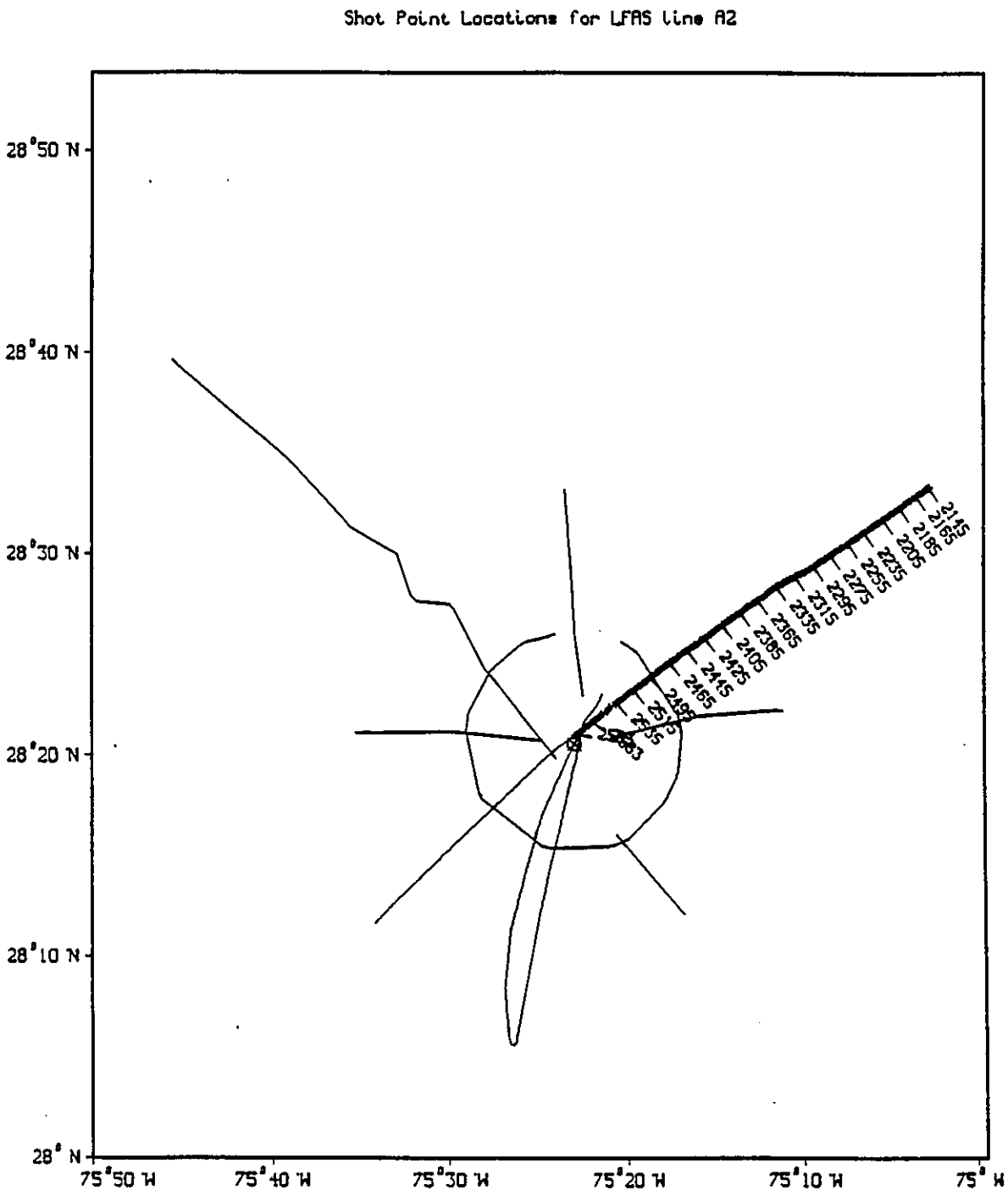


Figure 7c. For line A2 every fifth shot is plotted and every twentieth shot is annotated.

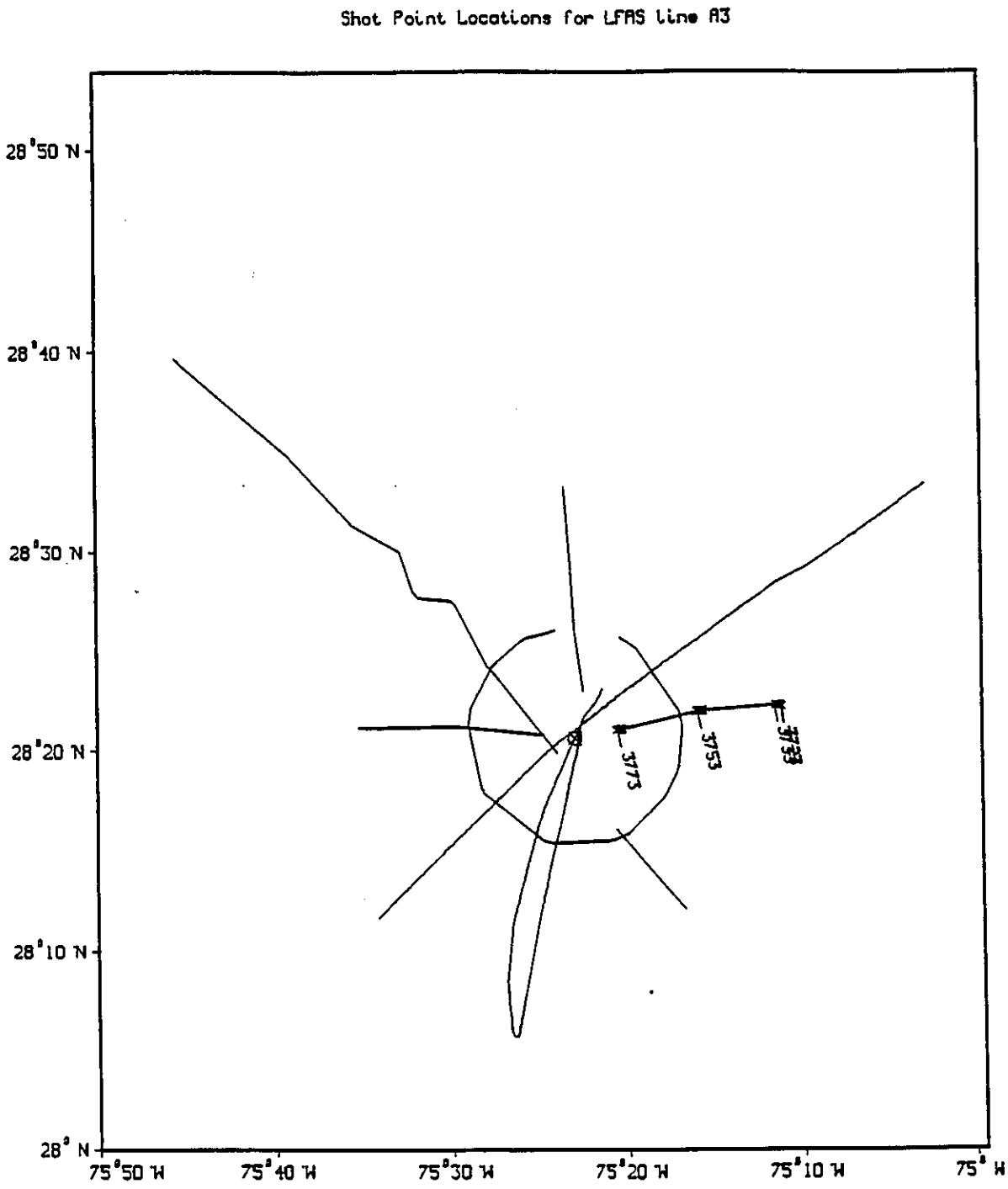


Figure 7d. For line A3 all shots are plotted and every tenth shot is annotated.

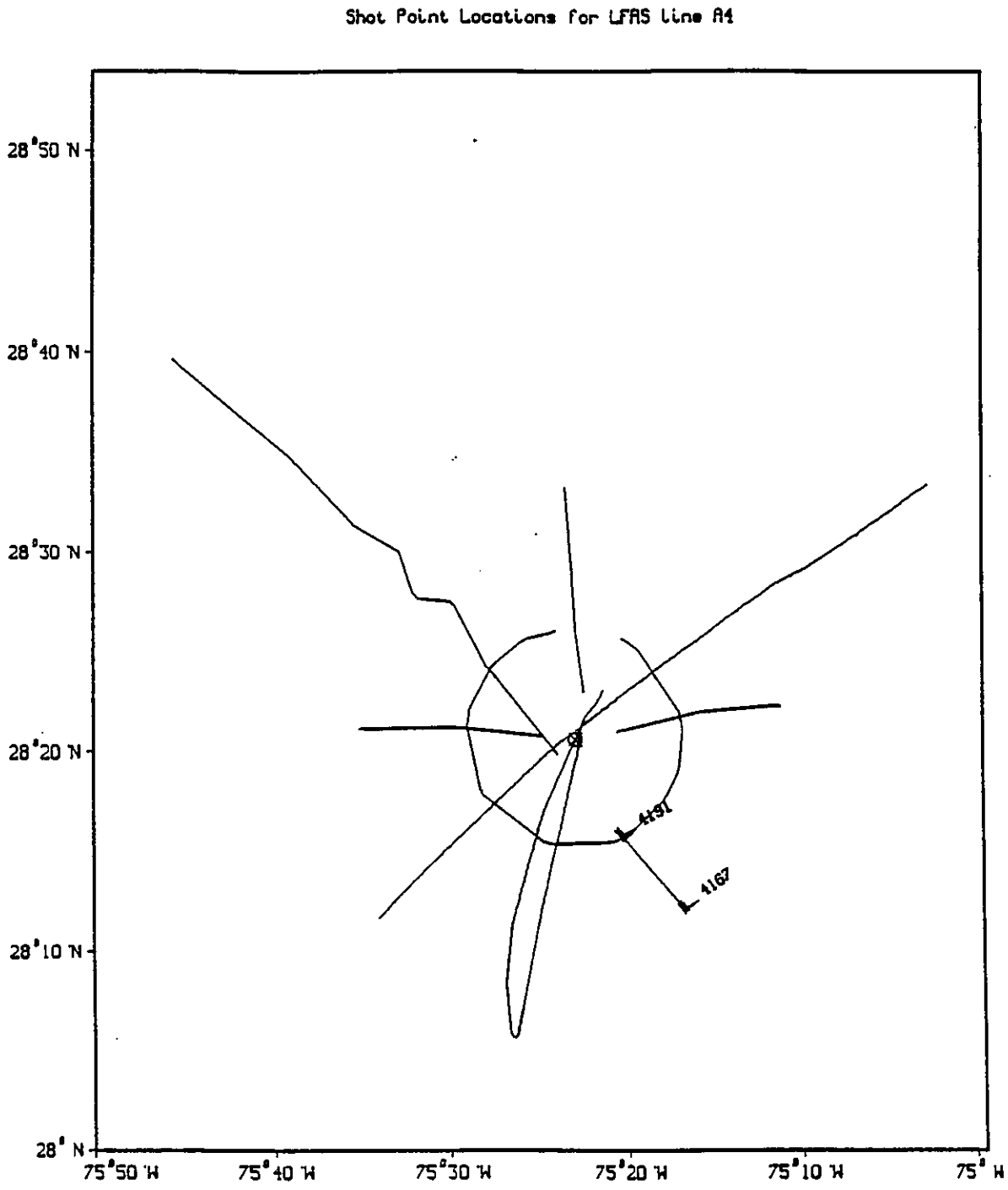


Figure 7e. For line A4 all shots are plotted and every fourteenth shot is annotated.

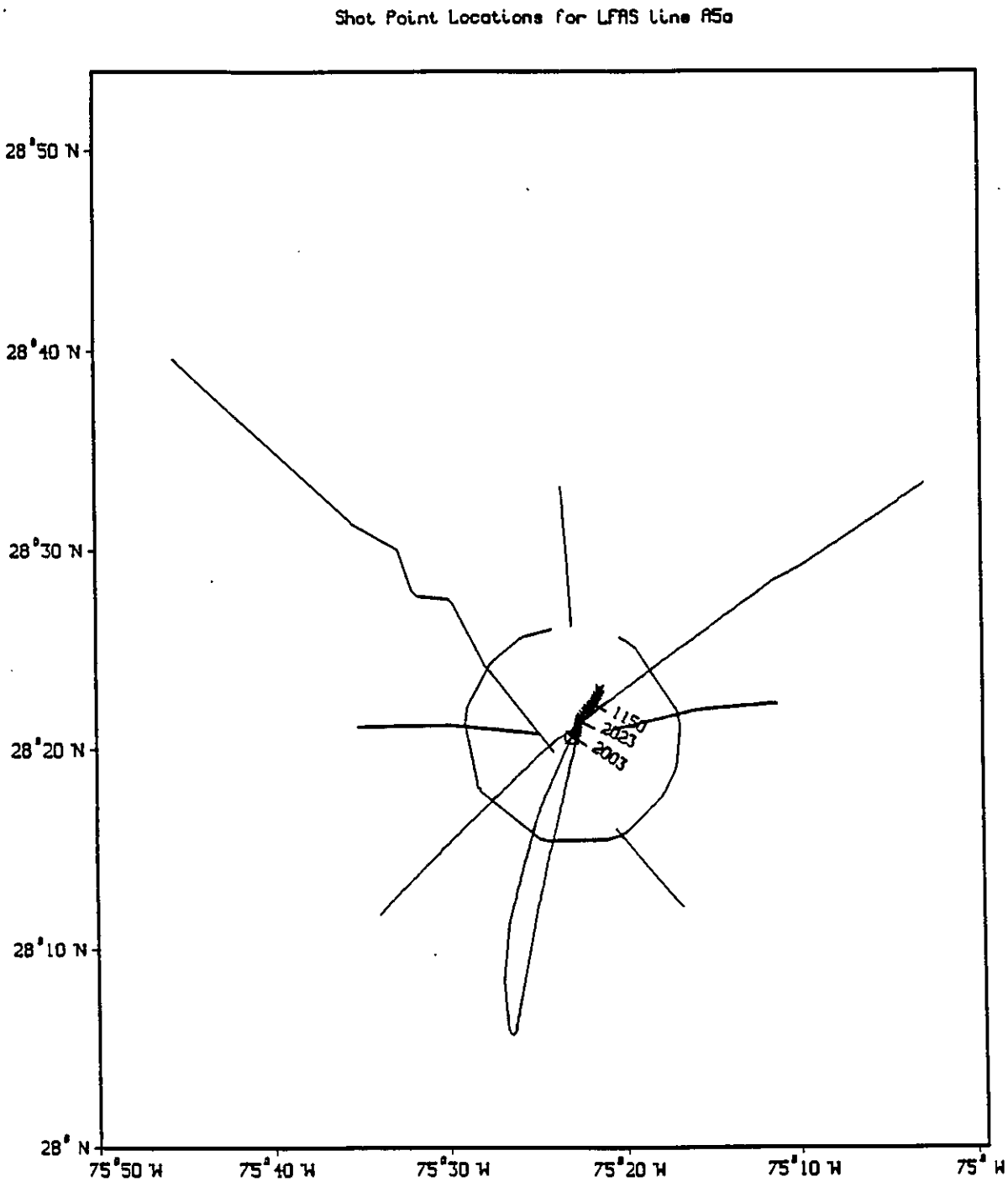


Figure 7f. For line A5A all shots are plotted and every twentieth shot is annotated.

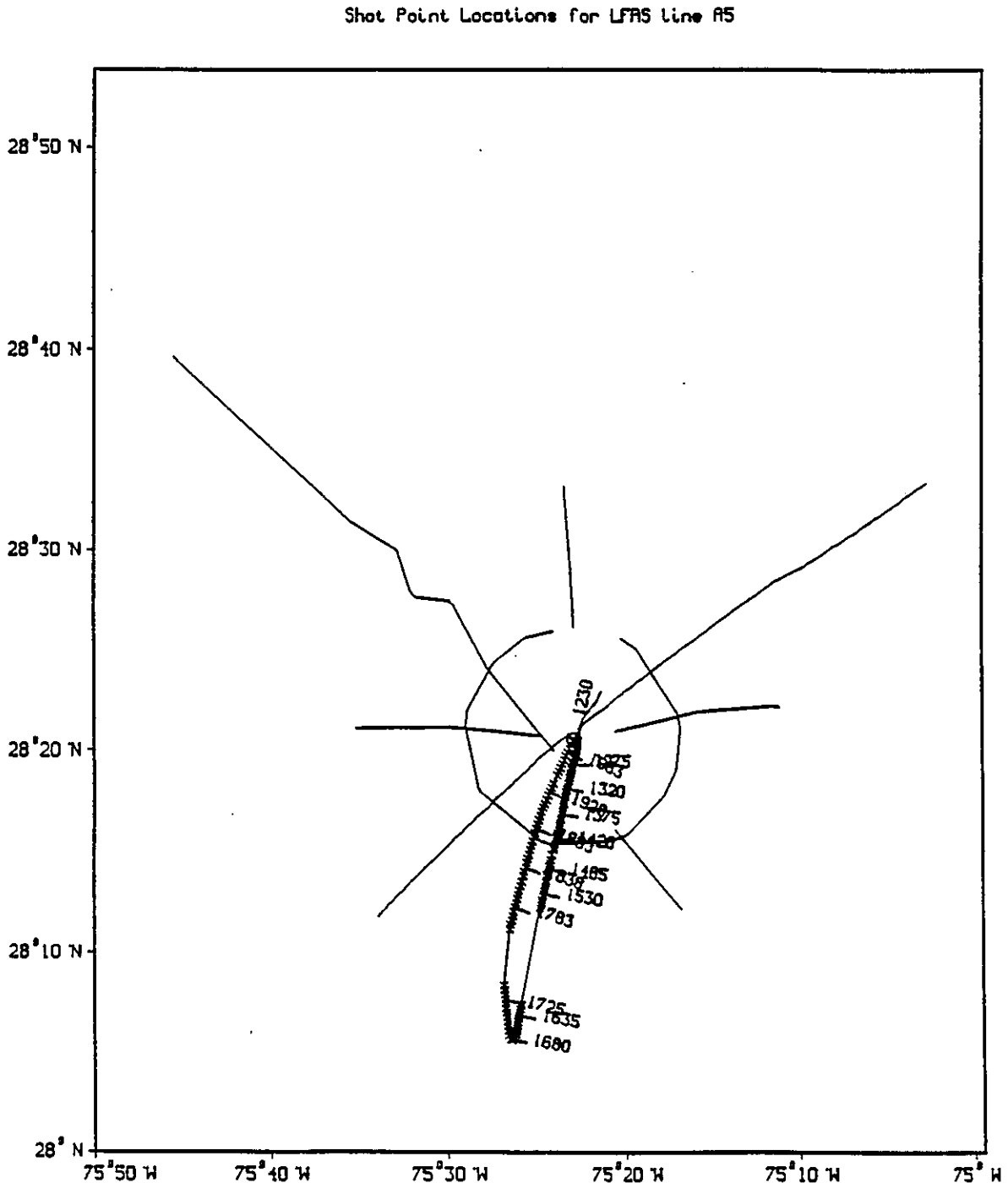


Figure 7g. For line A5 all shots are plotted and every forty fifth shot is annotated.

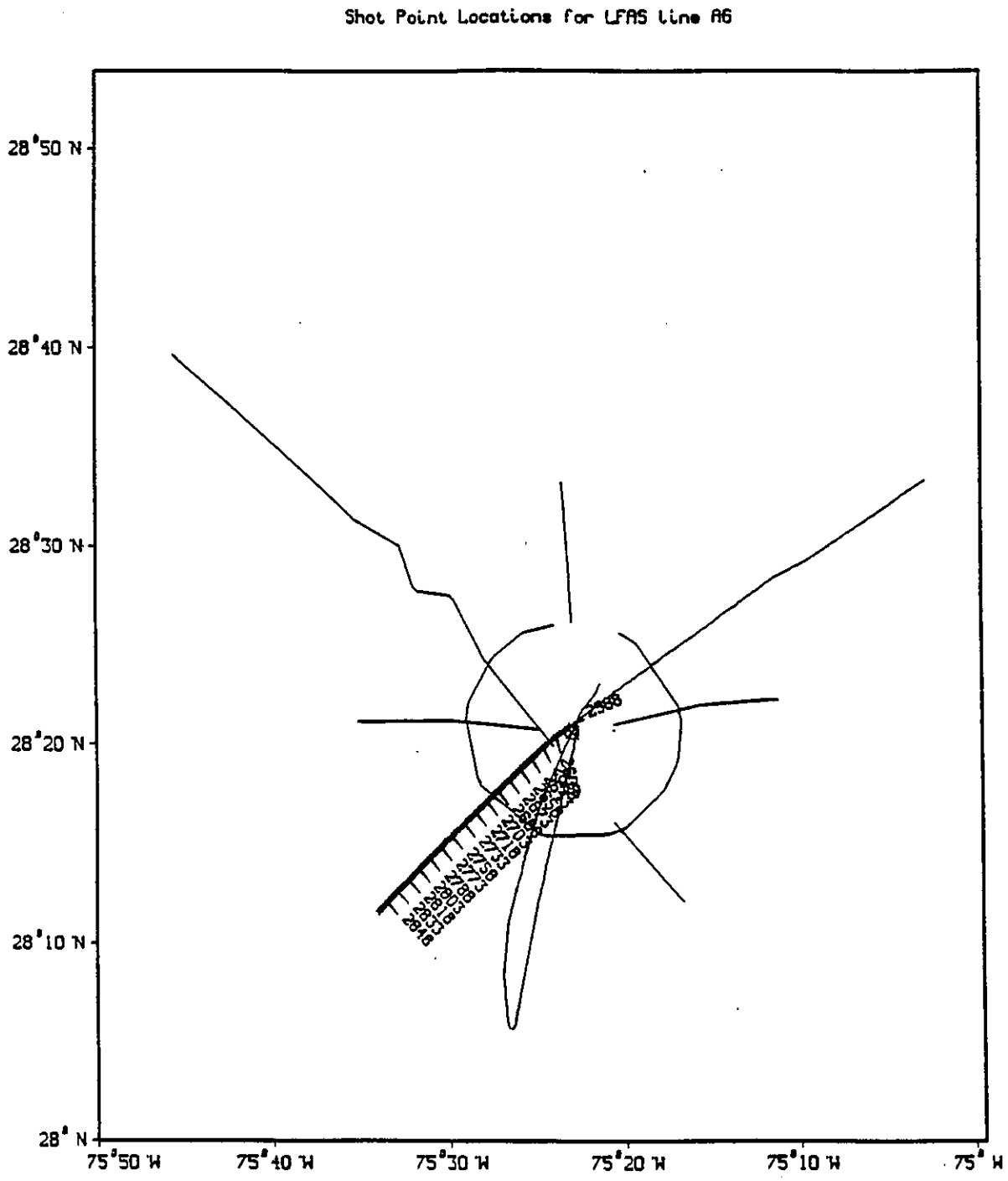


Figure 7h. For line A6 all shots are plotted and every fifteenth shot is annotated.

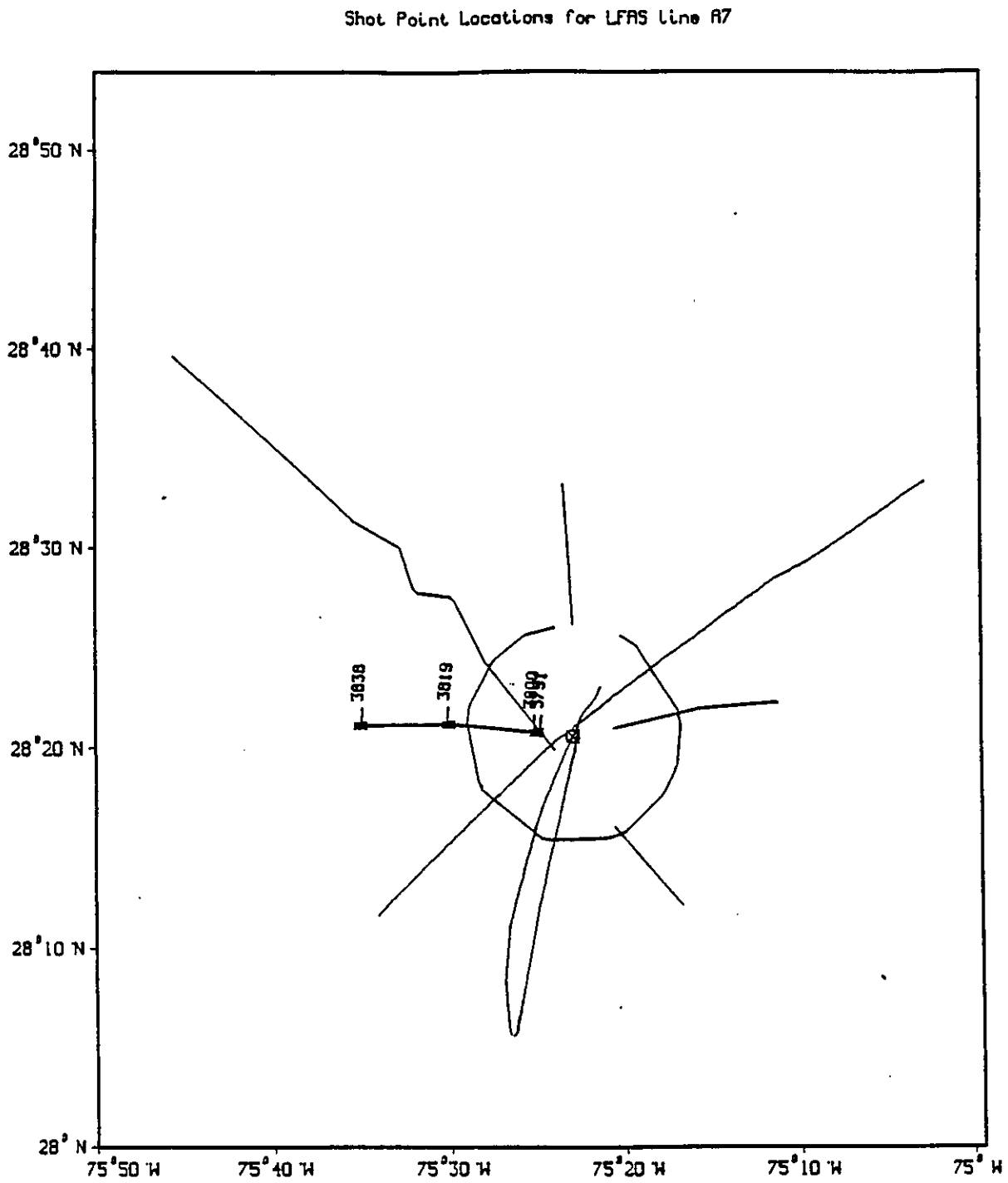


Figure 7i. For line A7 all shots are plotted and every nineth shot annotated.

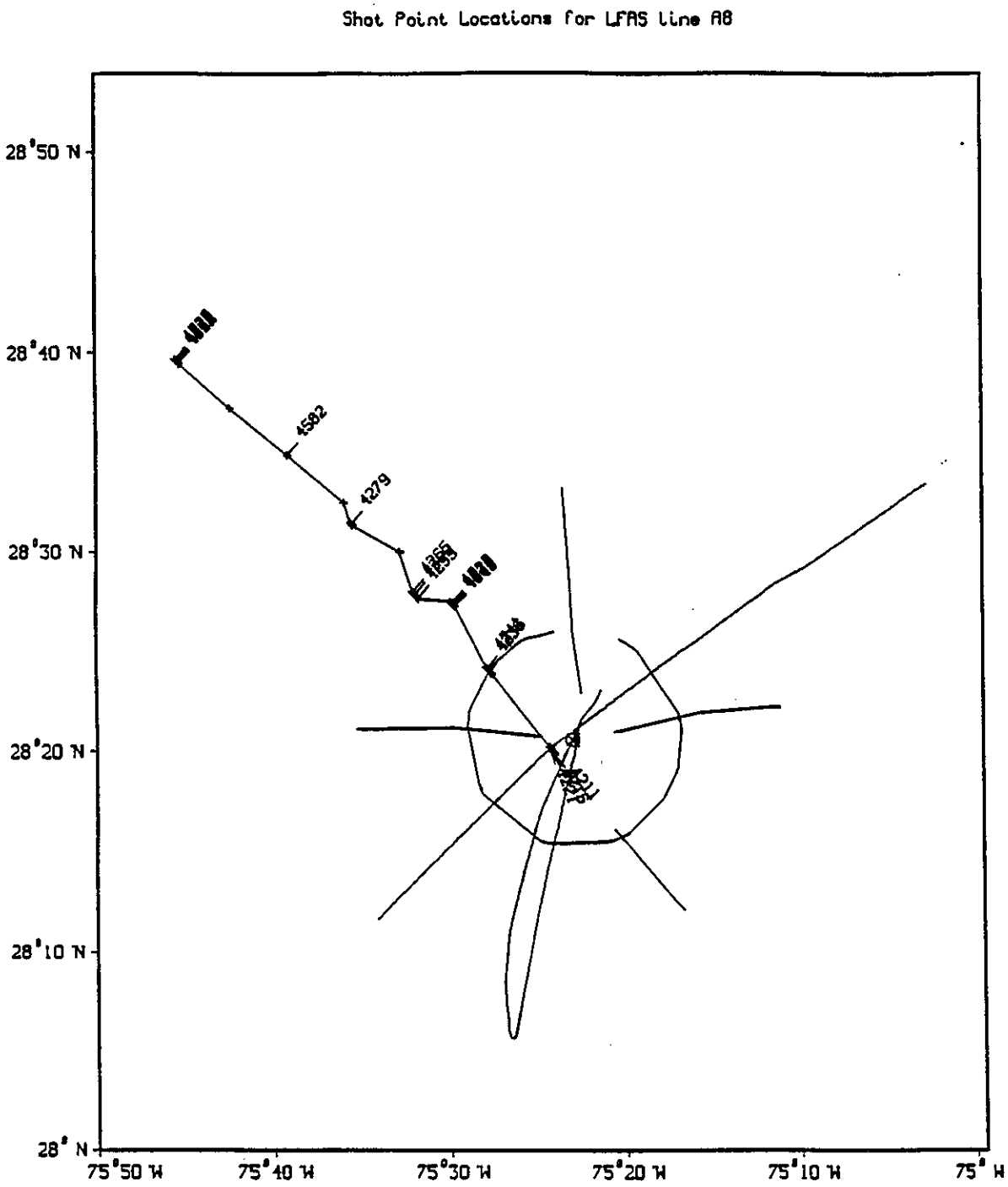


Figure 7j. For line A8 all shots are plotted and every fifth shot is annotated.

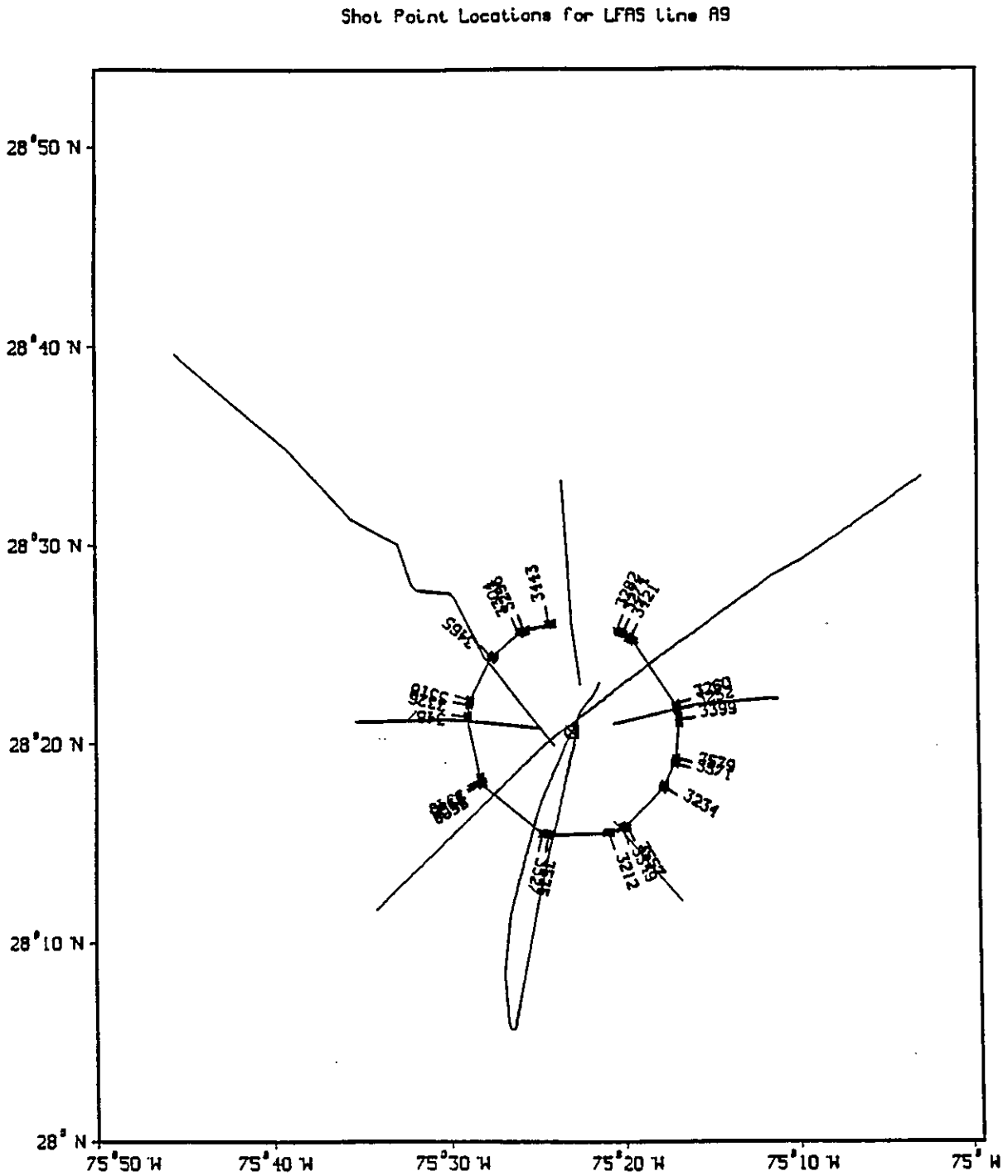


Figure 7k. For line A9, the 10 kilometer circle, all shots are plotted and every eigth shot is annotated.

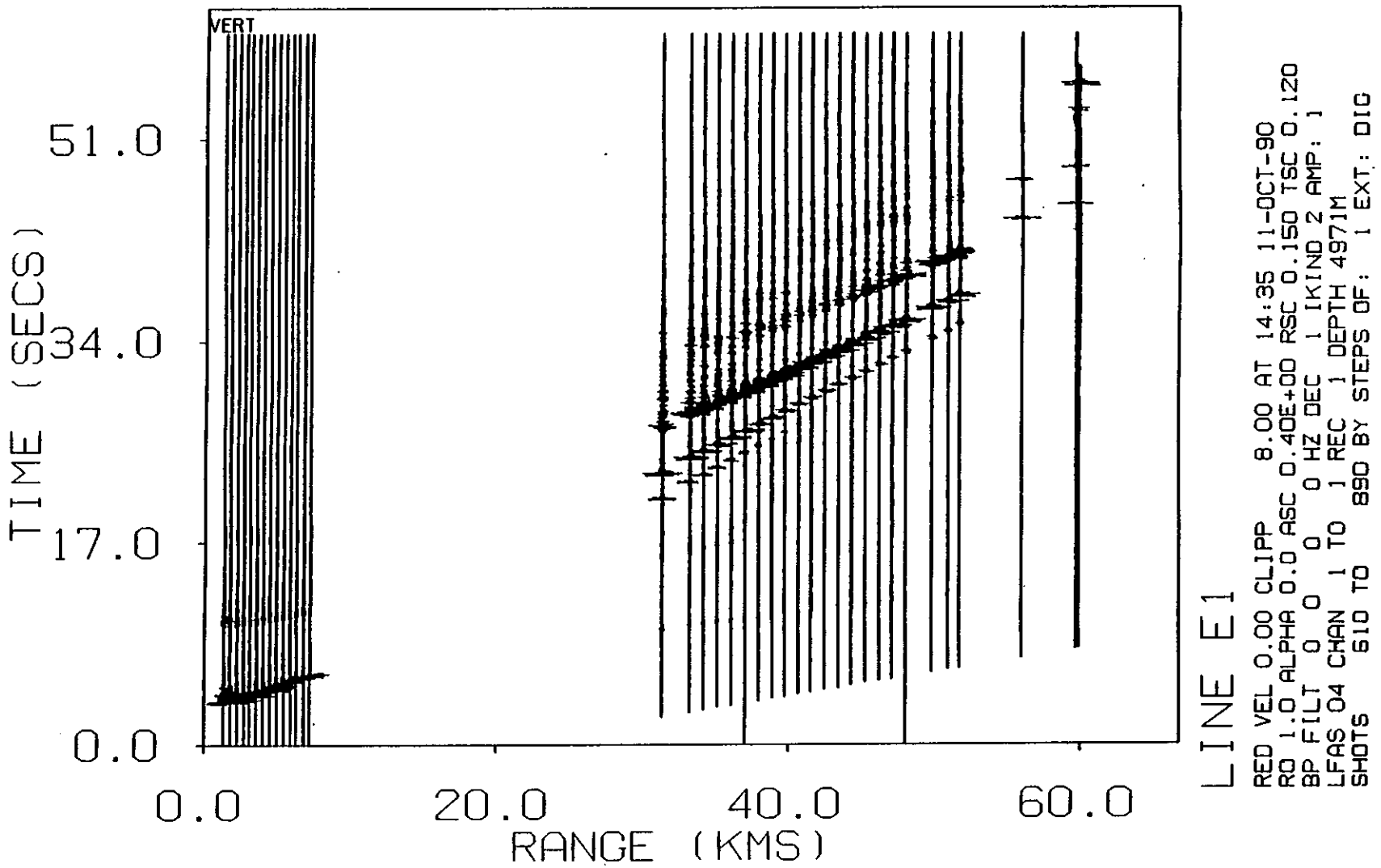


Figure 8. Seismograms for the 10 meter deep vertical component for explosive lines are plotted using equal maximum amplitude scaling.

Figure 8a. Line E1 is plotted versus range from the borehole for all shots.

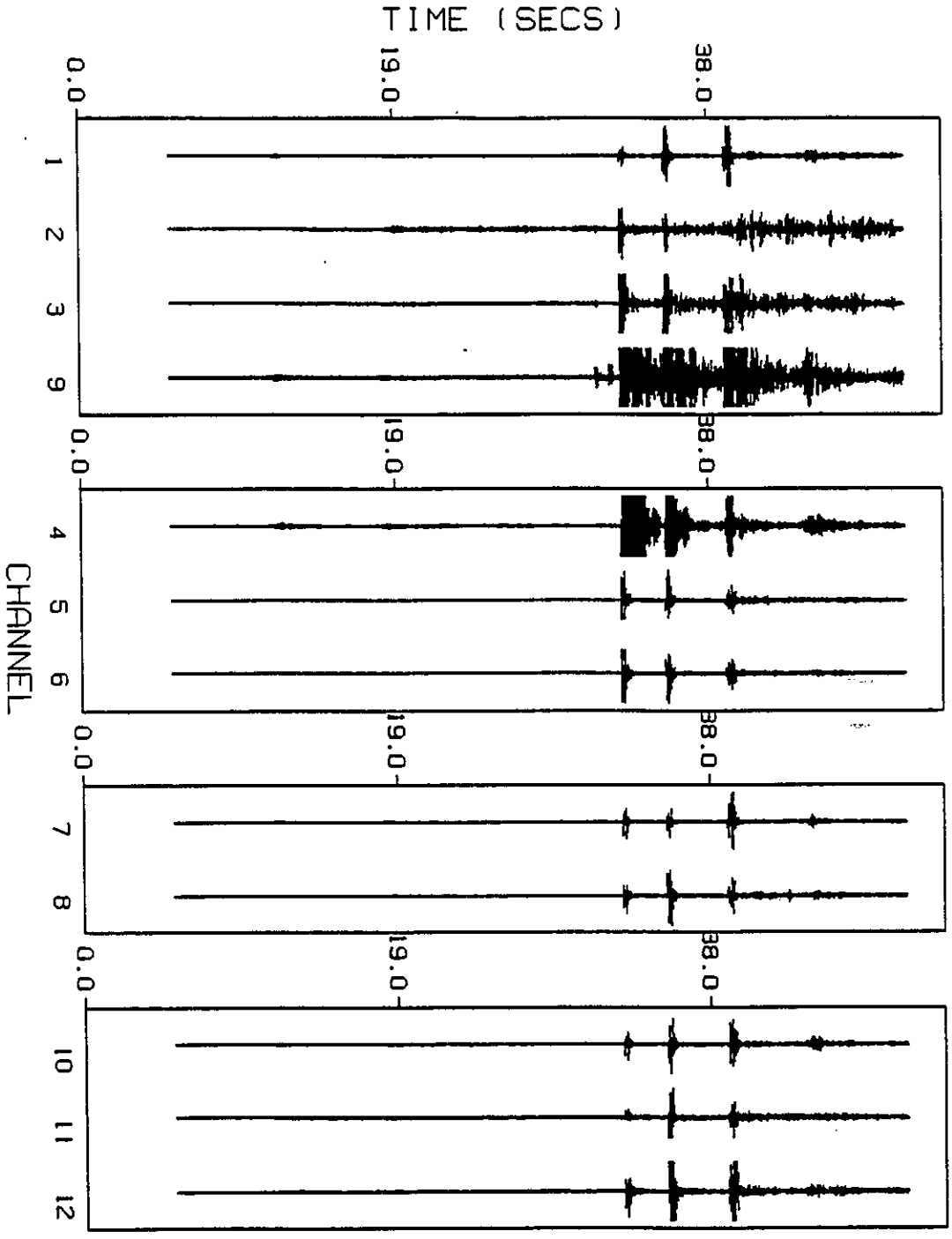


Figure 8b. Line E2 is plotted showing all 12 channels for the one shot recorded.

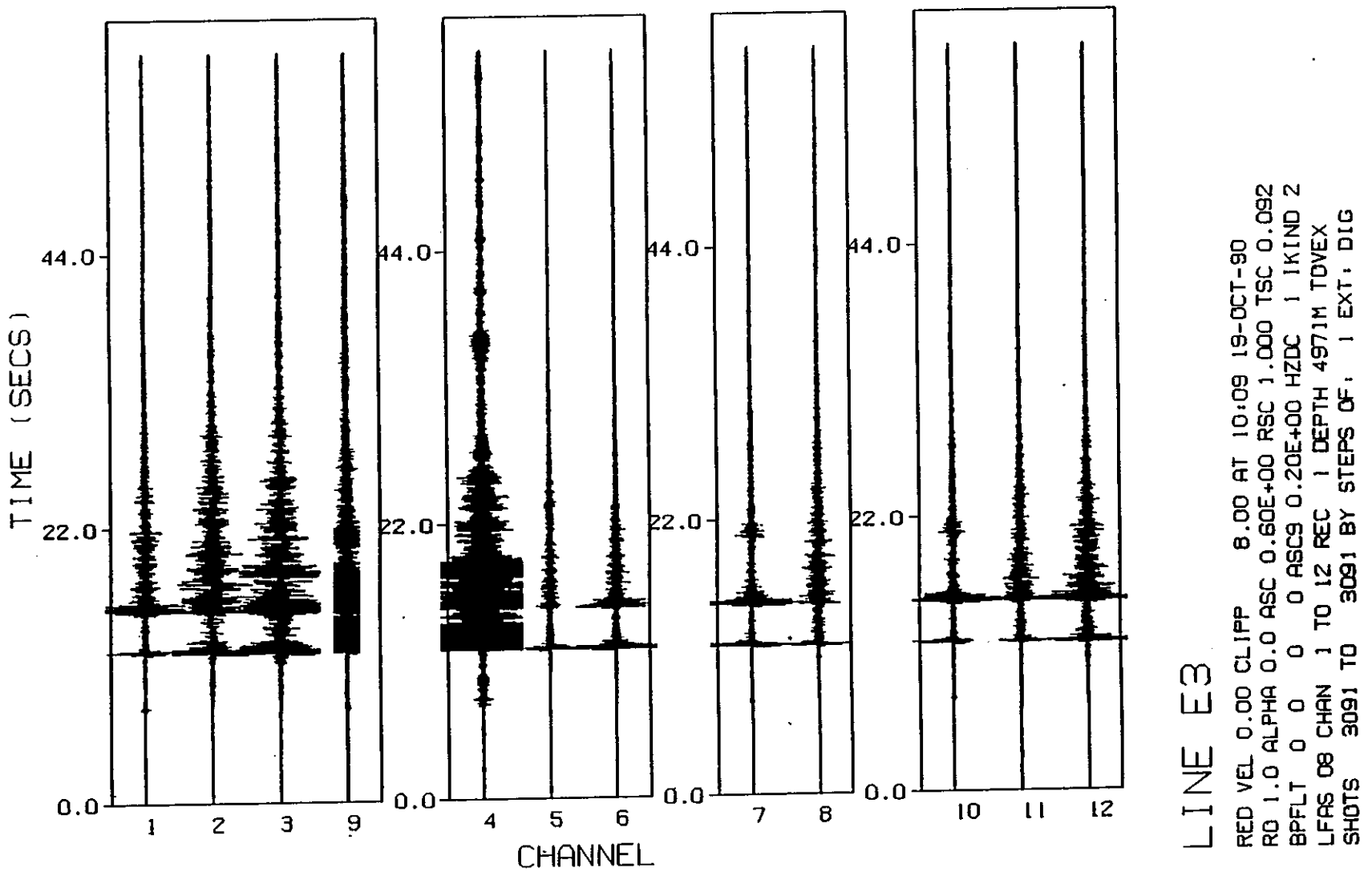


Figure 8c. Line E3 is plotted showing all 12 channels for the one good shot recorded.

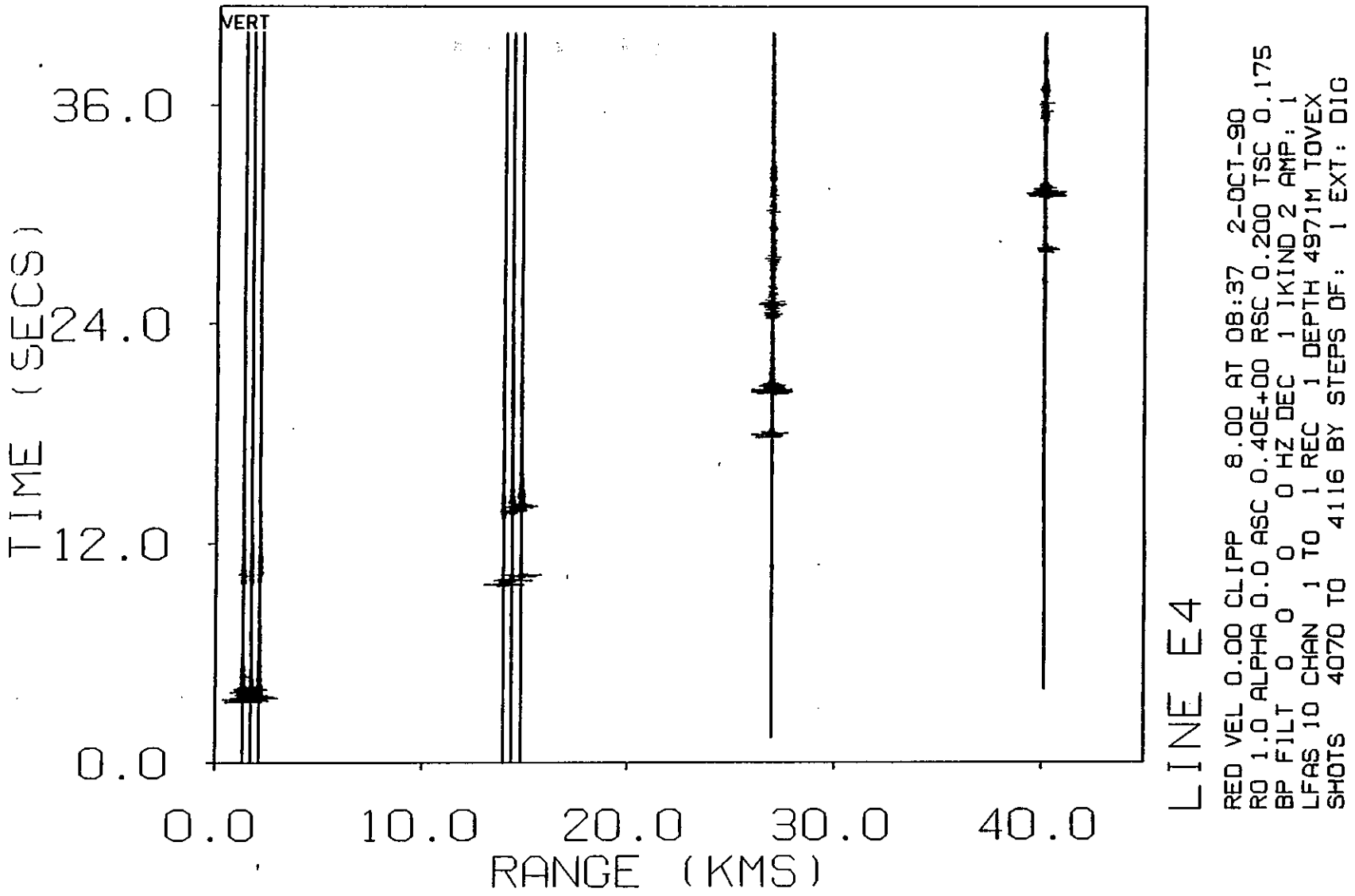


Figure 8d. Line E4 is plotted versus range from the borehole for all shots.

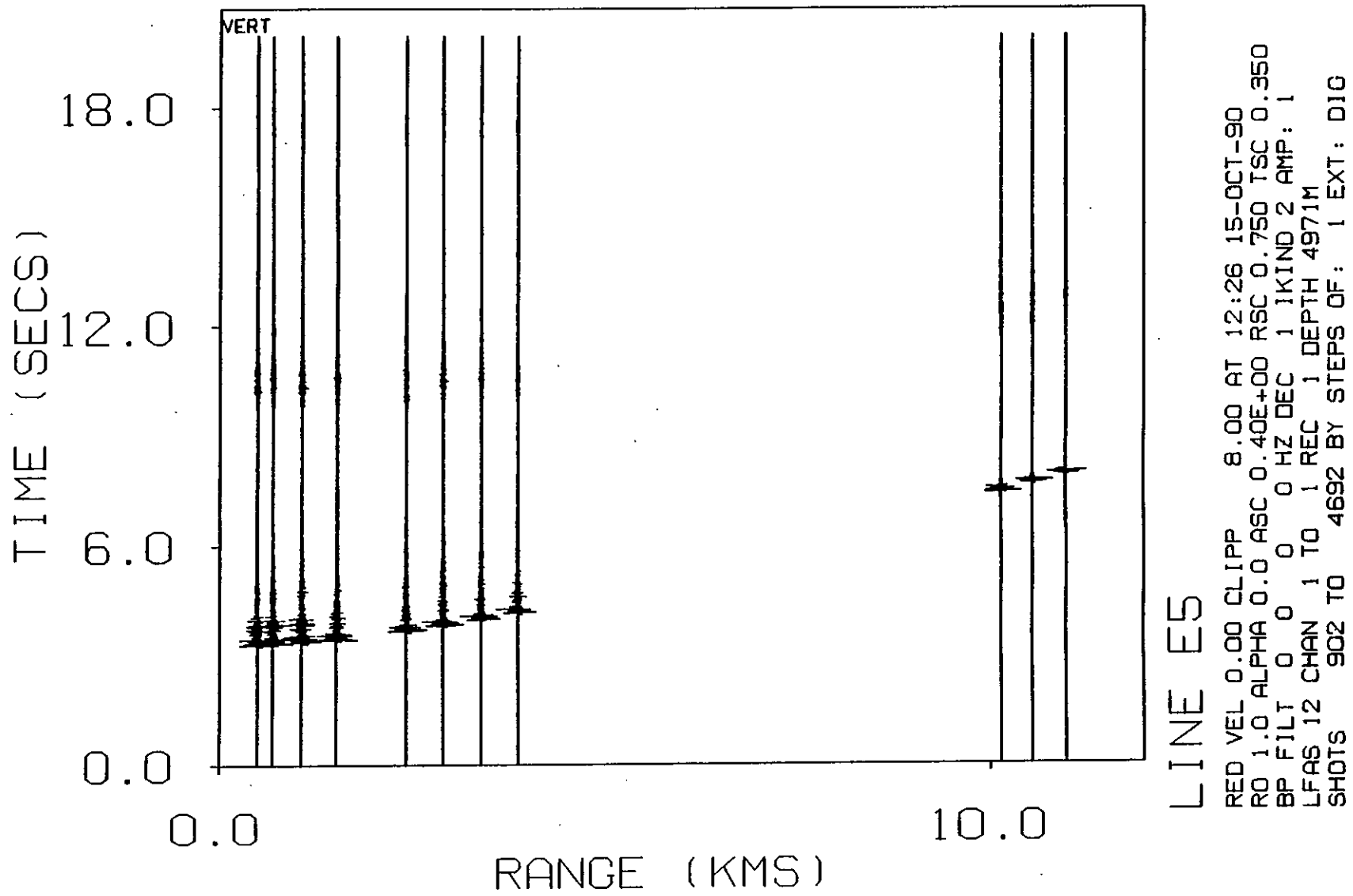


Figure 8e. Line E5 is plotted versus range from the borehole for all shots.

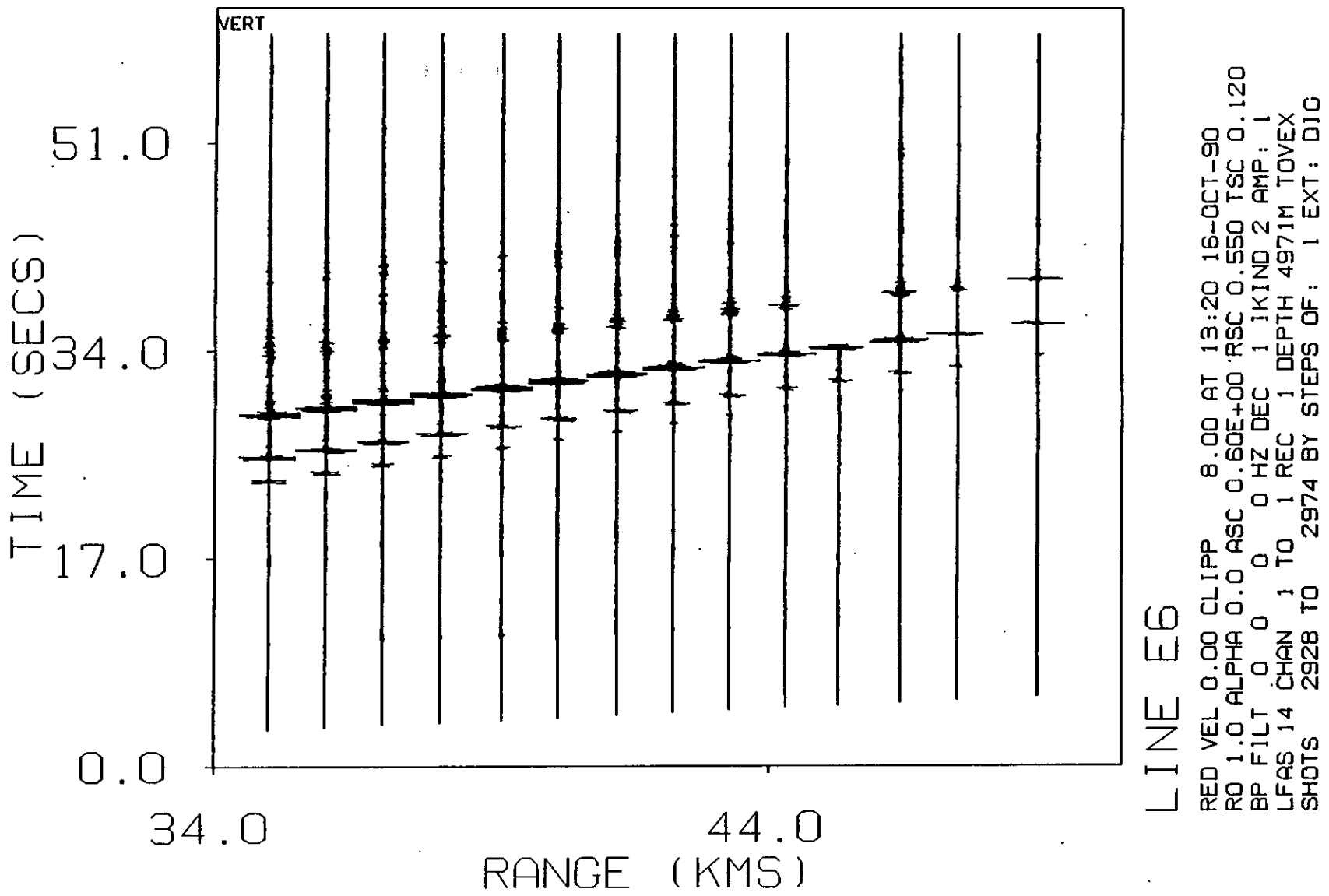


Figure 8f. Line E6 is plotted versus range from the borehole for all shots.

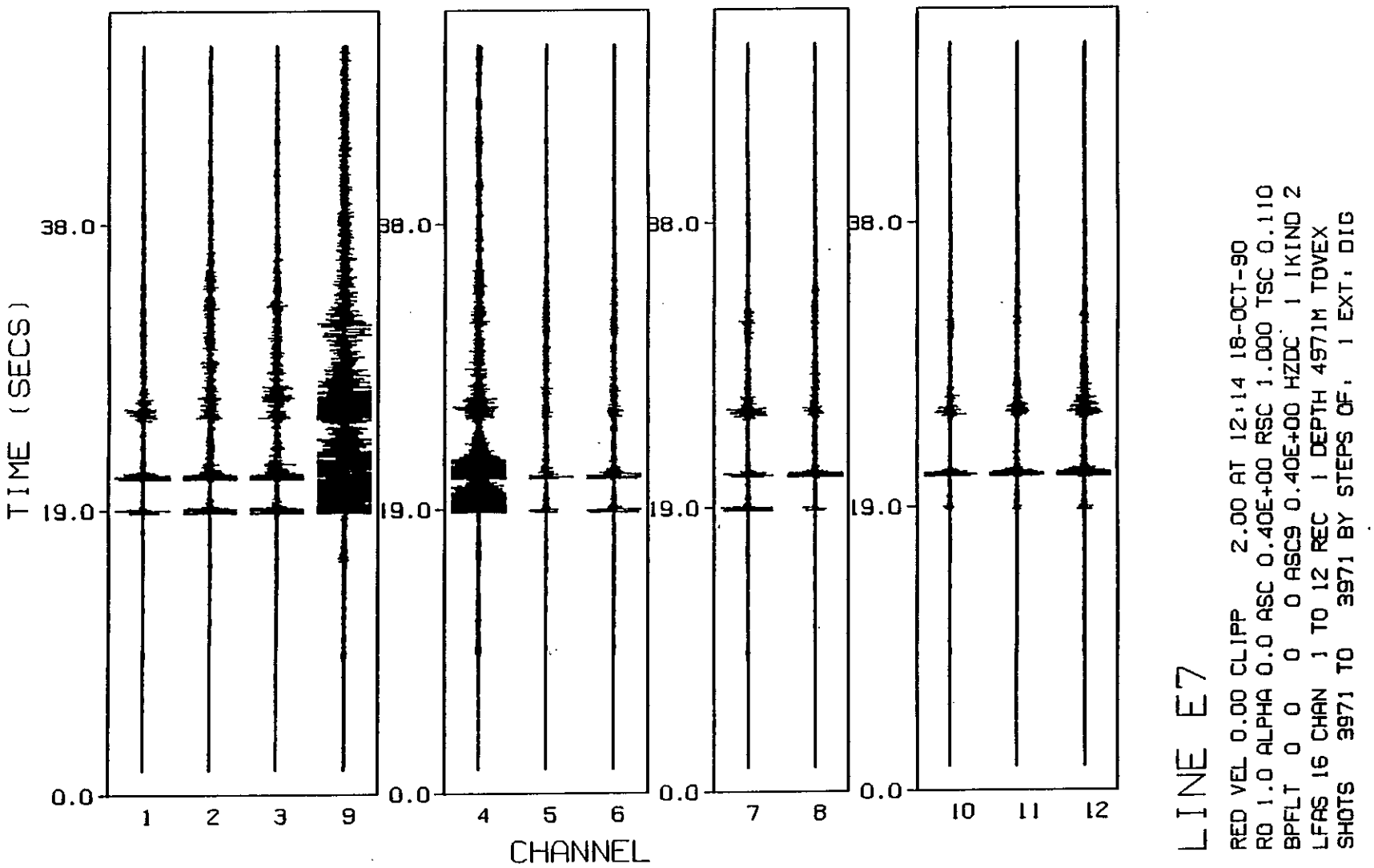


Figure 8g. Line E7 is plotted showing all 12 channels for one of the two good shots recorded.

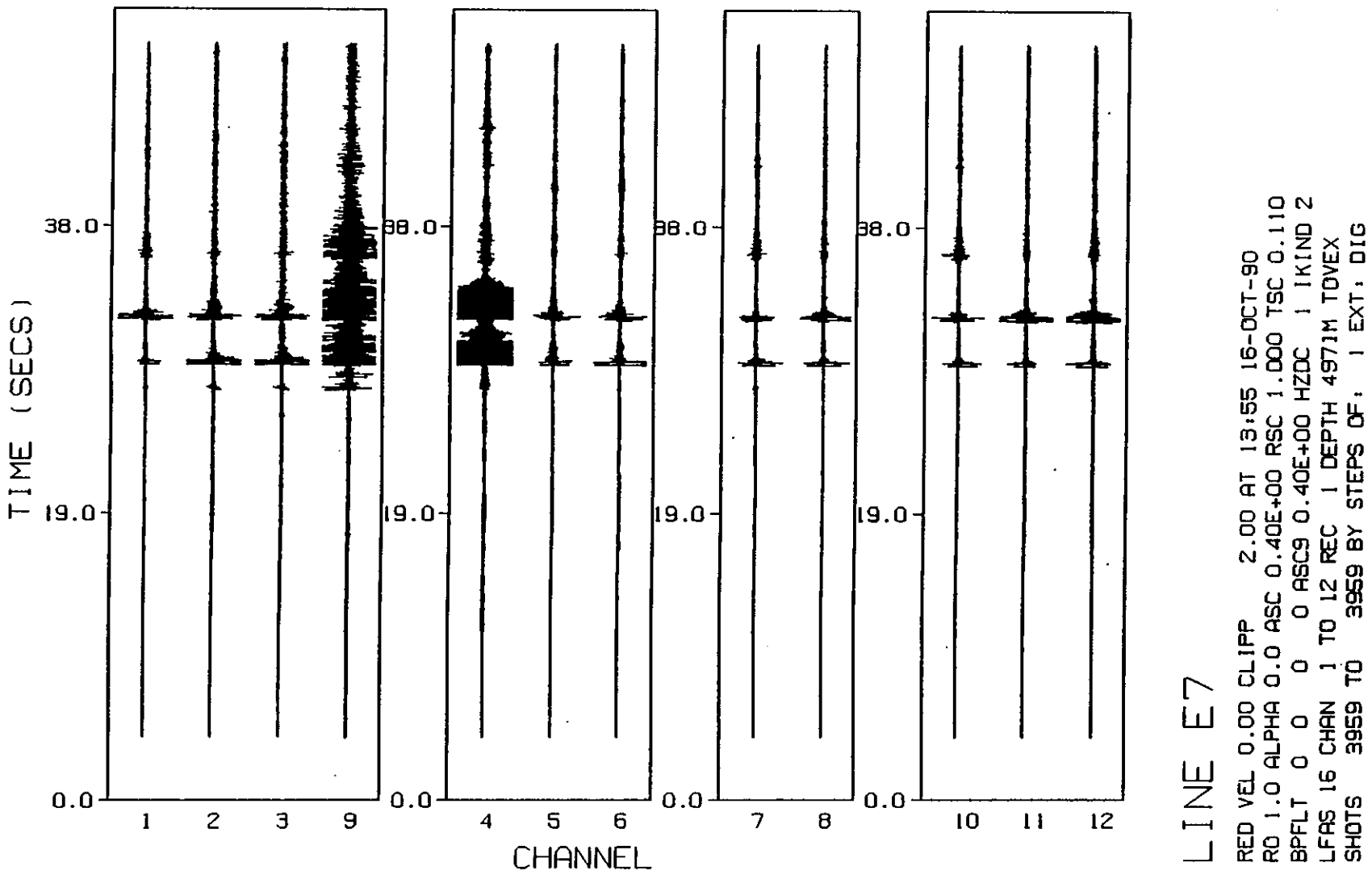
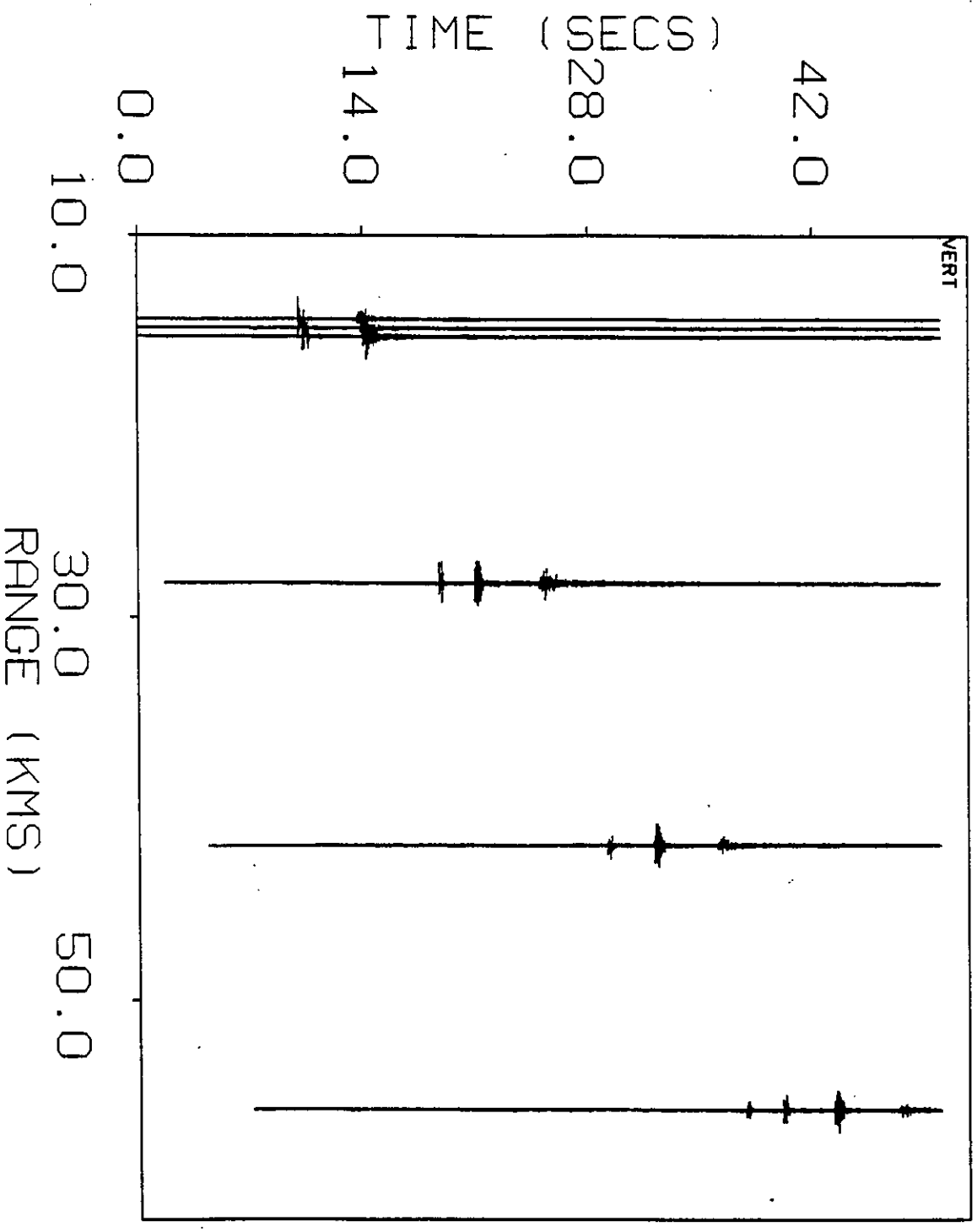


Figure 8h. Line E7 is plotted showing all 12 channels for one of the two good shots recorded.



LINE E8

RED VEL 0.00 CLIPP 8.00 AT 16:54 3-OCT-90
RO 1.0 ALPHA 0.0 ASC 0.40E+00 RSC 0.175 TSC 0.145
BP FILT 0 0 0 0 HZ DEC 1 IKIND 2 AMP: 1
LFAS 18 CHAN 1 TO 1 REC 1 DEPTH 4971M TOVEX
SHOTS 4476 TO 4514 BY STEPS OF: 1 EXT: DIG

Figure 8i. Line E8 is plotted versus range from the borehole for all shots.

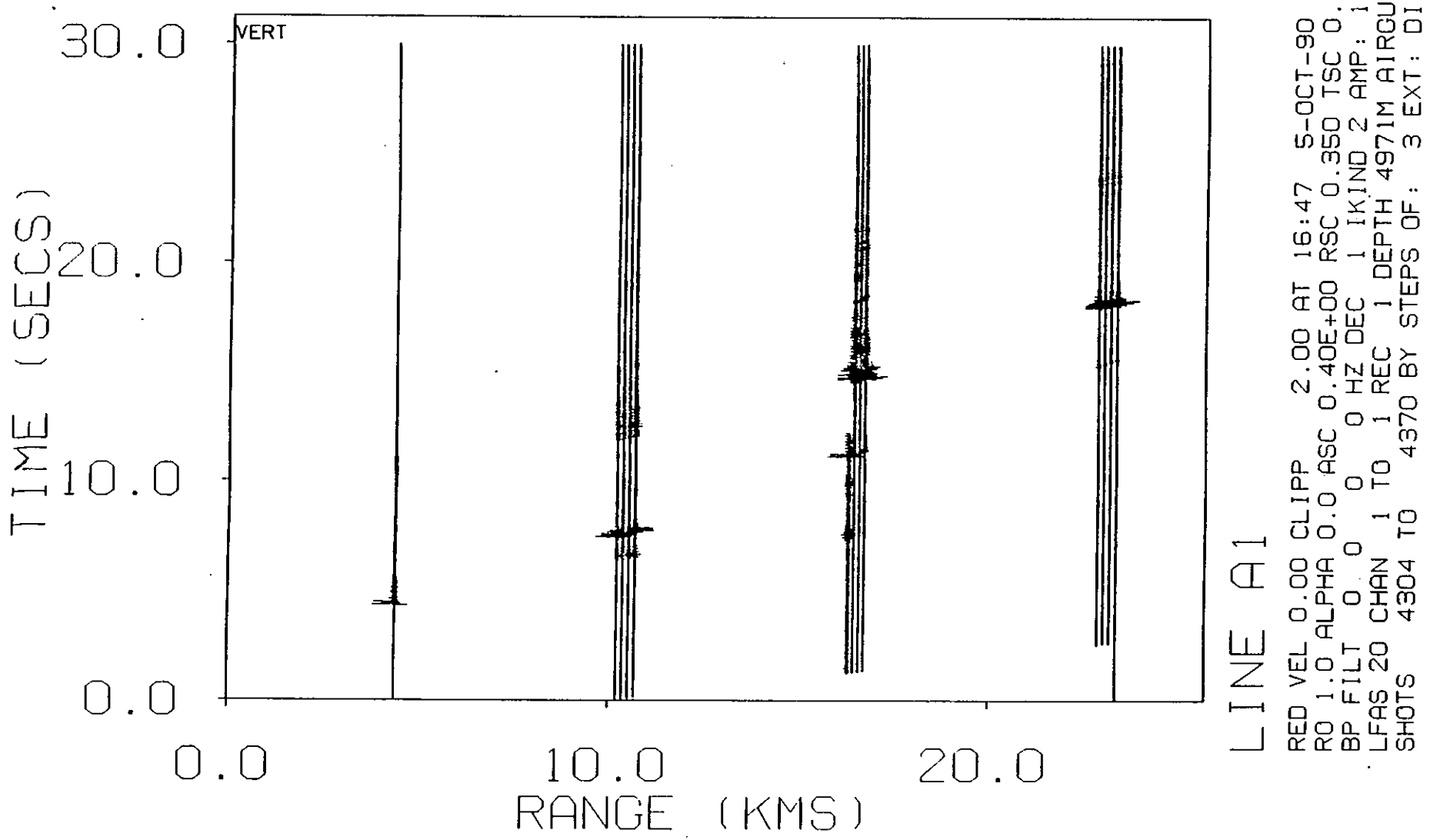


Figure 9. Seismograms from the 10 meter deep vertical component for the airgun lines are plotted using equal maximum amplitude scaling.

Figure 9a. Line A1 is plotted versus range from the borehole using every third shot recorded.

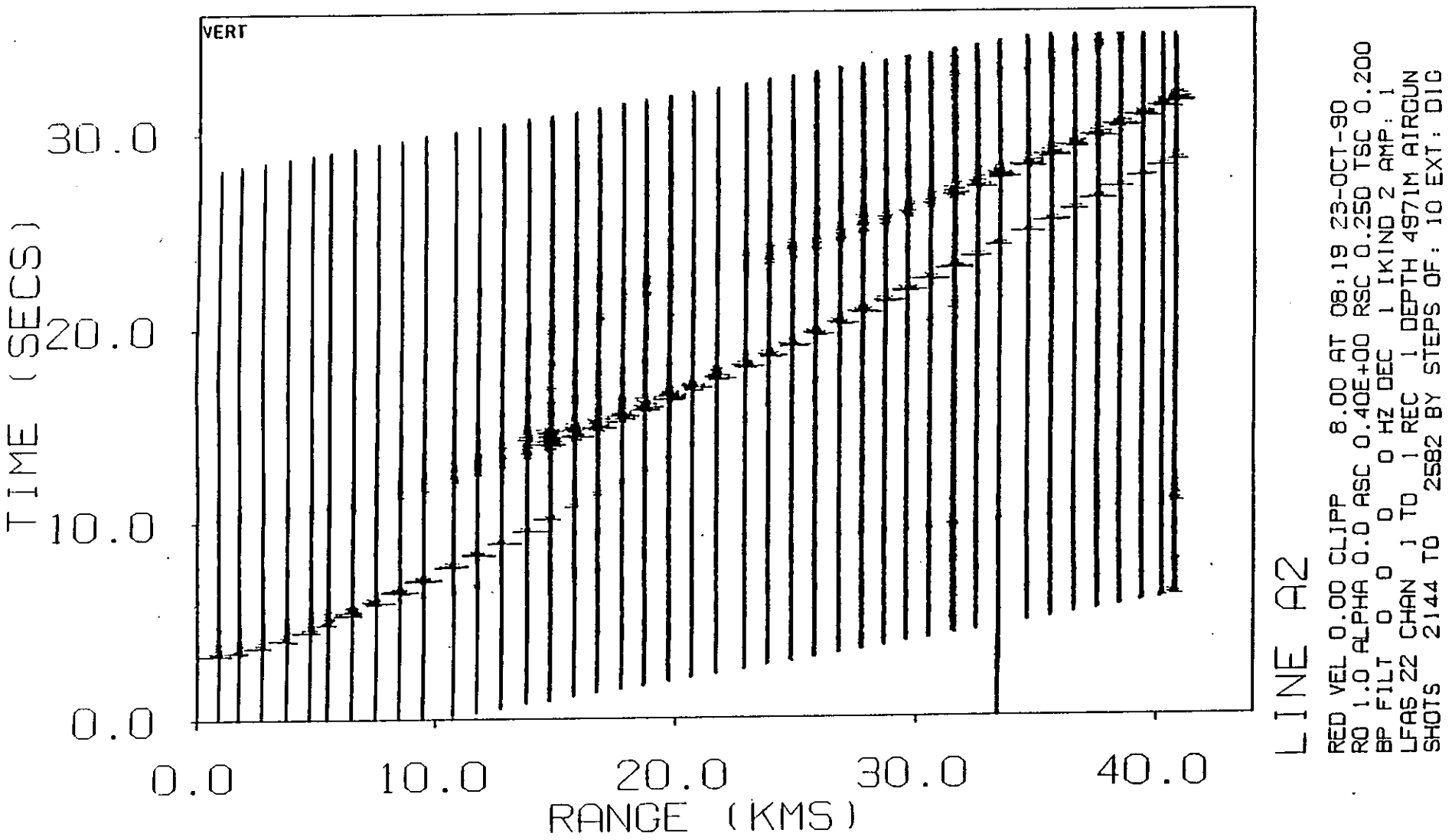


Figure 9b. Line A2 is plotted versus range from the borehole using every tenth shot recorded.

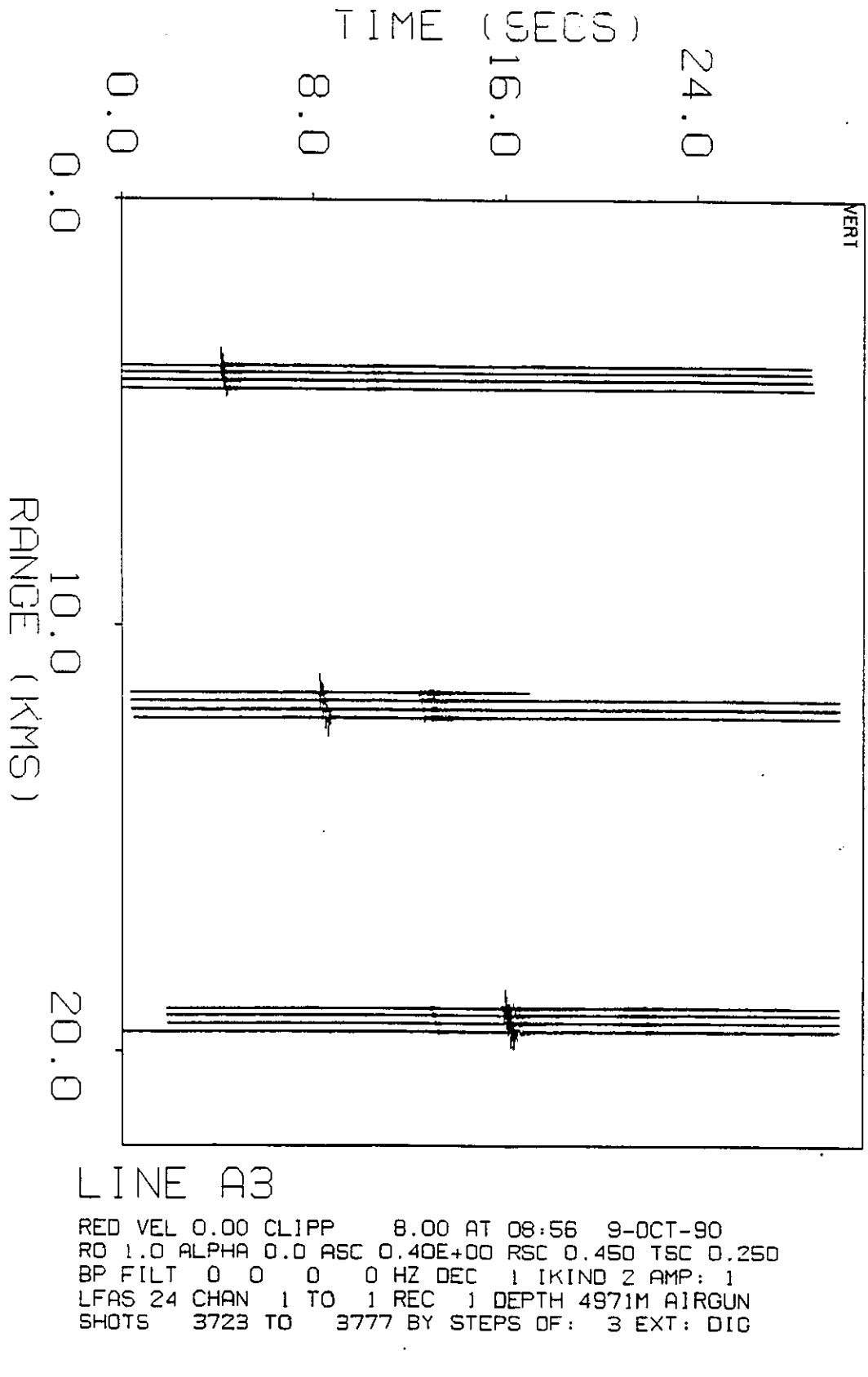


Figure 9c. Line A3 is plotted versus range from the borehole using every third shot recorded.

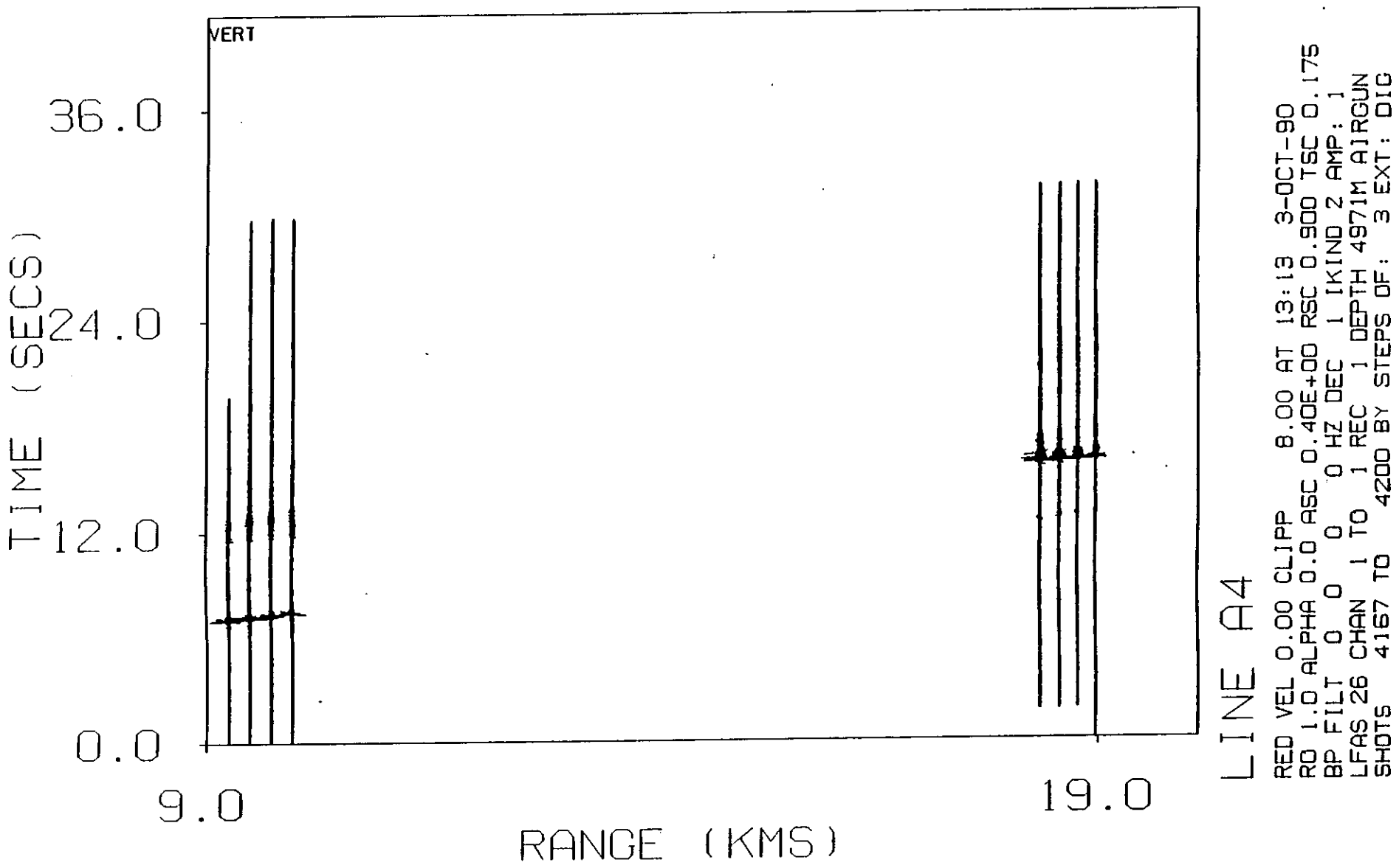
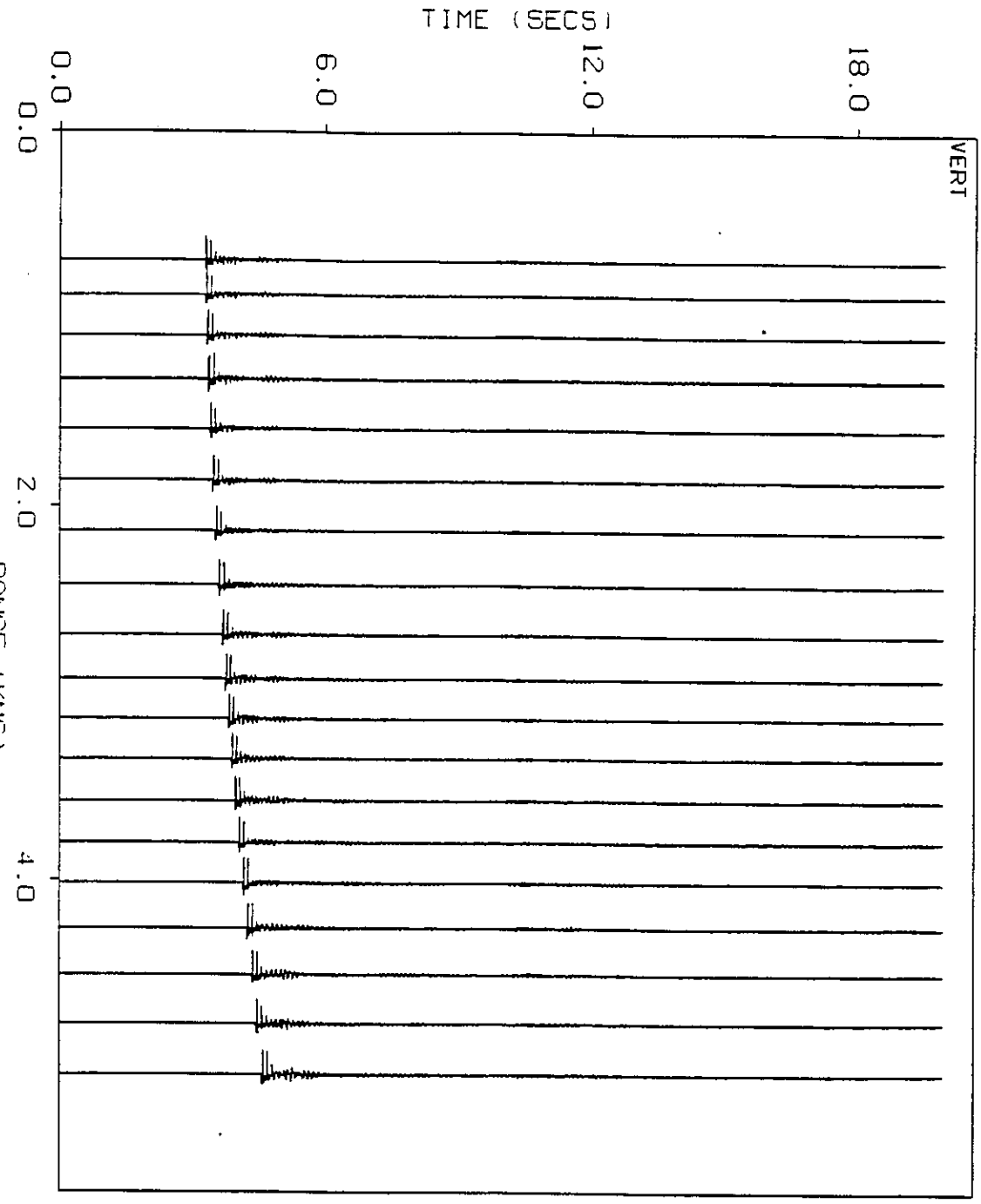


Figure 9d. Line A4 is plotted versus range from the borehole using every third shot recorded.



LINE A5A

RED VEL 0.00 CLIPP 8.00 AT 20:00 11-JUL-91
RO 10.0 ALPHA 1.0 ASC 0.40E+00 RSC 1 500 TSC 0.350 EMAX
BUTFLT 12 12 HZ 48 DB ROLL FILTY -1 DEC 1 KND 2
LFAS 28 CHAN 1 TO 1 REC 1 DEPTH 4971M AIRGUN
SHOTS 1121 TO 1211 BY STEPS OF: 5 EXT: 010

Figure 9e. Line A5A is plotted versus range from the borehole using every fifth shot recorded.

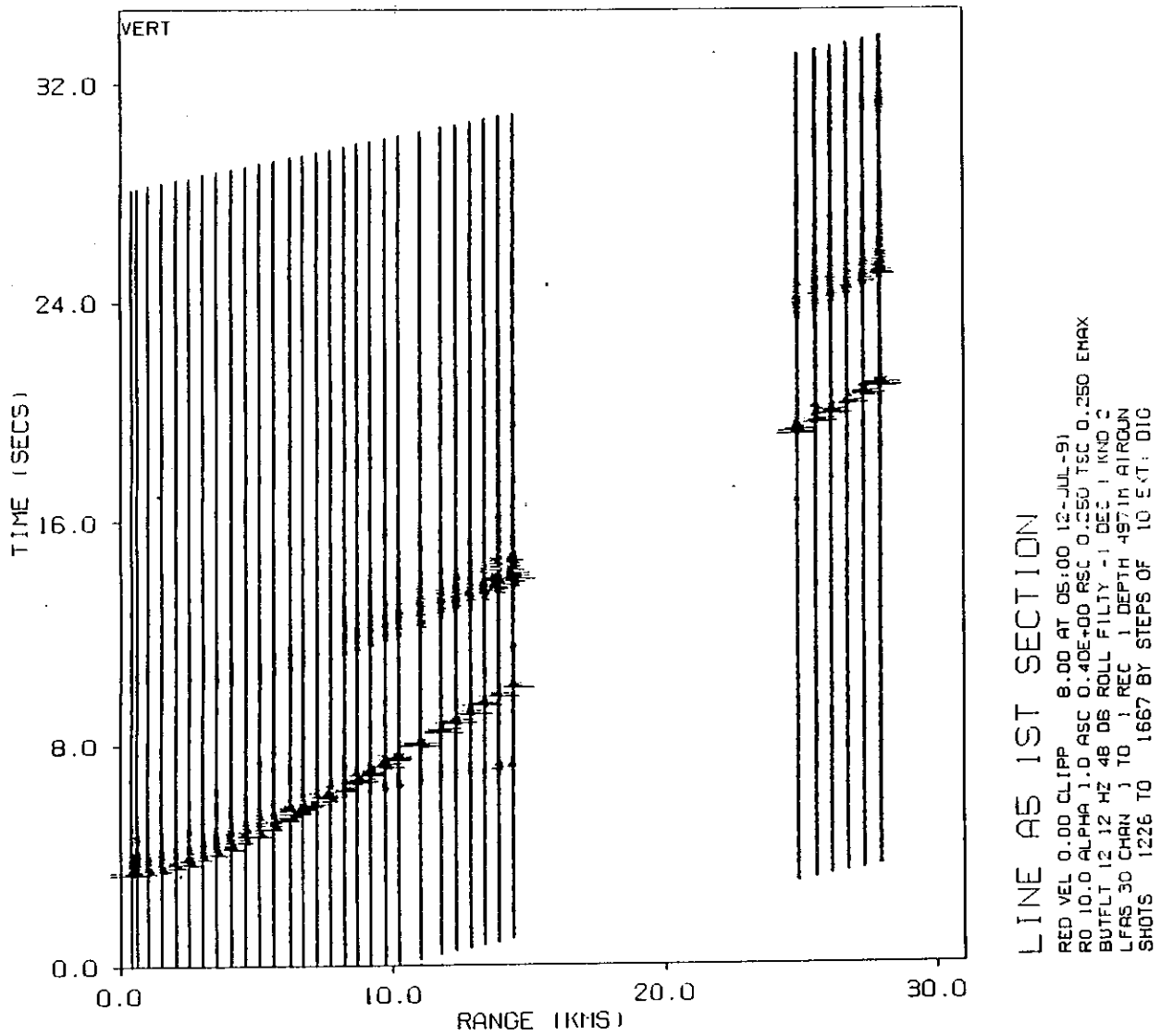


Figure 9f. The south going first half of line A5 is plotted versus range from the borehole using every tenth shot recorded

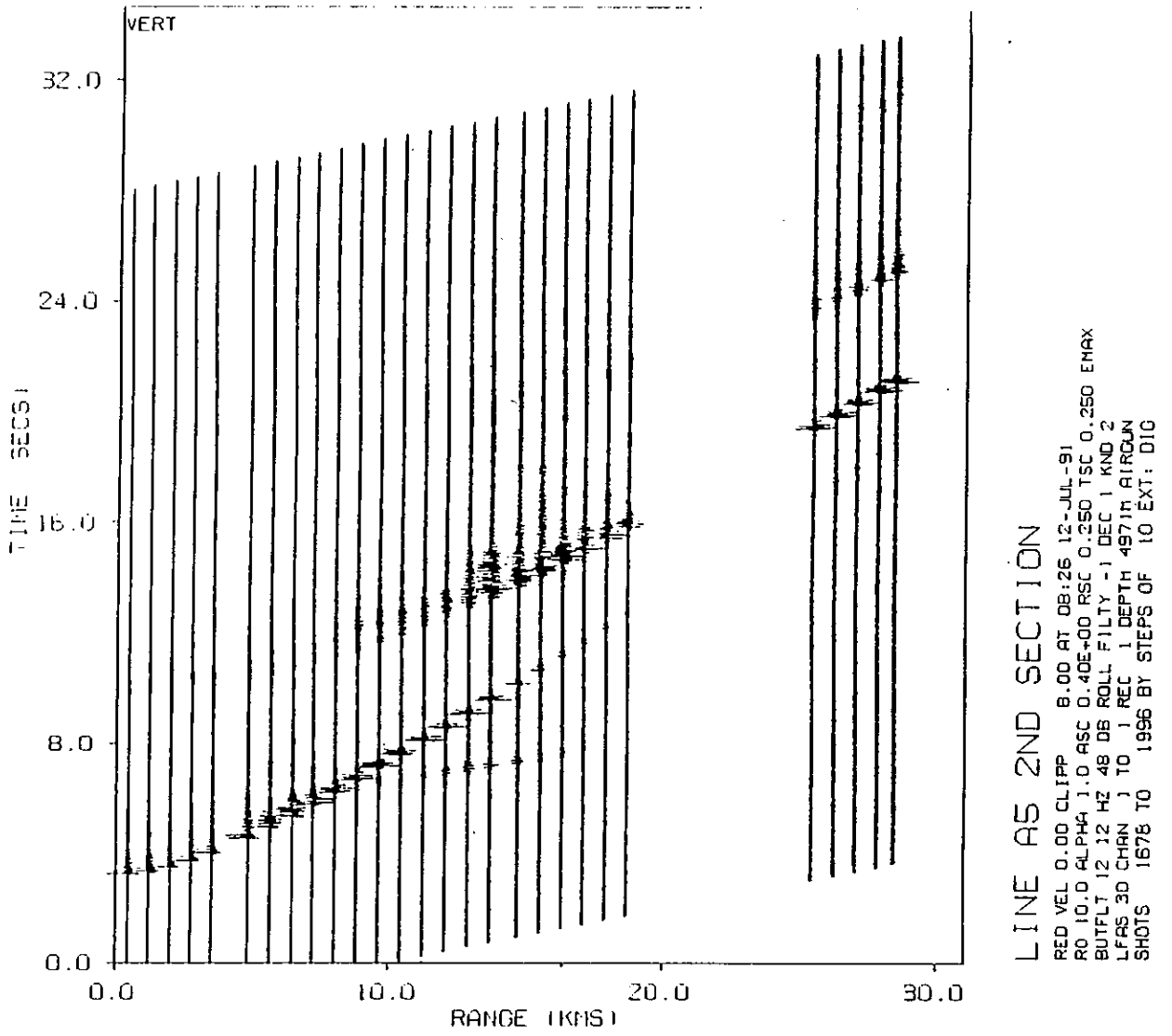


Figure 9g. The north going second half of line A5 is plotted versus range from the borehole using every tenth shot recorded.

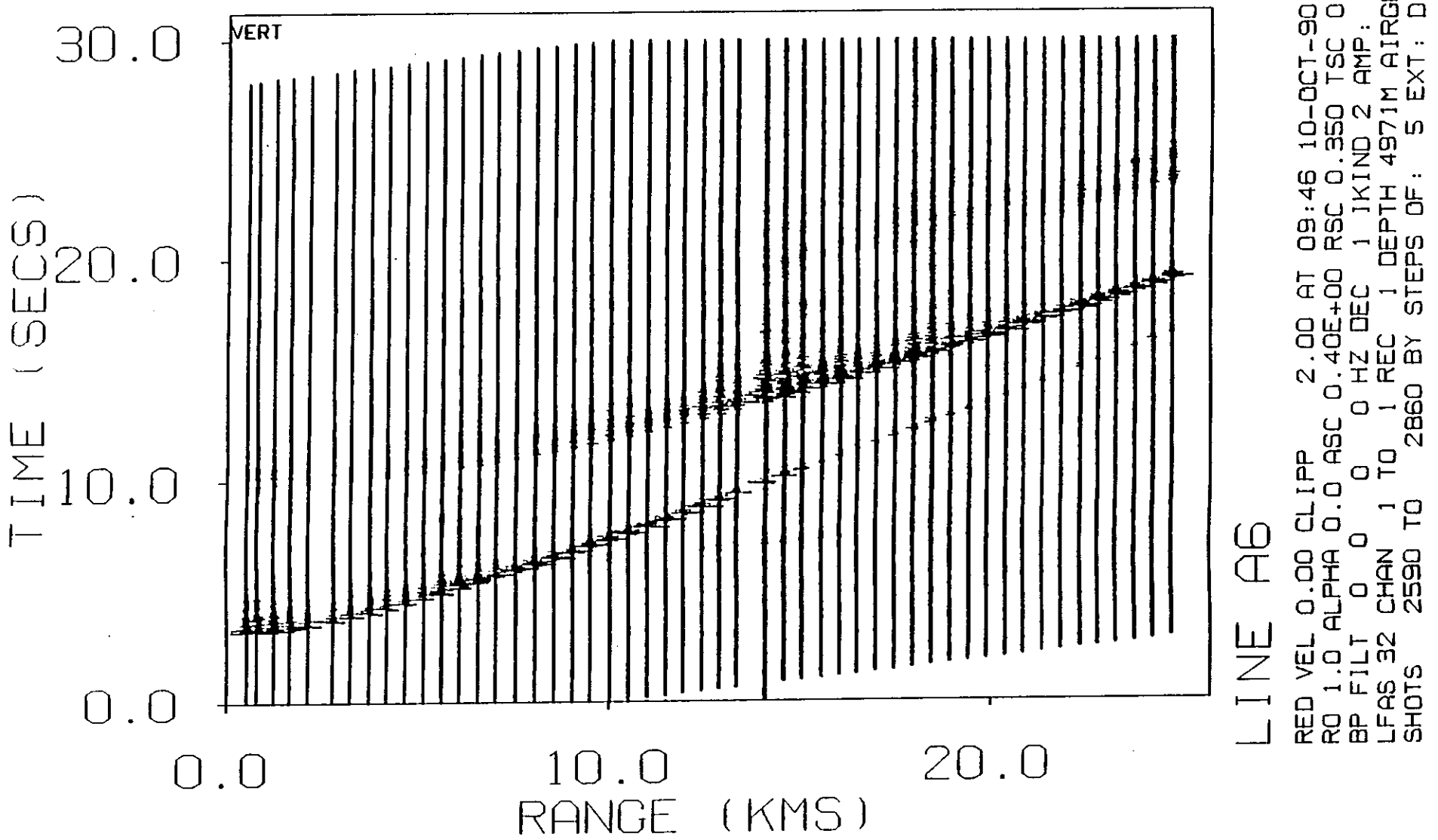


Figure 9h. Line A6 is plotted versus range from the borehole using every fifth shot recorded.

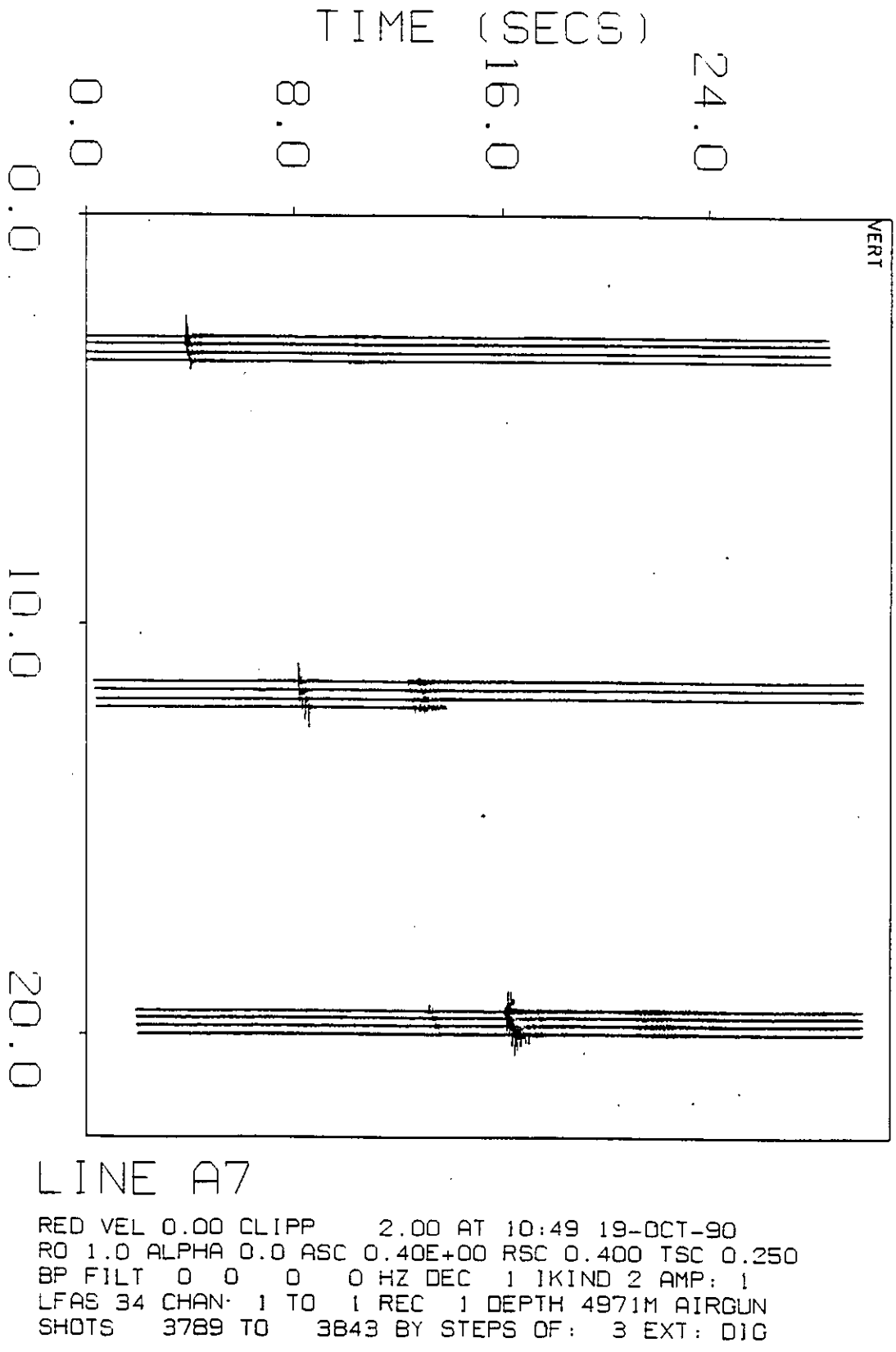


Figure 9i. Line A7 is plotted versus range from the borehole using every third shot recorded.

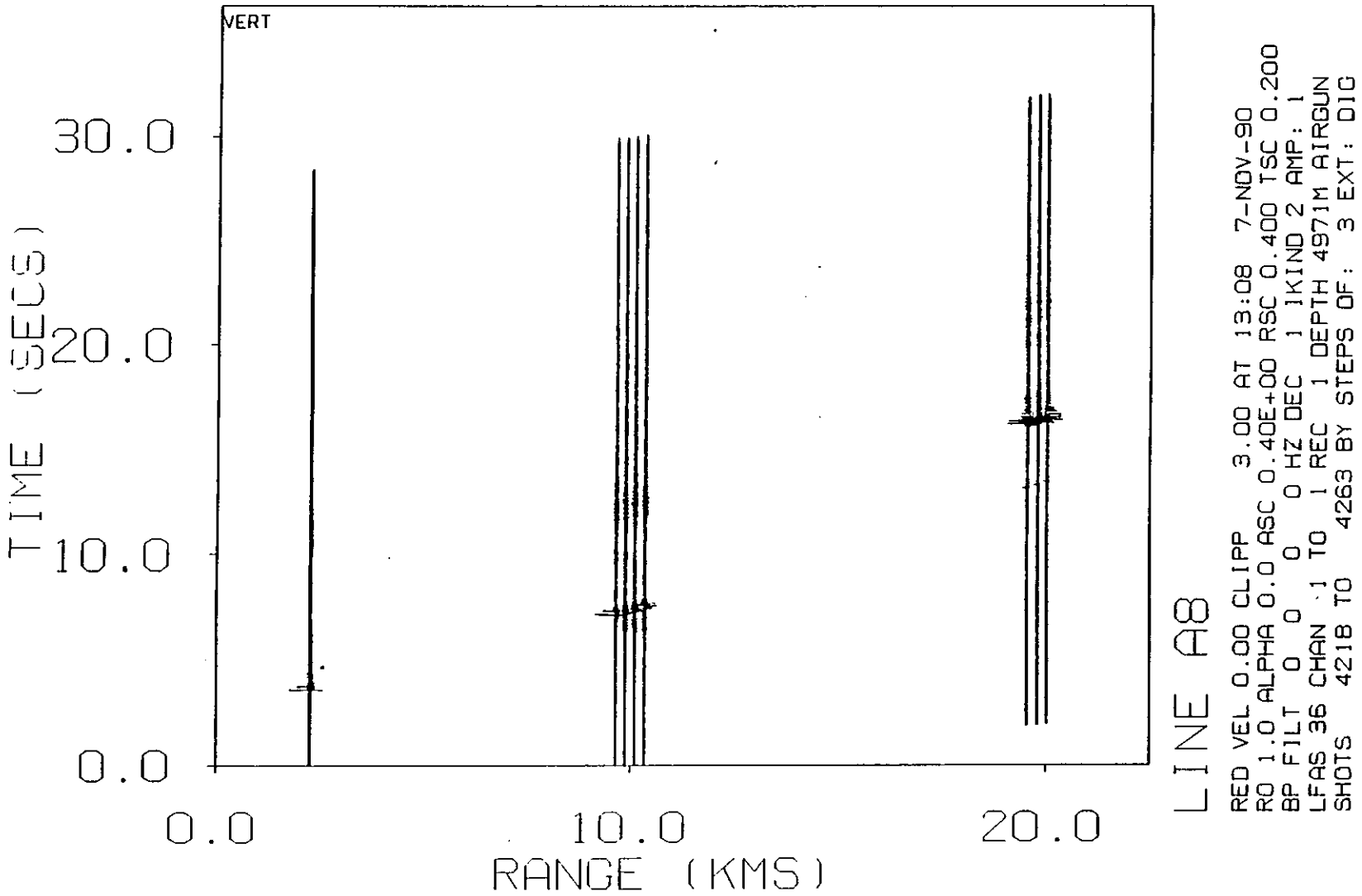


Figure 9j. Line A8 is plotted versus range from the borehole using every third shot recorded. Shots that were fired every 10 seconds are not plotted.

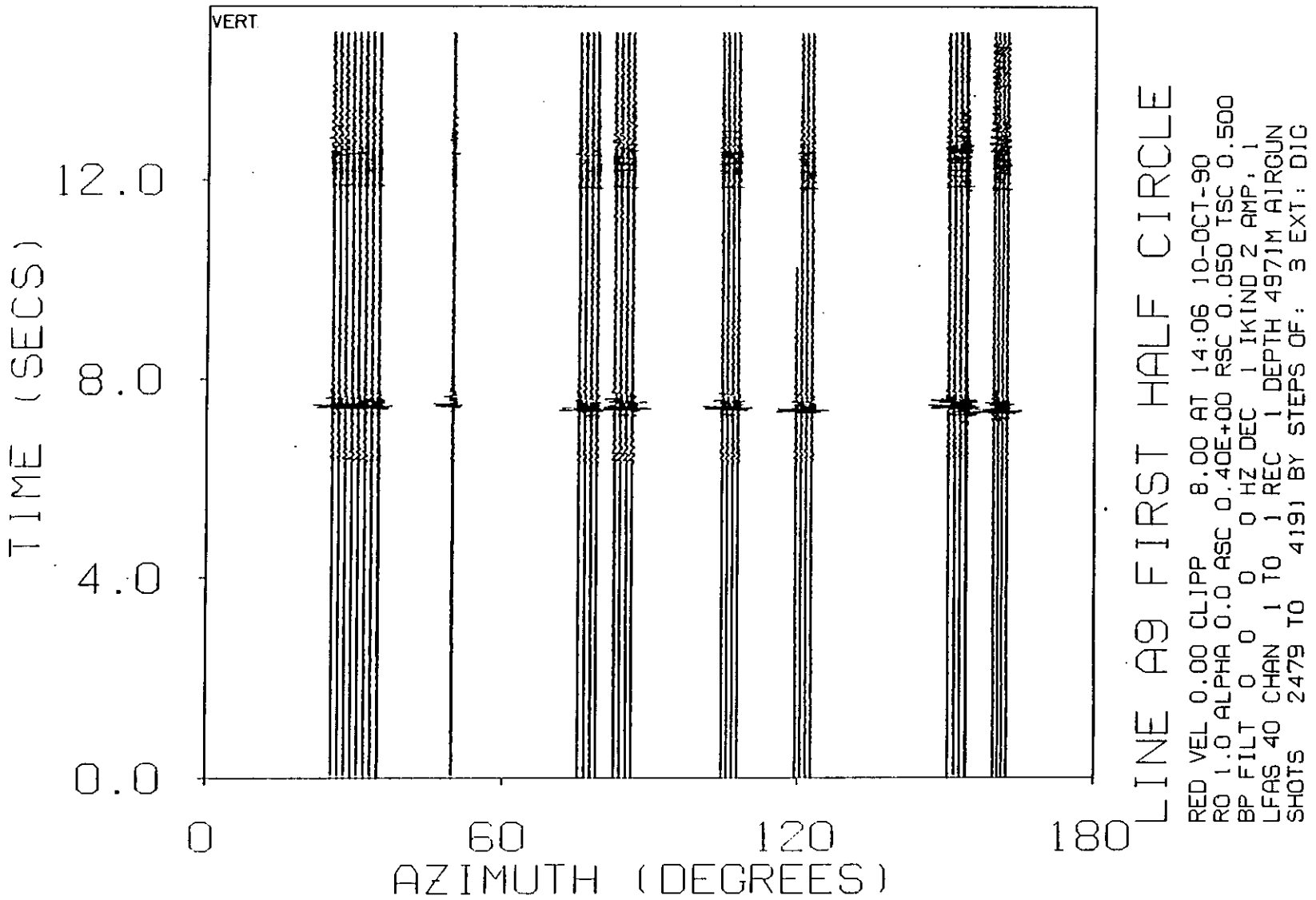


Figure 9k. Line A9 is plotted versus azimuth from the borehole for azimuths of 0 to 180 degrees true. Data from airgun lines, if the range is within 250 meters of a 10 kilometer range from the borehole, are included to fill in areas where shots were not recorded during shooting of the circle.

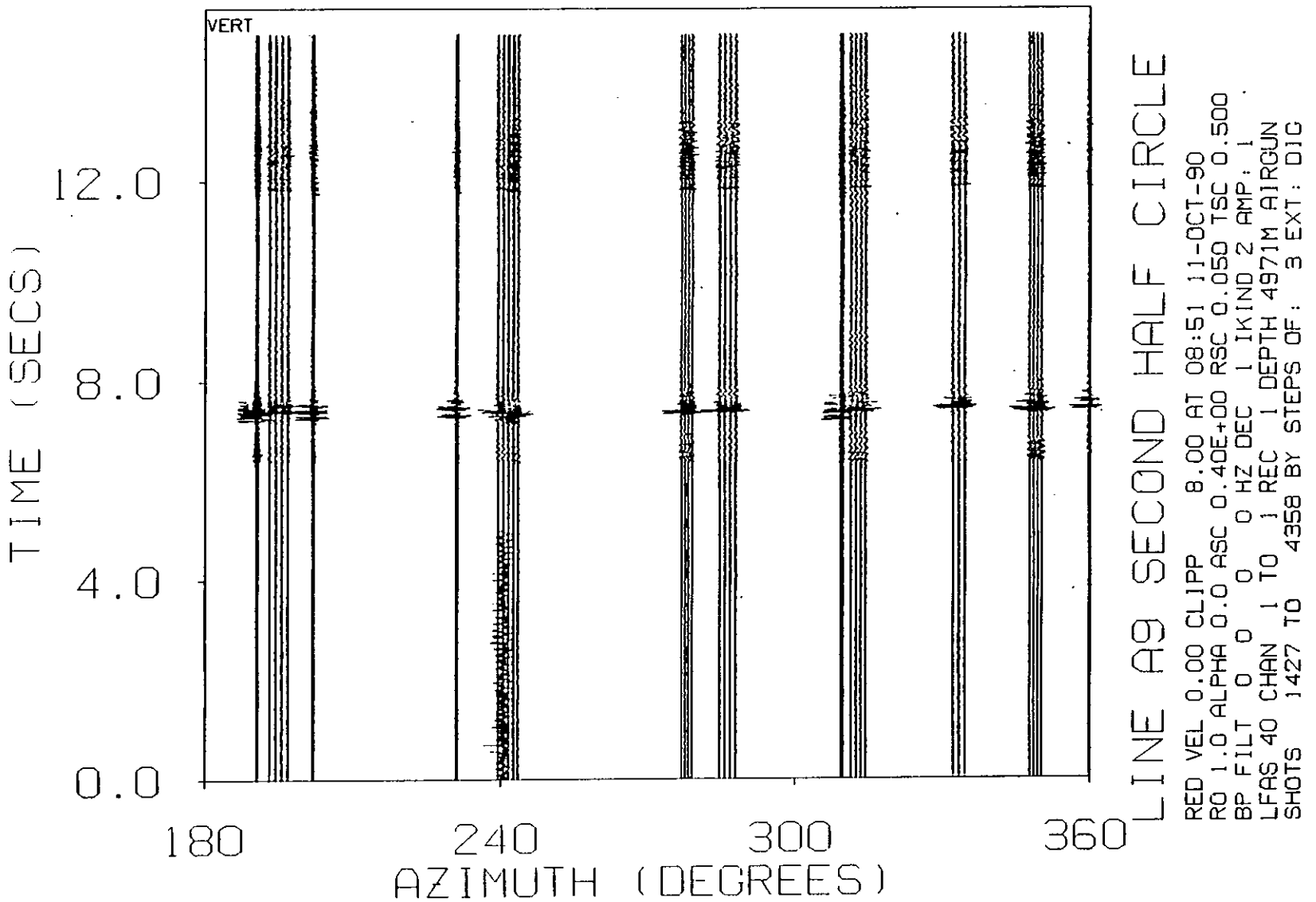


Figure 91. Line A9 is plotted versus azimuth from the borehole for azimuths of 180 to 360 degrees true. Data from airgun lines, if the range is within 250 meters of a 10 kilometer range from the borehole, are included to fill in areas where shots were not recorded during shooting of the circle.

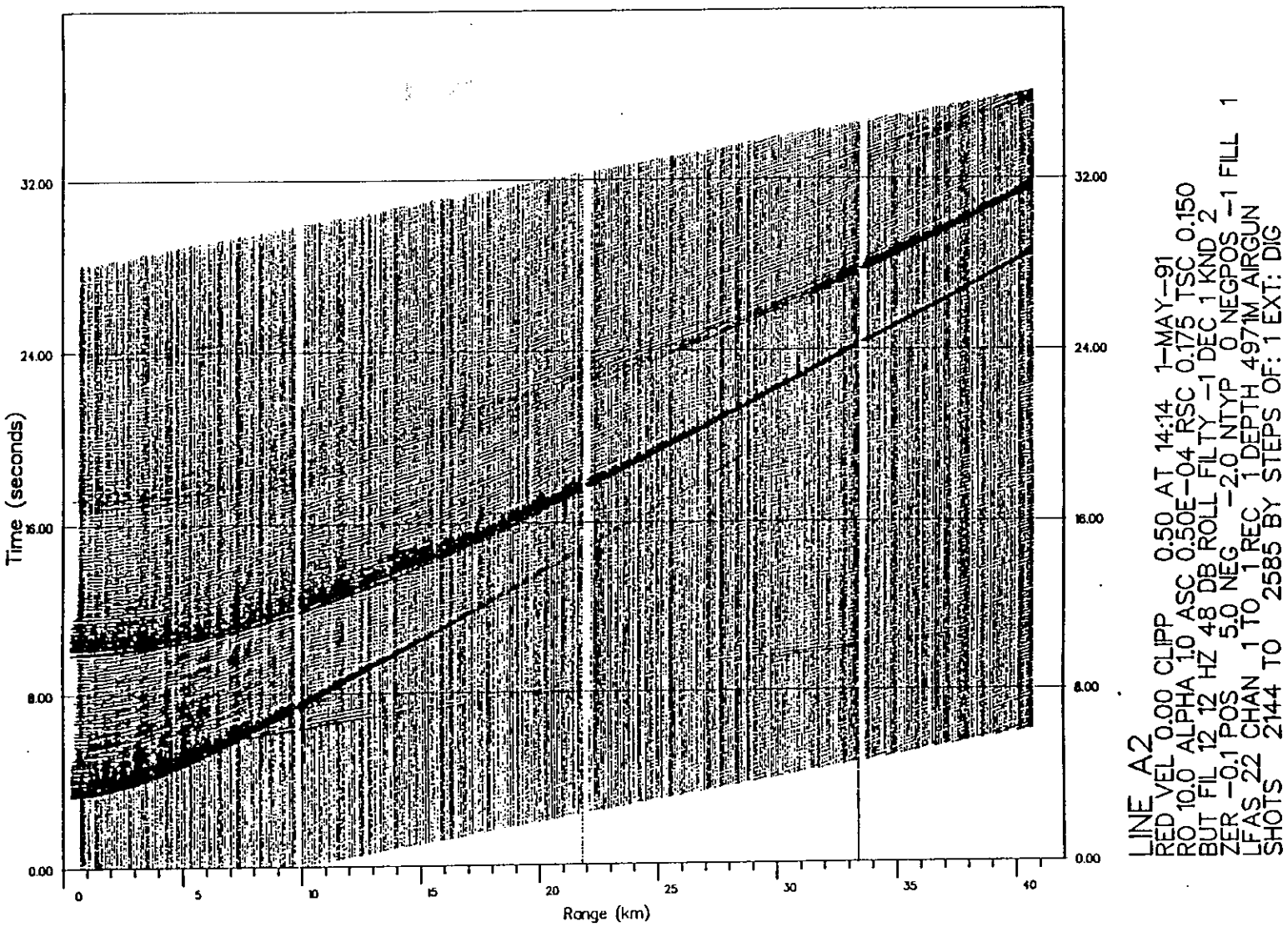


Figure 10. Seismograms from the 10 meter deep vertical component for the airgun lines are plotted using equal maximum amplitude scaling. Lines A2, the South heading part of line A5 (first part), and line A6 are shown using filled wiggles. All shots are plotted for each shot.

Figure 10a. Line A2 is shown with all shots plotted.

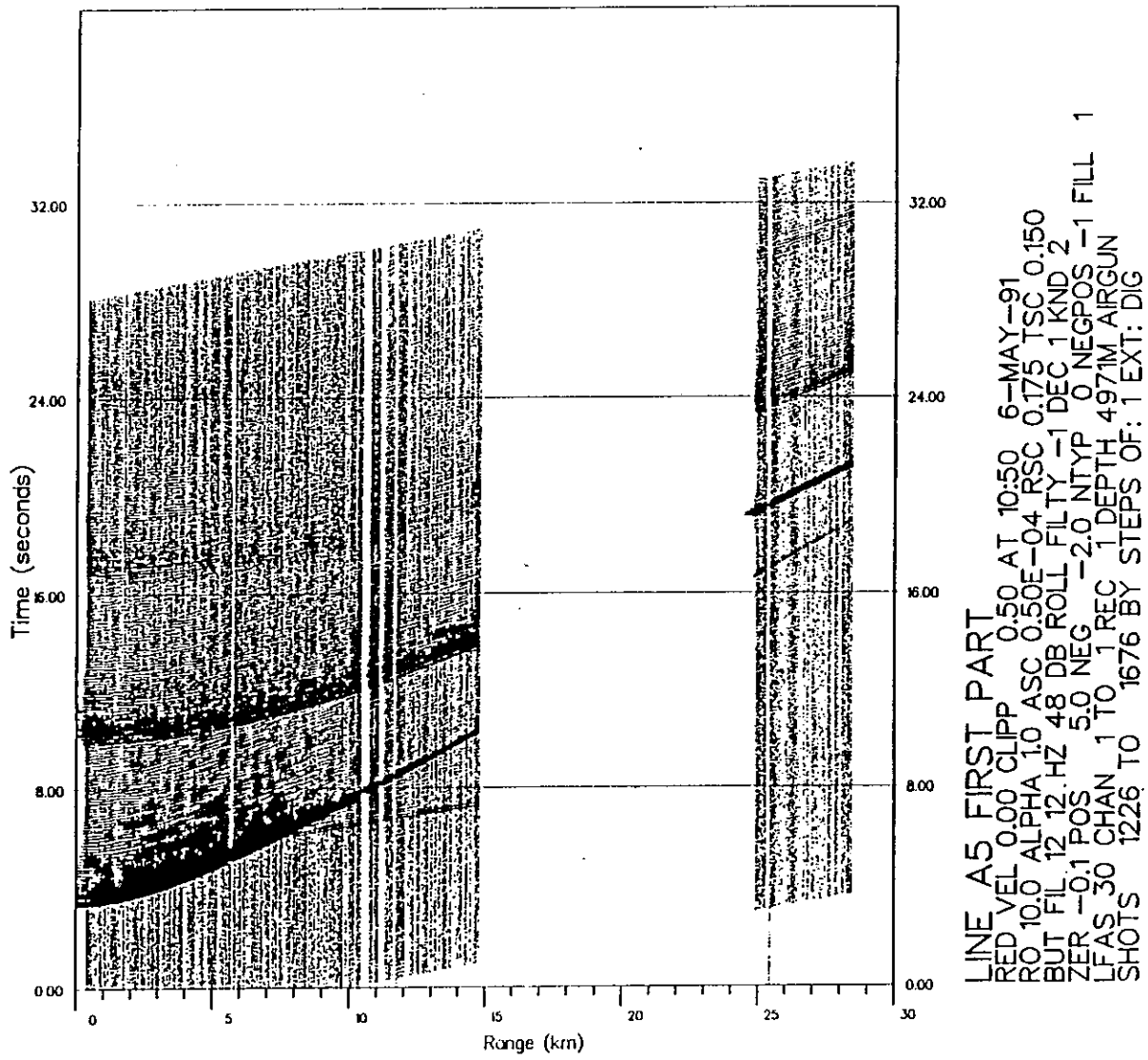


Figure 10b. The first part of line A5 is shown with all shots plotted.

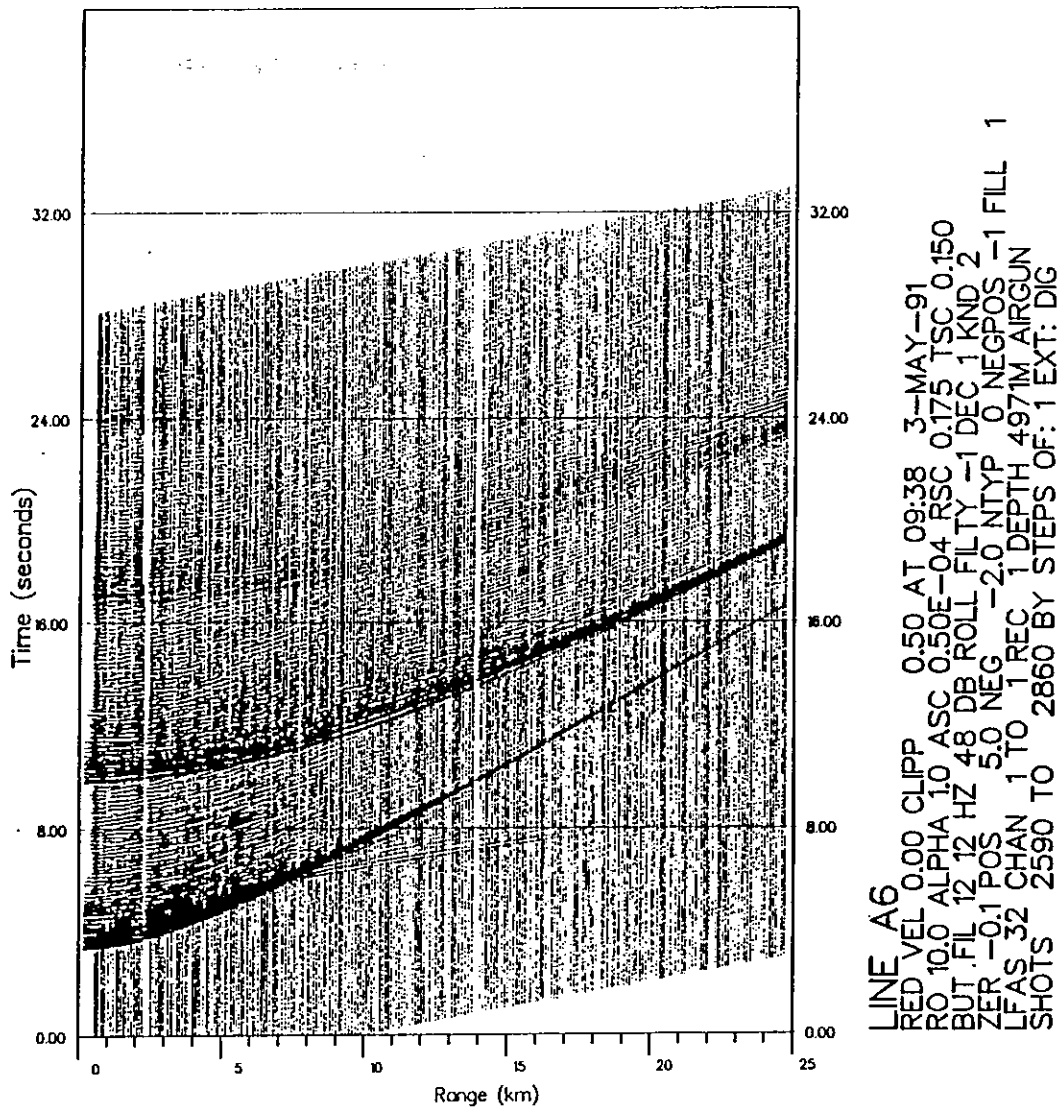


Figure 10c. Line A6 is shown with all shots plotted.

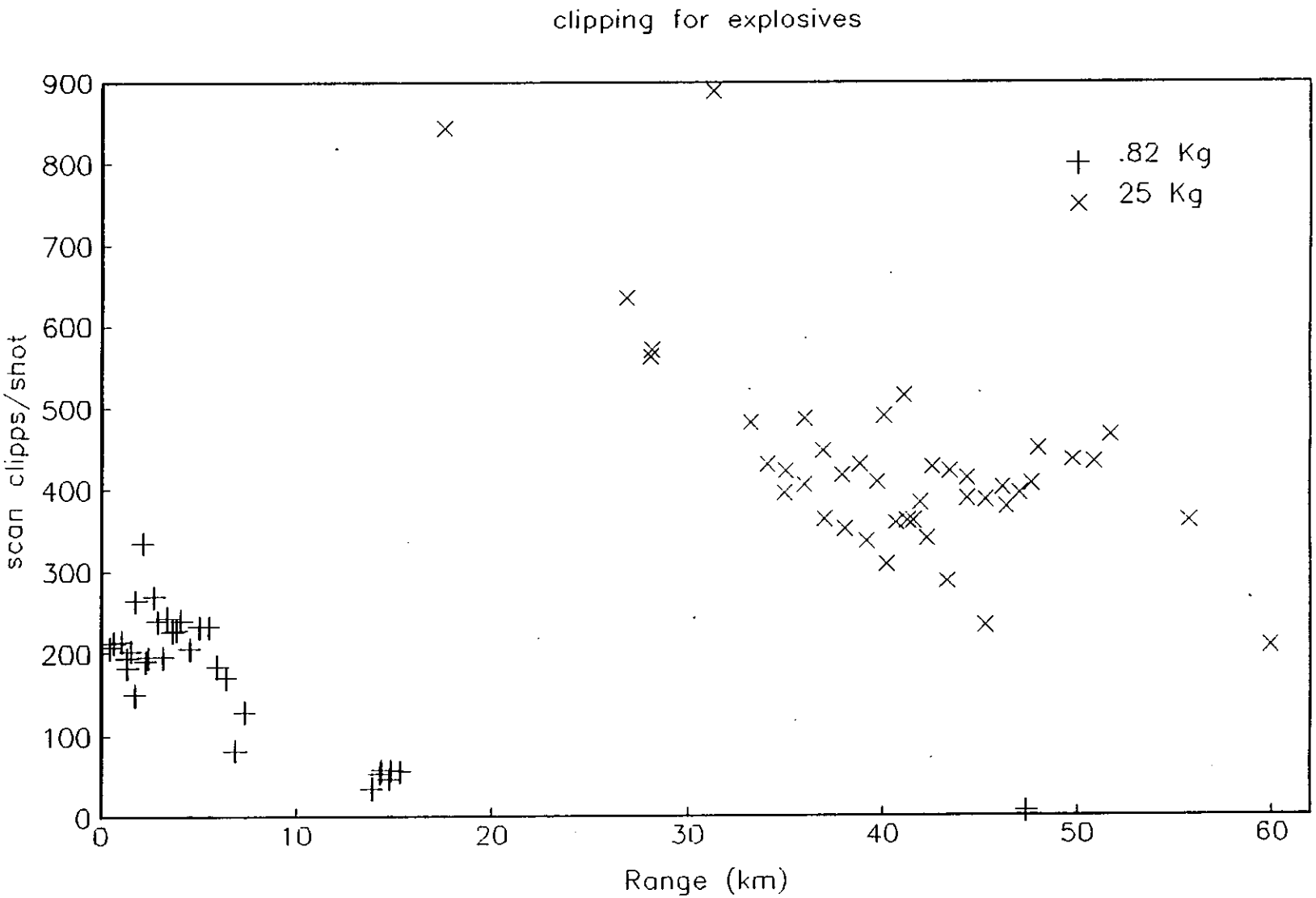


Figure 11. The total number of clipped values in a shot file are plotted versus range from the borehole.

Figure 11a. The number of clipped values in the explosive shot files in every channel are plotted as a function of range from the borehole with the two explosive sizes grouping together. 0.82 Kg shots were shot out to a range of 16 kilometers and 25 Kg shots are farther ranges.

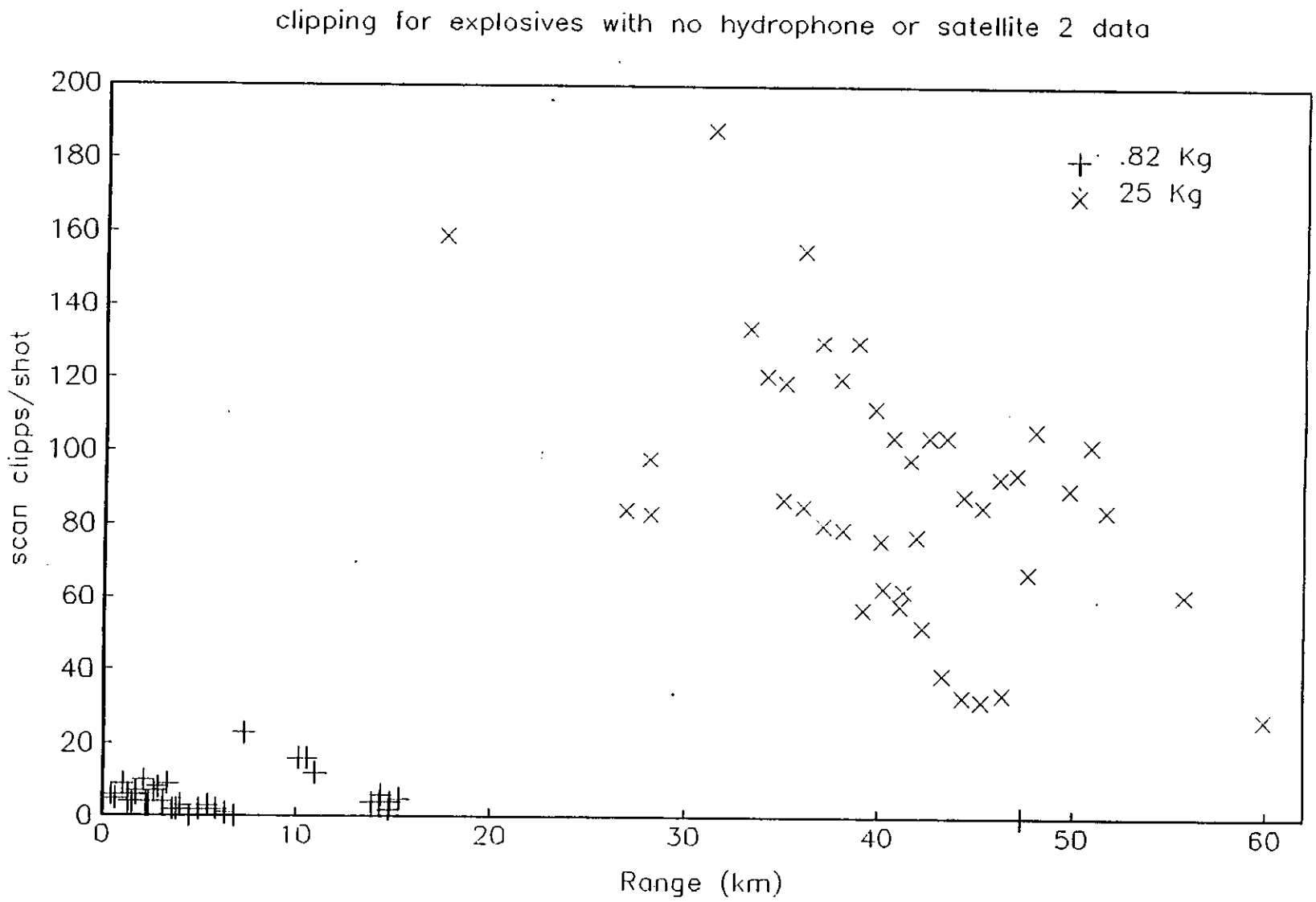


Figure 11b. The number of clipped values in the explosive shot files are plotted as a function of range from the borehole. Data from the vertical component in satellite 2 and the hydrophone are not included in the data plotted.

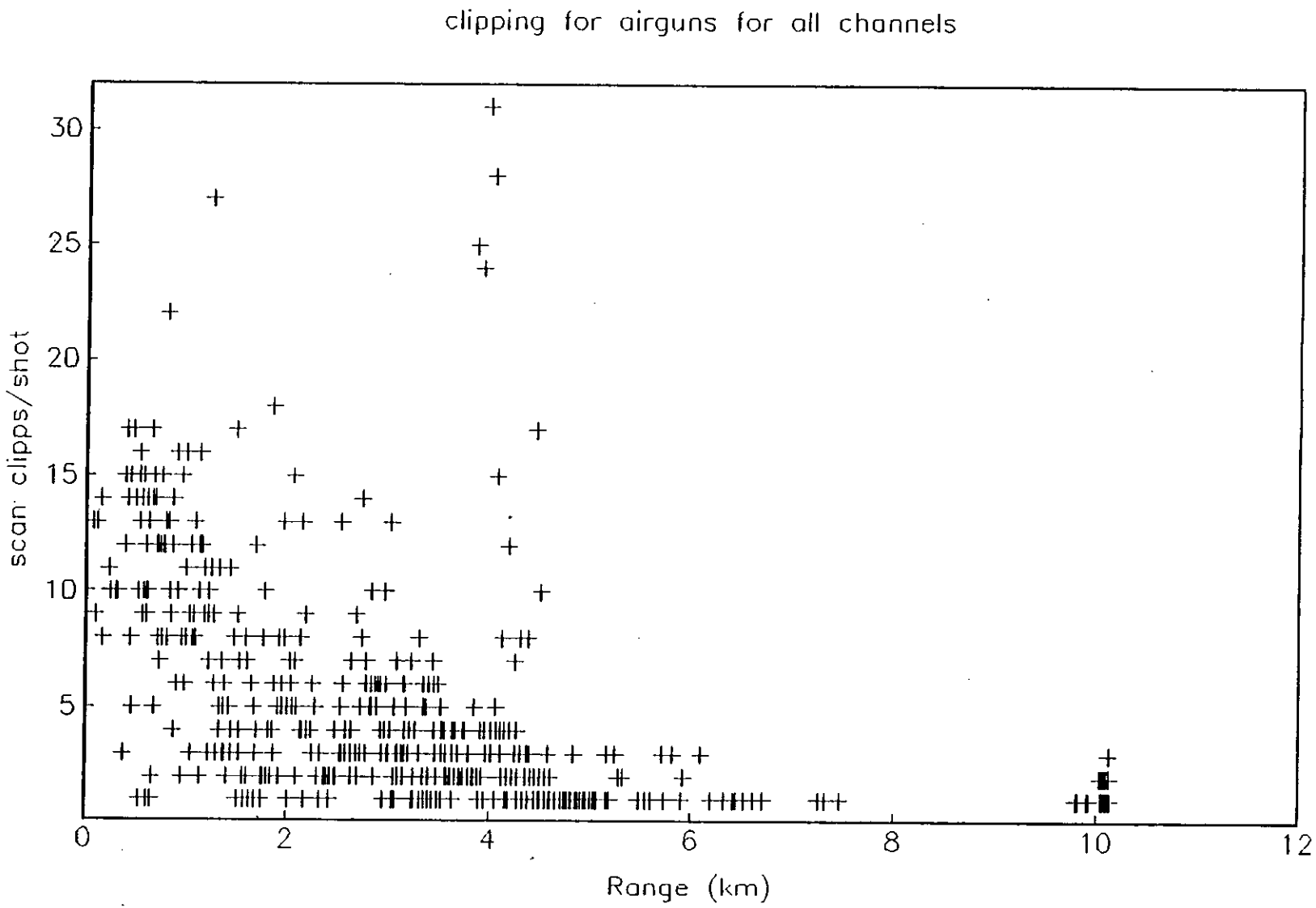


Figure 11c. The number of clipped values in an airgun shot file is plotted relative to the range from the borehole. Note that the axes are different form Figures 10a & b. The number of clipped values appears to fall off with range. The strong grouping of clipped values at around 10 kilometers is from the 10 kilometer circle.

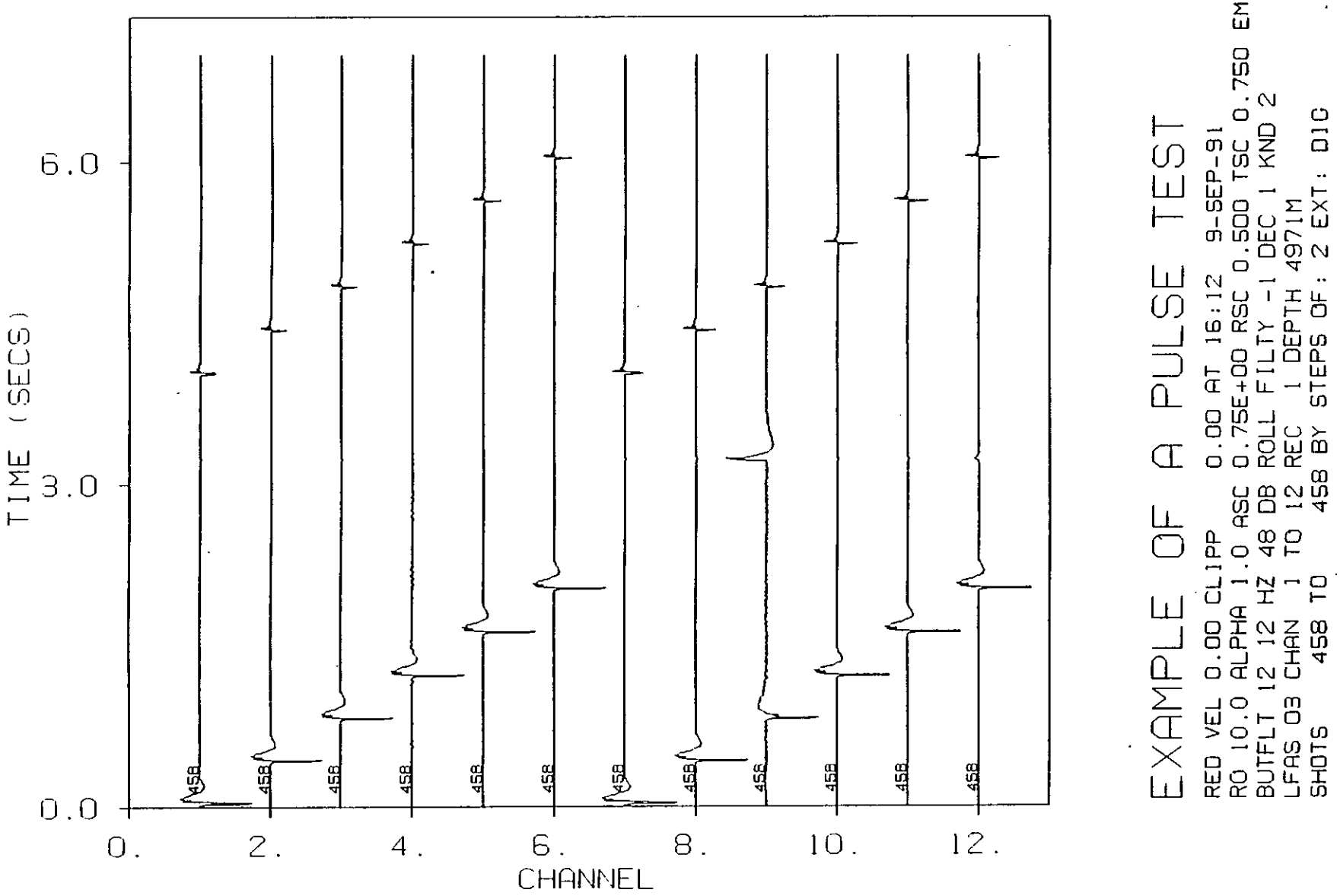


Figure 12. An example of a pulse test is shown. The geophone test occurs between 0.0 and 3.2 seconds and the filter test occurs between 3.2 and 8 seconds. The pulse test shown is WHOI event number 458 recorded after the borehole tool was clamped in the borehole.

Table 1 Summary of data recorded in WHOI Borehole Array Optical files.

Column #	Description of Data
1	The LFASE line number being shot at the time of recording. Ambient noise and test windows are labeled "NOISE".
2-3	The first and last WHOI event numbers made from the optical file shown. WHOI makes a ROSE file for each shot number.
4-5	The first and last NOARL shot numbers that are shot within the recording window and used by WHOI (where applicable).
6-7	The maximum and minimum range of the source from the borehole in the recording window (where applicable).
8	The name of the optical file recorded. This name is assigned by the BCU microprocessor and gives the month, day, and approximate time (GMT) of the start of the file.
9	The day in August 1989.
10-11	The start and stop time of the optical file in GMT referenced to the GOES satellite time.
12	The optical file length in whole seconds.
13	The number of scans computed from the number of bytes recorded in the Optical file. A scan corresponds to one time sample (every 0.008 seconds) of all twelve channels.
14	The number of scans CGG2ROSE2 was able to read. This may not agree with the number of computed scans since the number of computed scans is only a calculation using a constant and the file size in bytes.
16	The percentage of the file that CGG2ROSE2 was able to read. This is computed from the number of scans read versus the computed number of scans in the file.
17	The first scan that showed a scan error. If CGGEDIT was successfully applied to the file no scan errors will appear here. A summary of the disk numbers used is in Table 4.
18	The optical disk number from which CGG2ROSE2 read the data. LFASE recorded data on 8 optical disks.
19	General comments written about the data file or for the time period shown. These were written at sea and during processing. The pulse test Polaroid picture number is also shown.

Note: That optical files can have data from two different lines in them.
That several lines were shot during two different time periods.
That times before and after active sources were used are labeled as Noise in the line number column.

Table 1 Borehole Array Recording Summary

Line #	Events WHOI start	WHOI end	WHOI total	NOARL start	NOARL end	Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments	DURATION MINS
Nois	1	1	1					08032000.269	03	19:59:54	20:00:04	10	1,250	1,248	100		05		0.17
	12	12	1					08032002.089	03	20:01:34	20:01:44	10	1,250	1,248	100		06		0.17
	23	23	1					08032003.509	03	20:03:34	20:03:44	10	1,250	1,248	100		07		0.17
	34	34	1					08081604.139	08	16:00:00	16:03:52	232	29,000	28,998	100		05		3.87
	45	45	1					08101040.569	10	10:40:18	10:40:28	10	1,250	1,248	100		06		0.17
	56	56	1					08101042.329	10	10:42:01	10:42:11	10	1,250	1,248	100		07		0.17
	67	67	1					08110306.229	11	03:00:00	03:06:00	360	45,000	44,998	100		18	field noise while locating cone	6.00
	78	78	1					08110539.219	11	05:39:38	05:39:58	20	2,500	2,499	100		18	field noise before re-entry	0.33
	89	89	1					08110540.429	11	05:40:59	05:41:19	20	2,500	2,499	100		18	pulse test before re-entry	0.33
	100	100	1					08110734.339	11	07:34:50	07:35:10	20	2,500	-1	0	-1	00	empty file, pulse test on TCU	0.33
	111	111	1					08110736.529	11	07:37:08	07:37:28	20	2,498	2,499	100		18	pulse test before clamp, in hole, pict. #3, TCU	0.33
	122	122	1					08110746.199	11	07:46:38	07:46:58	20	2,498	2,499	100		18	pulse test after clamping, picture #4	0.33
	133	133	1					08110748.349	11	07:48:53	07:53:51	298	37,274	37,498	100		18	field noise, picture # 5	4.97
	144	144	1					08110755.009	11	07:55:18	07:55:38	20	2,498	2,499	100		18	pulse test, electronic noise, picture #6	0.33
	155	155	1					08110756.389	11	07:56:56	08:01:54	298	37,274	37,498	100		18	preliminary field noise	4.97
	166	166	1					08110804.229	11	08:04:41	08:09:39	298	37,274	37,498	100		18	preliminary noise data	4.97
	177	177	1					08110811.579	11	08:11:16	08:16:14	298	37,274	37,498	100		18	preliminary noise data	4.97
	188	188	1					08110822.519	11	08:23:11	08:28:09	298	37,274	37,498	100		18	clock check	4.97
	199	199	1					08110828.409	11	08:28:59	08:33:57	298	37,272	37,498	100		18	field noise, picture # 7	4.97
	210	210	1					08110837.299	11	08:37:48	08:37:53	5	635	624	98		18	system test	0.08
	221	221	1					08110838.269	11	08:38:45	08:43:43	298	37,274	37,498	100		18	preliminary noise tests	4.97
	232	233	2					08110846.219	11	08:46:42	09:01:36	894	111,794	112,498	100		18	preliminary noise tests	14.90
	244	244	1					08110905.549	11	09:06:13	09:06:22	9	1,129	1,124	100		18	in hole noise tests	0.15
	255	257	3					08110907.289	11	09:07:47	09:37:36	1789	223,579	224,995	100		18	Bombed above record manually	29.82
	268	268	1					08110938.159	11	09:38:34	09:38:54	20	2,498	2,499	100		18	in hole pulse test	0.33
	279	280	2					08110940.379	11	09:40:56	09:55:50	894	111,792	112,498	100		18	in hole noise record	14.90
	291	293	3					08110959.499	11	10:00:08	10:27:07	1619	202,417	208,614	100		18	in hole noise tests	26.98
	304	304	1					08111030.489	11	10:31:07	10:32:07	60	7,466	7,499	100		18	in hole noise record	1.00
	315	316	2					08111033.399	11	10:33:59	10:53:51	1192	149,054	149,998	100		18		19.87
	327	327	1					08111057.039	11	10:57:23	10:57:23	0	16	1	6		18	null record	0.00
	338	338	1					08111100.069	11	11:00:25	11:01:25	60	7,466	7,499	100		18		1.00
	349	351	3					08111103.149	11	11:03:34	11:28:25	1491	186,319	187,498	100		18		24.85
	362	364	3					08111130.309	11	11:30:49	11:55:40	1491	186,319	187,498	100		18		24.85
	375	375	1					08111203.259	11	12:03:44	12:04:44	60	7,464	7,499	100		18		1.00
	386	388	3					08111208.389	11	12:08:57	12:33:48	1491	186,316	187,498	100		18		24.85
	399	400	2					08111236.009	11	12:36:20	12:56:12	1192	149,058	149,998	100		18		19.87
	411	411	1					08111258.039	11	12:58:23	12:59:23	60	7,466	7,499	100		18		1.00
	422	422	1					08111306.239	11	13:06:42	13:06:42	0	16	-1	0	-1	00	null record	0.00
	433	434	2					08111308.379	11	13:08:57	13:28:49	1192	149,058	149,998	100		18		19.87
	445	447	3					08111330.209	11	13:30:40	13:55:31	1491	186,317	187,498	100		18		24.85
	458	458	1					08111356.409	11	13:57:00	13:57:20	20	2,498	2,499	100		18	pulse test	0.33
	469	471	3					08111406.309	11	14:06:46	14:31:37	1491	186,317	187,498	100		12	3 missing scans	24.85

Table 1-1

Table 1 Borehole Array Recording Summary

Line	Events WHOI start	WHOI end	WHOI total	NOARL start	NOARL end	Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments
	482	484	3					08111435.179	11	14:35:34	15:00:25	1491	186,318	187,498	100		12	1 missing scan
	495	495	1					08111501.249	11	15:01:41	15:02:01	20	2,498	2,499	100		12	pulse test
	506	506	1					08111503.009	11	15:03:17	15:04:17	60	7,466	7,499	100		12	3 mising scans
	517	517	1					08111533.099	11	15:33:26	15:33:46	20	2,498	2,499	100		12	new disk
	528	529	2					08111535.039	11	15:35:20	15:55:12	1192	149,055	149,998	100		12	4 missed scans - Radio interference
	540	540	1					08111556.549	11	15:57:10	15:57:30	20	2,498	2,499	100		12	pulse test
	551	551	1					08111559.209	11	15:59:37	15:59:57	20	2,498	2,499	100		12	noise test
	562	563	2					08111607.479	11	16:08:04	16:27:56	1192	149,058	149,998	100		12	2 missing scans
	574	576	3					08111629.069	11	16:29:23	16:59:12	1789	223,581	224,998	100		12	
	587	587	1					08111704.139	11	17:04:29	17:04:49	20	2,498	2,499	100		12	pulse test - 2 missing scans
	598	598	1					08111705.429	11	17:05:58	17:06:58	60	7,466	7,499	100		12	
E1	609	617	9	2	5	55.9	59.9	08111712.409	11	17:12:57	17:56:40	2623	327,910	329,997	100		10	read wrap - 2 missind scans
	628	637	10	6	8	49.7	51.6	08111758.479	11	17:59:04	18:55:39	3395	424,376	427,505	100		12	read wraps & 500 errors
	648	670	23	10	21	37.9	47.9	08111900.289	11	19:00:44	19:58:22	3458	432,243	434,997	100		10	serious disk errors
	681	693	13	22	28	31.3	37.0	08112000.309	11	20:00:46	20:58:24	3458	432,241	434,997	100		10	5 missing scans
	794	799	6					08112100.299	11	21:00:46	21:58:10	3444	430,549	434,997	100		18	read wraps & 1000's of missing scans
	810	815	6					08112200.299	11	22:00:46	22:57:57	3431	428,885	434,997	100	14,664	18	read wraps & missing scans, CGGEDIT ok
	826	826	1					08112303.159	11	23:03:31	23:03:31	0	16	1,623	100	2	10	null record
	837	837	1					08112304.589	11	23:05:14	23:06:14	60	7,466	7,499	100		10	
	848	848	1					08112306.459	11	23:07:01	23:07:21	20	2,498	2,499	100		10	pulse test
	859	863	5					08112317.009	11	23:17:17	23:56:51	2374	296,735	298,623	100		12	5 missing scans
	874	890	17	76	89	1.4	7.3	08120000.009	12	00:00:16	00:57:54	3458	432,243	434,997	100		12	1 missing scan, user terminate 2 min. early
E5	901	913	13	92	99	.5	3.9	08120100.019	12	01:00:17	01:57:55	3458	432,243	434,997	100		11	3 missing scans
	934	934	1					08120210.209	12	02:10:40	02:10:50	10	1,256	1,249	99		18	engineering tests
	939	938						08122800.???	12	02:28:00	02:28:00	0			0			incomplete file
	945	945	1					08120234.209	12	02:34:41	02:35:41	60	7,464	7,499	100		18	engineering tests
	956	956	1					08120240.229	12	02:40:42	02:41:42	60	7,466	7,499	100		18	engineering tests
	967	967	1					08120656.369	12	06:56:53	06:57:13	20	2,498	2,499	100		12	pulse test
	978	978	1					08120658.149	12	06:58:31	06:59:31	60	7,465	7,498	100		12	
	989	994	6					08120800.099	12	08:00:26	08:58:04	3458	432,241	434,997	100		12	3 missing scans
	1005	1010	6					08120900.009	12	09:00:16	09:57:54	3458	432,242	434,997	100		12	1 missing scan
	1021	1026	6					08121000.009	12	10:00:16	10:57:54	3458	432,242	434,997	100		12	2 missing scans
	1037	1042	6					08121100.009	12	11:00:16	11:57:54	3458	432,243	434,997	100		13	
	1053	1053	1					08121209.259	12	12:09:42	12:09:42	0	16	2,498	100		03	null record
	1064	1064	1					08121211.579	12	12:12:13	12:12:13	0	16	2,498	100		03	null record
	1075	1075	1					08121216.039	12	12:16:20	12:16:40	20	2,498	2,499	100		13	pulse test
	1086	1089	4					08121219.419	12	12:19.58	12:59:43	2385	298,103	299,998	100		13	
	1100	1105	6					08121302.399	12	13:02:55	13:58:34	3339	417,338	419,997	100		18	
A5A	1116	1215	100	1001	1099	.5	5.2	08121400.399	12	14.00:55	14:58:33	3458	432,210	434,997	100		13	
A5	1226	1337	112	1105	1216	.4	5.7	08121501.149	12	15:01:39	15:57:18	3339	417,338	419,997	100		13	
	1348	1454	107	1219	1334	5.8	11.6	08121558.239	12	15:58:40	16:56:18	3458	432,243	434,997	100		13	
	1475	1558	84	1337	1418	11.7	16.0	08121657.159	12	16:57:41	17:59:17	3696	462,052	464,997	100		13	

Table 1 Borehole Array Recording Summary

Line	Events WHOI			Events NOARL		Range min.	Range max.	OPTICAL file	day Aug.	Time (GMT)	Time (GMT)	file length	# of Scans	Scans read	% scan	1st bad	from disk	Comments
#	start	end	total	start	end	(km)	(km)	name	'89	start	end	(sec)	computed		read	scan	#	
	1569	1569	1					08121801.459	12	18:02:02	18:02:22	20	2,498	2,499	100		13	pulse test
	1580	1580	1					08121803.059	12	18:03:21	18:04:21	60	7,466	7,499	100		13	
	1591	1592	2					08121810.109	12	18:10:26	18:10:26	0	16		0		13	null record
	1603	1614	12	1419	1426	24.9	25.3	08121819.499	12	18:20:05	18:59:50	2385	298,103	299,998	100		13	
	1625	1742	118	1429	1546	23.4	28.3	08121900.509	12	19:01:13	19:59:51	3518	439,694	442,497	100		13	Turn back on line at shot 1678
	1753	1814	62	1547	1605	14.0	18.7	08122000.309	12	20:00:46	20:58:24	3458	432,242	434,997	100		13	
	1825	1942	118	1608	1725	4.3	13.7	08122059.279	12	20:59:46	21:58:24	3518	439,694	442,497	100		13	
A5/A5a	1953	2025	73	1732	1802	.1	3.8	08122201.049	12	22:01:47	23:00:25	3518	439,695	442,497	100		13	A5 runs back into A5A, ends with shot 2000
A5A	2036	2041	6					08122301.039	12	23:01:20	23:59:58	3518	439,694	442,497	100		13	
	2052	2057	6					08130001.199	13	00:01:35	01:00:13	3518	439,694	442,497	100		13	
	2068	2073	6					08130101.045	13	01:02:10	02:00:48	3518	439,695	442,497	100		14	
	2084	2089	6					08130203.289	13	02:03:45	03:02:23	3518	439,695	442,497	100		14	
	2100	2105	6					08130303.499	13	03:04:05	04:01:43	3458	432,243	434,997	100		14	
	2116	2116	1					08130402.459	13	04:03:01	04:03:21	20	2,498	2,499	100		14	pulse test
	2127	2131	5					08130410.329	13	04:10:49	04:55:32	2683	335,365	337,498	100		14	
A2	2142	2223	82	1803	1882	33.7	40.7	08130459.559	13	05:00:11	05:57:49	3458	432,242	434,997	100		17	
	2234	2351	118	1885	2002	22.1	33.4	08130558.999	13	05:59:25	06:58:03	3518	439,694	442,497	100		05	
	2362	2481	120	2005	2124	10.0	21.8	08130659.029	13	06:59:26	07:59:03	3577	447,147	449,997	100		17	
A2/A6	2492	2611	120	2127	2246	.5	9.7	08130800.009	13	08:00:27	09:00:04	3577	447,147	449,997	100		17	A2 becomes line A6 at shot 2586
	2622	2739	118	2249	2366	2.5	13.8	08130901.089	13	09:01:28	10:00:06	3518	439,694	442,497	100		14	
	2750	2860	111	2369	2479	14.1	24.7	08131000.559	13	10:01:29	11:01:06	3577	447,145	449,997	100		14	
	2881	2886	6					08131101.469	13	11:02:03	11:59:41	3458	432,243	434,997	100		14	
	2897	2897	1					08131203.269	13	12:03:42	12:04:42	60	7,466	7,499	100		14	
	2908	2913	6					08131207.509	13	12:08:06	13:05:44	3458	432,243	434,997	100		14	
E6	2924	2934	11	102	105	45.3	48.8	08131307.579	13	13:08:13	14:01:52	3219	402,434	404,997	100		14	
	2955	2974	20	106	115	35.0	44.3	08131403.129	13	14:03:28	14:57:30	3242	405,280	405,083	100		14	END of SHIPboard RECORDing
	2990	2991	2	155	155	6.8	6.8	08131706.229	13	17:00:02	17:06:02	360	45,000	24	0	9	05	no EOF mark, BCU hung up
E2	3012	3012	1					08132006.239	13	20:00:02	20:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3023	3024	2	247	247	47.6	47.6	08132106.239	13	21:00:02	21:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3045	3045	1					08132206.239	13	22:00:02	22:06:02	360	45,000	44,998	100		09	MELVILLE noise, LYNCH in the area
	3056	3056	1					08132306.239	13	23:00:02	23:06:02	360	45,000	392	1	392	05	incomplete file
	3067	3067	1					08140006.239	14	00:00:02	00:06:02	360	45,000	40,200	89		05	MELVILLE noise, LYNCCH in the area
E3	3078	3079	2	264	264	30.2	30.2	08140106.239	14	01:00:02	01:06:02	360	45,000	72	0	72	05	incomplete file
	3090	3091	2	276	276	17.5	17.5	08140206.239	14	02:00:02	02:06:02	360	45,000	44,998	100		09	MELVILLE noise - 2 missing scans
	3172	3172	1					08140306.249	14	03:00:02	03:06:02	360	45,000	44,998	100		09	MELVILLE noise, LYNCH in the area
	3183	3183	1					08140406.289	14	04:00:02	04:06:02	360	45,000	44,998	100		09	MELVILLE noise, LYNCH in the area
	3194	3194	1					08140506.289	14	05:00:02	05:06:02	360	45,000	44,998	100		05	MELVILLE noise, LYNCH in the area
A9	3205	3216	12	2573	2584	10.0	10.0	08140606.289	14	06:00:02	06:06:02	360	45,000	44,998	100		09	MELVILLE noise, begin circle, 2 scans missing
	3227	3238	12	2693	2704	10.0	10.0	08140706.249	14	07:00:02	07:06:02	360	45,000	44,998	100		09	MELVILLE noise
	3249	3260	12	2813	2824	10.0	10.0	08140806.249	14	08:00:02	08:06:02	360	45,000	44,998	100		09	MELVILLE noise
	3271	3282	12	2933	2944	10.0	10.0	08140906.999	14	09:00:02	09:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3293	3304	12	3053	3064	10.0	10.0	08141006.309	14	10:00:02	10:06:02	360	45,000	44,998	100		05	MELVILLE noise

Table 1 Borehole Array Recording Summary

Line	Events WHOI			Events NOARL		Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments
#	start	end	total	start	end													
	3315	3326	12	3173	3184	10.0	10.0	08141106.309	14	11:00:02	11:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3337	3348	12	3293	3304	10.0	10.0	08141206.309	14	12:00:02	12:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3359	3359	1					08141306.319	14	13:00:02	13:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3370	3370	1					08141406.319	14	14:00:02	14:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3381	3381	1					08141506.309	14	15:00:02	15:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3392	3403	12	3383	3394	10.0	10.0	08141606.309	14	16:00:02	16:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3414	3425	12	3394	3513	10.0	10.0	08141706.319	14	17:00:02	17:06:02	360	45,000	44,998	100		05	MELVILLE noise
	3436	3447	12	3622	3633	10.0	10.0	08141806.309	14	18:00:03	18:06:03	360	45,000	44,998	100		05	MELVILLE noise
	3458	3469	12	3742	3753	10.0	10.0	08141906.319	14	19:00:04	19:06:04	360	45,000	44,998	100		05	MELVILLE noise
	3480	3491	12	3863	3873	10.0	10.0	08142006.319	14	20:00:05	20:06:05	360	45,000	44,998	100		05	MELVILLE noise
	3502	3513	12	3982	3993	10.0	10.0	08142106.319	14	21:00:06	21:06:06	360	45,000	44,998	100		05	MELVILLE noise
	3524	3535	12	4102	4113	10.0	10.0	08142206.309	14	22:00:07	22:06:07	360	45,000	44,998	100		05	MELVILLE noise
	3546	3557	12	4222	4233	10.0	10.0	08142306.309	14	23:00:08	23:06:08	360	45,000	44,998	100		05	MELVILLE noise
	3568	3579	12	4342	4353	10.0	10.0	08150006.319	15	00:00:09	00:06:09	360	45,000	44,998	100		05	MELVILLE noise, Farrell's color picture
	3690	3690	1					08150106.309	15	01:00:02	01:06:02	360	45,000	44,998	100		05	Farrell's color picture
	3701	3701	1					08150206.309	15	02:00:02	02:06:02	360	45,000	44,998	100		05	Farrell's color picture
	3712	3712	1					08150306.319	15	03:00:02	03:06:02	360	45,000	44,998	100		05	Farrell's color picture, end of circle
A3	3723	3734	12	4524	4535	18.9	19.5	08150406.309	15	04:00:14	04:06:14	360	45,000	44,998	100		18	
	3745	3756	12	4644	4655	11.6	12.3	08150506.259	15	05:00:15	05:06:15	360	45,000	44,998	100		05	
	3767	3778	12	4764	4775	3.9	4.5	08150606.259	15	06:00:16	06:06:16	360	45,000	44,998	100		05	
A7	3789	3800	12	4884	4895	3.0	3.7	08150706.259	15	07:00:17	07:06:17	360	45,000	44,998	100		05	
	3811	3822	12	5004	5015	11.2	12.0	08150806.249	15	08:00:18	08:06:18	360	45,000	44,998	100		05	
	3833	3844	12	5124	5135	19.3	20.0	08150906.259	15	09:00:19	09:06:19	360	45,000	44,998	100		05	
	3855	3855	1					08151006.259	15	10:00:02	10:06:02	360	45,000	44,998	100		05	LYNCH in the area
	3866	3866	1					08151106.259	15	11:00:02	11:06:02	360	45,000	44,998	100		05	LYNCH in the area
E7	3877	3877	1					08151206.259	15	12:00:02	12:06:02	360	45,000	44,998	100		05	LYNCH in the area
	3958	3959	2	327	327	41.1	41.1	08151306.259	15	13:00:02	13:06:02	360	45,000	44,998	100		05	
	3970	3971	2	339	339	28.1	28.1	08151406.259	15	14:00:02	14:06:02	360	45,000	44,998	100		05	
	3982	3982	1					08151506.259	15	15:00:02	15:06:02	360	45,000	44,998	100		05	
	3993	3993	1					08151606.259	15	16:00:02	16:06:02	360	45,000	44,998	100		05	
	4004	4004	1					08151706.269	15	17:00:02	17:06:02	360	45,000	44,998	100		05	
	4015	4015	1					08151806.259	15	18:00:02	18:06:02	360	45,000	44,998	100		05	
	4026	4026	1					08151906.259	15	19:00:02	19:06:02	360	45,000	44,998	100		09	3 missing scans
	4037	4037	1					08152006.279	15	20:00:02	20:06:02	360	45,000	44,998	100		05	
	4048	4048	1					08152106.279	15	21:00:02	21:06:02	360	45,000	44,998	100		05	
	4059	4059	1					08152206.279	15	22:00:02	22:06:02	360	45,000	44,998	100		05	
E4	4070	4072	3	397	399	1.3	2.1	08152306.269	15	23:00:18	23:06:18	360	45,000	44,998	100		05	
	4090	4092	3	427	429	13.9	14.8	08160006.279	16	00:00:19	00:06:19	360	45,000	44,998	100		05	
	4103	4104	2	447	447	26.9	26.9	08160106.279	16	01:00:02	01:06:02	360	45,000	44,998	100		05	
	4115	4116	2	459	459	40.1	40.1	08160206.289	16	02:00:02	02:06:02	360	45,000	44,998	100		05	
	4134	4134	1					08160306.279	16	03:00:02	03:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4145	4145	1					08160406.279	16	04:00:02	04:06:02	360	45,000	44,998	100		05	LYNCH in the area

Table 1 Borehole Array Recording Summary

Line	Events WHOI			Events NOARL		Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments
	4156	4156	1					08160506.279	16	05:00:02	05:06:02	360	45,000	44,998	100		05	LYNCH in the area
A4	4167	4178	12	5319	5330	18.2	19.0	08160606.289	16	06:00:11	06:06:11	360	45,000	44,998	100		05	
	4189	4200	12	5439	5450	9.3	10.1	08160706.279	16	07:00:12	07:06:12	360	45,000	44,998	100		05	
A8	4211	4222	12	5559	5570	2.2	2.3	08160806.279	16	08:00:13	08:06:13	360	45,000	44,998	100		05	
	4233	4244	12	5679	5690	9.6	10.5	08160906.289	16	09:00:14	09:06:14	360	45,000	44,998	100		05	AIRGUNS
	4255	4266	12	5799	5810	19.3	20.2	08161006.279	16	10:00:15	10:06:15	360	45,000	44,998	100		05	
	4277	4282	6	5919	5924	28.4	28.7	08161106.289	16	11:00:16	11:06:16	360	45,000	44,998	100		05	Noise not Airgun
A1	4293	4293	1					08161206.279	16	12:00:02	12:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4304	4315	12	5940	5951	22.8	23.4	08161306.289	16	13:00:18	13:06:18	360	45,000	44,998	100		05	
	4326	4337	12	6060	6071	16.3	16.8	08161406.279	16	14:00:19	14:06:19	360	45,000	44,998	100		05	
	4348	4359	12	6180	6191	10.1	10.7	08161506.289	16	15:00:20	15:06:20	360	45,000	44,998	100		05	
	4370	4371	2	6300	6300	4.4	4.4	08161606.279	16	16:00:22	16:06:22	360	45,000	44,998	100		05	LYNCH in the area
	4381	4381	1					08161706.289	16	17:00:02	17:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4392	4392	1					08161806.279	16	18:00:02	18:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4403	4403	1					08161906.279	16	19:00:02	19:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4414	4414	1					08162006.279	16	20:00:02	20:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4425	4425	1					08162106.289	16	21:00:02	21:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4436	4436	1					08162206.279	16	22:00:02	22:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4447	4447	1					08162306.279	16	23:00:02	23:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4458	4458	1					08170006.289	17	00:00:02	00:06:02	360	45,000	44,998	100		05	LYNCH in the area
E8	4476	4478	3	494	496	14.4	15.3	08170106.289	17	01:00:14	01:06:14	360	45,000	44,998	100		05	
	4489	4490	2	516	516	28.2	28.2	08170206.289	17	02:00:02	02:06:02	360	45,000	44,998	100		05	
	4501	4502	2	528	528	41.9	41.9	08170306.289	17	03:00:02	03:06:02	360	45,000	44,998	100		05	
	4513	4514	2	540	540	55.7	55.7	08170406.289	17	04:00:02	04:06:02	360	45,000	44,998	100		05	
A8	4525	4560	36	6462	6497	50.3	51.0	08170506.289	17	04:59:55	05:05:55	360	45,000	44,998	100		05	airgun firing rate too fast for good data
	4571	4571	1	6822	6822	44.1	44.1	08170600.389	17	05:59:56	06:00:05	10	1,250	1,248	100		05	airgun firing rate too fast for good data
	4582	4582	1	7182	7182	37.3	37.3	08170700.389	17	06:59:57	07:00:06	10	1,250	1,248	100		05	airgun firing rate too fast for good data
	4593	4593	1	7542	7542	30.5	30.5	08170800.399	17	07:59:58	08:00:07	10	1,250	1,248	100		05	airgun firing rate too fast for good data
	4604	4604	1	7902	7902	23.6	23.6	08170900.389	17	08:59:59	09:00:08	10	1,250	1,248	100		05	airgun firing rate too fast for good data
	4615	4650	36	8262	8297	16.5	17.1	08171006.289	17	10:00:00	10:06:00	360	45,000	44,998	100		05	airgun firing rate too fast for good data
	4661	4661	1					08171106.289	17	11:00:02	11:06:02	360	45,000	44,998	100		05	LYNCH in the area
E5	4672	4672	1					08171206.289	17	12:00:02	12:06:02	360	45,000	44,998	100		05	LYNCH in the area
	4690	4692	3	556	558	10.1	11.0	08171306.289	17	13:00:15	13:06:15	360	45,000	44,998	100		05	
	4713	4713	1					08171400.389	17	14:00:02	14:00:11	9.996	1,250	1,248	100		05	
	4724	4724	1					08171500.389	17	15:00:02	15:00:11	9.996	1,250	1,248	100		05	
Nois	4735	4735	1					08171600.399	17	16:00:02	16:00:11	9.996	1,250	1,248	100		05	
	4746	4746	1					08171700.389	17	17:00:02	17:00:11	9.996	1,250	1,248	100		05	
	4757	4757	1					08171800.389	17	18:00:02	18:00:11	9.996	1,250	1,248	100		05	
	4768	4768	1					08171900.389	17	19:00:02	19:00:11	9.996	1,250	1,248	100		05	
	4779	4779	1					08172000.399	17	20:00:02	20:00:11	9.996	1,250	1,248	100		05	
	4790	4790	1					08172100.399	17	21:00:02	21:00:11	9.996	1,250	1,248	100		05	
	4801	4801	1					08172206.289	17	22:00:02	22:06:02	360	45,000	44,998	100		05	

Table 1 Borehole Array Recording Summary

Line #	Events WHOI start	WHOI end	WHOI total	NOARL start	NOARL end	Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments
	4812	4812	1					08172300.399	17	23:00:02	23:00:11	9.996	1,250	1,248	100		05	
	4823	4823	1					08180006.299	17	00:00:02	00:06:02	360	45,000	44,998	100		05	
	4834	4834	1					08180100.389	17	01:00:02	01:00:11	9.996	1,250	1,248	100		05	
	4845	4846	2					08180159.999	18	02:00:02	02:20:02	1200	150,000	149,998	100		05	
	4857	4857	1					08180306.299	18	03:00:02	03:06:02	360	45,000	648	1		05	no trailer information
	4868	4869	2					08180359.369	18	04:00:02	04:20:02	1200	150,000	149,998	100		05	
	4880	4880	1					08180506.289	18	05:00:02	05:06:02	360	45,000	44,998	100		05	
	4891	4892	2					08180559.369	18	06:00:02	06:20:02	1200	150,000	149,998	100		05	
	4903	4903	1					08180706.299	18	07:00:02	07:06:02	360	45,000	44,998	100		05	
	4914	4915	2					08180759.369	18	08:00:02	08:20:02	1200	150,000	149,998	100		05	
	4926	4926	1					08180906.299	18	09:00:02	09:06:02	360	45,000	44,998	100		05	
	4937	4938	2					08180959.369	18	10:00:02	10:20:02	1200	150,000	149,998	100		05	
	4949	4949	1					08181106.299	18	11:00:02	11:06:02	360	45,000	44,998	100		05	
	4960	4961	2					08181159.369	18	12:00:02	12:20:02	1200	150,000	149,998	100		05	
	4972	4972	1					08181306.299	18	13:00:02	13:06:02	360	45,000	44,998	100		05	
	4983	4984	2					08181359.369	18	14:00:02	14:20:02	1200	150,000	149,998	100		05	
	4995	4995	1					08181506.289	18	15:00:02	15:06:02	360	45,000	44,998	100		05	
	5006	5007	2					08181559.379	18	16:00:02	16:20:02	1200	150,000	149,998	100		05	
	5018	5018	1					08181706.299	18	17:00:02	17:06:02	360	45,000	44,998	100		05	
	5029	5029	1					08181806.299	18	18:00:02	18:06:02	360	45,000	44,998	100		05	
	5040	5040	1					08181900.399	18	19:00:02	19:00:11	9.996	1,250	1,248	100		05	
	5051	5051	1					08182006.299	18	20:00:02	20:06:02	360	45,000	44,998	100		05	
	5062	5062	1					08182100.399	18	21:00:02	21:00:11	9.996	1,250	1,248	100		05	
	5073	5073	1					08182206.309	18	22:00:02	22:06:02	360	45,000	44,998	100		05	
	5084	5084	1					08182300.409	18	23:00:02	23:00:11	9.996	1,250	1,248	100		05	
	5095	5095	1					08190006.299	18	00:00:02	00:06:02	360	45,000	44,998	100		05	
	5106	5106	1					08190100.399	18	01:00:02	01:00:11	9.996	1,250	1,248	100		05	
	5117	5117	1					08190206.309	19	02:00:02	02:06:02	360	45,000	44,998	100		05	
	5128	5128	1					08190300.399	19	03:00:02	03:00:11	9.996	1,250	1,248	100		05	
	5139	5139	1					08190406.299	19	04:00:02	04:06:02	360	45,000	44,998	100		05	
	5150	5150	1					08190500.409	19	05:00:02	05:00:11	9.996	1,250	1,248	100		05	
	5161	5161	1					08190606.309	19	06:00:02	06:06:02	360	45,000	44,998	100		05	
	5172	5172	1					08190700.399	19	07:00:02	07:00:11	9.996	1,250	1,248	100		05	
	5183	5183	1					08190806.299	19	08:00:02	08:06:02	360	45,000	44,998	100		05	
	5194	5194	1					08190900.409	19	09:00:02	09:00:11	9.996	1,250	1,248	100		05	
	5205	5205	1					08191006.299	19	10:00:02	10:06:02	360	45,000	44,998	100		05	
	5216	5216	1					08191100.409	19	11:00:02	11:00:11	9.996	1,250	1,248	100		05	
	5227	5227	1					08191207.129	19	12:00:02	12:06:02	360	45,000	44,998	100		09	numerous optical disk errors
	5238	5238	1					08191300.349	19	13:00:02	13:00:11	9.996	1,250	1,248	100		06	
	5249	5249	1					08191406.509	19	14:00:02	14:06:02	360	45,000	44,998	100		06	
	5260	5260	1					08191500.539	19	15:00:02	15:00:11	9.996	1,250	1,248	100		06	
	5271	5271	1					08191606.259	19	16:00:02	16:06:02	360	45,000	44,998	100		06	

Table 1 Borehole Array Recording Summary

Line #	Events WHOI start	WHOI end	WHOI total	NOARL start	NOARL end	Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments
	5282	5282	1					08191700.509	19	17:00:02	17:00:11	9.996	1,250	1,248	100		06	
	5293	5293	1					08191806.409	19	18:00:02	18:06:02	360	45,000	44,998	100		06	
	5304	5304	1					08191900.549	19	19:00:02	19:00:11	9.996	1,250	1,248	100		06	
	5315	5315	1					08192006.249	19	20:00:02	20:06:02	360	45,000	44,998	100		06	
	5326	5326	1					08192100.519	19	21:00:02	21:00:11	10	1,250	1,248	100		06	BCU hung up
	5337	5337	1					08200101.589	20	01:00:02	01:00:11	10	1,250	1,248	100		07	
	5348	5348	1					08200206.239	20	02:00:02	02:06:02	360	45,000	44,998	100		07	
	5359	5359	1					08200300.329	20	03:00:02	03:00:11	10	1,250	1,248	100		07	
	5370	5370	1					08200406.229	20	04:00:02	04:06:02	360	45,000	44,998	100		07	
	5381	5381	1					08200500.329	20	05:00:02	05:00:11	10	1,250	1,248	100		07	
	5392	5392	1					08200606.239	20	06:00:02	06:06:02	360	45,000	44,998	100		07	
	5403	5403	1					08200700.329	20	07:00:02	07:00:11	10	1,250	1,248	100		07	
	5414	5414	1					08200806.229	20	08:00:02	08:06:02	360	45,000	44,998	100		07	
	5425	5425	1					08200900.329	20	09:00:02	09:00:11	10	1,250	1,248	100		07	
	5436	5436	1					08201006.239	20	10:00:02	10:06:02	360	45,000	44,998	100		18	
	5447	5447	1					08201100.329	20	11:00:02	11:00:11	10	1,250	1,248	100		07	
	5458	5458	1					08201206.229	20	12:00:02	12:06:02	360	45,000	44,998	100		07	
	5469	5469	1					08201300.339	20	13:00:02	13:00:11	10	1,250	1,248	100		07	
	5480	5480	1					08201406.229	20	14:00:02	14:06:02	360	45,000	44,998	100		07	
	5491	5491	1					08201500.329	20	15:00:02	15:00:11	10	1,250	1,248	100		07	
	5502	5502	1					08201606.229	20	16:00:02	16:06:02	360	45,000	44,998	100		07	
	5513	5513	1					08201700.339	20	17:00:02	17:00:11	10	1,250	1,248	100		07	
	5524	5524	1					08201806.229	20	18:00:02	18:06:02	360	45,000	44,998	100		07	
	5535	5535	1					08201900.329	20	19:00:02	19:00:11	10	1,250	1,248	100		07	
	5546	5546	1					08202006.229	20	20:00:02	20:06:02	360	45,000	44,998	100		07	
	5557	5557	1					08202100.329	20	21:00:02	21:00:11	10	1,250	1,248	100		07	
	5568	5568	1					08202206.229	20	22:00:02	22:06:02	360	45,000	44,998	100		07	BCU hung up
	5579	5579	1					08210100.329	21	01:00:02	01:00:11	10	1,250	1,248	100		07	
	5590	5590	1					08210206.229	21	02:00:02	02:06:02	360	45,000	44,998	100		07	
	5601	5601	1					08210300.329	21	03:00:02	03:00:11	10	1,250	1,248	100		07	
	5612	5612	1					08210406.229	21	04:00:02	04:06:02	360	45,000	44,998	100		07	
	5623	5623	1					08210500.329	21	05:00:02	05:00:11	10	1,250	1,248	100		07	
	5634	5634	1					08210606.229	21	06:00:02	06:06:02	360	45,000	44,998	100		07	
	5645	5645	1					08210700.329	21	07:00:02	07:00:11	10	1,250	1,248	100		07	
	5656	5656	1					08210806.229	21	08:00:02	08:06:02	360	45,000	44,998	100		07	
	5667	5667	1					08210900.329	21	09:00:02	09:00:11	10	1,250	1,248	100		07	
	5678	5678	1					08211006.229	21	10:00:02	10:06:02	360	45,000	44,998	100		07	
	5689	5689	1					08211100.329	21	11:00:02	11:00:11	10	1,250	1,248	100		07	
	5700	5700	1					08211206.229	21	12:00:02	12:06:02	360	45,000	44,998	100		07	
	5711	5711	1					08211300.329	21	13:00:02	13:00:11	10	1,250	1,248	100		07	
	5722	5722	1					08211406.229	21	14:00:02	14:06:02	360	45,000	44,998	100		07	
	5733	5733	1					08211500.329	21	15:00:02	15:00:11	10	1,250	1,248	100		07	

Table 1 Borehole Array Recording Summary

Line #	Events WHOI start	WHOI end	WHOI total	NOARL start	NOARL end	Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments
	5744	5744	1					08211606.229	21	16:00:02	16:06:02	360	45,000	44,998	100		07	
	5755	5755	1					08211700.329	21	17:00:02	17:00:11	10	1,250	1,248	100		07	
	5766	5766	1					08211806.229	21	18:00:02	18:06:02	360	45,000	44,998	100		07	
	5777	5777	1					08211900.329	21	19:00:02	19:00:11	10	1,250	1,248	100		07	
	5788	5788	1					08212006.229	21	20:00:02	20:06:02	360	45,000	44,998	100		07	
	5799	5799	1					08212100.329	21	21:00:02	21:00:11	10	1,250	1,248	100		07	
	5810	5810	1					08212206.229	21	22:00:02	22:06:02	360	45,000	44,998	100		07	
	5821	5821	1					08212300.329	21	23:00:02	23:00:11	10	1,250	1,248	100		07	
	5832	5832	1					08220006.229	22	00:00:02	00:06:02	360	45,000	44,998	100		07	
	5843	5843	1					08220100.329	22	01:00:02	01:00:11	10	1,250	1,248	100		07	
	5854	5854	1					08220206.229	22	02:00:02	02:06:02	360	45,000	44,998	100		07	
	5865	5865	1					08220300.329	22	03:00:02	03:00:11	10	1,250	1,248	100		07	
	5876	5876	1					08220406.229	22	04:00:02	04:06:02	360	45,000	44,998	100		07	
	5887	5887	1					08220500.329	22	05:00:02	05:00:11	10	1,250	1,248	100		07	
	5898	5898	1					08220606.229	22	06:00:02	06:06:02	360	45,000	44,998	100		07	
	5909	5909	1					08220700.329	22	07:00:02	07:00:11	10	1,250	1,248	100		07	
	5920	5920	1					08220806.229	22	08:00:02	08:06:02	360	45,000	44,998	100		07	
	5931	5931	1					08220900.329	22	09:00:02	09:00:11	10	1,250	1,248	100		07	
	5942	5942	1					08221006.229	22	10:00:02	10:06:02	360	45,000	44,998	100		07	
	5953	5953	1					08221100.329	22	11:00:02	11:00:11	10	1,250	1,248	100		07	
	5964	5964	1					08221206.229	22	12:00:02	12:06:02	360	45,000	44,998	100		07	
	5975	5975	1					08221300.329	22	13:00:02	13:00:11	10	1,250	1,248	100		07	
	5986	5986	1					08221406.229	22	14:00:02	14:06:02	360	45,000	44,998	100		07	
	5997	5997	1					08221500.329	22	15:00:02	15:00:11	10	1,250	1,248	100		07	
	6008	6008	1					08221606.229	22	16:00:02	16:06:02	360	45,000	44,998	100		07	
	6019	6019	1					08221700.329	22	17:00:02	17:00:11	10	1,250	1,248	100		07	
	6030	6030	1					08221806.229	22	18:00:02	18:06:02	360	45,000	44,998	100		07	
	6041	6041	1					08221900.329	22	19:00:02	19:00:11	10	1,250	1,248	100		07	
	6052	6052	1					08222006.229	22	20:00:02	20:06:02	360	45,000	44,998	100		07	
	6063	6063	1					08222100.329	22	21:00:02	21:00:11	10	1,250	1,248	100		07	
	6074	6074	1					08222206.229	22	22:00:02	22:06:02	360	45,000	44,998	100		07	
	6085	6085	1					08222300.329	22	23:00:02	23:00:11	10	1,250	1,248	100		07	
	6096	6096	1					08230006.229	22	00:00:02	00:06:02	360	45,000	44,998	100		07	
	6107	6107	1					08230100.329	22	01:00:02	01:00:11	10	1,250	1,248	100		07	
	6118	6118	1					08230206.229	23	02:00:02	02:06:02	360	45,000	44,998	100		07	
	6129	6129	1					08230300.329	23	03:00:02	03:00:11	10	1,250	1,248	100		07	
	6140	6140	1					08230406.229	23	04:00:02	04:06:02	360	45,000	44,998	100		07	
	6151	6151	1					08230500.329	23	05:00:02	05:00:11	10	1,250	1,248	100		07	
	6162	6162	1					08230606.229	23	06:00:02	06:06:02	360	45,000	44,998	100		07	
	6173	6173	1					08230700.329	23	07:00:02	07:00:11	10	1,250	1,248	100		07	
	6184	6184	1					08230806.229	23	08:00:02	08:06:02	360	45,000	44,998	100		07	
	6195	6195	1					08230900.329	23	09:00:02	09:00:11	10	1,250	1,248	100		07	

Table 1 Borehole Array Recording Summary

Line #	Events WHOI start	WHOI end	WHOI total	NOARL start	NOARL end	Range min. (km)	Range max. (km)	OPTICAL file name	day Aug. '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments
	6206	6206	1					08231006.239	23	10:00:02	10:06:02	360	45,000	44,998	100		07	
	6217	6217	1					08231100.339	23	11:00:02	11:00:11	10	1,250	1,248	100		07	
	6228	6228	1					08231206.239	23	12:00:02	12:06:02	360	45,000	44,998	100		07	
	6239	6239	1					08231300.339	23	13:00:02	13:00:11	10	1,250	1,248	100		07	
	6250	6250	1					08231406.249	23	14:00:02	14:06:02	360	45,000	44,998	100		07	
	6261	6261	1					08231500.339	23	15:00:02	15:00:11	10	1,250	1,248	100		07	
	6272	6272	1					08231606.239	23	16:00:02	16:06:02	360	45,000	44,998	100		07	
	6283	6283	1					08231700.349	23	17:00:02	17:00:11	10	1,250	1,248	100		07	
	6294	6294	1					08231806.249	23	18:00:02	18:06:02	360	45,000	44,998	100		07	
	6305	6305	1					08231900.339	23	19:00:02	19:00:11	10	1,250	1,248	100		07	
	6316	6316	1					08232006.239	23	20:00:02	20:06:02	360	45,000	44,998	100		07	
	6327	6327	1					08232100.349	23	21:00:02	21:00:11	10	1,250	1,248	100		07	
	6338	6338	1					08232206.239	23	22:00:02	22:06:02	360	45,000	44,998	100		07	
	6349	6349	1					08232300.349	23	23:00:02	23:00:11	10	1,250	1,248	100		07	
	6360	6360	1					08240006.249	24	00:00:02	00:06:02	360	45,000	44,998	100		07	
	6371	6371	1					08240100.349	24	01:00:02	01:00:11	10	1,250	1,248	100		07	
	6382	6382	1					08240206.249	24	02:00:02	02:06:02	360	45,000	44,998	100		07	
	6393	6393	1					08240300.349	24	03:00:02	03:00:11	9.996	1,250	1,248	100		07	
	6404	6404	1					08240406.249	24	04:00:02	04:06:02	360	45,000	44,998	100		07	
	6415	6415	1					08240500.349	24	05:00:02	05:00:11	9.996	1,250	1,248	100		07	BCU hung up
	6426	6426	1					08250302.019	25	03:00:02	03:00:11	10	1,250	1,248	100		07	
	6437	6437	1					08250406.259	25	04:00:02	04:06:02	360	45,000	44,998	100		07	
	6448	6448	1					08250500.359	25	05:00:02	05:00:11	10	1,250	1,248	100		07	BCU problem
	6459	6459	1					08261502.009	26	15:00:02	15:00:11	10	1,250	1,248	100		07	BCU problem
	6470	6470	1					08262121.269	26	21:00:02	21:00:11	10	1,250	1,248	100		07	BCU problem
	6481	6481	1					08262300.359	26	23:00:02	23:00:11	10	1,250	1,248	100		07	BCU problem
	6492	6492	1					08270100.369	27	01:00:02	01:00:11	10	1,250	1,248	100		07	BCU problem
	6503	6503	1					08270300.359	27	03:00:02	03:00:11	10	1,250	1,248	100		07	BCU problem
	6514	6514	1					08270500.359	27	05:00:02	05:00:11	10	1,250	1,248	100		07	BCU problem
	6525	6525	1					08270700.369	27	07:00:02	07:00:11	10	1,250	1,248	100		07	BCU problem
	6536	6536	1					08270900.369	27	09:00:02	09:00:11	10	1,250	1,248	100		07	BCU problem
	6547	6547	1					08271100.359	27	11:00:02	11:00:11	10	1,250	1,248	100		07	BCU problem
	6558	6558	1					08271300.359	27	13:00:02	13:00:11	10	1,250	1,248	100		07	BCU problem
	6569	6569	1					08271500.369	27	15:00:02	15:00:11	10	1,250	1,248	100		07	BCU problem
	6580	6580	1					08271700.369	27	17:00:02	17:00:11	10	1,250	1,248	100		07	BCU problem
	6591	6591	1					08271900.369	27	19:00:02	19:00:11	10	1,250	1,248	100		07	BCU problem
	6602	6602	1					08272100.369	27	21:00:02	21:00:11	10	1,250	1,248	100		07	BCU problem
	6613	6613	1					08272300.359	27	23:00:02	23:00:11	10	1,250	1,248	100		07	BCU problem
	6624	6624	1					08280100.359	28	01:00:02	01:00:11	10	1,250	1,248	100		07	BCU problem
	6635	6635	1					08280300.369	28	03:00:02	03:00:11	10	1,250	1,248	100		07	BCU problem

Table 1 Borehole Array Recording Summary

Line #	Events WHOI start	WHOI end	WHOI total	NOARL start	NOARL end	Range min. (km)	Range max (km)	OPTICAL file name	day Aug '89	Time (GMT) start	Time (GMT) end	file length (sec)	# of Scans computed	Scans read	% scan read	1st bad scan	from disk #	Comments	DURATION MINS
Explosive shots		85			time:	total		02.15 21.10					2.9E+07	2.8E+07	100				
Airgun shots		2000			time:	done		02 15.14:52											3801.18
Noise files		378																	
ROSE files		2463																	
					scans read			28461555											
					scans total			28506951											
					MegaBytes ship			768 989697		Ambient noise seconds			37169.9						
					MegaBytes boit			149 632458											
					MegaBytes all			918 622155											
					MegaBytes ROSE			1370 91576											

Table 2 Summary of ROSE files at WHOI.

This table shows parameters for all ROSE files created at WHOI. The data here are organized by line number. The explosive lines are presented first and then the airgun lines. Noise periods before and after the active source section of LFASE are first and last in the table, respectively, in this listing.

Column #	Description of Data
1	LFASE Line number (if no active source is shot this is labeled "NOISE").
2	WHOI event number
3	NOARL shot number if there is one for this time frame.
4-6	The shot instant in GMT referenced to the USNS Lynch time (day, hour, minute, and second of August 1989).
7	The range in kilometers from the borehole (for active sources).
8	The azimuth in true degrees from the hole to the shot (for active sources).
9-10	The latitude and longitude of the seismic source.
11	The size in kilograms of the source if explosive, "Airgun" if for an airgun source or blank for no active source.
12	The sum of the clipped values in all twelve channels or blank if no clips.

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
NOISE	1		03	19:59	56.299						
noise	12		03	20:01	36.299						
noise	23		03	20:03	21.299						
noise	34		08	16:00	02.299						
noise	45		10	10:40	20.299						
noise	56		10	10:42	03.299						
noise	67		11	03:00	02.299						
noise	78		11	05:39	40.299						
noise	89		11	05:41	01.299						
noise	100		11	07:34	52.299						
noise	111		11	07:37	10.299						
noise	122		11	07:46	38.299						
noise	133		11	07:48	53.299						
noise	144		11	07:55	18.299						
noise	155		11	07:56	56.299						
noise	166		11	08:04	41.299						
noise	177		11	08:12	16.299						
noise	188		11	08:23	11.299						
noise	199		11	08:28	59.299						
noise	210		11	08:37	48.299						
noise	221		11	08:38	45.299						
noise	232		11	08:46	42.299						
noise	233		11	08:56	42.299						
noise	244		11	09:06	13.299						
noise	255		11	09:07	47.299						
noise	256		11	09:17	47.299						
noise	257		11	09:27	47.299						
noise	268		11	09:38	34.299						
noise	279		11	09:40	56.299						
noise	280		11	09:50	56.299						
noise	291		11	10:00	08.299						
noise	292		11	10:10	08.299						
noise	293		11	10:20	08.299						
noise	304		11	10:31	07.299						
noise	315		11	10:33	59.299						
noise	316		11	10:43	59.299						
noise	327		11	10:57	23.299						
noise	338		11	11:00	25.299						
noise	349		11	11:03	34.299						
noise	350		11	11:13	34.299						
noise	351		11	11:23	34.299						
noise	362		11	11:30	49.299						
noise	363		11	11:40	49.299						
noise	364		11	11:50	49.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
noise	375		11	12:03	44.299						
noise	386		11	12:08	57.299						
noise	387		11	12:18	57.299						
noise	388		11	12:28	57.299						
noise	399		11	12:36	20.299						
noise	400		11	12:46	20.299						
noise	411		11	12:58	23.299						
noise	422		11	13:06	42.299						
noise	433		11	13:08	57.299						
noise	434		11	13:18	57.299						
noise	445		11	13:30	40.299						
noise	446		11	13:40	40.299						
noise	447		11	13:50	40.299						
noise	458		11	13:57	00.299						
noise	469		11	14:06	46.299						
noise	470		11	14:16	46.299						
noise	471		11	14:26	46.299						
noise	482		11	14:35	34.299						
noise	483		11	14:45	34.299						
noise	484		11	14:55	34.299						
noise	495		11	15:01	41.299						
noise	506		11	15:03	17.299						
noise	517		11	15:33	26.299						
noise	528		11	15:35	20.299						
noise	529		11	15:45	20.299						
noise	540		11	15:57	10.299						
noise	551		11	15:59	37.299						
noise	562		11	16:08	04.299						
noise	563		11	16:18	04.299						
noise	574		11	16:29	23.299						
noise	575		11	16:39	23.299						
noise	576		11	16:49	23.299						
noise	587		11	17:04	29.299						
noise	598		11	17:05	58.299						

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
E1 noi	609		11	17:12	57.299						
	610	2	11	17:16	00.227	55.89	358.95	28.85	75.39	00.23	
noise	611		11	17:18	07.405						
noise	612		11	17:28	07.405						
	613	4	11	17:31	00.384	59.66	359.75	28.88	75.38	00.23	
noise	614		11	17:33	08.324						
noise	615		11	17:43	08.324						
noise	616		11	17:53	08.324						
	617	5	11	17:56	00.069	59.91	000.95	28.88	75.37	25.00	208
noise	628		11	17:59	04.299						
noise	629		11	18:09	04.299						
noise	630		11	18:19	04.299						
noise	631		11	18:29	04.299						
noise	632		11	18:39	04.299						
	633	6	11	18:41	17.631	51.65	000.52	28.81	75.38	25.00	467
noise	634		11	18:43	23.968						
	635	7	11	18:46	17.373	50.87	000.29	28.80	75.38	25.00	434
noise	636		11	18:48	23.546						
	637	8	11	18:51	17.234	49.74	000.51	28.79	75.38	25.00	436
	648	10	11	19:01	17.659	47.97	000.32	28.78	75.38	25.00	450
noise	649		11	19:02	44.299						
	650	11	11	19:06	16.278	47.05	000.30	28.77	75.38	25.00	395
noise	651		11	19:08	21.688						
	652	12	11	19:11	14.931	46.16	000.23	28.76	75.38	25.00	401
noise	653		11	19:13	20.171						
	654	13	11	19:16	32.839	45.23	000.32	28.75	75.38	25.00	386
noise	655		11	19:18	37.894						
	656	14	11	19:21	25.102	44.32	000.42	28.74	75.38	25.00	388
noise	657		11	19:23	29.966						
	658	15	11	19:26	24.823	43.40	000.50	28.73	75.38	25.00	422
noise	659		11	19:28	29.511						
	660	16	11	19:31	25.241	42.50	000.60	28.73	75.38	25.00	426
noise	661		11	19:33	29.749						
	662	17	11	19:36	28.436	41.58	000.69	28.72	75.38	25.00	362
noise	663		11	19:38	32.760						
	664	18	11	19:41	25.961	40.70	000.81	28.71	75.38	25.00	359
noise	665		11	19:43	30.102						
	666	19	11	19:46	33.234	39.74	000.97	28.70	75.38	25.00	408
noise	667		11	19:48	37.182						
	668	20	11	19:51	27.193	38.85	001.08	28.69	75.37	25.00	430
noise	669		11	19:53	30.962						
	670	21	11	19:56	33.513	37.92	001.27	28.68	75.37	25.00	416
	681	22	11	20:01	26.462	36.97	001.41	28.68	75.37	25.00	447
noise	682		11	20:02	46.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	683	23	11	20:06	27.770	36.04	001.63	28.67	75.37	25.00	487
noise	684		11	20:08	30.986						
	685	24	11	20:11	26.171	35.09	001.82	28.66	75.37	25.00	421
noise	686		11	20:13	29.198						
	687	25	11	20:16	27.249	34.15	001.99	28.65	75.37	25.00	430
noise	688		11	20:18	30.078						
	689	26	11	20:21	30.970	33.22	002.19	28.64	75.37	25.00	482
noise	690		11	20:23	33.622						
	691	28	11	20:31	26.546	31.33	002.59	28.63	75.37	25.00	889
noise	692		11	20:41	28.827						
noise	693		11	20:51	28.835						
noise	794		11	21:00	46.299						
noise	795		11	21:10	46.299						
noise	796		11	21:20	46.299						
noise	797		11	21:30	46.299						
noise	798		11	21:40	46.299						
noise	799		11	21:50	46.299						
noise	810		11	22:00	46.299						
noise	811		11	22:10	46.299						
noise	812		11	22:20	46.299						
noise	813		11	22:30	46.299						
noise	814		11	22:40	46.299						
noise	815		11	22:50	46.299						
noise	826		11	23:03	31.299						
noise	837		11	23:05	14.299						
noise	848		11	23:07	01.299						
noise	859		11	23:17	17.299						
noise	860		11	23:27	17.299						
noise	861		11	23:37	17.299						
noise	862		11	23:47	17.299						
noise	863		11	23:57	17.299						
noise	874		12	00:00	16.299						
noise	875		12	00:10	16.299						
noise	876		12	00:20	16.299						
	877	76	12	00:30	19.619	07.34	015.66	28.41	75.36	00.82	129
	878	77	12	00:32	19.463	06.89	016.23	28.40	75.36	00.82	82
	879	78	12	00:34	18.776	06.39	016.97	28.40	75.36	00.82	170
	880	79	12	00:36	20.627	05.95	016.95	28.40	75.36	00.82	184
	881	80	12	00:38	19.044	05.49	017.37	28.39	75.36	00.82	232
	882	81	12	00:40	20.527	05.00	018.67	28.39	75.36	00.82	232
	883	82	12	00:42	19.630	04.55	019.17	28.38	75.37	00.82	205
	884	83	12	00:44	19.480	04.09	019.45	28.38	75.37	00.82	240
	885	84	12	00:46	18.471	03.65	020.83	28.38	75.37	00.82	226
	886	85	12	00:48	19.844	03.18	022.35	28.37	75.37	00.82	195

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	887	86	12	00:50	20.702	02.73	024.56	28.37	75.37	00.82	269
	888	87	12	00:52	19.380	02.28	027.81	28.36	75.37	00.82	190
	889	88	12	00:54	18.129	01.78	031.36	28.36	75.37	00.82	264
	890	89	12	00:56	19.014	01.37	037.06	28.35	75.37	00.82	183

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
E5 noi	901		12	01:00	17.299						
	902	92	12	01:02	21.291	00.49	102.58	28.34	75.38	00.82	207
	903	93	12	01:04	20.336	00.69	156.39	28.34	75.38	00.82	213
	904	94	12	01:06	20.698	01.06	176.37	28.33	75.38	00.82	215
	905	95	12	01:08	20.500	01.52	186.02	28.33	75.38	00.82	203
	906		12	01:10	16.813						
	907	96	12	01:12	21.090	02.43	191.81	28.32	75.39	00.82	195
	908	97	12	01:14	19.960	02.90	193.03	28.32	75.39	00.82	239
	909	98	12	01:16	20.515	03.39	193.75	28.32	75.39	00.82	243
	910	99	12	01:18	20.733	03.86	194.41	28.31	75.39	00.82	228
noise	911		12	01:28	17.523						
noise	912		12	01:38	17.523						
noise	913		12	01:48	17.523						
noise	934		12	02:10	40.299						
noise	945		12	02:34	41.299						
noise	956		12	02:40	42.299						
noise	967		12	06:56	53.299						
noise	978		12	06:58	31.299						
noise	989		12	08:00	26.299						
noise	990		12	08:10	26.299						
noise	991		12	08:20	26.299						
noise	992		12	08:30	26.299						
noise	993		12	08:40	26.299						
noise	994		12	08:50	26.299						
noise	1005		12	09:00	16.299						
noise	1006		12	09:10	16.299						
noise	1007		12	09:20	16.299						
noise	1008		12	09:30	16.299						
noise	1009		12	09:40	16.299						
noise	1010		12	09:50	16.299						
noise	1021		12	10:00	16.299						
noise	1022		12	10:10	16.299						
noise	1023		12	10:20	16.299						
noise	1024		12	10:30	16.299						
noise	1025		12	10:40	16.299						
noise	1026		12	10:50	16.299						
noise	1037		12	11:00	16.299						
noise	1038		12	11:10	16.299						
noise	1039		12	11:20	16.299						
noise	1040		12	11:30	16.299						
noise	1041		12	11:40	16.299						
noise	1042		12	11:50	16.299						
noise	1053		12	12:09	42.299						
noise	1064		12	12:12	13.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	Event Tme da	hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
noise	1075		12	12:16	20.299						
noise	1086		12	12:19	58.299						
noise	1087		12	12:29	58.299						
noise	1088		12	12:39	58.299						
noise	1089		12	12:49	58.299						
noise	1100		12	13:02	55.299						
noise	1101		12	13:12	55.299						
noise	1102		12	13:22	55.299						
noise	1103		12	13:32	55.299						
noise	1104		12	13:42	55.299						
noise	1105		12	13:52	55.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A5a noi	1116		12	14:00	55.299						
	1117	1001	12	14:09	38.824	05.19	028.99	28.39	75.36	airgun	1
	1118	1002	12	14:10	08.832	05.16	029.14	28.39	75.36	airgun	1
	1119	1003	12	14:10	38.841	05.13	029.26	28.38	75.36	airgun	
	1120	1004	12	14:11	08.850	05.09	029.39	28.38	75.36	airgun	
	1121	1005	12	14:11	38.858	05.04	029.48	28.38	75.36	airgun	1
	1122	1006	12	14:12	08.867	04.99	029.58	28.38	75.36	airgun	
	1123	1007	12	14:12	38.876	04.94	029.65	28.38	75.36	airgun	1
	1124	1008	12	14:13	08.885	04.88	029.71	28.38	75.36	airgun	1
	1125	1009	12	14:13	38.894	04.82	029.77	28.38	75.36	airgun	1
	1126	1010	12	14:14	08.908	04.77	029.84	28.38	75.36	airgun	1
	1127	1011	12	14:14	38.912	04.71	029.88	28.38	75.36	airgun	1
	1128	1012	12	14:15	08.920	04.66	029.93	28.38	75.36	airgun	1
	1129	1013	12	14:15	38.929	04.61	029.99	28.38	75.36	airgun	2
	1130	1014	12	14:16	08.937	04.55	030.04	28.38	75.36	airgun	2
	1131	1015	12	14:16	38.946	04.50	030.09	28.38	75.36	airgun	2
	1132	1016	12	14:17	08.955	04.45	030.13	28.38	75.36	airgun	2
	1133	1017	12	14:17	38.964	04.40	030.17	28.38	75.36	airgun	3
	1134	1018	12	14:18	08.976	04.36	030.23	28.38	75.36	airgun	2
	1135	1019	12	14:18	38.981	04.30	030.27	28.38	75.36	airgun	3
	1136	1020	12	14:19	08.990	04.25	030.32	28.38	75.36	airgun	3
	1137	1021	12	14:19	38.999	04.20	030.36	28.38	75.36	airgun	4
	1138	1022	12	14:20	09.008	04.15	030.38	28.38	75.36	airgun	4
	1139	1023	12	14:20	39.016	04.11	030.38	28.38	75.36	airgun	3
	1140	1024	12	14:21	09.025	04.06	030.38	28.38	75.36	airgun	5
	1141	1025	12	14:21	39.034	04.01	030.37	28.38	75.36	airgun	3
	1142	1026	12	14:22	09.043	03.97	030.36	28.38	75.36	airgun	3
	1143	1027	12	14:22	39.052	03.93	030.33	28.38	75.36	airgun	2
	1144	1028	12	14:23	09.060	03.88	030.28	28.37	75.36	airgun	2
	1145	1029	12	14:23	39.069	03.84	030.21	28.37	75.36	airgun	2
	1146	1030	12	14:24	09.078	03.80	030.16	28.37	75.36	airgun	3
	1147	1031	12	14:24	39.087	03.76	030.08	28.37	75.36	airgun	4
	1148	1032	12	14:25	09.095	03.71	029.99	28.37	75.36	airgun	2
	1149	1033	12	14:25	39.104	03.66	029.91	28.37	75.36	airgun	2
	1150	1034	12	14:26	09.113	03.62	029.81	28.37	75.36	airgun	2
	1151	1035	12	14:26	39.122	03.58	029.69	28.37	75.36	airgun	2
	1152	1036	12	14:27	09.130	03.53	029.55	28.37	75.36	airgun	4
	1153	1037	12	14:27	39.139	03.48	029.42	28.37	75.36	airgun	6
	1154	1038	12	14:28	09.148	03.44	029.29	28.37	75.36	airgun	7
	1155	1039	12	14:28	39.162	03.39	029.15	28.37	75.36	airgun	6
	1156	1040	12	14:29	09.166	03.35	029.01	28.37	75.36	airgun	6
	1157	1041	12	14:29	39.174	03.31	028.89	28.37	75.36	airgun	3
	1158	1042	12	14:30	09.183	03.26	028.75	28.37	75.36	airgun	4
	1159	1043	12	14:30	39.192	03.22	028.63	28.37	75.36	airgun	4

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	1160	1044	12	14:31	09.201	03.18	028.51	28.37	75.37	airgun	5
	1161	1045	12	14:31	39.209	03.14	028.37	28.37	75.37	airgun	3
	1162	1046	12	14:32	09.218	03.09	028.24	28.37	75.37	airgun	3
	1163	1047	12	14:32	39.228	03.05	028.08	28.37	75.37	airgun	2
	1164	1048	12	14:33	09.236	03.01	027.92	28.37	75.37	airgun	4
	1165	1049	12	14:33	39.245	02.96	027.76	28.37	75.37	airgun	4
	1166	1050	12	14:34	09.253	02.92	027.58	28.37	75.37	airgun	6
	1167	1051	12	14:34	39.263	02.87	027.37	28.37	75.37	airgun	6
	1168	1052	12	14:35	09.271	02.83	027.12	28.37	75.37	airgun	6
	1169	1053	12	14:35	39.280	02.78	026.87	28.37	75.37	airgun	7
	1170	1054	12	14:36	09.288	02.73	026.63	28.37	75.37	airgun	5
	1171	1055	12	14:36	39.297	02.68	026.37	28.37	75.37	airgun	3
	1172	1056	12	14:37	09.307	02.63	026.09	28.36	75.37	airgun	3
	1173	1057	12	14:37	39.315	02.58	025.79	28.36	75.37	airgun	3
	1174	1058	12	14:38	09.324	02.53	025.52	28.36	75.37	airgun	3
	1175	1059	12	14:38	39.332	02.48	025.29	28.36	75.37	airgun	2
	1176	1060	12	14:39	09.341	02.42	025.05	28.36	75.37	airgun	2
	1177	1061	12	14:39	39.350	02.36	024.83	28.36	75.37	airgun	2
	1178	1062	12	14:40	09.363	02.31	024.65	28.36	75.37	airgun	2
	1179	1063	12	14:40	39.368	02.25	024.46	28.36	75.37	airgun	3
	1180	1064	12	14:41	09.376	02.19	024.28	28.36	75.37	airgun	4
	1181	1065	12	14:41	39.385	02.13	024.11	28.36	75.37	airgun	4
	1182	1066	12	14:42	09.394	02.08	023.93	28.36	75.37	airgun	7
	1183	1067	12	14:42	39.403	02.02	023.76	28.36	75.37	airgun	7
	1184	1068	12	14:43	09.417	01.97	023.54	28.36	75.37	airgun	8
	1185	1069	12	14:43	39.420	01.92	023.30	28.36	75.37	airgun	8
	1186	1070	12	14:44	09.429	01.86	023.14	28.36	75.37	airgun	6
	1187	1071	12	14:44	39.438	01.81	022.98	28.36	75.37	airgun	4
	1188	1072	12	14:45	09.446	01.76	022.86	28.36	75.37	airgun	8
	1189	1073	12	14:45	39.455	01.70	022.71	28.36	75.38	airgun	4
	1190	1074	12	14:46	09.465	01.64	022.63	28.36	75.38	airgun	6
	1191	1075	12	14:46	39.473	01.59	022.58	28.36	75.38	airgun	8
	1192	1076	12	14:47	09.482	01.53	022.60	28.36	75.38	airgun	7
	1193	1077	12	14:47	39.491	01.48	022.65	28.36	75.38	airgun	8
	1194	1078	12	14:48	09.502	01.42	022.70	28.36	75.38	airgun	5
	1195	1079	12	14:48	39.511	01.37	022.83	28.36	75.38	airgun	5
	1196	1080	12	14:49	09.518	01.32	022.98	28.35	75.38	airgun	11
	1197	1081	12	14:49	39.530	01.27	023.33	28.35	75.38	airgun	9
	1198	1082	12	14:50	09.535	01.23	023.65	28.35	75.38	airgun	10
	1199	1083	12	14:50	39.543	01.18	024.08	28.35	75.38	airgun	11
	1200	1084	12	14:51	09.552	01.13	024.55	28.35	75.38	airgun	12
	1201	1085	12	14:51	39.561	01.09	025.32	28.35	75.38	airgun	13
	1202	1086	12	14:52	09.570	01.04	026.12	28.35	75.38	airgun	12
	1203	1087	12	14:52	39.578	01.00	027.03	28.35	75.38	airgun	16

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1204	1088	12	14:53	09.604	00.95	028.00	28.35	75.38	airgun	15
	1205	1089	12	14:53	39.596	00.91	029.15	28.35	75.38	airgun	16
	1206	1090	12	14:54	09.605	00.87	030.29	28.35	75.38	airgun	14
	1207	1091	12	14:54	39.614	00.83	031.53	28.35	75.38	airgun	13
	1208	1092	12	14:55	09.623	00.80	032.76	28.35	75.38	airgun	13
	1209	1093	12	14:55	39.631	00.76	034.07	28.35	75.38	airgun	15
	1210	1094	12	14:56	09.640	00.72	035.52	28.35	75.38	airgun	12
	1211	1095	12	14:56	39.649	00.69	037.09	28.35	75.38	airgun	15
	1212	1096	12	14:57	09.658	00.65	038.77	28.35	75.38	airgun	17
	1213	1097	12	14:57	39.672	00.61	040.84	28.35	75.38	airgun	14
	1214	1098	12	14:58	09.675	00.57	043.33	28.35	75.38	airgun	15
	1215	1099	12	14:58	39.684	00.54	046.10	28.35	75.38	airgun	15

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A5	1226	1105	12	15:01	39.737	00.39	074.85	28.34	75.38	airgun	15
	1227	1106	12	15:02	09.746	00.39	081.86	28.34	75.38	airgun	15
	1228	1107	12	15:02	39.755	00.39	089.75	28.34	75.38	airgun	12
	1229	1108	12	15:03	09.763	00.40	097.59	28.34	75.38	airgun	17
	1230	1109	12	15:03	39.773	00.42	105.13	28.34	75.38	airgun	14
	1231	1110	12	15:04	09.782	00.44	112.69	28.34	75.38	airgun	15
	1232	1111	12	15:04	39.793	00.47	119.37	28.34	75.38	airgun	17
	1233	1112	12	15:05	09.799	00.50	125.27	28.34	75.38	airgun	14
	1234	1113	12	15:05	39.807	00.53	130.50	28.34	75.38	airgun	16
	1235	1114	12	15:06	09.817	00.57	135.18	28.34	75.38	airgun	14
	1236	1115	12	15:06	39.825	00.60	139.07	28.34	75.38	airgun	12
	1237	1116	12	15:07	09.834	00.63	142.61	28.34	75.38	airgun	13
	1238	1117	12	15:07	39.843	00.67	145.70	28.34	75.38	airgun	14
	1239	1118	12	15:08	09.852	00.71	148.65	28.34	75.38	airgun	12
	1240	1119	12	15:08	39.860	00.75	151.22	28.34	75.38	airgun	12
	1241	1120	12	15:09	09.870	00.79	153.56	28.34	75.38	airgun	12
	1242	1121	12	15:09	39.878	00.83	155.61	28.34	75.38	airgun	13
	1243	1122	12	15:10	09.887	00.87	157.44	28.34	75.38	airgun	12
	1244	1123	12	15:10	39.895	00.91	159.18	28.34	75.38	airgun	10
	1245	1124	12	15:11	09.905	00.96	160.71	28.34	75.38	airgun	8
	1246	1125	12	15:11	39.913	01.00	162.09	28.34	75.38	airgun	8
	1247	1126	12	15:12	09.927	01.04	163.44	28.33	75.38	airgun	9
	1248	1127	12	15:12	39.931	01.09	164.58	28.33	75.38	airgun	8
	1249	1128	12	15:13	09.940	01.13	165.73	28.33	75.38	airgun	10
	1250	1129	12	15:13	39.948	01.18	166.81	28.33	75.38	airgun	9
	1251	1130	12	15:14	09.958	01.23	167.81	28.33	75.38	airgun	9
	1252	1131	12	15:14	39.966	01.28	168.75	28.33	75.38	airgun	6
	1253	1132	12	15:15	09.975	01.33	169.62	28.33	75.38	airgun	4
	1254	1133	12	15:15	39.984	01.39	170.53	28.33	75.38	airgun	3
	1255	1134	12	15:16	09.993	01.45	171.37	28.33	75.38	airgun	3
	1256	1135	12	15:16	40.001	01.51	172.21	28.33	75.38	airgun	1
	1257	1136	12	15:17	10.010	01.57	173.01	28.33	75.38	airgun	2
	1258	1137	12	15:17	40.019	01.63	173.77	28.33	75.38	airgun	1
	1259	1138	12	15:18	10.028	01.69	174.54	28.33	75.38	airgun	1
	1260	1139	12	15:18	40.037	01.75	175.24	28.33	75.38	airgun	1
	1261	1140	12	15:19	10.045	01.80	175.95	28.33	75.38	airgun	2
	1262	1141	12	15:19	40.054	01.85	176.66	28.33	75.38	airgun	4
	1263	1142	12	15:20	10.063	01.90	177.33	28.33	75.38	airgun	5
	1264	1143	12	15:20	40.072	01.95	177.96	28.33	75.38	airgun	5
	1265	1144	12	15:21	10.081	02.00	178.55	28.33	75.38	airgun	5
	1266	1145	12	15:21	40.090	02.05	179.12	28.33	75.38	airgun	5
	1267	1146	12	15:22	10.099	02.09	179.68	28.33	75.38	airgun	5
	1268	1147	12	15:22	40.107	02.14	180.19	28.33	75.38	airgun	8
	1269	1148	12	15:23	10.116	02.18	180.62	28.33	75.38	airgun	9

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	1270	1149	12	15:23	40.125	02.23	181.01	28.32	75.38	airgun	4
	1271	1150	12	15:24	10.134	02.28	181.34	28.32	75.38	airgun	5
	1272	1151	12	15:24	40.143	02.33	181.64	28.32	75.38	airgun	3
	1273	1152	12	15:25	10.151	02.38	181.88	28.32	75.38	airgun	2
	1274	1153	12	15:25	40.161	02.43	182.17	28.32	75.38	airgun	2
	1275	1154	12	15:26	10.169	02.48	182.40	28.32	75.38	airgun	2
	1276	1155	12	15:26	40.181	02.53	182.61	28.32	75.38	airgun	3
	1277	1156	12	15:27	10.187	02.58	182.84	28.32	75.38	airgun	4
	1278	1157	12	15:27	40.195	02.63	183.07	28.32	75.38	airgun	7
	1279	1158	12	15:28	10.204	02.68	183.31	28.32	75.38	airgun	9
	1280	1159	12	15:28	40.213	02.73	183.52	28.32	75.38	airgun	8
	1281	1160	12	15:29	10.222	02.78	183.70	28.32	75.38	airgun	6
	1282	1161	12	15:29	40.231	02.83	183.88	28.32	75.38	airgun	10
	1283	1162	12	15:30	10.240	02.88	184.04	28.32	75.38	airgun	5
	1284	1163	12	15:30	40.248	02.93	184.17	28.32	75.38	airgun	3
	1285	1164	12	15:31	10.257	02.99	184.28	28.32	75.38	airgun	3
	1286	1165	12	15:31	40.267	03.04	184.40	28.32	75.38	airgun	1
	1287	1166	12	15:32	10.275	03.10	184.50	28.32	75.38	airgun	2
	1288	1167	12	15:32	40.284	03.15	184.61	28.32	75.38	airgun	2
	1289	1168	12	15:33	10.293	03.20	184.73	28.32	75.38	airgun	3
	1290	1169	12	15:33	40.301	03.25	184.85	28.32	75.38	airgun	2
	1291	1170	12	15:34	10.310	03.30	184.98	28.32	75.38	airgun	3
	1292	1171	12	15:34	40.319	03.35	185.14	28.31	75.39	airgun	2
	1293	1172	12	15:35	10.328	03.40	185.26	28.31	75.39	airgun	2
	1294	1173	12	15:35	40.337	03.44	185.41	28.31	75.39	airgun	1
	1295	1174	12	15:36	10.346	03.49	185.54	28.31	75.39	airgun	1
	1296	1175	12	15:36	40.355	03.53	185.68	28.31	75.39	airgun	3
	1297	1176	12	15:37	10.364	03.58	185.79	28.31	75.39	airgun	2
	1298	1177	12	15:37	40.373	03.63	185.93	28.31	75.39	airgun	4
	1299	1178	12	15:38	10.381	03.68	186.02	28.31	75.39	airgun	3
	1300	1179	12	15:38	40.390	03.73	186.15	28.31	75.39	airgun	2
	1301	1180	12	15:39	10.399	03.79	186.26	28.31	75.39	airgun	2
	1302	1181	12	15:39	40.408	03.84	186.37	28.31	75.39	airgun	2
	1303	1182	12	15:40	10.417	03.90	186.45	28.31	75.39	airgun	1
	1304	1183	12	15:40	40.425	03.95	186.55	28.31	75.39	airgun	1
	1305	1184	12	15:41	10.434	04.01	186.65	28.31	75.39	airgun	3
	1306	1185	12	15:41	40.443	04.07	186.77	28.31	75.39	airgun	4
	1307	1186	12	15:42	10.452	04.12	186.86	28.31	75.39	airgun	2
	1308	1187	12	15:42	40.461	04.18	186.98	28.31	75.39	airgun	2
	1309	1188	12	15:43	10.469	04.23	187.07	28.31	75.39	airgun	2
	1310	1189	12	15:43	40.479	04.28	187.18	28.31	75.39	airgun	2
	1311	1190	12	15:44	10.487	04.34	187.26	28.31	75.39	airgun	1
	1312	1191	12	15:44	40.496	04.39	187.37	28.31	75.39	airgun	1
	1313	1192	12	15:45	10.505	04.45	187.45	28.31	75.39	airgun	1

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1314	1193	12	15:45	40.514	04.50	187.53	28.30	75.39	airgun	1
	1315	1194	12	15:46	10.523	04.55	187.59	28.30	75.39	airgun	1
	1316	1195	12	15:46	40.532	04.61	187.67	28.30	75.39	airgun	1
	1317	1196	12	15:47	10.541	04.66	187.72	28.30	75.39	airgun	1
	1318	1197	12	15:47	40.550	04.71	187.78	28.30	75.39	airgun	1
	1319	1198	12	15:48	10.558	04.76	187.84	28.30	75.39	airgun	1
	1320	1199	12	15:48	40.567	04.81	187.90	28.30	75.39	airgun	1
	1321	1200	12	15:49	10.576	04.86	187.95	28.30	75.39	airgun	1
	1322	1201	12	15:49	40.585	04.91	188.03	28.30	75.39	airgun	1
	1323	1202	12	15:50	10.593	04.96	188.09	28.30	75.39	airgun	1
	1324	1203	12	15:50	40.602	05.00	188.14	28.30	75.39	airgun	1
	1325	1204	12	15:51	10.615	05.05	188.20	28.30	75.39	airgun	1
	1326	1205	12	15:51	40.620	05.10	188.26	28.30	75.39	airgun	
	1327	1206	12	15:52	10.629	05.16	188.31	28.30	75.39	airgun	
	1328	1207	12	15:52	40.638	05.21	188.35	28.30	75.39	airgun	
	1329	1208	12	15:53	10.646	05.26	188.39	28.30	75.39	airgun	
	1330	1209	12	15:53	40.656	05.32	188.41	28.30	75.39	airgun	
	1331	1210	12	15:54	10.664	05.37	188.44	28.30	75.39	airgun	
	1332	1211	12	15:54	40.673	05.43	188.47	28.30	75.39	airgun	
	1333	1212	12	15:55	10.682	05.48	188.49	28.30	75.39	airgun	1
	1334	1213	12	15:55	40.691	05.52	188.53	28.30	75.39	airgun	
	1335	1214	12	15:56	10.700	05.57	188.55	28.30	75.39	airgun	
	1336	1215	12	15:56	40.708	05.62	188.58	28.29	75.39	airgun	
	1337	1216	12	15:57	10.717	05.67	188.59	28.29	75.39	airgun	
	1348	1219	12	15:58	40.744	05.82	188.65	28.29	75.39	airgun	
	1349	1220	12	15:59	10.752	05.88	188.68	28.29	75.39	airgun	
	1350	1221	12	15:59	40.761	05.93	188.72	28.29	75.39	airgun	
	1351	1222	12	16:00	10.770	05.98	188.76	28.29	75.39	airgun	
	1352	1223	12	16:00	40.780	06.03	188.81	28.29	75.39	airgun	
	1353	1224	12	16:01	10.788	06.08	188.85	28.29	75.39	airgun	
	1354	1225	12	16:01	40.798	06.14	188.89	28.29	75.39	airgun	
	1355	1226	12	16:02	10.805	06.18	188.93	28.29	75.39	airgun	
	1356	1227	12	16:02	40.815	06.24	188.98	28.29	75.39	airgun	
	1357	1228	12	16:03	10.823	06.28	189.01	28.29	75.39	airgun	
	1358	1229	12	16:03	40.832	06.33	189.06	28.29	75.39	airgun	
	1359	1230	12	16:04	10.841	06.38	189.10	28.29	75.39	airgun	
	1360	1231	12	16:04	40.850	06.43	189.13	28.29	75.39	airgun	
	1361	1232	12	16:05	10.858	06.47	189.18	28.29	75.39	airgun	
	1362	1233	12	16:05	40.868	06.52	189.23	28.29	75.39	airgun	1
	1363	1234	12	16:06	10.876	06.57	189.26	28.29	75.39	airgun	
	1364	1235	12	16:06	40.885	06.61	189.28	28.29	75.39	airgun	1
	1365	1236	12	16:07	10.894	06.66	189.31	28.28	75.39	airgun	
	1366	1237	12	16:07	40.903	06.71	189.33	28.28	75.39	airgun	
	1367	1238	12	16:08	10.911	06.76	189.34	28.28	75.39	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1368	1239	12	16:08	40.921	06.81	189.35	28.28	75.39	airgun	
	1369	1240	12	16:09	10.929	06.87	189.35	28.28	75.39	airgun	
	1370	1241	12	16:09	40.938	06.92	189.35	28.28	75.39	airgun	
	1371	1242	12	16:10	10.946	06.97	189.34	28.28	75.39	airgun	
	1372	1243	12	16:10	40.955	07.03	189.35	28.28	75.39	airgun	
	1373	1244	12	16:11	10.964	07.08	189.36	28.28	75.39	airgun	
	1374	1245	12	16:11	40.973	07.14	189.37	28.28	75.39	airgun	
	1375	1246	12	16:12	10.982	07.19	189.39	28.28	75.39	airgun	
	1376	1247	12	16:12	40.990	07.23	189.43	28.28	75.39	airgun	
	1377	1248	12	16:13	11.000	07.28	189.46	28.28	75.39	airgun	
	1378	1249	12	16:13	41.008	07.33	189.50	28.28	75.39	airgun	
	1379	1250	12	16:14	11.018	07.37	189.53	28.28	75.39	airgun	
	1380	1251	12	16:14	41.026	07.42	189.56	28.28	75.39	airgun	
	1381	1252	12	16:15	11.035	07.47	189.58	28.28	75.39	airgun	
	1382	1253	12	16:15	41.043	07.52	189.61	28.28	75.39	airgun	
	1383	1254	12	16:16	11.052	07.57	189.63	28.28	75.39	airgun	
	1384	1255	12	16:16	41.061	07.62	189.64	28.28	75.39	airgun	
	1385	1256	12	16:17	11.070	07.68	189.65	28.28	75.39	airgun	
	1386	1257	12	16:17	41.079	07.73	189.64	28.28	75.39	airgun	
	1387	1258	12	16:18	11.087	07.79	189.65	28.27	75.39	airgun	
	1388	1259	12	16:18	41.097	07.84	189.66	28.27	75.39	airgun	
	1389	1260	12	16:19	11.105	07.89	189.67	28.27	75.39	airgun	
	1390	1261	12	16:19	41.114	07.94	189.67	28.27	75.39	airgun	
	1391	1262	12	16:20	11.123	07.99	189.68	28.27	75.39	airgun	
	1392	1263	12	16:20	41.131	08.04	189.69	28.27	75.39	airgun	
	1393	1264	12	16:21	11.140	08.09	189.70	28.27	75.39	airgun	
	1394	1265	12	16:21	41.149	08.14	189.71	28.27	75.40	airgun	
	1395	1266	12	16:22	11.158	08.19	189.73	28.27	75.40	airgun	
	1396	1267	12	16:22	41.167	08.23	189.75	28.27	75.40	airgun	
	1397	1268	12	16:23	11.176	08.28	189.76	28.27	75.40	airgun	
	1398	1269	12	16:23	41.184	08.33	189.77	28.27	75.40	airgun	
	1399	1270	12	16:24	11.193	08.37	189.80	28.27	75.40	airgun	
	1400	1271	12	16:24	41.202	08.42	189.81	28.27	75.40	airgun	
	1401	1272	12	16:25	11.211	08.46	189.84	28.27	75.40	airgun	
	1402	1273	12	16:25	41.220	08.50	189.88	28.27	75.40	airgun	
	1403	1274	12	16:26	11.229	08.55	189.91	28.27	75.40	airgun	
	1404	1275	12	16:26	41.237	08.60	189.94	28.27	75.40	airgun	
	1405	1276	12	16:27	11.246	08.64	189.96	28.27	75.40	airgun	
	1406	1277	12	16:27	41.255	08.69	189.99	28.27	75.40	airgun	
	1407	1278	12	16:28	11.264	08.74	190.04	28.27	75.40	airgun	
	1408	1279	12	16:28	41.273	08.79	190.06	28.27	75.40	airgun	
	1409	1280	12	16:29	11.281	08.84	190.10	28.27	75.40	airgun	
	1410	1281	12	16:29	41.290	08.89	190.12	28.27	75.40	airgun	
	1411	1282	12	16:30	11.300	08.94	190.15	28.26	75.40	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	1412	1283	12	16:30	41.308	08.99	190.18	28.26	75.40	airgun	
	1413	1284	12	16:31	11.317	09.04	190.20	28.26	75.40	airgun	
	1414	1285	12	16:31	41.326	09.08	190.22	28.26	75.40	airgun	
	1415	1286	12	16:32	11.335	09.13	190.24	28.26	75.40	airgun	
	1416	1287	12	16:32	41.343	09.18	190.26	28.26	75.40	airgun	
	1417	1288	12	16:33	11.352	09.22	190.28	28.26	75.40	airgun	
	1418	1289	12	16:33	41.361	09.27	190.29	28.26	75.40	airgun	
	1419	1290	12	16:34	11.370	09.33	190.29	28.26	75.40	airgun	
	1420	1291	12	16:34	41.379	09.39	190.29	28.26	75.40	airgun	
	1421	1292	12	16:35	11.387	09.44	190.28	28.26	75.40	airgun	
	1422	1293	12	16:35	41.396	09.50	190.28	28.26	75.40	airgun	
	1423	1294	12	16:36	11.405	09.56	190.27	28.26	75.40	airgun	
	1424	1295	12	16:36	41.414	09.61	190.28	28.26	75.40	airgun	
	1425	1296	12	16:37	11.422	09.67	190.28	28.26	75.40	airgun	
	1426	1297	12	16:37	41.436	09.73	190.30	28.26	75.40	airgun	
	1427	1298	12	16:38	11.440	09.78	190.31	28.26	75.40	airgun	
	1428	1299	12	16:38	41.449	09.83	190.33	28.26	75.40	airgun	
	1429	1300	12	16:39	11.458	09.89	190.37	28.26	75.40	airgun	
	1430	1301	12	16:39	41.467	09.93	190.39	28.26	75.40	airgun	
	1431	1302	12	16:40	11.476	09.98	190.43	28.26	75.40	airgun	
	1432	1303	12	16:40	41.485	10.03	190.46	28.26	75.40	airgun	
	1433	1304	12	16:41	11.493	10.08	190.49	28.25	75.40	airgun	
	1434	1305	12	16:41	41.502	10.13	190.51	28.25	75.40	airgun	
	1435	1306	12	16:42	11.511	10.17	190.54	28.25	75.40	airgun	
	1436	1307	12	16:42	41.520	10.22	190.56	28.25	75.40	airgun	
	1437	1308	12	16:43	11.529	10.27	190.58	28.25	75.40	airgun	
	1438	1309	12	16:43	41.537	10.32	190.60	28.25	75.40	airgun	
	1439	1310	12	16:44	11.546	10.37	190.62	28.25	75.40	airgun	
	1440	1311	12	16:44	41.555	10.42	190.64	28.25	75.40	airgun	
	1441	1318	12	16:48	11.615	10.76	190.83	28.25	75.40	airgun	
	1442	1319	12	16:48	41.624	10.81	190.86	28.25	75.40	airgun	
	1443	1320	12	16:49	11.633	10.87	190.90	28.25	75.40	airgun	
	1444	1321	12	16:49	41.642	10.92	190.92	28.25	75.40	airgun	
	1445	1322	12	16:50	11.651	10.97	190.94	28.25	75.40	airgun	
	1446	1323	12	16:50	41.660	11.02	190.95	28.25	75.40	airgun	
	1447	1324	12	16:51	11.668	11.08	190.96	28.25	75.40	airgun	
	1448	1328	12	16:53	11.704	11.29	190.97	28.25	75.40	airgun	
	1449	1329	12	16:53	41.715	11.34	190.98	28.24	75.40	airgun	
	1450	1330	12	16:54	11.721	11.39	190.98	28.24	75.40	airgun	
	1451	1331	12	16:54	41.730	11.44	190.98	28.24	75.40	airgun	
	1452	1332	12	16:55	11.739	11.48	190.99	28.24	75.40	airgun	
	1453	1333	12	16:55	41.748	11.53	191.00	28.24	75.40	airgun	
	1454	1334	12	16:56	11.757	11.58	191.01	28.24	75.40	airgun	
	1475	1337	12	16:57	41.783	11.73	191.05	28.24	75.40	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1476	1338	12	16:58	11.792	11.79	191.06	28.24	75.40	airgun	
	1477	1339	12	16:58	41.801	11.84	191.06	28.24	75.40	airgun	
	1478	1340	12	16:59	11.810	11.90	191.08	28.24	75.40	airgun	
	1479	1341	12	16:59	41.818	11.96	191.08	28.24	75.40	airgun	
	1480	1342	12	17:00	11.831	12.01	191.09	28.24	75.40	airgun	
	1481	1343	12	17:00	41.840	12.07	191.10	28.24	75.40	airgun	
	1482	1344	12	17:01	11.848	12.12	191.10	28.24	75.40	airgun	
	1483	1345	12	17:01	41.857	12.18	191.11	28.24	75.40	airgun	
	1484	1346	12	17:02	11.863	12.23	191.12	28.24	75.41	airgun	
	1485	1347	12	17:02	41.872	12.28	191.13	28.24	75.41	airgun	
	1486	1348	12	17:03	11.881	12.34	191.13	28.24	75.41	airgun	
	1487	1349	12	17:03	41.889	12.39	191.15	28.24	75.41	airgun	
	1488	1350	12	17:04	11.898	12.44	191.16	28.24	75.41	airgun	
	1489	1351	12	17:04	41.907	12.49	191.16	28.23	75.41	airgun	
	1490	1352	12	17:05	11.916	12.55	191.17	28.23	75.41	airgun	
	1491	1353	12	17:05	41.924	12.60	191.17	28.23	75.41	airgun	
	1492	1354	12	17:06	11.934	12.65	191.18	28.23	75.41	airgun	
	1493	1355	12	17:06	41.942	12.70	191.19	28.23	75.41	airgun	
	1494	1356	12	17:07	11.951	12.76	191.19	28.23	75.41	airgun	
	1495	1357	12	17:07	41.959	12.81	191.18	28.23	75.41	airgun	
	1496	1358	12	17:08	11.970	12.87	191.19	28.23	75.41	airgun	
	1497	1359	12	17:08	41.978	12.92	191.19	28.23	75.41	airgun	
	1498	1360	12	17:09	11.986	12.97	191.19	28.23	75.41	airgun	
	1499	1361	12	17:09	41.995	13.02	191.19	28.23	75.41	airgun	
	1500	1362	12	17:10	12.004	13.07	191.19	28.23	75.41	airgun	
	1501	1363	12	17:10	42.013	13.13	191.21	28.23	75.41	airgun	
	1502	1364	12	17:11	12.021	13.18	191.21	28.23	75.41	airgun	
	1503	1365	12	17:11	42.030	13.23	191.21	28.23	75.41	airgun	
	1504	1366	12	17:12	12.040	13.28	191.21	28.23	75.41	airgun	
	1505	1367	12	17:12	42.048	13.33	191.22	28.23	75.41	airgun	
	1506	1368	12	17:13	12.057	13.38	191.22	28.23	75.41	airgun	
	1507	1369	12	17:13	42.066	13.43	191.23	28.23	75.41	airgun	
	1508	1370	12	17:14	12.074	13.48	191.23	28.23	75.41	airgun	
	1509	1371	12	17:14	42.084	13.53	191.24	28.23	75.41	airgun	
	1510	1372	12	17:15	12.092	13.58	191.24	28.23	75.41	airgun	
	1511	1373	12	17:15	42.101	13.63	191.25	28.22	75.41	airgun	
	1512	1374	12	17:16	12.110	13.68	191.25	28.22	75.41	airgun	
	1513	1375	12	17:16	42.118	13.73	191.24	28.22	75.41	airgun	
	1514	1376	12	17:17	12.127	13.78	191.23	28.22	75.41	airgun	
	1515	1377	12	17:17	42.136	13.84	191.23	28.22	75.41	airgun	
	1516	1378	12	17:18	12.145	13.89	191.23	28.22	75.41	airgun	
	1517	1379	12	17:18	42.154	13.94	191.22	28.22	75.41	airgun	
	1518	1380	12	17:19	12.163	14.00	191.21	28.22	75.41	airgun	
	1519	1381	12	17:19	42.172	14.05	191.20	28.22	75.41	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1520	1382	12	17:20	12.180	14.11	191.19	28.22	75.41	airgun	
	1521	1383	12	17:20	42.190	14.16	191.19	28.22	75.41	airgun	
	1522	1384	12	17:21	12.198	14.21	191.19	28.22	75.41	airgun	
	1523	1385	12	17:21	42.207	14.27	191.19	28.22	75.41	airgun	
	1524	1386	12	17:22	12.216	14.32	191.19	28.22	75.41	airgun	
	1525	1387	12	17:22	42.224	14.37	191.19	28.22	75.41	airgun	
	1526	1388	12	17:23	12.233	14.42	191.19	28.22	75.41	airgun	
	1527	1389	12	17:23	42.242	14.47	191.20	28.22	75.41	airgun	
	1528	1390	12	17:24	12.252	14.52	191.20	28.22	75.41	airgun	
	1529	1391	12	17:24	42.260	14.58	191.21	28.22	75.41	airgun	
	1530	1392	12	17:25	12.268	14.63	191.22	28.22	75.41	airgun	
	1531	1393	12	17:25	42.277	14.68	191.23	28.22	75.41	airgun	
	1532	1394	12	17:26	12.286	14.73	191.24	28.21	75.41	airgun	
	1533	1395	12	17:26	42.295	14.78	191.25	28.21	75.41	airgun	
	1534	1396	12	17:27	12.304	14.83	191.26	28.21	75.41	airgun	
	1535	1397	12	17:27	42.313	14.88	191.28	28.21	75.41	airgun	
	1536	1398	12	17:28	12.321	14.93	191.29	28.21	75.41	airgun	
	1537	1399	12	17:28	42.330	14.98	191.30	28.21	75.41	airgun	
	1538	1400	12	17:29	12.339	15.03	191.31	28.21	75.41	airgun	
	1539	1401	12	17:29	42.348	15.08	191.31	28.21	75.41	airgun	
	1540	1402	12	17:30	12.357	15.14	191.32	28.21	75.41	airgun	
	1541	1403	12	17:30	42.365	15.19	191.32	28.21	75.41	airgun	
	1542	1404	12	17:31	12.374	15.24	191.33	28.21	75.41	airgun	
	1543	1405	12	17:31	42.383	15.30	191.33	28.21	75.41	airgun	
	1544	1406	12	17:32	12.392	15.35	191.33	28.21	75.41	airgun	
	1545	1407	12	17:32	42.401	15.40	191.34	28.21	75.41	airgun	
	1546	1408	12	17:33	12.410	15.46	191.34	28.21	75.41	airgun	
	1547	1409	12	17:33	42.419	15.51	191.34	28.21	75.41	airgun	
	1548	1410	12	17:34	12.427	15.56	191.35	28.21	75.41	airgun	
	1549	1411	12	17:34	42.436	15.62	191.36	28.21	75.41	airgun	
	1550	1412	12	17:35	12.445	15.66	191.36	28.21	75.41	airgun	
	1551	1413	12	17:35	42.454	15.72	191.37	28.21	75.41	airgun	
	1552	1414	12	17:36	12.463	15.76	191.37	28.20	75.41	airgun	
	1553	1415	12	17:36	42.472	15.82	191.38	28.20	75.41	airgun	
	1554	1416	12	17:37	12.480	15.86	191.38	28.20	75.41	airgun	
	1555	1417	12	17:37	42.490	15.92	191.39	28.20	75.41	airgun	
	1556	1418	12	17:38	12.498	15.97	191.39	28.20	75.41	airgun	
noise	1557		12	17:48	13.707						
noise	1558		12	17:58	13.715						
noise	1569		12	18:02	02.299						
noise	1580		12	18:03	21.299						
noise	1591		12	18:10	26.299						
noise	1592		12	18:20	26.299						
noise	1603		12	18:20	05.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
noise	1604		12	18:30	05.299						
noise	1605		12	18:40	05.299						
noise	1606		12	18:50	05.299						
	1607	1419	12	18:56	13.877	24.87	191.24	28.13	75.43	airgun	
	1608	1420	12	18:56	43.885	24.93	191.24	28.12	75.43	airgun	
	1609	1421	12	18:57	13.894	24.99	191.25	28.12	75.43	airgun	
	1610	1422	12	18:57	43.903	25.04	191.25	28.12	75.43	airgun	
	1611	1423	12	18:58	13.912	25.10	191.25	28.12	75.43	airgun	
	1612	1424	12	18:58	43.921	25.16	191.25	28.12	75.43	airgun	
	1613	1425	12	18:59	13.930	25.21	191.26	28.12	75.43	airgun	
	1614	1426	12	18:59	43.938	25.27	191.26	28.12	75.43	airgun	
	1625	1429	12	19:01	13.965	25.44	191.26	28.12	75.43	airgun	
	1626	1430	12	19:01	43.974	25.50	191.26	28.12	75.43	airgun	603
	1627	1431	12	19:02	13.982	25.56	191.25	28.12	75.43	airgun	
	1628	1432	12	19:02	43.992	25.61	191.25	28.12	75.43	airgun	
	1629	1433	12	19:03	14.004	25.67	191.25	28.12	75.43	airgun	
	1630	1434	12	19:03	44.012	25.74	191.24	28.12	75.43	airgun	1284
	1631	1435	12	19:04	14.018	25.79	191.24	28.12	75.43	airgun	
	1632	1436	12	19:04	44.034	25.85	191.24	28.12	75.43	airgun	
	1633	1437	12	19:05	14.038	25.91	191.24	28.12	75.43	airgun	
	1634	1438	12	19:05	44.045	25.97	191.23	28.11	75.43	airgun	
	1635	1439	12	19:06	14.053	26.02	191.23	28.11	75.43	airgun	
	1636	1440	12	19:06	44.062	26.08	191.24	28.11	75.43	airgun	
	1637	1441	12	19:07	14.071	26.14	191.24	28.11	75.43	airgun	
	1638	1442	12	19:07	44.079	26.19	191.24	28.11	75.43	airgun	
	1639	1443	12	19:08	14.089	26.24	191.25	28.11	75.43	airgun	
	1640	1444	12	19:08	44.098	26.30	191.25	28.11	75.43	airgun	
	1641	1445	12	19:09	14.106	26.36	191.25	28.11	75.43	airgun	
	1642	1446	12	19:09	44.115	26.42	191.26	28.11	75.43	airgun	
	1643	1447	12	19:10	14.124	26.48	191.26	28.11	75.43	airgun	
	1644	1448	12	19:10	44.133	26.54	191.26	28.11	75.43	airgun	
	1645	1449	12	19:11	14.142	26.60	191.26	28.11	75.43	airgun	
	1646	1450	12	19:11	44.150	26.67	191.26	28.11	75.43	airgun	
	1647	1451	12	19:12	14.159	26.73	191.26	28.11	75.43	airgun	
	1648	1452	12	19:12	44.168	26.80	191.26	28.11	75.43	airgun	
	1649	1453	12	19:13	14.177	26.86	191.26	28.11	75.43	airgun	
	1650	1454	12	19:13	44.186	26.92	191.26	28.11	75.43	airgun	
	1651	1455	12	19:14	14.194	26.99	191.25	28.11	75.43	airgun	
	1652	1456	12	19:14	44.204	27.05	191.25	28.11	75.43	airgun	
	1653	1457	12	19:15	14.212	27.11	191.25	28.10	75.43	airgun	
	1654	1458	12	19:15	44.221	27.17	191.25	28.10	75.43	airgun	
	1655	1459	12	19:16	14.230	27.22	191.25	28.10	75.44	airgun	
	1656	1460	12	19:16	44.239	27.28	191.26	28.10	75.44	airgun	
	1657	1461	12	19:17	14.247	27.34	191.26	28.10	75.44	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	1658	1462	12	19:17	44.256	27.39	191.26	28.10	75.44	airgun	
	1659	1463	12	19:18	14.265	27.45	191.26	28.10	75.44	airgun	
	1660	1464	12	19:18	44.274	27.51	191.25	28.10	75.44	airgun	
	1661	1465	12	19:19	14.283	27.58	191.25	28.10	75.44	airgun	
	1662	1466	12	19:19	44.292	27.64	191.25	28.10	75.44	airgun	
	1663	1467	12	19:20	14.300	27.70	191.24	28.10	75.44	airgun	
	1664	1468	12	19:20	44.310	27.76	191.24	28.10	75.44	airgun	
	1665	1469	12	19:21	14.318	27.82	191.24	28.10	75.44	airgun	
	1666	1470	12	19:21	44.327	27.89	191.25	28.10	75.44	airgun	
	1667	1471	12	19:22	14.336	27.95	191.26	28.10	75.44	airgun	
	1668	1472	12	19:22	44.345	28.01	191.27	28.10	75.44	airgun	
	1669	1473	12	19:23	14.354	28.07	191.28	28.10	75.44	airgun	
	1670	1474	12	19:23	44.362	28.13	191.31	28.10	75.44	airgun	
	1671	1475	12	19:24	14.372	28.19	191.35	28.10	75.44	airgun	
	1672	1476	12	19:24	44.380	28.25	191.39	28.09	75.44	airgun	
	1673	1477	12	19:25	14.389	28.30	191.44	28.09	75.44	airgun	
	1674	1478	12	19:25	44.398	28.35	191.50	28.09	75.44	airgun	
	1675	1479	12	19:26	14.407	28.39	191.57	28.09	75.44	airgun	
	1676	1480	12	19:26	44.416	28.42	191.65	28.09	75.44	airgun	
	1677	1481	12	19:27	14.424	28.43	191.75	28.09	75.44	airgun	
	1678	1482	12	19:27	44.433	28.43	191.85	28.09	75.44	airgun	
	1679	1483	12	19:28	14.442	28.42	191.95	28.09	75.44	airgun	
	1680	1484	12	19:28	44.451	28.38	192.06	28.09	75.44	airgun	
	1681	1485	12	19:29	14.460	28.33	192.16	28.09	75.44	airgun	
	1682	1486	12	19:29	44.468	28.28	192.26	28.10	75.44	airgun	
	1683	1487	12	19:30	14.477	28.21	192.35	28.10	75.44	airgun	
	1684	1488	12	19:30	44.486	28.14	192.44	28.10	75.44	airgun	
	1685	1489	12	19:31	14.495	28.06	192.52	28.10	75.44	airgun	
	1686	1490	12	19:31	44.504	27.99	192.59	28.10	75.44	airgun	
	1687	1491	12	19:32	14.513	27.91	192.66	28.10	75.44	airgun	
	1688	1492	12	19:32	44.522	27.83	192.72	28.10	75.44	airgun	
	1689	1493	12	19:33	14.535	27.74	192.78	28.10	75.44	airgun	
	1690	1494	12	19:33	44.539	27.66	192.83	28.10	75.44	airgun	
	1691	1495	12	19:34	14.548	27.59	192.88	28.10	75.44	airgun	
	1692	1496	12	19:34	44.557	27.51	192.93	28.10	75.44	airgun	
	1693	1497	12	19:35	14.566	27.43	192.98	28.10	75.44	airgun	
	1694	1498	12	19:35	44.575	27.35	193.03	28.10	75.44	airgun	
	1695	1499	12	19:36	14.584	27.27	193.08	28.10	75.44	airgun	
	1696	1500	12	19:36	44.593	27.19	193.13	28.11	75.44	airgun	
	1697	1501	12	19:37	14.601	27.11	193.19	28.11	75.44	airgun	
	1698	1502	12	19:37	44.610	27.03	193.24	28.11	75.44	airgun	
	1699	1503	12	19:38	14.619	26.94	193.30	28.11	75.44	airgun	
	1700	1504	12	19:38	44.628	26.86	193.36	28.11	75.44	airgun	
	1701	1505	12	19:39	14.637	26.78	193.42	28.11	75.44	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	1702	1506	12	19:39	44.646	26.70	193.48	28.11	75.44	airgun	
	1703	1507	12	19:40	14.655	26.62	193.54	28.11	75.44	airgun	
	1704	1508	12	19:40	44.663	26.55	193.60	28.11	75.44	airgun	
	1705	1509	12	19:41	14.673	26.47	193.66	28.11	75.44	airgun	
	1706	1510	12	19:41	44.681	26.39	193.71	28.11	75.44	airgun	
	1707	1511	12	19:42	14.690	26.31	193.77	28.11	75.44	airgun	
	1708	1512	12	19:42	44.699	26.23	193.83	28.11	75.44	airgun	
	1709	1513	12	19:43	14.708	26.15	193.89	28.12	75.44	airgun	
	1710	1514	12	19:43	44.717	26.07	193.95	28.12	75.44	airgun	
	1711	1515	12	19:44	14.726	25.99	194.01	28.12	75.45	airgun	
	1712	1516	12	19:44	44.735	25.90	194.08	28.12	75.45	airgun	
	1713	1517	12	19:45	14.743	25.82	194.14	28.12	75.45	airgun	
	1714	1518	12	19:45	44.753	25.74	194.20	28.12	75.45	airgun	
	1715	1519	12	19:46	14.761	25.66	194.26	28.12	75.45	airgun	
	1716	1520	12	19:46	44.770	25.57	194.33	28.12	75.45	airgun	
	1717	1521	12	19:47	14.779	25.49	194.39	28.12	75.45	airgun	
	1718	1522	12	19:47	44.793	25.42	194.45	28.12	75.45	airgun	
	1719	1523	12	19:48	14.796	25.34	194.51	28.12	75.45	airgun	
	1720	1524	12	19:48	44.806	25.26	194.57	28.12	75.45	airgun	
	1721	1525	12	19:49	14.815	25.18	194.63	28.13	75.45	airgun	
	1722	1526	12	19:49	44.824	25.10	194.69	28.13	75.45	airgun	
	1723	1527	12	19:50	14.832	25.03	194.75	28.13	75.45	airgun	
	1724	1528	12	19:50	44.841	24.95	194.81	28.13	75.45	airgun	
	1725	1529	12	19:51	14.853	24.87	194.87	28.13	75.45	airgun	
	1726	1530	12	19:51	44.859	24.80	194.93	28.13	75.45	airgun	
	1727	1531	12	19:52	14.868	24.72	195.00	28.13	75.45	airgun	
	1728	1532	12	19:52	44.877	24.64	195.06	28.13	75.45	airgun	
	1729	1533	12	19:53	14.885	24.56	195.12	28.13	75.45	airgun	
	1730	1534	12	19:53	44.895	24.48	195.19	28.13	75.45	airgun	
	1731	1535	12	19:54	14.903	24.40	195.25	28.13	75.45	airgun	
	1732	1536	12	19:54	44.912	24.32	195.32	28.13	75.45	airgun	
	1733	1537	12	19:55	14.921	24.24	195.39	28.13	75.45	airgun	
	1734	1538	12	19:55	44.929	24.16	195.46	28.14	75.45	airgun	
	1735	1539	12	19:56	14.938	24.07	195.53	28.14	75.45	airgun	
	1736	1540	12	19:56	44.947	23.99	195.60	28.14	75.45	airgun	
	1737	1541	12	19:57	14.957	23.91	195.67	28.14	75.45	airgun	
	1738	1542	12	19:57	44.965	23.83	195.74	28.14	75.45	airgun	
	1739	1543	12	19:58	14.975	23.75	195.81	28.14	75.45	airgun	
	1740	1544	12	19:58	44.983	23.67	195.88	28.14	75.45	airgun	
	1741	1545	12	19:59	14.992	23.59	195.95	28.14	75.45	airgun	
	1742	1546	12	19:59	45.000	23.50	196.02	28.14	75.45	airgun	
noise	1753		12	20:00	46.299						
noise	1754		12	20:10	46.299						
noise	1755		12	20:20	46.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1756	1547	12	20:29	15.522	18.67	198.69	28.18	75.44	airgun	
	1757	1548	12	20:29	45.532	18.59	198.71	28.19	75.44	airgun	
	1758	1549	12	20:30	15.540	18.51	198.73	28.19	75.44	airgun	
	1759	1550	12	20:30	45.549	18.43	198.75	28.19	75.44	airgun	
	1760	1551	12	20:31	15.561	18.35	198.78	28.19	75.44	airgun	
	1761	1552	12	20:31	45.567	18.27	198.79	28.19	75.44	airgun	
	1762	1553	12	20:32	15.576	18.20	198.82	28.19	75.44	airgun	
	1763	1554	12	20:32	45.585	18.12	198.84	28.19	75.44	airgun	
	1764	1555	12	20:33	15.594	18.04	198.86	28.19	75.44	airgun	
	1765	1556	12	20:33	45.602	17.96	198.88	28.19	75.44	airgun	
	1766	1557	12	20:34	15.611	17.88	198.91	28.19	75.44	airgun	
	1767	1558	12	20:34	45.621	17.80	198.93	28.19	75.44	airgun	
	1768	1559	12	20:35	15.629	17.72	198.96	28.19	75.44	airgun	
	1769	1560	12	20:35	45.638	17.63	198.99	28.19	75.44	airgun	
	1770	1561	12	20:36	15.647	17.55	199.02	28.19	75.44	airgun	
	1771	1562	12	20:36	45.656	17.47	199.04	28.20	75.44	airgun	
	1772	1563	12	20:37	15.664	17.38	199.07	28.20	75.44	airgun	
	1773	1564	12	20:37	45.677	17.30	199.09	28.20	75.44	airgun	
	1774	1565	12	20:38	15.682	17.22	199.12	28.20	75.44	airgun	
	1775	1566	12	20:38	45.691	17.13	199.15	28.20	75.44	airgun	
	1776	1567	12	20:39	15.701	17.05	199.18	28.20	75.44	airgun	
	1777	1568	12	20:39	45.709	16.97	199.21	28.20	75.44	airgun	
	1778	1569	12	20:40	15.718	16.89	199.23	28.20	75.44	airgun	
	1779	1570	12	20:40	45.727	16.80	199.26	28.20	75.44	airgun	
	1780	1571	12	20:41	15.736	16.72	199.28	28.20	75.44	airgun	
	1781	1572	12	20:41	45.744	16.64	199.30	28.20	75.44	airgun	
	1782	1573	12	20:42	15.754	16.57	199.32	28.20	75.44	airgun	
	1783	1574	12	20:42	45.762	16.49	199.34	28.20	75.44	airgun	
	1784	1575	12	20:43	15.771	16.41	199.35	28.20	75.44	airgun	
	1785	1576	12	20:43	45.781	16.33	199.37	28.21	75.44	airgun	
	1786	1577	12	20:44	15.789	16.26	199.38	28.21	75.44	airgun	
	1787	1578	12	20:44	45.798	16.18	199.40	28.21	75.44	airgun	
	1788	1579	12	20:45	15.807	16.09	199.43	28.21	75.44	airgun	
	1789	1580	12	20:45	45.815	16.01	199.46	28.21	75.44	airgun	
	1790	1581	12	20:46	15.825	15.93	199.49	28.21	75.44	airgun	
	1791	1582	12	20:46	45.834	15.84	199.52	28.21	75.43	airgun	
	1792	1583	12	20:47	15.843	15.76	199.56	28.21	75.43	airgun	
	1793	1584	12	20:47	45.851	15.68	199.60	28.21	75.43	airgun	
	1794	1585	12	20:48	15.860	15.60	199.63	28.21	75.43	airgun	
	1795	1586	12	20:48	45.868	15.53	199.66	28.21	75.43	airgun	
	1796	1587	12	20:49	15.878	15.45	199.69	28.21	75.43	airgun	
	1797	1588	12	20:49	45.886	15.37	199.72	28.21	75.43	airgun	
	1798	1589	12	20:50	15.895	15.30	199.75	28.22	75.43	airgun	
	1799	1590	12	20:50	45.904	15.22	199.78	28.22	75.43	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1800	1591	12	20:51	15.913	15.13	199.80	28.22	75.43	airgun	
	1801	1592	12	20:51	45.922	15.05	199.83	28.22	75.43	airgun	
	1802	1593	12	20:52	15.931	14.97	199.86	28.22	75.43	airgun	
	1803	1594	12	20:52	45.940	14.89	199.88	28.22	75.43	airgun	
	1804	1595	12	20:53	15.948	14.81	199.89	28.22	75.43	airgun	
	1805	1596	12	20:53	45.957	14.72	199.91	28.22	75.43	airgun	
	1806	1597	12	20:54	15.966	14.64	199.93	28.22	75.43	airgun	
	1807	1598	12	20:54	45.975	14.56	199.94	28.22	75.43	airgun	
	1808	1599	12	20:55	15.984	14.47	199.95	28.22	75.43	airgun	
	1809	1600	12	20:55	45.993	14.39	199.96	28.22	75.43	airgun	
	1810	1601	12	20:56	16.002	14.30	199.98	28.22	75.43	airgun	
	1811	1602	12	20:56	46.010	14.22	200.00	28.22	75.43	airgun	
	1812	1603	12	20:57	16.019	14.14	200.02	28.23	75.43	airgun	
	1813	1604	12	20:57	46.028	14.06	200.03	28.23	75.43	airgun	
	1814	1605	12	20:58	16.037	13.97	200.06	28.23	75.43	airgun	
	1825	1608	12	20:59	46.063	13.73	200.17	28.23	75.43	airgun	
	1826	1609	12	21:00	16.073	13.65	200.21	28.23	75.43	airgun	
	1827	1610	12	21:00	46.081	13.56	200.25	28.23	75.43	airgun	
	1828	1611	12	21:01	16.090	13.48	200.30	28.23	75.43	airgun	
	1829	1612	12	21:01	46.099	13.40	200.34	28.23	75.43	airgun	
	1830	1613	12	21:02	16.108	13.32	200.38	28.23	75.43	airgun	
	1831	1614	12	21:02	46.117	13.24	200.42	28.23	75.43	airgun	
	1832	1615	12	21:03	16.126	13.16	200.45	28.23	75.43	airgun	
	1833	1616	12	21:03	46.134	13.09	200.49	28.23	75.43	airgun	
	1834	1617	12	21:04	16.144	13.01	200.53	28.24	75.43	airgun	
	1835	1618	12	21:04	46.152	12.93	200.56	28.24	75.43	airgun	
	1836	1619	12	21:05	16.161	12.85	200.59	28.24	75.43	airgun	
	1837	1620	12	21:05	46.170	12.77	200.62	28.24	75.43	airgun	
	1838	1621	12	21:06	16.179	12.69	200.66	28.24	75.43	airgun	
	1839	1622	12	21:06	46.188	12.61	200.70	28.24	75.43	airgun	
	1840	1623	12	21:07	16.197	12.52	200.73	28.24	75.43	airgun	
	1841	1624	12	21:07	46.205	12.44	200.77	28.24	75.43	airgun	
	1842	1625	12	21:08	16.215	12.36	200.81	28.24	75.43	airgun	
	1843	1626	12	21:08	46.223	12.28	200.83	28.24	75.43	airgun	
	1844	1627	12	21:09	16.232	12.19	200.87	28.24	75.43	airgun	
	1845	1628	12	21:09	46.241	12.11	200.89	28.24	75.43	airgun	
	1846	1629	12	21:10	16.250	12.03	200.91	28.24	75.43	airgun	
	1847	1630	12	21:10	46.258	11.95	200.94	28.24	75.43	airgun	
	1848	1631	12	21:11	16.268	11.87	200.97	28.25	75.43	airgun	
	1849	1632	12	21:11	46.276	11.80	201.00	28.25	75.42	airgun	
	1850	1633	12	21:12	16.285	11.72	201.02	28.25	75.42	airgun	
	1851	1634	12	21:12	46.294	11.64	201.06	28.25	75.42	airgun	
	1852	1635	12	21:13	16.303	11.56	201.08	28.25	75.42	airgun	
	1853	1636	12	21:13	46.312	11.49	201.12	28.25	75.42	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1854	1637	12	21:14	16.321	11.40	201.16	28.25	75.42	airgun	
	1855	1638	12	21:14	46.329	11.32	201.21	28.25	75.42	airgun	
	1856	1639	12	21:15	16.338	11.23	201.25	28.25	75.42	airgun	
	1857	1640	12	21:15	46.347	11.15	201.29	28.25	75.42	airgun	
	1858	1641	12	21:16	16.356	11.06	201.34	28.25	75.42	airgun	
	1859	1642	12	21:16	46.365	10.98	201.39	28.25	75.42	airgun	
	1860	1643	12	21:17	16.373	10.89	201.44	28.25	75.42	airgun	
	1861	1644	12	21:17	46.383	10.81	201.48	28.25	75.42	airgun	
	1862	1645	12	21:18	16.391	10.73	201.52	28.25	75.42	airgun	
	1863	1646	12	21:18	46.400	10.64	201.57	28.25	75.42	airgun	
	1864	1647	12	21:19	16.409	10.56	201.60	28.26	75.42	airgun	
	1865	1648	12	21:19	46.418	10.48	201.64	28.26	75.42	airgun	
	1866	1649	12	21:20	16.427	10.41	201.67	28.26	75.42	airgun	
	1867	1650	12	21:20	46.436	10.33	201.72	28.26	75.42	airgun	
	1868	1651	12	21:21	16.445	10.25	201.76	28.26	75.42	airgun	
	1869	1652	12	21:21	46.453	10.17	201.80	28.26	75.42	airgun	
	1870	1653	12	21:22	16.462	10.09	201.84	28.26	75.42	airgun	
	1871	1654	12	21:22	46.471	10.01	201.88	28.26	75.42	airgun	
	1872	1655	12	21:23	16.480	09.93	201.93	28.26	75.42	airgun	
	1873	1656	12	21:23	46.489	09.85	201.98	28.26	75.42	airgun	
	1874	1657	12	21:24	16.501	09.77	202.03	28.26	75.42	airgun	
	1875	1658	12	21:24	46.507	09.69	202.08	28.26	75.42	airgun	
	1876	1659	12	21:25	16.515	09.60	202.13	28.26	75.42	airgun	
	1877	1660	12	21:25	46.524	09.52	202.19	28.26	75.42	airgun	
	1878	1661	12	21:26	16.534	09.44	202.25	28.27	75.42	airgun	
	1879	1662	12	21:26	46.542	09.36	202.32	28.27	75.42	airgun	
	1880	1663	12	21:27	16.551	09.28	202.38	28.27	75.42	airgun	
	1881	1664	12	21:27	46.560	09.20	202.44	28.27	75.42	airgun	
	1882	1665	12	21:28	16.569	09.12	202.51	28.27	75.42	airgun	
	1883	1666	12	21:28	46.577	09.05	202.59	28.27	75.42	airgun	
	1884	1667	12	21:29	16.587	08.97	202.66	28.27	75.42	airgun	
	1885	1668	12	21:29	46.595	08.89	202.74	28.27	75.42	airgun	
	1886	1669	12	21:30	16.604	08.81	202.81	28.27	75.42	airgun	
	1887	1670	12	21:30	46.613	08.72	202.89	28.27	75.42	airgun	
	1888	1671	12	21:31	16.622	08.65	202.96	28.27	75.42	airgun	
	1889	1672	12	21:31	46.631	08.57	203.02	28.27	75.42	airgun	
	1890	1673	12	21:32	16.640	08.49	203.09	28.27	75.42	airgun	
	1891	1674	12	21:32	46.648	08.41	203.13	28.27	75.42	airgun	
	1892	1675	12	21:33	16.657	08.34	203.19	28.27	75.42	airgun	
	1893	1676	12	21:33	46.667	08.26	203.24	28.28	75.42	airgun	
	1894	1677	12	21:34	16.675	08.18	203.30	28.28	75.41	airgun	
	1895	1678	12	21:34	46.684	08.09	203.37	28.28	75.41	airgun	
	1896	1679	12	21:35	16.693	08.01	203.43	28.28	75.41	airgun	
	1897	1680	12	21:35	46.702	07.92	203.49	28.28	75.41	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1898	1681	12	21:36	16.710	07.84	203.55	28.28	75.41	airgun	
	1899	1682	12	21:36	46.719	07.75	203.63	28.28	75.41	airgun	
	1900	1683	12	21:37	16.728	07.67	203.69	28.28	75.41	airgun	
	1901	1684	12	21:37	46.737	07.59	203.75	28.28	75.41	airgun	
	1902	1685	12	21:38	16.746	07.50	203.83	28.28	75.41	airgun	
	1903	1686	12	21:38	46.755	07.42	203.89	28.28	75.41	airgun	
	1904	1687	12	21:39	16.763	07.34	203.94	28.28	75.41	airgun	
	1905	1688	12	21:39	46.773	07.27	203.99	28.28	75.41	airgun	
	1906	1689	12	21:40	16.781	07.19	204.03	28.28	75.41	airgun	
	1907	1690	12	21:40	46.791	07.12	204.05	28.29	75.41	airgun	
	1908	1691	12	21:41	16.800	07.05	204.06	28.29	75.41	airgun	
	1909	1692	12	21:41	46.808	06.98	204.07	28.29	75.41	airgun	
	1910	1693	12	21:42	16.817	06.91	204.08	28.29	75.41	airgun	
	1911	1694	12	21:42	46.830	06.84	204.07	28.29	75.41	airgun	
	1912	1695	12	21:43	16.837	06.76	204.08	28.29	75.41	airgun	
	1913	1696	12	21:43	46.846	06.69	204.09	28.29	75.41	airgun	
	1914	1697	12	21:44	16.852	06.61	204.09	28.29	75.41	airgun	
	1915	1698	12	21:44	46.864	06.53	204.10	28.29	75.41	airgun	
	1916	1699	12	21:45	16.871	06.45	204.11	28.29	75.41	airgun	1
	1917	1700	12	21:45	46.879	06.37	204.12	28.29	75.41	airgun	
	1918	1701	12	21:46	16.888	06.28	204.13	28.29	75.41	airgun	
	1919	1702	12	21:46	46.897	06.20	204.14	28.29	75.41	airgun	
	1920	1703	12	21:47	16.906	06.11	204.16	28.29	75.41	airgun	
	1921	1704	12	21:47	46.914	06.03	204.17	28.30	75.41	airgun	
	1922	1705	12	21:48	16.923	05.95	204.18	28.30	75.41	airgun	
	1923	1706	12	21:48	46.932	05.86	204.19	28.30	75.41	airgun	
	1924	1707	12	21:49	16.941	05.78	204.18	28.30	75.40	airgun	
	1925	1708	12	21:49	46.950	05.71	204.20	28.30	75.40	airgun	
	1926	1709	12	21:50	16.959	05.63	204.19	28.30	75.40	airgun	
	1927	1710	12	21:50	46.968	05.55	204.18	28.30	75.40	airgun	
	1928	1711	12	21:51	16.976	05.48	204.19	28.30	75.40	airgun	
	1929	1712	12	21:51	46.985	05.40	204.20	28.30	75.40	airgun	
	1930	1713	12	21:52	16.994	05.32	204.21	28.30	75.40	airgun	
	1931	1714	12	21:52	47.003	05.24	204.21	28.30	75.40	airgun	
	1932	1715	12	21:53	17.012	05.15	204.23	28.30	75.40	airgun	
	1933	1716	12	21:53	47.021	05.07	204.26	28.30	75.40	airgun	
	1934	1717	12	21:54	17.030	04.99	204.27	28.30	75.40	airgun	
	1935	1718	12	21:54	47.038	04.91	204.31	28.30	75.40	airgun	
	1936	1719	12	21:55	17.047	04.83	204.33	28.31	75.40	airgun	
	1937	1720	12	21:55	47.056	04.75	204.37	28.31	75.40	airgun	
	1938	1721	12	21:56	17.065	04.67	204.40	28.31	75.40	airgun	
	1939	1722	12	21:56	47.074	04.59	204.45	28.31	75.40	airgun	
	1940	1723	12	21:57	17.088	04.51	204.48	28.31	75.40	airgun	1
	1941	1724	12	21:57	47.091	04.43	204.51	28.31	75.40	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	1942	1725	12	21:58	17.100	04.35	204.52	28.31	75.40	airgun	
	1953	1732	12	22:01	47.162	03.80	204.53	28.31	75.40	airgun	2
	1954	1733	12	22:02	17.171	03.71	204.51	28.31	75.40	airgun	2
	1955	1734	12	22:02	47.180	03.63	204.50	28.31	75.40	airgun	1
	1956	1735	12	22:03	17.189	03.55	204.49	28.32	75.40	airgun	
	1957	1736	12	22:03	47.198	03.47	204.46	28.32	75.40	airgun	2
	1958	1737	12	22:04	17.207	03.39	204.44	28.32	75.40	airgun	1
	1959	1738	12	22:04	47.215	03.31	204.42	28.32	75.39	airgun	1
	1960	1739	12	22:05	17.224	03.23	204.38	28.32	75.39	airgun	1
	1961	1740	12	22:05	47.233	03.15	204.38	28.32	75.39	airgun	3
	1962	1741	12	22:06	17.242	03.08	204.40	28.32	75.39	airgun	3
	1963	1742	12	22:06	47.251	03.00	204.39	28.32	75.39	airgun	3
	1964	1743	12	22:07	17.260	02.93	204.42	28.32	75.39	airgun	4
	1965	1744	12	22:07	47.269	02.85	204.46	28.32	75.39	airgun	2
	1966	1745	12	22:08	17.277	02.78	204.50	28.32	75.39	airgun	3
	1967	1746	12	22:08	47.286	02.70	204.54	28.32	75.39	airgun	2
	1968	1747	12	22:09	17.295	02.63	204.59	28.32	75.39	airgun	3
	1969	1748	12	22:09	47.304	02.55	204.62	28.32	75.39	airgun	6
	1970	1749	12	22:10	17.313	02.47	204.69	28.32	75.39	airgun	4
	1971	1750	12	22:10	47.326	02.40	204.74	28.33	75.39	airgun	2
	1972	1751	12	22:11	17.331	02.32	204.80	28.33	75.39	airgun	1
	1973	1752	12	22:11	47.345	02.25	204.88	28.33	75.39	airgun	3
	1974	1753	12	22:12	17.348	02.17	204.90	28.33	75.39	airgun	1
	1975	1754	12	22:12	47.357	02.09	205.00	28.33	75.39	airgun	2
	1976	1755	12	22:13	17.366	02.01	205.05	28.33	75.39	airgun	1
	1977	1756	12	22:13	47.375	01.92	205.12	28.33	75.39	airgun	2
	1978	1757	12	22:14	17.383	01.84	205.20	28.33	75.39	airgun	2
	1979	1758	12	22:14	47.393	01.76	205.26	28.33	75.39	airgun	2
	1980	1759	12	22:15	17.401	01.68	205.31	28.33	75.39	airgun	3
	1981	1760	12	22:15	47.411	01.60	205.33	28.33	75.39	airgun	2
	1982	1761	12	22:16	17.419	01.52	205.34	28.33	75.39	airgun	4
	1983	1762	12	22:16	47.428	01.45	205.31	28.33	75.39	airgun	4
	1984	1763	12	22:17	17.437	01.37	205.29	28.33	75.39	airgun	3
	1985	1764	12	22:17	47.445	01.29	205.20	28.33	75.39	airgun	3
	1986	1765	12	22:18	17.454	01.22	205.14	28.33	75.39	airgun	3
	1987	1766	12	22:18	47.463	01.14	205.03	28.33	75.39	airgun	2
	1988	1767	12	22:19	17.472	01.06	205.03	28.33	75.39	airgun	8
	1989	1768	12	22:19	47.481	00.99	204.90	28.34	75.39	airgun	6
	1990	1769	12	22:20	17.490	00.91	204.79	28.34	75.39	airgun	6
	1991	1770	12	22:20	47.499	00.83	204.60	28.34	75.39	airgun	10
	1992	1771	12	22:21	17.508	00.75	204.43	28.34	75.38	airgun	8
	1993	1772	12	22:21	47.516	00.68	204.21	28.34	75.38	airgun	5
	1994	1773	12	22:22	17.525	00.60	204.09	28.34	75.38	airgun	10
	1995	1774	12	22:22	47.534	00.52	203.63	28.34	75.38	airgun	10

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	1996	1775	12	22:23	17.543	00.45	202.98	28.34	75.38	airgun	8
	1997	1776	12	22:23	47.552	00.37	201.94	28.34	75.38	airgun	3
	1998	1777	12	22:24	17.561	00.30	199.89	28.34	75.38	airgun	10
	1999	1778	12	22:24	47.570	00.23	195.70	28.34	75.38	airgun	11
	2000	1779	12	22:25	17.578	00.16	178.29	28.34	75.38	airgun	14

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
A5A	2001	1780	12	22:25	47.587	00.10	067.79	28.34	75.38	airgun	9
	2002	1781	12	22:26	17.602	00.07	040.75	28.34	75.38	airgun	13
	2003	1782	12	22:26	47.605	00.11	035.19	28.34	75.38	airgun	13
	2004	1783	12	22:27	17.614	00.17	032.60	28.34	75.38	airgun	8
	2005	1784	12	22:27	47.622	00.24	030.89	28.35	75.38	airgun	10
	2006	1785	12	22:28	17.632	00.31	029.89	28.35	75.38	airgun	10
	2007	1786	12	22:28	47.640	00.39	029.06	28.35	75.38	airgun	12
	2008	1787	12	22:29	17.650	00.46	028.52	28.35	75.38	airgun	5
	2009	1788	12	22:29	47.659	00.54	028.17	28.35	75.38	airgun	13
	2010	1789	12	22:30	17.667	00.62	027.82	28.35	75.38	airgun	10
	2011	1790	12	22:30	47.675	00.69	027.50	28.35	75.38	airgun	14
	2012	1791	12	22:31	17.685	00.77	027.27	28.35	75.38	airgun	12
	2013	1792	12	22:31	47.693	00.85	027.01	28.35	75.38	airgun	9
	2014	1793	12	22:32	17.702	00.92	026.82	28.35	75.38	airgun	10
	2015	1794	12	22:32	47.712	01.00	026.73	28.35	75.38	airgun	11
	2016	1795	12	22:33	17.720	01.08	026.66	28.35	75.38	airgun	9
	2017	1796	12	22:33	47.729	01.15	026.50	28.35	75.38	airgun	12
	2018	1797	12	22:34	17.738	01.22	026.49	28.35	75.38	airgun	7
	2019	1798	12	22:34	47.746	01.30	026.41	28.35	75.38	airgun	3
	2020	1799	12	22:35	17.756	01.38	026.37	28.35	75.38	airgun	6
	2021	1800	12	22:35	47.765	01.45	026.33	28.36	75.38	airgun	3
	2022	1801	12	22:36	17.774	01.53	026.29	28.36	75.37	airgun	3
	2023	1802	12	22:36	47.782	01.60	026.24	28.36	75.37	airgun	7
noise	2024		12	22:46	46.107						
noise	2025		12	22:56	46.107						
noise	2036		12	23:01	20.299						
noise	2037		12	23:11	20.299						
noise	2038		12	23:21	20.299						
noise	2039		12	23:31	20.299						
noise	2040		12	23:41	20.299						
noise	2041		12	23:51	20.299						
noise	2052		13	00:01	35.299						
noise	2053		13	00:11	35.299						
noise	2054		13	00:21	35.299						
noise	2055		13	00:31	35.299						
noise	2056		13	00:41	35.299						
noise	2057		13	00:51	35.299						
noise	2068		13	01:02	10.299						
noise	2069		13	01:12	10.299						
noise	2070		13	01:22	10.299						
noise	2071		13	01:32	10.299						
noise	2072		13	01:42	10.299						
noise	2073		13	01:52	10.299						
noise	2084		13	02:03	45.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
			August of		1989	Event					
noise	2085		13	02:13	45.299						
noise	2086		13	02:23	45.299						
noise	2087		13	02:33	45.299						
noise	2088		13	02:43	45.299						
noise	2089		13	02:53	45.299						
noise	2100		13	03:04	05.299						
noise	2101		13	03:14	05.299						
noise	2102		13	03:24	05.299						
noise	2103		13	03:34	05.299						
noise	2104		13	03:44	05.299						
noise	2105		13	03:54	05.299						
noise	2116		13	04:03	01.299						
noise	2127		13	04:10	49.299						
noise	2128		13	04:20	49.299						
noise	2129		13	04:30	49.299						
noise	2130		13	04:40	49.299						
noise	2131		13	04:50	49.299						
noise	2142		13	05:00	11.299						
noise	2143		13	05:10	11.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A2	2144	1803	13	05:18	24.832	40.71	054.17	28.56	75.04	airgun	
	2145	1804	13	05:18	54.840	40.65	054.17	28.56	75.04	airgun	
	2146	1805	13	05:19	24.849	40.62	054.19	28.56	75.04	airgun	
	2147	1806	13	05:19	54.858	40.58	054.20	28.56	75.04	airgun	
	2148	1807	13	05:20	24.867	40.52	054.19	28.56	75.04	airgun	
	2149	1808	13	05:20	54.875	40.46	054.18	28.56	75.04	airgun	
	2150	1809	13	05:21	24.884	40.39	054.17	28.56	75.05	airgun	
	2151	1810	13	05:21	54.893	40.33	054.16	28.56	75.05	airgun	
	2152	1811	13	05:22	24.902	40.27	054.15	28.56	75.05	airgun	
	2153	1812	13	05:22	54.910	40.21	054.15	28.56	75.05	airgun	
	2154	1813	13	05:23	24.919	40.16	054.16	28.56	75.05	airgun	
	2155	1814	13	05:23	54.928	40.11	054.17	28.55	75.05	airgun	
	2156	1815	13	05:24	24.937	40.03	054.16	28.55	75.05	airgun	
	2157	1816	13	05:24	54.945	39.94	054.14	28.55	75.05	airgun	
	2158	1817	13	05:25	24.954	39.85	054.13	28.55	75.05	airgun	
	2159	1818	13	05:25	54.963	39.77	054.12	28.55	75.05	airgun	
	2160	1819	13	05:26	24.972	39.68	054.12	28.55	75.05	airgun	
	2161	1820	13	05:26	54.983	39.60	054.12	28.55	75.05	airgun	
	2162	1821	13	05:27	24.989	39.51	054.12	28.55	75.05	airgun	
	2163	1822	13	05:27	54.998	39.41	054.11	28.55	75.05	airgun	
	2164	1823	13	05:28	25.007	39.31	054.10	28.55	75.06	airgun	
	2165	1824	13	05:28	55.015	39.22	054.10	28.55	75.06	airgun	
	2166	1825	13	05:29	25.025	39.13	054.10	28.55	75.06	airgun	
	2167	1826	13	05:29	55.033	39.05	054.11	28.55	75.06	airgun	
	2168	1827	13	05:30	25.042	38.93	054.08	28.55	75.06	airgun	
	2169	1828	13	05:30	55.051	38.81	054.05	28.55	75.06	airgun	
	2170	1829	13	05:31	25.059	38.72	054.05	28.55	75.06	airgun	
	2171	1830	13	05:31	55.068	38.63	054.06	28.55	75.06	airgun	
	2172	1831	13	05:32	25.077	38.56	054.08	28.55	75.06	airgun	
	2173	1832	13	05:32	55.086	38.49	054.10	28.55	75.06	airgun	
	2174	1833	13	05:33	25.094	38.38	054.08	28.55	75.06	airgun	
	2175	1834	13	05:33	55.103	38.26	054.05	28.55	75.06	airgun	
	2176	1835	13	05:34	25.112	38.15	054.03	28.55	75.07	airgun	
	2177	1836	13	05:34	55.120	38.04	054.00	28.54	75.07	airgun	
	2178	1837	13	05:35	25.129	37.96	054.01	28.54	75.07	airgun	
	2179	1838	13	05:35	55.138	37.88	054.03	28.54	75.07	airgun	
	2180	1839	13	05:36	25.147	37.81	054.05	28.54	75.07	airgun	
	2181	1840	13	05:36	55.155	37.74	054.07	28.54	75.07	airgun	
	2182	1841	13	05:37	25.164	37.65	054.09	28.54	75.07	airgun	
	2183	1842	13	05:37	55.173	37.56	054.10	28.54	75.07	airgun	
	2184	1843	13	05:38	25.182	37.46	054.09	28.54	75.07	airgun	
	2185	1844	13	05:38	55.190	37.34	054.07	28.54	75.07	airgun	
	2186	1845	13	05:39	25.199	37.25	054.07	28.54	75.07	airgun	
	2187	1846	13	05:39	55.208	37.16	054.08	28.54	75.07	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	2188	1847	13	05:40	25.217	37.06	054.07	28.54	75.07	airgun	
	2189	1848	13	05:40	55.226	36.97	054.06	28.54	75.07	airgun	
	2190	1849	13	05:41	25.234	36.86	054.05	28.54	75.08	airgun	
	2191	1850	13	05:41	55.244	36.76	054.04	28.54	75.08	airgun	
	2192	1851	13	05:42	25.252	36.68	054.06	28.54	75.08	airgun	
	2193	1852	13	05:42	55.261	36.60	054.08	28.54	75.08	airgun	
	2194	1853	13	05:43	25.269	36.49	054.07	28.54	75.08	airgun	
	2195	1854	13	05:43	55.278	36.37	054.05	28.53	75.08	airgun	
	2196	1855	13	05:44	25.286	36.27	054.05	28.53	75.08	airgun	
	2197	1856	13	05:44	55.295	36.17	054.04	28.53	75.08	airgun	
	2198	1857	13	05:45	25.304	36.07	054.04	28.53	75.08	airgun	
	2199	1858	13	05:45	55.313	35.97	054.04	28.53	75.08	airgun	
	2200	1859	13	05:46	25.321	35.88	054.04	28.53	75.08	airgun	
	2201	1860	13	05:46	55.330	35.79	054.04	28.53	75.08	airgun	
	2202	1861	13	05:47	25.339	35.70	054.04	28.53	75.08	airgun	
	2203	1862	13	05:47	55.348	35.62	054.05	28.53	75.09	airgun	
	2204	1863	13	05:48	25.357	35.53	054.05	28.53	75.09	airgun	
	2205	1864	13	05:48	55.365	35.43	054.04	28.53	75.09	airgun	
	2206	1865	13	05:49	25.374	35.32	054.02	28.53	75.09	airgun	
	2207	1866	13	05:49	55.383	35.21	054.00	28.53	75.09	airgun	
	2208	1867	13	05:50	25.391	35.11	053.99	28.53	75.09	airgun	
	2209	1868	13	05:50	55.400	35.01	053.98	28.53	75.09	airgun	
	2210	1869	13	05:51	25.409	34.93	053.99	28.53	75.09	airgun	
	2211	1870	13	05:51	55.418	34.85	054.01	28.53	75.09	airgun	
	2212	1871	13	05:52	25.427	34.76	054.00	28.53	75.09	airgun	
	2213	1872	13	05:52	55.436	34.65	053.98	28.53	75.09	airgun	
	2214	1873	13	05:53	25.447	34.56	053.98	28.53	75.10	airgun	
	2215	1874	13	05:53	55.453	34.47	053.97	28.53	75.10	airgun	
	2216	1875	13	05:54	25.461	34.37	053.96	28.52	75.10	airgun	
	2217	1876	13	05:54	55.470	34.26	053.95	28.52	75.10	airgun	
	2218	1877	13	05:55	25.479	34.17	053.95	28.52	75.10	airgun	
	2219	1878	13	05:55	55.488	34.08	053.95	28.52	75.10	airgun	
	2220	1879	13	05:56	25.497	33.98	053.94	28.52	75.10	airgun	
	2221	1880	13	05:56	55.505	33.87	053.93	28.52	75.10	airgun	
	2222	1881	13	05:57	25.514	33.78	053.93	28.52	75.10	airgun	
	2223	1882	13	05:57	55.523	33.70	053.94	28.52	75.10	airgun	
	2234	1885	13	05:59	25.549	33.39	053.92	28.52	75.11	airgun	
	2235	1886	13	05:59	55.558	33.29	053.92	28.52	75.11	airgun	
	2236	1887	13	06:00	25.567	33.20	053.92	28.52	75.11	airgun	
	2237	1888	13	06:00	55.575	33.10	053.92	28.52	75.11	airgun	
	2238	1889	13	06:01	25.584	33.01	053.93	28.52	75.11	airgun	
	2239	1890	13	06:01	55.592	32.92	053.94	28.52	75.11	airgun	
	2240	1891	13	06:02	25.602	32.84	053.95	28.52	75.11	airgun	
	2241	1892	13	06:02	55.610	32.76	053.97	28.52	75.11	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2242	1893	13	06:03	25.619	32.67	053.98	28.52	75.11	airgun	
	2243	1894	13	06:03	55.627	32.58	053.98	28.52	75.11	airgun	
	2244	1895	13	06:04	25.636	32.47	053.94	28.51	75.11	airgun	
	2245	1896	13	06:04	55.645	32.35	053.91	28.51	75.11	airgun	
	2246	1897	13	06:05	25.654	32.26	053.90	28.51	75.11	airgun	
	2247	1898	13	06:05	55.662	32.17	053.89	28.51	75.11	airgun	
	2248	1899	13	06:06	25.672	32.08	053.89	28.51	75.12	airgun	
	2249	1900	13	06:06	55.680	31.99	053.89	28.51	75.12	airgun	
	2250	1901	13	06:07	25.689	31.89	053.86	28.51	75.12	airgun	
	2251	1902	13	06:07	55.697	31.77	053.84	28.51	75.12	airgun	
	2252	1903	13	06:08	25.706	31.69	053.85	28.51	75.12	airgun	
	2253	1904	13	06:08	55.715	31.61	053.87	28.51	75.12	airgun	
	2254	1905	13	06:09	25.723	31.52	053.87	28.51	75.12	airgun	
	2255	1906	13	06:09	55.732	31.43	053.88	28.51	75.12	airgun	
	2256	1907	13	06:10	25.741	31.34	053.88	28.51	75.12	airgun	
	2257	1908	13	06:10	55.750	31.25	053.89	28.51	75.12	airgun	
	2258	1909	13	06:11	25.759	31.15	053.88	28.51	75.12	airgun	
	2259	1910	13	06:11	55.767	31.04	053.86	28.51	75.13	airgun	
	2260	1911	13	06:12	25.776	30.94	053.86	28.51	75.13	airgun	
	2261	1912	13	06:12	55.785	30.84	053.85	28.51	75.13	airgun	
	2262	1913	13	06:13	25.797	30.73	053.83	28.51	75.13	airgun	
	2263	1914	13	06:13	55.802	30.62	053.81	28.51	75.13	airgun	
	2264	1915	13	06:14	25.811	30.52	053.79	28.51	75.13	airgun	
	2265	1916	13	06:14	55.820	30.42	053.78	28.50	75.13	airgun	
	2266	1917	13	06:15	25.829	30.33	053.77	28.50	75.13	airgun	
	2267	1918	13	06:15	55.837	30.23	053.76	28.50	75.13	airgun	
	2268	1919	13	06:16	25.846	30.13	053.76	28.50	75.13	airgun	
	2269	1920	13	06:16	55.855	30.03	053.75	28.50	75.13	airgun	
	2270	1921	13	06:17	25.864	29.94	053.75	28.50	75.13	airgun	
	2271	1922	13	06:17	55.872	29.85	053.75	28.50	75.14	airgun	
	2272	1923	13	06:18	25.881	29.75	053.74	28.50	75.14	airgun	
	2273	1924	13	06:18	55.890	29.64	053.72	28.50	75.14	airgun	
	2274	1925	13	06:19	25.899	29.55	053.73	28.50	75.14	airgun	
	2275	1926	13	06:19	55.907	29.47	053.74	28.50	75.14	airgun	
	2276	1927	13	06:20	25.916	29.37	053.74	28.50	75.14	airgun	
	2277	1928	13	06:20	55.925	29.27	053.73	28.50	75.14	airgun	
	2278	1929	13	06:21	25.934	29.19	053.74	28.50	75.14	airgun	
	2279	1930	13	06:21	55.943	29.10	053.75	28.50	75.14	airgun	
	2280	1931	13	06:22	25.951	29.01	053.75	28.50	75.14	airgun	
	2281	1932	13	06:22	55.960	28.91	053.74	28.50	75.14	airgun	
	2282	1933	13	06:23	25.969	28.82	053.74	28.50	75.14	airgun	
	2283	1934	13	06:23	55.977	28.74	053.75	28.50	75.14	airgun	
	2284	1935	13	06:24	25.987	28.62	053.70	28.50	75.14	airgun	
	2285	1936	13	06:24	55.995	28.49	053.63	28.50	75.15	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2286	1937	13	06:25	26.004	28.41	053.64	28.50	75.15	airgun	
	2287	1938	13	06:25	56.012	28.34	053.66	28.49	75.15	airgun	
	2288	1939	13	06:26	26.021	28.24	053.65	28.49	75.15	airgun	
	2289	1940	13	06:26	56.030	28.14	053.62	28.49	75.15	airgun	
	2290	1941	13	06:27	26.038	28.04	053.61	28.49	75.15	airgun	
	2291	1942	13	06:27	56.047	27.94	053.60	28.49	75.15	airgun	
	2292	1943	13	06:28	26.056	27.85	053.59	28.49	75.15	airgun	
	2293	1944	13	06:28	56.065	27.75	053.58	28.49	75.15	airgun	
	2294	1945	13	06:29	26.073	27.67	053.59	28.49	75.15	airgun	
	2295	1946	13	06:29	56.082	27.59	053.60	28.49	75.15	airgun	
	2296	1947	13	06:30	26.092	27.50	053.59	28.49	75.15	airgun	
	2297	1948	13	06:30	56.100	27.39	053.56	28.49	75.16	airgun	
	2298	1949	13	06:31	26.108	27.30	053.54	28.49	75.16	airgun	
	2299	1950	13	06:31	56.117	27.20	053.53	28.49	75.16	airgun	
	2300	1951	13	06:32	26.126	27.12	053.54	28.49	75.16	airgun	
	2301	1952	13	06:32	56.135	27.05	053.56	28.49	75.16	airgun	
	2302	1953	13	06:33	26.143	26.93	053.51	28.49	75.16	airgun	
	2303	1954	13	06:33	56.152	26.81	053.45	28.49	75.16	airgun	
	2304	1955	13	06:34	26.161	26.71	053.44	28.49	75.16	airgun	
	2305	1956	13	06:34	56.169	26.63	053.43	28.49	75.16	airgun	
	2306	1957	13	06:35	26.178	26.52	053.38	28.49	75.16	airgun	
	2307	1958	13	06:35	56.187	26.42	053.34	28.49	75.16	airgun	
	2308	1959	13	06:36	26.197	26.31	053.28	28.49	75.17	airgun	
	2309	1960	13	06:36	56.205	26.19	053.22	28.49	75.17	airgun	
	2310	1961	13	06:37	26.213	26.09	053.18	28.48	75.17	airgun	
	2311	1962	13	06:37	56.222	26.00	053.14	28.48	75.17	airgun	
	2312	1963	13	06:38	26.231	25.91	053.11	28.48	75.17	airgun	
	2313	1964	13	06:38	56.240	25.82	053.08	28.48	75.17	airgun	
	2314	1965	13	06:39	26.248	25.72	053.04	28.48	75.17	airgun	
	2315	1966	13	06:39	56.257	25.62	053.00	28.48	75.17	airgun	
	2316	1967	13	06:40	26.266	25.54	053.00	28.48	75.17	airgun	
	2317	1968	13	06:40	56.275	25.47	053.01	28.48	75.17	airgun	
	2318	1969	13	06:41	26.283	25.36	052.96	28.48	75.17	airgun	
	2319	1970	13	06:41	56.292	25.24	052.90	28.48	75.18	airgun	
	2320	1971	13	06:42	26.301	25.14	052.85	28.48	75.18	airgun	
	2321	1972	13	06:42	56.310	25.03	052.81	28.48	75.18	airgun	
	2322	1973	13	06:43	26.319	24.93	052.77	28.48	75.18	airgun	
	2323	1974	13	06:43	56.327	24.83	052.73	28.48	75.18	airgun	
	2324	1975	13	06:44	26.336	24.75	052.72	28.48	75.18	airgun	
	2325	1976	13	06:44	56.344	24.67	052.71	28.48	75.18	airgun	
	2326	1977	13	06:45	26.353	24.57	052.67	28.48	75.18	airgun	
	2327	1978	13	06:45	56.362	24.47	052.63	28.48	75.18	airgun	
	2328	1979	13	06:46	26.371	24.37	052.57	28.48	75.18	airgun	
	2329	1980	13	06:46	56.379	24.26	052.51	28.48	75.18	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2330	1981	13	06:47	26.388	24.17	052.47	28.48	75.18	airgun	
	2331	1982	13	06:47	56.397	24.07	052.42	28.48	75.19	airgun	
	2332	1983	13	06:48	26.406	23.96	052.37	28.48	75.19	airgun	
	2333	1984	13	06:48	56.414	23.86	052.32	28.48	75.19	airgun	
	2334	1985	13	06:49	26.423	23.77	052.30	28.47	75.19	airgun	
	2335	1986	13	06:49	56.432	23.68	052.29	28.47	75.19	airgun	
	2336	1987	13	06:50	26.441	23.61	052.30	28.47	75.19	airgun	
	2337	1988	13	06:50	56.450	23.54	052.33	28.47	75.19	airgun	
	2338	1989	13	06:51	26.458	23.43	052.28	28.47	75.19	airgun	
	2339	1990	13	06:51	56.467	23.31	052.23	28.47	75.19	airgun	
	2340	1991	13	06:52	26.476	23.22	052.23	28.47	75.19	airgun	
	2341	1992	13	06:52	56.485	23.14	052.24	28.47	75.19	airgun	
	2342	1993	13	06:53	26.493	23.02	052.21	28.47	75.19	airgun	
	2343	1994	13	06:53	56.502	22.91	052.18	28.47	75.20	airgun	
	2344	1995	13	06:54	26.511	22.81	052.17	28.47	75.20	airgun	
	2345	1996	13	06:54	56.520	22.70	052.17	28.47	75.20	airgun	
	2346	1997	13	06:55	26.528	22.61	052.18	28.47	75.20	airgun	
	2347	1998	13	06:55	56.537	22.51	052.19	28.47	75.20	airgun	
	2348	1999	13	06:56	26.546	22.42	052.21	28.47	75.20	airgun	
	2349	2000	13	06:56	56.555	22.32	052.22	28.47	75.20	airgun	
	2350	2001	13	06:57	26.563	22.22	052.21	28.47	75.20	airgun	
	2351	2002	13	06:57	56.573	22.12	052.20	28.47	75.20	airgun	
	2362	2005	13	06:59	26.598	21.82	052.15	28.46	75.21	airgun	
	2363	2006	13	06:59	56.612	21.74	052.19	28.46	75.21	airgun	
	2364	2007	13	07:00	26.616	21.63	052.15	28.46	75.21	airgun	
	2365	2008	13	07:00	56.625	21.52	052.10	28.46	75.21	airgun	
	2366	2009	13	07:01	26.634	21.43	052.10	28.46	75.21	airgun	
	2367	2010	13	07:01	56.643	21.34	052.11	28.46	75.21	airgun	
	2368	2011	13	07:02	26.651	21.24	052.10	28.46	75.21	airgun	
	2369	2012	13	07:02	56.660	21.14	052.08	28.46	75.21	airgun	
	2370	2013	13	07:03	26.669	21.05	052.07	28.46	75.21	airgun	
	2371	2014	13	07:03	56.678	20.95	052.05	28.46	75.21	airgun	
	2372	2015	13	07:04	26.686	20.84	052.02	28.46	75.21	airgun	
	2373	2016	13	07:04	56.695	20.74	051.99	28.46	75.21	airgun	
	2374	2017	13	07:05	26.704	20.62	051.96	28.46	75.21	airgun	
	2375	2018	13	07:05	56.713	20.51	051.92	28.46	75.22	airgun	
	2376	2019	13	07:06	26.721	20.40	051.89	28.46	75.22	airgun	
	2377	2020	13	07:06	56.731	20.30	051.86	28.46	75.22	airgun	
	2378	2021	13	07:07	26.739	20.21	051.86	28.46	75.22	airgun	
	2379	2022	13	07:07	56.748	20.12	051.88	28.45	75.22	airgun	
	2380	2023	13	07:08	26.756	20.04	051.90	28.45	75.22	airgun	
	2381	2024	13	07:08	56.765	19.97	051.92	28.45	75.22	airgun	
	2382	2025	13	07:09	26.774	19.87	051.91	28.45	75.22	airgun	
	2383	2026	13	07:09	56.782	19.77	051.89	28.45	75.22	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2384	2027	13	07:10	26.791	19.66	051.84	28.45	75.22	airgun	
	2385	2028	13	07:10	56.800	19.55	051.79	28.45	75.22	airgun	
	2386	2029	13	07:11	26.809	19.47	051.82	28.45	75.22	airgun	
	2387	2030	13	07:11	56.817	19.40	051.87	28.45	75.22	airgun	
	2388	2031	13	07:12	26.827	19.28	051.82	28.45	75.23	airgun	
	2389	2032	13	07:12	56.836	19.15	051.75	28.45	75.23	airgun	
	2390	2033	13	07:13	26.844	19.06	051.77	28.45	75.23	airgun	
	2391	2034	13	07:13	56.852	18.98	051.81	28.45	75.23	airgun	
	2392	2035	13	07:14	26.861	18.87	051.78	28.45	75.23	airgun	
	2393	2036	13	07:14	56.870	18.76	051.74	28.45	75.23	airgun	
	2394	2037	13	07:15	26.879	18.65	051.71	28.45	75.23	airgun	
	2395	2038	13	07:15	56.887	18.54	051.68	28.45	75.23	airgun	
	2396	2039	13	07:16	26.896	18.45	051.69	28.45	75.23	airgun	
	2397	2040	13	07:16	56.905	18.35	051.68	28.45	75.23	airgun	
	2398	2041	13	07:17	26.914	18.25	051.65	28.44	75.24	airgun	
	2399	2042	13	07:17	56.923	18.14	051.61	28.44	75.24	airgun	
	2400	2043	13	07:18	26.931	18.06	051.61	28.44	75.24	airgun	
	2401	2044	13	07:18	56.941	17.97	051.62	28.44	75.24	airgun	
	2402	2045	13	07:19	26.948	17.88	051.61	28.44	75.24	airgun	
	2403	2046	13	07:19	56.957	17.79	051.60	28.44	75.24	airgun	
	2404	2047	13	07:20	26.966	17.69	051.57	28.44	75.24	airgun	
	2405	2048	13	07:20	56.975	17.58	051.54	28.44	75.24	airgun	
	2406	2049	13	07:21	26.984	17.50	051.56	28.44	75.24	airgun	
	2407	2050	13	07:21	56.992	17.42	051.60	28.44	75.24	airgun	
	2408	2051	13	07:22	27.001	17.29	051.54	28.44	75.24	airgun	
	2409	2052	13	07:22	57.010	17.16	051.48	28.44	75.24	airgun	
	2410	2053	13	07:23	27.018	17.05	051.47	28.44	75.25	airgun	
	2411	2054	13	07:23	57.027	16.94	051.48	28.44	75.25	airgun	
	2412	2055	13	07:24	27.036	16.85	051.51	28.44	75.25	airgun	
	2413	2056	13	07:24	57.044	16.76	051.54	28.44	75.25	airgun	
	2414	2057	13	07:25	27.053	16.67	051.55	28.44	75.25	airgun	
	2415	2058	13	07:25	57.062	16.57	051.56	28.44	75.25	airgun	
	2416	2059	13	07:26	27.071	16.47	051.53	28.44	75.25	airgun	
	2417	2060	13	07:26	57.080	16.36	051.49	28.43	75.25	airgun	
	2418	2061	13	07:27	27.088	16.28	051.54	28.43	75.25	airgun	
	2419	2062	13	07:27	57.097	16.21	051.59	28.43	75.25	airgun	
	2420	2063	13	07:28	27.106	16.09	051.56	28.43	75.25	airgun	
	2421	2064	13	07:28	57.115	15.98	051.49	28.43	75.25	airgun	
	2422	2065	13	07:29	27.123	15.90	051.52	28.43	75.25	airgun	
	2423	2066	13	07:29	57.132	15.82	051.57	28.43	75.25	airgun	
	2424	2067	13	07:30	27.141	15.70	051.47	28.43	75.26	airgun	
	2425	2068	13	07:30	57.149	15.57	051.35	28.43	75.26	airgun	
	2426	2069	13	07:31	27.159	15.49	051.38	28.43	75.26	airgun	
	2427	2070	13	07:31	57.167	15.42	051.42	28.43	75.26	airgun	

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Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2428	2071	13	07:32	27.176	15.31	051.38	28.43	75.26	airgun	
	2429	2072	13	07:32	57.185	15.19	051.32	28.43	75.26	airgun	
	2430	2073	13	07:33	27.193	15.08	051.30	28.43	75.26	airgun	
	2431	2074	13	07:33	57.201	14.98	051.27	28.43	75.26	airgun	
	2432	2075	13	07:34	27.211	14.89	051.29	28.43	75.26	airgun	
	2433	2076	13	07:34	57.219	14.80	051.32	28.43	75.26	airgun	
	2434	2077	13	07:35	27.228	14.70	051.32	28.43	75.26	airgun	
	2435	2078	13	07:35	57.237	14.61	051.31	28.43	75.26	airgun	
	2436	2079	13	07:36	27.245	14.51	051.27	28.42	75.26	airgun	
	2437	2080	13	07:36	57.254	14.40	051.21	28.42	75.27	airgun	
	2438	2081	13	07:37	27.263	14.30	051.17	28.42	75.27	airgun	
	2439	2082	13	07:37	57.272	14.21	051.13	28.42	75.27	airgun	
	2440	2083	13	07:38	27.280	14.11	051.09	28.42	75.27	airgun	
	2441	2084	13	07:38	57.289	14.01	051.05	28.42	75.27	airgun	
	2442	2085	13	07:39	27.298	13.95	051.11	28.42	75.27	airgun	
	2443	2086	13	07:39	57.306	13.88	051.17	28.42	75.27	airgun	
	2444	2087	13	07:40	27.315	13.76	051.06	28.42	75.27	airgun	
	2445	2088	13	07:40	57.324	13.63	050.91	28.42	75.27	airgun	
	2446	2089	13	07:41	27.333	13.52	050.87	28.42	75.27	airgun	
	2447	2090	13	07:41	57.341	13.43	050.83	28.42	75.28	airgun	
	2448	2091	13	07:42	27.350	13.31	050.74	28.42	75.28	airgun	
	2449	2092	13	07:42	57.359	13.19	050.65	28.42	75.28	airgun	
	2450	2093	13	07:43	27.368	13.08	050.59	28.42	75.28	airgun	
	2451	2094	13	07:43	57.376	12.98	050.54	28.42	75.28	airgun	
	2452	2095	13	07:44	27.385	12.89	050.57	28.42	75.28	airgun	
	2453	2096	13	07:44	57.394	12.81	050.61	28.42	75.28	airgun	
	2454	2097	13	07:45	27.403	12.71	050.58	28.42	75.28	airgun	
	2455	2098	13	07:45	57.411	12.61	050.55	28.42	75.28	airgun	
	2456	2099	13	07:46	27.424	12.53	050.56	28.42	75.28	airgun	
	2457	2100	13	07:46	57.429	12.44	050.57	28.42	75.28	airgun	
	2458	2101	13	07:47	27.437	12.33	050.54	28.41	75.28	airgun	
	2459	2102	13	07:47	57.446	12.23	050.48	28.41	75.29	airgun	
	2460	2103	13	07:48	27.455	12.11	050.41	28.41	75.29	airgun	
	2461	2104	13	07:48	57.464	12.00	050.32	28.41	75.29	airgun	
	2462	2105	13	07:49	27.473	11.90	050.26	28.41	75.29	airgun	
	2463	2106	13	07:49	57.481	11.79	050.19	28.41	75.29	airgun	
	2464	2107	13	07:50	27.490	11.72	050.22	28.41	75.29	airgun	
	2465	2108	13	07:50	57.499	11.65	050.27	28.41	75.29	airgun	
	2466	2109	13	07:51	27.507	11.56	050.25	28.41	75.29	airgun	
	2467	2110	13	07:51	57.516	11.47	050.22	28.41	75.29	airgun	
	2468	2111	13	07:52	27.525	11.36	050.11	28.41	75.29	airgun	
	2469	2112	13	07:52	57.534	11.25	050.01	28.41	75.29	airgun	
	2470	2113	13	07:53	27.542	11.14	049.95	28.41	75.29	airgun	
	2471	2114	13	07:53	57.551	11.03	049.88	28.41	75.29	airgun	

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Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2472	2115	13	07:54	27.560	10.94	049.87	28.41	75.30	airgun	
	2473	2116	13	07:54	57.568	10.84	049.87	28.41	75.30	airgun	
	2474	2117	13	07:55	27.578	10.74	049.85	28.41	75.30	airgun	
	2475	2118	13	07:55	57.586	10.64	049.82	28.41	75.30	airgun	
	2476	2119	13	07:56	27.594	10.53	049.78	28.41	75.30	airgun	
	2477	2120	13	07:56	57.604	10.42	049.72	28.40	75.30	airgun	
	2478	2121	13	07:57	27.612	10.33	049.77	28.40	75.30	airgun	
	2479	2122	13	07:57	57.621	10.25	049.82	28.40	75.30	airgun	
	2480	2123	13	07:58	27.629	10.13	049.72	28.40	75.30	airgun	
	2481	2124	13	07:58	57.638	10.01	049.59	28.40	75.30	airgun	
	2492	2127	13	08:00	27.665	09.70	049.43	28.40	75.31	airgun	
	2493	2128	13	08:00	57.673	09.59	049.36	28.40	75.31	airgun	
	2494	2129	13	08:01	27.683	09.49	049.28	28.40	75.31	airgun	
	2495	2130	13	08:01	57.691	09.38	049.20	28.40	75.31	airgun	
	2496	2131	13	08:02	27.700	09.28	049.14	28.40	75.31	airgun	
	2497	2132	13	08:02	57.708	09.18	049.08	28.40	75.31	airgun	
	2498	2133	13	08:03	27.717	09.09	049.09	28.40	75.31	airgun	
	2499	2134	13	08:03	57.726	09.00	049.09	28.40	75.31	airgun	
	2500	2135	13	08:04	27.735	08.90	049.05	28.40	75.31	airgun	
	2501	2136	13	08:04	57.743	08.80	048.99	28.40	75.31	airgun	
	2502	2137	13	08:05	27.752	08.71	048.98	28.40	75.31	airgun	
	2503	2138	13	08:05	57.761	08.61	048.96	28.40	75.32	airgun	
	2504	2139	13	08:06	27.770	08.50	048.84	28.39	75.32	airgun	
	2505	2140	13	08:06	57.778	08.39	048.69	28.39	75.32	airgun	
	2506	2141	13	08:07	27.787	08.31	048.73	28.39	75.32	airgun	
	2507	2142	13	08:07	57.795	08.22	048.77	28.39	75.32	airgun	
	2508	2143	13	08:08	27.805	08.10	048.57	28.39	75.32	airgun	
	2509	2144	13	08:08	57.813	07.98	048.34	28.39	75.32	airgun	
	2510	2145	13	08:09	27.822	07.89	048.31	28.39	75.32	airgun	
	2511	2146	13	08:09	57.830	07.80	048.30	28.39	75.32	airgun	
	2512	2147	13	08:10	27.844	07.70	048.24	28.39	75.32	airgun	
	2513	2148	13	08:10	57.851	07.60	048.16	28.39	75.32	airgun	
	2514	2149	13	08:11	27.858	07.50	048.07	28.39	75.32	airgun	
	2515	2150	13	08:11	57.866	07.40	047.97	28.39	75.32	airgun	
	2516	2151	13	08:12	27.875	07.33	048.02	28.39	75.32	airgun	1
	2517	2152	13	08:12	57.883	07.26	048.08	28.39	75.33	airgun	
	2518	2153	13	08:13	27.891	07.13	047.81	28.39	75.33	airgun	
	2519	2154	13	08:13	57.900	07.00	047.48	28.39	75.33	airgun	
	2520	2155	13	08:14	27.909	06.88	047.25	28.39	75.33	airgun	
	2521	2156	13	08:14	57.918	06.77	047.00	28.39	75.33	airgun	
	2522	2157	13	08:15	27.926	06.67	046.97	28.39	75.33	airgun	
	2523	2158	13	08:15	57.936	06.59	046.96	28.38	75.33	airgun	
	2524	2159	13	08:16	27.944	06.51	047.10	28.38	75.33	airgun	
	2525	2160	13	08:16	57.953	06.44	047.25	28.38	75.33	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2526	2161	13	08:17	27.962	06.32	047.00	28.38	75.33	airgun	1
	2527	2162	13	08:17	57.970	06.20	046.71	28.38	75.33	airgun	1
	2528	2163	13	08:18	27.979	06.09	046.58	28.38	75.34	airgun	3
	2529	2164	13	08:18	57.988	05.99	046.46	28.38	75.34	airgun	
	2530	2165	13	08:19	27.997	05.90	046.40	28.38	75.34	airgun	1
	2531	2166	13	08:19	58.006	05.81	046.35	28.38	75.34	airgun	
	2532	2167	13	08:20	28.014	05.71	046.16	28.38	75.34	airgun	3
	2533	2168	13	08:20	58.023	05.60	045.95	28.38	75.34	airgun	1
	2534	2169	13	08:21	28.032	05.48	045.61	28.38	75.34	airgun	
	2535	2170	13	08:21	58.041	05.36	045.23	28.38	75.34	airgun	
	2536	2171	13	08:22	28.049	05.32	045.66	28.38	75.34	airgun	2
	2537	2172	13	08:22	58.058	05.28	046.14	28.38	75.34	airgun	2
	2538	2173	13	08:23	28.067	100.00	1000.00	28.38	43.61	airgun	1
	2539	2174	13	08:23	58.076	100.00	1000.00	28.38	09.61	airgun	1
	2540	2175	13	08:24	28.085	100.00	1000.00	28.38	39.08	airgun	1
	2541	2176	13	08:24	58.094	100.00	1000.00	28.37	73.08	airgun	3
	2542	2177	13	08:25	28.102	04.74	045.23	28.37	75.35	airgun	1
	2543	2178	13	08:25	58.112	04.58	044.38	28.37	75.35	airgun	3
	2544	2179	13	08:26	28.120	04.49	044.35	28.37	75.35	airgun	1
	2545	2180	13	08:26	58.129	04.41	044.35	28.37	75.35	airgun	2
	2546	2181	13	08:27	28.138	04.34	044.54	28.37	75.35	airgun	
	2547	2182	13	08:27	58.146	04.28	044.77	28.37	75.35	airgun	1
	2548	2183	13	08:28	28.155	100.00	1000.00	28.37	43.62	airgun	1
	2549	2184	13	08:28	58.164	100.00	1000.00	28.37	09.62	airgun	1
	2550	2185	13	08:29	28.173	100.00	1000.00	28.37	39.09	airgun	4
	2551	2186	13	08:29	58.182	100.00	1000.00	28.37	73.09	airgun	5
	2552	2187	13	08:30	28.191	03.74	043.28	28.37	75.36	airgun	4
	2553	2188	13	08:30	58.199	03.61	042.53	28.37	75.36	airgun	2
	2554	2189	13	08:31	28.208	03.53	042.50	28.37	75.36	airgun	1
	2555	2190	13	08:31	58.218	03.44	042.55	28.37	75.36	airgun	6
	2556	2191	13	08:32	28.226	03.35	042.31	28.37	75.36	airgun	5
	2557	2192	13	08:32	58.240	03.26	042.07	28.37	75.36	airgun	1
	2558	2193	13	08:33	28.244	03.17	041.85	28.36	75.36	airgun	4
	2559	2194	13	08:33	58.253	03.07	041.60	28.36	75.36	airgun	1
	2560	2195	13	08:34	28.262	02.95	040.93	28.36	75.36	airgun	1
	2561	2196	13	08:34	58.271	02.84	040.19	28.36	75.36	airgun	5
	2562	2197	13	08:35	28.279	02.74	039.91	28.36	75.36	airgun	14
	2563	2198	13	08:35	58.288	02.64	039.61	28.36	75.36	airgun	4
	2564	2199	13	08:36	28.297	02.53	039.03	28.36	75.36	airgun	13
	2565	2200	13	08:36	58.306	02.42	038.33	28.36	75.37	airgun	1
	2566	2201	13	08:37	28.315	02.33	038.02	28.36	75.37	airgun	1
	2567	2202	13	08:37	58.325	02.24	037.67	28.36	75.37	airgun	3
	2568	2203	13	08:38	28.333	02.14	036.84	28.36	75.37	airgun	4
	2569	2204	13	08:38	58.341	02.04	035.87	28.36	75.37	airgun	6

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2570	2205	13	08:39	28.350	01.94	034.99	28.36	75.37	airgun	6
	2571	2206	13	08:39	58.359	01.85	034.02	28.36	75.37	airgun	18
	2572	2207	13	08:40	28.368	01.75	033.11	28.36	75.37	airgun	2
	2573	2208	13	08:40	58.377	01.66	032.17	28.36	75.37	airgun	5
	2574	2209	13	08:41	28.386	01.57	031.12	28.36	75.37	airgun	1
	2575	2210	13	08:41	58.395	01.49	029.94	28.36	75.37	airgun	17
	2576	2211	13	08:42	28.404	01.41	029.16	28.35	75.37	airgun	2
	2577	2212	13	08:42	58.413	01.33	028.26	28.35	75.38	airgun	5
	2578	2213	13	08:43	28.422	01.23	025.84	28.35	75.38	airgun	27
	2579	2214	13	08:43	58.431	01.13	022.88	28.35	75.38	airgun	16
	2580	2215	13	08:44	28.440	01.05	020.66	28.35	75.38	airgun	3
	2581	2216	13	08:44	58.448	00.96	018.14	28.35	75.38	airgun	2
	2582	2217	13	08:45	28.458	00.88	014.39	28.35	75.38	airgun	4
	2583	2218	13	08:45	58.466	00.79	009.83	28.35	75.38	airgun	22
	2584	2219	13	08:46	28.475	00.72	005.42	28.35	75.38	airgun	8
	2585	2220	13	08:46	58.484	00.66	000.39	28.35	75.38	airgun	1

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A6	2586	2221	13	08:47	28.493	00.60	353.41	28.35	75.38	airgun	9
	2587	2222	13	08:47	58.502	00.56	345.11	28.35	75.38	airgun	9
	2588	2223	13	08:48	28.511	00.54	337.05	28.35	75.38	airgun	1
	2589	2224	13	08:48	58.520	00.53	328.55	28.35	75.39	airgun	
	2590	2225	13	08:49	28.529	00.54	319.12	28.35	75.39	airgun	1
	2591	2226	13	08:49	58.539	00.57	310.07	28.35	75.39	airgun	10
	2592	2227	13	08:50	28.547	00.61	301.98	28.35	75.39	airgun	1
	2593	2228	13	08:50	58.556	00.66	294.89	28.35	75.39	airgun	2
	2594	2229	13	08:51	28.565	00.73	288.11	28.34	75.39	airgun	7
	2595	2230	13	08:51	58.574	00.82	282.53	28.34	75.39	airgun	8
	2596	2231	13	08:52	28.583	00.89	277.87	28.34	75.39	airgun	
	2597	2232	13	08:52	58.592	00.96	273.98	28.34	75.39	airgun	
	2598	2233	13	08:53	28.601	01.05	270.41	28.34	75.39	airgun	
	2599	2234	13	08:53	58.610	01.15	267.38	28.34	75.39	airgun	12
	2600	2235	13	08:54	28.619	01.25	264.63	28.34	75.39	airgun	11
	2601	2236	13	08:54	58.627	01.35	262.37	28.34	75.39	airgun	7
	2602	2237	13	08:55	28.637	01.43	260.17	28.34	75.40	airgun	11
	2603	2238	13	08:55	58.646	01.51	258.20	28.34	75.40	airgun	9
	2604	2239	13	08:56	28.654	01.60	256.42	28.34	75.40	airgun	8
	2605	2240	13	08:56	58.664	01.69	254.84	28.34	75.40	airgun	12
	2606	2241	13	08:57	28.673	01.78	253.40	28.34	75.40	airgun	10
	2607	2242	13	08:57	58.682	01.87	252.12	28.34	75.40	airgun	3
	2608	2243	13	08:58	28.691	01.96	250.94	28.34	75.40	airgun	13
	2609	2244	13	08:58	58.705	02.05	249.88	28.34	75.40	airgun	15
	2610	2245	13	08:59	28.708	02.15	249.01	28.34	75.40	airgun	13
	2611	2246	13	08:59	58.718	02.25	248.25	28.34	75.40	airgun	6
	2622	2249	13	09:01	28.745	02.53	246.10	28.33	75.40	airgun	5
	2623	2250	13	09:01	58.754	02.64	245.67	28.33	75.41	airgun	2
	2624	2251	13	09:02	28.762	02.72	245.07	28.33	75.41	airgun	3
	2625	2252	13	09:02	58.772	02.81	244.50	28.33	75.41	airgun	5
	2626	2253	13	09:03	28.781	02.89	243.88	28.33	75.41	airgun	6
	2627	2254	13	09:03	58.790	02.97	243.30	28.33	75.41	airgun	6
	2628	2255	13	09:04	28.799	03.06	242.78	28.33	75.41	airgun	5
	2629	2256	13	09:04	58.808	03.14	242.30	28.33	75.41	airgun	6
	2630	2257	13	09:05	28.816	03.25	241.99	28.33	75.41	airgun	1
	2631	2258	13	09:05	58.826	03.36	241.75	28.33	75.41	airgun	1
	2632	2259	13	09:06	28.835	03.46	241.39	28.33	75.41	airgun	3
	2633	2260	13	09:06	58.843	03.56	241.03	28.33	75.41	airgun	4
	2634	2261	13	09:07	28.853	03.65	240.65	28.33	75.41	airgun	4
	2635	2262	13	09:07	58.862	03.75	240.29	28.33	75.41	airgun	4
	2636	2263	13	09:08	28.871	03.83	239.74	28.33	75.42	airgun	2
	2637	2264	13	09:08	58.880	03.91	239.17	28.33	75.42	airgun	4
	2638	2265	13	09:09	28.889	04.01	238.81	28.33	75.42	airgun	4
	2639	2266	13	09:09	58.898	04.11	238.47	28.32	75.42	airgun	4

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2640	2267	13	09:10	28.907	04.19	238.03	28.32	75.42	airgun	1
	2641	2268	13	09:10	58.916	04.27	237.57	28.32	75.42	airgun	4
	2642	2269	13	09:11	28.925	04.39	237.47	28.32	75.42	airgun	1
	2643	2270	13	09:11	58.934	04.51	237.43	28.32	75.42	airgun	1
	2644	2271	13	09:12	28.943	04.60	237.19	28.32	75.42	airgun	1
	2645	2272	13	09:12	58.952	04.69	236.95	28.32	75.42	airgun	
	2646	2273	13	09:13	28.965	04.78	236.73	28.32	75.42	airgun	1
	2647	2274	13	09:13	58.970	04.87	236.52	28.32	75.42	airgun	1
	2648	2275	13	09:14	28.979	04.97	236.41	28.32	75.42	airgun	1
	2649	2276	13	09:14	58.987	05.08	236.30	28.32	75.42	airgun	1
	2650	2277	13	09:15	28.997	05.16	236.05	28.32	75.43	airgun	3
	2651	2278	13	09:15	59.006	05.25	235.80	28.32	75.43	airgun	3
	2652	2279	13	09:16	29.015	05.35	235.65	28.32	75.43	airgun	
	2653	2280	13	09:16	59.023	05.45	235.52	28.32	75.43	airgun	
	2654	2281	13	09:17	29.032	05.54	235.38	28.32	75.43	airgun	1
	2655	2282	13	09:17	59.041	05.64	235.24	28.32	75.43	airgun	
	2656	2283	13	09:18	29.050	05.73	235.00	28.31	75.43	airgun	1
	2657	2284	13	09:18	59.059	05.81	234.79	28.31	75.43	airgun	3
	2658	2285	13	09:19	29.068	05.92	234.70	28.31	75.43	airgun	2
	2659	2286	13	09:19	59.077	06.03	234.61	28.31	75.43	airgun	
	2660	2287	13	09:20	29.086	06.11	234.40	28.31	75.43	airgun	
	2661	2288	13	09:20	59.095	06.20	234.18	28.31	75.43	airgun	1
	2662	2289	13	09:21	29.104	06.31	234.10	28.31	75.43	airgun	
	2663	2290	13	09:21	59.113	06.41	234.03	28.31	75.43	airgun	1
	2664	2291	13	09:22	29.122	06.51	233.86	28.31	75.43	airgun	
	2665	2292	13	09:22	59.131	06.60	233.71	28.31	75.43	airgun	
	2666	2293	13	09:23	29.140	06.71	233.66	28.31	75.44	airgun	1
	2667	2294	13	09:23	59.148	06.81	233.61	28.31	75.44	airgun	
	2668	2295	13	09:24	29.157	06.89	233.41	28.31	75.44	airgun	
	2669	2296	13	09:24	59.166	06.97	233.21	28.31	75.44	airgun	
	2670	2297	13	09:25	29.175	07.06	233.05	28.31	75.44	airgun	
	2671	2298	13	09:25	59.184	07.14	232.91	28.31	75.44	airgun	
	2672	2299	13	09:26	29.193	07.26	232.97	28.30	75.44	airgun	1
	2673	2300	13	09:26	59.202	07.38	233.03	28.30	75.44	airgun	
	2674	2301	13	09:27	29.211	07.47	232.92	28.30	75.44	airgun	1
	2675	2302	13	09:27	59.222	07.56	232.82	28.30	75.44	airgun	
	2676	2303	13	09:28	29.228	07.67	232.77	28.30	75.44	airgun	
	2677	2304	13	09:28	59.237	07.78	232.73	28.30	75.44	airgun	
	2678	2305	13	09:29	29.246	07.86	232.57	28.30	75.44	airgun	
	2679	2306	13	09:29	59.255	07.95	232.41	28.30	75.44	airgun	
	2680	2307	13	09:30	29.264	08.05	232.33	28.30	75.45	airgun	
	2681	2308	13	09:30	59.273	08.15	232.26	28.30	75.45	airgun	
	2682	2309	13	09:31	29.282	08.25	232.15	28.30	75.45	airgun	
	2683	2310	13	09:31	59.290	08.34	232.06	28.30	75.45	airgun	

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Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2684	2311	13	09:32	29.300	08.44	232.01	28.30	75.45	airgun	
	2685	2312	13	09:32	59.308	08.54	231.96	28.30	75.45	airgun	
	2686	2313	13	09:33	29.317	08.63	231.84	28.30	75.45	airgun	
	2687	2314	13	09:33	59.326	08.71	231.74	28.30	75.45	airgun	
	2688	2315	13	09:34	29.335	08.82	231.73	28.30	75.45	airgun	
	2689	2316	13	09:34	59.344	08.92	231.73	28.29	75.45	airgun	
	2690	2317	13	09:35	29.353	09.03	231.76	28.29	75.45	airgun	
	2691	2318	13	09:35	59.362	09.14	231.79	28.29	75.45	airgun	
	2692	2319	13	09:36	29.371	09.20	231.56	28.29	75.46	airgun	
	2693	2320	13	09:36	59.379	09.26	231.34	28.29	75.46	airgun	
	2694	2321	13	09:37	29.388	09.38	231.34	28.29	75.46	airgun	
	2695	2322	13	09:37	59.397	09.49	231.36	28.29	75.46	airgun	
	2696	2323	13	09:38	29.407	09.60	231.36	28.29	75.46	airgun	
	2697	2324	13	09:38	59.415	09.72	231.38	28.29	75.46	airgun	
	2698	2325	13	09:39	29.424	09.81	231.29	28.29	75.46	airgun	
	2699	2326	13	09:39	59.432	09.90	231.21	28.29	75.46	airgun	
	2700	2327	13	09:40	29.442	10.00	231.14	28.29	75.46	airgun	
	2701	2328	13	09:40	59.451	10.10	231.07	28.29	75.46	airgun	
	2702	2329	13	09:41	29.459	10.19	230.99	28.29	75.46	airgun	
	2703	2330	13	09:41	59.468	10.28	230.91	28.28	75.46	airgun	
	2704	2331	13	09:42	29.477	10.39	230.86	28.28	75.46	airgun	
	2705	2332	13	09:42	59.486	10.49	230.82	28.28	75.46	airgun	
	2706	2333	13	09:43	29.495	10.59	230.79	28.28	75.46	airgun	
	2707	2334	13	09:43	59.504	10.69	230.76	28.28	75.47	airgun	
	2708	2335	13	09:44	29.513	10.78	230.72	28.28	75.47	airgun	
	2709	2336	13	09:44	59.522	10.87	230.67	28.28	75.47	airgun	
	2710	2337	13	09:45	29.530	10.97	230.68	28.28	75.47	airgun	
	2711	2338	13	09:45	59.539	11.08	230.70	28.28	75.47	airgun	
	2712	2339	13	09:46	29.549	11.17	230.65	28.28	75.47	airgun	
	2713	2340	13	09:46	59.557	11.26	230.61	28.28	75.47	airgun	
	2714	2341	13	09:47	29.567	11.36	230.58	28.28	75.47	airgun	
	2715	2342	13	09:47	59.575	11.46	230.56	28.28	75.47	airgun	
	2716	2343	13	09:48	29.584	11.55	230.49	28.28	75.47	airgun	
	2717	2344	13	09:48	59.592	11.65	230.43	28.28	75.47	airgun	
	2718	2345	13	09:49	29.602	11.74	230.34	28.28	75.47	airgun	
	2719	2346	13	09:49	59.610	11.82	230.26	28.28	75.47	airgun	
	2720	2347	13	09:50	29.620	11.92	230.21	28.27	75.47	airgun	
	2721	2348	13	09:50	59.628	12.01	230.17	28.27	75.47	airgun	
	2722	2349	13	09:51	29.637	12.12	230.18	28.27	75.48	airgun	
	2723	2350	13	09:51	59.646	12.22	230.19	28.27	75.48	airgun	
	2724	2351	13	09:52	29.655	12.32	230.21	28.27	75.48	airgun	
	2725	2352	13	09:52	59.663	12.43	230.23	28.27	75.48	airgun	
	2726	2353	13	09:53	29.672	12.53	230.23	28.27	75.48	airgun	
	2727	2354	13	09:53	59.681	12.64	230.25	28.27	75.48	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2728	2355	13	09:54	29.690	12.71	230.11	28.27	75.48	airgun	
	2729	2356	13	09:54	59.699	12.77	229.97	28.27	75.48	airgun	
	2730	2357	13	09:55	29.708	12.89	229.99	28.27	75.48	airgun	
	2731	2358	13	09:55	59.716	13.00	230.01	28.27	75.48	airgun	
	2732	2359	13	09:56	29.727	13.10	229.99	28.27	75.48	airgun	
	2733	2360	13	09:56	59.734	13.20	229.97	28.27	75.48	airgun	
	2734	2361	13	09:57	29.743	13.27	229.83	28.27	75.49	airgun	
	2735	2362	13	09:57	59.751	13.34	229.71	28.27	75.49	airgun	
	2736	2363	13	09:58	29.760	13.45	229.75	28.27	75.49	airgun	
	2737	2364	13	09:58	59.769	13.57	229.80	28.26	75.49	airgun	
	2738	2365	13	09:59	29.778	13.69	229.83	28.26	75.49	airgun	
	2739	2366	13	09:59	59.787	13.80	229.87	28.26	75.49	airgun	
	2750	2369	13	10:01	29.813	14.09	229.80	28.26	75.49	airgun	
	2751	2370	13	10:01	59.822	14.18	229.76	28.26	75.49	airgun	
	2752	2371	13	10:02	29.831	14.28	229.74	28.26	75.49	airgun	
	2753	2372	13	10:02	59.840	14.38	229.72	28.26	75.49	airgun	
	2754	2373	13	10:03	29.848	14.48	229.67	28.26	75.49	airgun	
	2755	2374	13	10:03	59.857	14.57	229.64	28.26	75.49	airgun	
	2756	2375	13	10:04	29.866	14.66	229.57	28.26	75.50	airgun	
	2757	2376	13	10:04	59.875	14.75	229.51	28.26	75.50	airgun	
	2758	2377	13	10:05	29.884	14.84	229.44	28.26	75.50	airgun	
	2759	2378	13	10:05	59.892	14.93	229.38	28.26	75.50	airgun	
	2760	2379	13	10:06	29.901	15.03	229.37	28.26	75.50	airgun	
	2761	2380	13	10:06	59.910	15.13	229.35	28.25	75.50	airgun	
	2762	2381	13	10:07	29.919	15.24	229.38	28.25	75.50	airgun	
	2763	2382	13	10:07	59.928	15.35	229.42	28.25	75.50	airgun	
	2764	2383	13	10:08	29.936	15.44	229.42	28.25	75.50	airgun	
	2765	2384	13	10:08	59.945	15.54	229.42	28.25	75.50	airgun	
	2766	2385	13	10:09	29.954	15.64	229.40	28.25	75.50	airgun	
	2767	2386	13	10:09	59.963	15.73	229.38	28.25	75.50	airgun	
	2768	2387	13	10:10	29.972	15.83	229.39	28.25	75.50	airgun	
	2769	2388	13	10:10	59.980	15.94	229.40	28.25	75.50	airgun	
	2770	2389	13	10:11	29.989	16.02	229.33	28.25	75.50	airgun	
	2771	2390	13	10:11	59.998	16.10	229.26	28.25	75.51	airgun	
	2772	2391	13	10:12	30.007	16.19	229.18	28.25	75.51	airgun	
	2773	2392	13	10:13	00.016	16.27	229.11	28.25	75.51	airgun	
	2774	2393	13	10:13	30.024	16.37	229.10	28.25	75.51	airgun	
	2775	2394	13	10:14	00.033	16.47	229.09	28.25	75.51	airgun	
	2776	2395	13	10:14	30.042	16.57	229.08	28.25	75.51	airgun	
	2777	2396	13	10:15	00.051	16.67	229.07	28.25	75.51	airgun	
	2778	2397	13	10:15	30.060	16.76	229.04	28.25	75.51	airgun	
	2779	2398	13	10:16	00.068	16.86	229.01	28.24	75.51	airgun	
	2780	2399	13	10:16	30.077	16.96	228.99	28.24	75.51	airgun	
	2781	2400	13	10:17	00.086	17.06	229.01	28.24	75.51	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2782	2401	13	10:17	30.094	17.15	228.98	28.24	75.51	airgun	
	2783	2402	13	10:18	00.103	17.25	228.95	28.24	75.51	airgun	
	2784	2403	13	10:18	30.112	17.35	228.94	28.24	75.51	airgun	
	2785	2404	13	10:19	00.121	17.45	228.93	28.24	75.51	airgun	
	2786	2405	13	10:19	30.130	17.55	228.95	28.24	75.52	airgun	
	2787	2406	13	10:20	00.139	17.66	228.96	28.24	75.52	airgun	
	2788	2407	13	10:20	30.147	17.75	228.96	28.24	75.52	airgun	
	2789	2408	13	10:21	00.156	17.85	228.96	28.24	75.52	airgun	
	2790	2409	13	10:21	30.164	17.93	228.88	28.24	75.52	airgun	
	2791	2410	13	10:22	00.174	18.00	228.81	28.24	75.52	airgun	
	2792	2411	13	10:22	30.182	18.12	228.85	28.24	75.52	airgun	
	2793	2412	13	10:23	00.191	18.24	228.89	28.24	75.52	airgun	
	2794	2413	13	10:23	30.200	18.32	228.83	28.24	75.52	airgun	
	2795	2414	13	10:24	00.212	18.41	228.76	28.24	75.52	airgun	
	2796	2415	13	10:24	30.217	18.51	228.76	28.23	75.52	airgun	
	2797	2416	13	10:25	00.236	18.62	228.77	28.23	75.52	airgun	
	2798	2417	13	10:25	30.238	18.69	228.67	28.23	75.52	airgun	
	2799	2418	13	10:26	00.244	18.76	228.58	28.23	75.53	airgun	
	2800	2419	13	10:26	30.252	18.89	228.63	28.23	75.53	airgun	
	2801	2420	13	10:27	00.262	19.02	228.68	28.23	75.53	airgun	
	2802	2421	13	10:27	30.270	19.11	228.64	28.23	75.53	airgun	
	2803	2422	13	10:28	00.279	19.19	228.59	28.23	75.53	airgun	
	2804	2423	13	10:28	30.287	19.29	228.59	28.23	75.53	airgun	
	2805	2424	13	10:29	00.296	19.39	228.59	28.23	75.53	airgun	
	2806	2425	13	10:29	30.305	19.47	228.51	28.23	75.53	airgun	
	2807	2426	13	10:30	00.314	19.54	228.45	28.23	75.53	airgun	
	2808	2427	13	10:30	30.322	19.65	228.46	28.23	75.53	airgun	
	2809	2428	13	10:31	00.331	19.76	228.47	28.23	75.53	airgun	
	2810	2429	13	10:31	30.340	19.86	228.47	28.23	75.53	airgun	
	2811	2430	13	10:32	00.349	19.97	228.48	28.23	75.53	airgun	
	2812	2431	13	10:32	30.358	20.06	228.42	28.22	75.53	airgun	
	2813	2432	13	10:33	00.367	20.14	228.36	28.22	75.54	airgun	
	2814	2433	13	10:33	30.375	20.25	228.36	28.22	75.54	airgun	
	2815	2434	13	10:34	00.384	20.36	228.37	28.22	75.54	airgun	
	2816	2435	13	10:34	30.392	20.43	228.30	28.22	75.54	airgun	
	2817	2436	13	10:35	00.401	20.51	228.23	28.22	75.54	airgun	
	2818	2437	13	10:35	30.410	20.62	228.24	28.22	75.54	airgun	
	2819	2438	13	10:36	00.419	20.72	228.25	28.22	75.54	airgun	
	2820	2439	13	10:36	30.427	20.81	228.22	28.22	75.54	airgun	
	2821	2440	13	10:37	00.436	20.90	228.18	28.22	75.54	airgun	
	2822	2441	13	10:37	30.445	21.01	228.21	28.22	75.54	airgun	
	2823	2442	13	10:38	00.454	21.12	228.23	28.22	75.54	airgun	
	2824	2443	13	10:38	30.462	21.21	228.22	28.22	75.54	airgun	
	2825	2444	13	10:39	00.472	21.31	228.21	28.22	75.54	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	2826	2445	13	10:39	30.480	21.40	228.19	28.22	75.54	airgun	
	2827	2446	13	10:40	00.489	21.49	228.18	28.22	75.54	airgun	
	2828	2447	13	10:40	30.497	21.60	228.19	28.21	75.54	airgun	
	2829	2448	13	10:41	00.506	21.70	228.20	28.21	75.55	airgun	
	2830	2449	13	10:41	30.515	21.79	228.16	28.21	75.55	airgun	
	2831	2450	13	10:42	00.523	21.88	228.13	28.21	75.55	airgun	
	2832	2451	13	10:42	30.533	21.97	228.09	28.21	75.55	airgun	
	2833	2452	13	10:43	00.541	22.07	228.04	28.21	75.55	airgun	
	2834	2453	13	10:43	30.550	22.18	228.06	28.21	75.55	airgun	
	2835	2454	13	10:44	00.559	22.29	228.08	28.21	75.55	airgun	
	2836	2455	13	10:44	30.567	22.37	228.04	28.21	75.55	airgun	
	2837	2456	13	10:45	00.576	22.46	227.99	28.21	75.55	airgun	
	2838	2457	13	10:45	30.585	22.55	227.98	28.21	75.55	airgun	
	2839	2458	13	10:46	00.594	22.64	227.97	28.21	75.55	airgun	
	2840	2459	13	10:46	30.602	22.75	227.98	28.21	75.55	airgun	
	2841	2460	13	10:47	00.612	22.85	228.00	28.21	75.55	airgun	
	2842	2461	13	10:47	30.620	22.92	227.94	28.21	75.56	airgun	
	2843	2462	13	10:48	00.629	23.00	227.89	28.20	75.56	airgun	
	2844	2463	13	10:48	30.637	23.11	227.89	28.20	75.56	airgun	
	2845	2464	13	10:49	00.646	23.22	227.89	28.20	75.56	airgun	
	2846	2465	13	10:49	30.655	23.31	227.85	28.20	75.56	airgun	
	2847	2466	13	10:50	00.664	23.41	227.80	28.20	75.56	airgun	
	2848	2467	13	10:50	30.672	23.52	227.80	28.20	75.56	airgun	
	2849	2468	13	10:51	00.681	23.63	227.80	28.20	75.56	airgun	
	2850	2469	13	10:51	30.690	23.72	227.78	28.20	75.56	airgun	
	2851	2470	13	10:52	00.699	23.82	227.76	28.20	75.56	airgun	
	2852	2471	13	10:52	30.707	23.91	227.73	28.20	75.56	airgun	
	2853	2472	13	10:53	00.723	24.00	227.70	28.20	75.56	airgun	
	2854	2473	13	10:53	30.725	24.10	227.69	28.20	75.56	airgun	
	2855	2474	13	10:54	00.734	24.21	227.68	28.20	75.56	airgun	
	2856	2475	13	10:54	30.742	24.31	227.65	28.20	75.56	airgun	
	2857	2476	13	10:55	00.752	24.40	227.63	28.20	75.57	airgun	
	2858	2477	13	10:55	30.760	24.51	227.62	28.19	75.57	airgun	
	2859	2478	13	10:56	00.769	24.61	227.61	28.19	75.57	airgun	
	2860	2479	13	10:56	30.777	24.70	227.57	28.19	75.57	airgun	
noise	2881		13	11:02	03.299						
noise	2882		13	11:12	03.299						
noise	2883		13	11:22	03.299						
noise	2884		13	11:32	03.299						
noise	2885		13	11:42	03.299						
noise	2886		13	11:52	03.299						
noise	2897		13	12:03	42.299						
noise	2908		13	12:08	06.299						
noise	2909		13	12:18	06.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	Event Tme da August of	hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
noise	2910		13	12:28	06.299						
noise	2911		13	12:38	06.299						
noise	2912		13	12:48	06.299						
noise	2913		13	12:58	06.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
E6 noi	2924		13	13:08	13.299						
noise	2925		13	13:18	13.299						
noise	2926		13	13:28	13.299						
noise	2927		13	13:38	13.299						
	2928	102	13	13:41	30.790	48.84	229.57	28.06	75.76	00.23	
noise	2929		13	13:43	36.566						
	2930	103	13	13:51	24.422	47.39	230.03	28.07	75.75	00.82	6
noise	2931		13	13:53	29.900						
	2932	104	13	13:56	24.027	46.36	230.23	28.08	75.74	25.00	378
noise	2933		13	13:58	29.298						
	2934	105	13	14:01	38.661	45.27	230.43	28.08	75.74	25.00	232
noise	2955		13	14:03	28.299						
	2956	106	13	14:06	27.686	44.31	230.67	28.09	75.73	25.00	414
noise	2957		13	14:08	32.548						
	2958	107	13	14:11	26.058	43.28	230.90	28.10	75.72	25.00	287
noise	2959		13	14:13	30.713						
	2960	108	13	14:16	27.240	42.27	231.19	28.10	75.72	25.00	339
noise	2961		13	14:18	31.702						
	2962	109	13	14:21	26.634	41.25	231.48	28.11	75.71	25.00	361
noise	2963		13	14:23	30.885						
	2964	110	13	14:26	26.758	40.20	231.77	28.12	75.70	25.00	308
noise	2965		13	14:28	30.806						
	2966	111	13	14:31	28.076	39.18	232.10	28.13	75.70	25.00	337
noise	2967		13	14:33	31.911						
	2968	112	13	14:36	23.380	38.08	232.38	28.13	75.69	25.00	351
noise	2969		13	14:38	26.997						
	2970	113	13	14:41	28.331	37.04	232.61	28.14	75.68	25.00	363
noise	2971		13	14:43	31.748						
	2972	114	13	14:46	27.123	36.03	232.78	28.15	75.67	25.00	405
noise	2973		13	14:48	30.336						
	2974	115	13	14:51	26.610	34.99	233.03	28.15	75.67	25.00	395
noise	2990		13	17:00	02.299						
	2991	155	13	17:02	19.771	06.87	253.31	28.33	75.45	00.82	

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
E2 noi	3012		13	20:00	02.299						
noise	3023		13	21:00	02.299						
	3024	247	13	21:01	26.657	47.64	045.06	28.65	75.04	25.00	406
noise	3045		13	22:00	02.299						
noise	3056		13	23:00	02.299						
noise	3067		14	00:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	Event Tme da	hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
E3 noi	3078		14	01:00	02.299						
	3079	264	14	01:01	26.957	30.22	083.22	28.38	75.07	25.00	
noise	3090		14	02:00	02.299						
	3091	276	14	02:01	25.874	17.53	078.41	28.38	75.21	25.00	843
noise	3172		14	03:00	02.299						
noise	3183		14	04:00	02.299						
noise	3194		14	05:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A9	3205	2573	14	06:00	20.862	10.03	162.37	28.26	75.35	airgun	2
	3206	2574	14	06:00	50.871	10.04	162.08	28.26	75.35	airgun	2
	3207	2575	14	06:01	20.880	10.04	161.77	28.26	75.35	airgun	1
	3208	2576	14	06:01	50.889	10.05	161.46	28.26	75.35	airgun	2
	3209	2577	14	06:02	20.898	10.05	161.16	28.26	75.35	airgun	1
	3210	2578	14	06:02	50.907	10.06	160.87	28.26	75.35	airgun	2
	3211	2579	14	06:03	20.916	10.06	160.57	28.26	75.35	airgun	1
	3212	2580	14	06:03	50.924	10.07	160.29	28.26	75.35	airgun	2
	3213	2581	14	06:04	20.933	10.07	159.98	28.26	75.35	airgun	2
	3214	2582	14	06:04	50.942	10.08	159.67	28.26	75.35	airgun	1
	3215	2583	14	06:05	20.951	10.09	159.37	28.26	75.35	airgun	1
	3216	2584	14	06:05	50.960	10.10	159.06	28.26	75.35	airgun	1
	3227	2693	14	07:00	21.921	10.07	123.46	28.29	75.30	airgun	
	3228	2694	14	07:00	51.930	10.07	123.09	28.29	75.30	airgun	1
	3229	2695	14	07:01	21.938	10.07	122.74	28.30	75.30	airgun	
	3230	2696	14	07:01	51.947	10.07	122.37	28.30	75.29	airgun	
	3231	2697	14	07:02	21.956	10.07	122.02	28.30	75.29	airgun	
	3232	2698	14	07:02	51.965	10.07	121.66	28.30	75.29	airgun	
	3233	2699	14	07:03	21.974	10.06	121.31	28.30	75.29	airgun	
	3234	2700	14	07:03	51.982	10.06	120.96	28.30	75.29	airgun	
	3235	2701	14	07:04	21.991	10.06	120.60	28.30	75.29	airgun	
	3236	2702	14	07:04	52.000	10.06	120.24	28.30	75.29	airgun	
	3237	2703	14	07:05	22.009	10.06	119.89	28.30	75.29	airgun	
	3238	2704	14	07:05	52.017	10.06	119.54	28.30	75.29	airgun	
	3249	2813	14	08:00	22.971	10.09	079.49	28.36	75.28	airgun	
	3250	2814	14	08:00	52.980	10.09	079.10	28.36	75.28	airgun	
	3251	2815	14	08:01	22.989	10.09	078.70	28.36	75.28	airgun	
	3252	2816	14	08:01	52.997	10.09	078.30	28.36	75.28	airgun	
	3253	2817	14	08:02	23.006	10.09	077.87	28.36	75.28	airgun	
	3254	2818	14	08:02	53.015	10.09	077.46	28.36	75.28	airgun	
	3255	2819	14	08:03	23.023	10.09	077.05	28.36	75.28	airgun	
	3256	2820	14	08:03	53.032	10.09	076.63	28.36	75.28	airgun	
	3257	2821	14	08:04	23.041	10.09	076.22	28.36	75.28	airgun	
	3258	2822	14	08:04	53.049	10.09	075.80	28.37	75.28	airgun	
	3259	2823	14	08:05	23.059	10.10	075.39	28.37	75.28	airgun	
	3260	2824	14	08:05	53.067	10.10	074.98	28.37	75.28	airgun	
	3271	2933	14	09:00	24.024	10.20	029.38	28.42	75.33	airgun	
	3272	2934	14	09:00	54.033	10.20	028.90	28.42	75.33	airgun	
	3273	2935	14	09:01	24.041	10.21	028.44	28.42	75.33	airgun	
	3274	2936	14	09:01	54.050	10.21	027.98	28.42	75.33	airgun	
	3275	2937	14	09:02	24.059	10.21	027.53	28.43	75.33	airgun	
	3276	2938	14	09:02	54.068	10.21	027.09	28.43	75.33	airgun	
	3277	2939	14	09:03	24.077	10.22	026.65	28.43	75.33	airgun	
	3278	2940	14	09:03	54.086	10.22	026.22	28.43	75.33	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	3279	2941	14	09:04	24.094	10.22	025.78	28.43	75.34	airgun	
	3280	2942	14	09:04	54.103	10.22	025.36	28.43	75.34	airgun	
	3281	2943	14	09:05	24.112	10.22	024.94	28.43	75.34	airgun	
	3282	2944	14	09:05	54.121	10.23	024.53	28.43	75.34	airgun	
	3293	3053	14	10:00	25.077	10.26	336.42	28.43	75.42	airgun	
	3294	3054	14	10:00	55.086	10.26	335.98	28.43	75.43	airgun	
	3295	3055	14	10:01	25.094	10.26	335.55	28.43	75.43	airgun	
	3296	3056	14	10:01	55.103	10.25	335.13	28.43	75.43	airgun	
	3297	3057	14	10:02	25.112	10.25	334.72	28.43	75.43	airgun	
	3298	3058	14	10:02	55.120	10.24	334.32	28.43	75.43	airgun	
	3299	3059	14	10:03	25.129	10.23	333.92	28.43	75.43	airgun	
	3300	3060	14	10:03	55.138	10.23	333.52	28.43	75.43	airgun	
	3301	3061	14	10:04	25.146	10.22	333.11	28.43	75.43	airgun	
	3302	3062	14	10:04	55.156	10.22	332.70	28.43	75.43	airgun	
	3303	3063	14	10:05	25.164	10.21	332.28	28.42	75.43	airgun	
	3304	3064	14	10:05	55.173	10.20	331.85	28.42	75.43	airgun	
	3315	3173	14	11:00	26.124	09.97	288.03	28.37	75.48	airgun	
	3316	3174	14	11:00	56.132	09.97	287.64	28.37	75.48	airgun	
	3317	3175	14	11:01	26.141	09.97	287.26	28.37	75.48	airgun	
	3318	3176	14	11:01	56.156	09.97	286.90	28.37	75.48	airgun	
	3319	3177	14	11:02	26.159	09.98	286.53	28.37	75.48	airgun	
	3320	3178	14	11:02	56.167	09.98	286.16	28.37	75.48	airgun	
	3321	3179	14	11:03	26.176	09.98	285.78	28.37	75.48	airgun	
	3322	3180	14	11:03	56.185	09.98	285.41	28.37	75.48	airgun	
	3323	3181	14	11:04	26.193	09.98	285.04	28.37	75.48	airgun	
	3324	3182	14	11:04	56.202	09.98	284.67	28.37	75.48	airgun	
	3325	3183	14	11:05	26.211	09.98	284.29	28.37	75.48	airgun	
	3326	3184	14	11:05	56.220	09.97	283.91	28.36	75.48	airgun	
	3337	3293	14	12:00	27.172	09.82	244.37	28.31	75.47	airgun	1
	3338	3294	14	12:00	57.181	09.82	244.02	28.31	75.47	airgun	1
	3339	3295	14	12:01	27.189	09.82	243.67	28.30	75.47	airgun	1
	3340	3296	14	12:01	57.198	09.81	243.32	28.30	75.47	airgun	1
	3341	3297	14	12:02	27.207	09.81	242.98	28.30	75.47	airgun	
	3342	3298	14	12:02	57.216	09.81	242.64	28.30	75.47	airgun	
	3343	3299	14	12:03	27.224	09.81	242.31	28.30	75.47	airgun	
	3344	3300	14	12:03	57.233	09.80	241.97	28.30	75.47	airgun	
	3345	3301	14	12:04	27.242	09.80	241.64	28.30	75.47	airgun	
	3346	3302	14	12:04	57.250	09.80	241.31	28.30	75.47	airgun	1
	3347	3303	14	12:05	27.260	09.80	240.99	28.30	75.47	airgun	1
	3348	3304	14	12:05	57.268	09.80	240.66	28.30	75.47	airgun	
noise	3359		14	13:00	02.299						
noise	3370		14	14:00	02.299						
noise	3381		14	15:00	02.299						
	3392	3383	14	16:00	31.385	10.10	086.34	28.35	75.28	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	3393	3384	14	16:01	01.394	10.10	085.93	28.35	75.28	airgun	
	3394	3385	14	16:01	31.403	10.10	085.53	28.35	75.28	airgun	
	3395	3386	14	16:02	01.411	10.10	085.13	28.35	75.28	airgun	
	3396	3387	14	16:02	31.420	10.10	084.73	28.35	75.28	airgun	
	3397	3388	14	16:03	01.429	10.10	084.32	28.35	75.28	airgun	
	3398	3389	14	16:03	31.438	10.10	083.92	28.35	75.28	airgun	
	3399	3390	14	16:04	01.447	10.10	083.51	28.35	75.28	airgun	
	3400	3391	14	16:04	31.455	10.10	083.11	28.35	75.28	airgun	
	3401	3392	14	16:05	01.465	10.10	082.71	28.35	75.28	airgun	
	3402	3393	14	16:05	31.473	10.10	082.31	28.36	75.28	airgun	
	3403	3394	14	16:06	01.482	10.10	081.90	28.36	75.28	airgun	
	3414	3502	14	17:00	02.432	10.15	035.76	28.42	75.32	airgun	
	3415	3503	14	17:00	32.441	10.15	035.29	28.42	75.32	airgun	
	3416	3504	14	17:01	02.450	10.16	034.83	28.42	75.32	airgun	
	3417	3505	14	17:01	32.459	10.16	034.38	28.42	75.32	airgun	
	3418	3506	14	17:02	02.468	10.16	033.92	28.42	75.32	airgun	
	3419	3507	14	17:02	32.477	10.16	033.45	28.42	75.32	airgun	
	3420	3508	14	17:03	02.485	10.17	033.00	28.42	75.32	airgun	
	3421	3509	14	17:03	32.494	10.17	032.54	28.42	75.32	airgun	
	3422	3510	14	17:04	02.503	10.17	032.08	28.42	75.33	airgun	
	3423	3511	14	17:04	32.512	10.17	031.62	28.42	75.33	airgun	
	3424	3512	14	17:05	02.521	10.18	031.16	28.42	75.33	airgun	
	3425	3513	14	17:05	32.529	10.18	030.70	28.42	75.33	airgun	
	3436	3622	14	18:00	03.495	10.13	350.23	28.43	75.40	airgun	1
	3437	3623	14	18:00	33.507	10.13	349.95	28.43	75.40	airgun	1
	3438	3624	14	18:01	03.510	10.13	349.68	28.43	75.40	airgun	1
	3439	3625	14	18:01	33.519	10.13	349.40	28.43	75.40	airgun	2
	3440	3626	14	18:02	03.527	10.13	349.13	28.43	75.40	airgun	1
	3441	3627	14	18:02	33.537	10.12	348.86	28.43	75.40	airgun	1
	3442	3628	14	18:03	03.545	10.12	348.58	28.43	75.40	airgun	2
	3443	3629	14	18:03	33.554	10.12	348.30	28.43	75.40	airgun	3
	3444	3630	14	18:04	03.563	10.12	348.03	28.43	75.40	airgun	1
	3445	3631	14	18:04	33.572	10.12	347.75	28.43	75.40	airgun	1
	3446	3632	14	18:05	03.581	10.12	347.49	28.43	75.40	airgun	1
	3447	3633	14	18:05	33.590	10.11	347.21	28.43	75.40	airgun	1
	3458	3742	14	19:00	04.555	10.07	315.12	28.41	75.46	airgun	
	3459	3743	14	19:00	34.564	10.07	314.80	28.41	75.46	airgun	
	3460	3744	14	19:01	04.572	10.07	314.47	28.41	75.46	airgun	
	3461	3745	14	19:01	34.582	10.06	314.13	28.41	75.46	airgun	
	3462	3746	14	19:02	04.590	10.06	313.79	28.41	75.46	airgun	
	3463	3747	14	19:02	34.599	10.06	313.47	28.41	75.46	airgun	
	3464	3748	14	19:03	04.608	10.06	313.14	28.41	75.46	airgun	
	3465	3749	14	19:03	34.622	10.06	312.80	28.41	75.46	airgun	
	3466	3750	14	19:04	04.631	10.06	312.46	28.41	75.46	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	3467	3751	14	19:04	34.635	10.05	312.13	28.40	75.46	airgun	
	3468	3752	14	19:05	04.644	10.05	311.80	28.40	75.46	airgun	
	3469	3753	14	19:05	34.652	10.05	311.46	28.40	75.46	airgun	
	3480	3862	14	20:00	05.619	09.92	279.42	28.36	75.48	airgun	1
	3481	3863	14	20:00	35.628	09.92	279.17	28.36	75.48	airgun	1
	3482	3864	14	20:01	05.637	09.92	278.93	28.36	75.48	airgun	1
	3483	3865	14	20:01	35.646	09.92	278.67	28.36	75.48	airgun	1
	3484	3866	14	20:02	05.655	09.92	278.42	28.36	75.48	airgun	1
	3485	3867	14	20:02	35.664	09.91	278.17	28.36	75.48	airgun	1
	3486	3868	14	20:03	05.673	09.91	277.92	28.36	75.48	airgun	1
	3487	3869	14	20:03	35.681	09.92	277.66	28.35	75.48	airgun	1
	3488	3870	14	20:04	05.690	09.91	277.41	28.35	75.48	airgun	1
	3489	3871	14	20:04	35.699	09.91	277.16	28.35	75.48	airgun	1
	3490	3872	14	20:05	05.708	09.91	276.92	28.35	75.48	airgun	1
	3491	3873	14	20:05	35.717	09.91	276.66	28.35	75.48	airgun	1
	3502	3982	14	21:00	06.682	09.93	242.76	28.30	75.47	airgun	
	3503	3983	14	21:00	36.691	09.93	242.40	28.30	75.47	airgun	
	3504	3984	14	21:01	06.700	09.93	242.04	28.30	75.47	airgun	
	3505	3985	14	21:01	36.709	09.93	241.69	28.30	75.47	airgun	
	3506	3986	14	21:02	06.718	09.93	241.33	28.30	75.47	airgun	
	3507	3987	14	21:02	36.726	09.93	240.98	28.30	75.47	airgun	
	3508	3988	14	21:03	06.736	09.93	240.63	28.30	75.47	airgun	
	3509	3989	14	21:03	36.744	09.93	240.26	28.30	75.47	airgun	
	3510	3990	14	21:04	06.753	09.93	239.91	28.30	75.47	airgun	
	3511	3991	14	21:04	36.761	09.93	239.55	28.30	75.47	airgun	
	3512	3992	14	21:05	06.771	09.93	239.19	28.30	75.47	airgun	
	3513	3993	14	21:05	36.779	09.93	238.85	28.30	75.47	airgun	
	3524	4102	14	22:00	07.742	10.00	197.64	28.26	75.41	airgun	
	3525	4103	14	22:00	37.752	10.00	197.23	28.26	75.41	airgun	
	3526	4104	14	22:01	07.760	10.00	196.80	28.26	75.41	airgun	
	3527	4105	14	22:01	37.769	10.00	196.38	28.26	75.41	airgun	
	3528	4106	14	22:02	07.778	10.00	195.96	28.26	75.41	airgun	
	3529	4107	14	22:02	37.787	10.00	195.54	28.26	75.41	airgun	
	3530	4108	14	22:03	07.796	10.00	195.12	28.26	75.41	airgun	
	3531	4109	14	22:03	37.805	10.00	194.69	28.26	75.41	airgun	
	3532	4110	14	22:04	07.813	10.00	194.26	28.26	75.41	airgun	
	3533	4111	14	22:04	37.822	10.00	193.84	28.26	75.41	airgun	
	3534	4112	14	22:05	07.831	10.00	193.42	28.26	75.40	airgun	
	3535	4113	14	22:05	37.840	10.00	193.01	28.26	75.40	airgun	
	3546	4222	14	23:00	08.800	10.14	154.06	28.26	75.34	airgun	
	3547	4223	14	23:00	38.809	10.14	153.67	28.26	75.34	airgun	
	3548	4224	14	23:01	08.818	10.14	153.27	28.26	75.33	airgun	
	3549	4225	14	23:01	38.827	10.14	152.88	28.26	75.33	airgun	
	3550	4226	14	23:02	08.836	10.15	152.49	28.26	75.33	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
	3551	4227	14	23:02	38.844	10.15	152.10	28.26	75.33	airgun	
	3552	4228	14	23:03	08.854	10.15	151.70	28.26	75.33	airgun	
	3553	4229	14	23:03	38.862	10.15	151.30	28.26	75.33	airgun	
	3554	4230	14	23:04	08.871	10.15	150.91	28.26	75.33	airgun	
	3555	4231	14	23:04	38.880	10.15	150.51	28.26	75.33	airgun	
	3556	4232	14	23:05	08.889	10.15	150.13	28.26	75.33	airgun	
	3557	4233	14	23:05	38.897	10.15	149.73	28.26	75.33	airgun	
	3568	4342	15	00:00	09.856	10.09	108.45	28.32	75.28	airgun	2
	3569	4343	15	00:00	39.865	10.09	108.08	28.32	75.28	airgun	2
	3570	4344	15	00:01	09.873	10.09	107.72	28.32	75.28	airgun	2
	3571	4345	15	00:01	39.882	10.09	107.36	28.32	75.28	airgun	2
	3572	4346	15	00:02	09.890	10.10	107.00	28.32	75.28	airgun	2
	3573	4347	15	00:02	39.900	10.10	106.64	28.32	75.28	airgun	2
	3574	4348	15	00:03	09.908	10.10	106.27	28.32	75.28	airgun	2
	3575	4349	15	00:03	39.917	10.10	105.91	28.32	75.28	airgun	2
	3576	4350	15	00:04	09.926	10.10	105.54	28.32	75.28	airgun	2
	3577	4351	15	00:04	39.934	10.10	105.18	28.32	75.28	airgun	2
	3578	4352	15	00:05	09.943	10.10	104.82	28.32	75.28	airgun	2
	3579	4353	15	00:05	39.952	10.10	104.46	28.32	75.28	airgun	2
noise	3690		15	01:00	02.299						
noise	3701		15	02:00	02.299						
noise	3712		15	03:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A3	3723	4524	15	04:00	14.074	19.53	081.09	28.37	75.18	airgun	
	3724	4525	15	04:00	44.082	19.47	081.03	28.37	75.18	airgun	
	3725	4526	15	04:01	14.095	19.40	080.96	28.37	75.19	airgun	
	3726	4527	15	04:01	44.100	19.33	080.89	28.37	75.19	airgun	
	3727	4528	15	04:02	14.109	19.26	080.82	28.37	75.19	airgun	
	3728	4529	15	04:02	44.118	19.20	080.76	28.37	75.19	airgun	
	3729	4530	15	04:03	14.126	19.14	080.69	28.37	75.19	airgun	
	3730	4531	15	04:03	44.135	19.08	080.64	28.37	75.19	airgun	
	3731	4532	15	04:04	14.144	19.03	080.59	28.37	75.19	airgun	
	3732	4533	15	04:04	44.153	18.98	080.54	28.37	75.19	airgun	
	3733	4534	15	04:05	14.162	18.93	080.48	28.37	75.19	airgun	
	3734	4535	15	04:05	44.170	18.87	080.43	28.37	75.19	airgun	
	3745	4644	15	05:00	15.129	12.26	077.68	28.37	75.26	airgun	
	3746	4645	15	05:00	45.138	12.21	077.69	28.37	75.26	airgun	
	3747	4646	15	05:01	15.148	12.16	077.71	28.37	75.26	airgun	
	3748	4647	15	05:01	45.156	12.11	077.71	28.37	75.26	airgun	
	3749	4648	15	05:02	15.164	12.05	077.71	28.37	75.26	airgun	
	3750	4649	15	05:02	45.173	11.97	077.68	28.37	75.26	airgun	
	3751	4650	15	05:03	15.182	11.89	077.66	28.37	75.26	airgun	
	3752	4651	15	05:03	45.191	11.82	077.64	28.37	75.26	airgun	
	3753	4652	15	05:04	15.200	11.76	077.63	28.37	75.26	airgun	
	3754	4653	15	05:04	45.208	11.70	077.63	28.37	75.26	airgun	
	3755	4654	15	05:05	15.217	11.64	077.63	28.37	75.26	airgun	
	3756	4655	15	05:05	45.226	11.58	077.62	28.37	75.27	airgun	
	3767	4764	15	06:00	16.181	04.51	078.49	28.35	75.34	airgun	10
	3768	4765	15	06:00	46.190	04.45	078.54	28.35	75.34	airgun	17
	3769	4766	15	06:01	16.199	04.38	078.57	28.35	75.34	airgun	8
	3770	4767	15	06:01	46.208	04.31	078.61	28.35	75.34	airgun	8
	3771	4768	15	06:02	16.217	04.25	078.66	28.35	75.34	airgun	7
	3772	4769	15	06:02	46.226	04.18	078.72	28.35	75.34	airgun	12
	3773	4770	15	06:03	16.234	04.12	078.76	28.35	75.34	airgun	8
	3774	4771	15	06:03	46.243	04.07	078.85	28.35	75.34	airgun	15
	3775	4772	15	06:04	16.251	04.02	078.94	28.35	75.34	airgun	28
	3776	4773	15	06:04	46.260	03.96	079.03	28.35	75.34	airgun	31
	3777	4774	15	06:05	16.269	03.91	079.12	28.35	75.34	airgun	24
	3778	4775	15	06:05	46.278	03.85	079.17	28.35	75.34	airgun	25

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A7	3789	4884	15	07:00	17.234	02.96	275.84	28.35	75.41	airgun	10
	3790	4885	15	07:00	47.243	03.02	275.80	28.35	75.41	airgun	13
	3791	4886	15	07:01	17.252	03.09	275.71	28.35	75.41	airgun	7
	3792	4887	15	07:01	47.260	03.15	275.59	28.35	75.41	airgun	6
	3793	4888	15	07:02	17.269	03.23	275.50	28.35	75.42	airgun	7
	3794	4889	15	07:02	47.278	03.30	275.40	28.35	75.42	airgun	8
	3795	4890	15	07:03	17.287	03.37	275.32	28.35	75.42	airgun	5
	3796	4891	15	07:03	47.295	03.44	275.21	28.35	75.42	airgun	4
	3797	4892	15	07:04	17.304	03.51	275.14	28.35	75.42	airgun	5
	3798	4893	15	07:04	47.313	03.57	275.05	28.35	75.42	airgun	3
	3799	4894	15	07:05	17.322	03.64	274.99	28.35	75.42	airgun	3
	3800	4895	15	07:05	47.330	03.70	274.91	28.35	75.42	airgun	2
	3811	5004	15	08:00	18.286	11.22	275.53	28.35	75.50	airgun	
	3812	5005	15	08:00	48.295	11.29	275.50	28.35	75.50	airgun	
	3813	5006	15	08:01	18.304	11.36	275.47	28.35	75.50	airgun	
	3814	5007	15	08:01	48.313	11.43	275.44	28.35	75.50	airgun	
	3815	5008	15	08:02	18.321	11.50	275.41	28.35	75.50	airgun	
	3816	5009	15	08:02	48.330	11.57	275.37	28.35	75.50	airgun	
	3817	5010	15	08:03	18.339	11.65	275.34	28.35	75.50	airgun	
	3818	5011	15	08:03	48.348	11.72	275.31	28.35	75.50	airgun	
	3819	5012	15	08:04	18.356	11.79	275.28	28.35	75.50	airgun	
	3820	5013	15	08:04	48.365	11.86	275.25	28.35	75.50	airgun	
	3821	5014	15	08:05	18.374	11.93	275.22	28.35	75.50	airgun	
	3822	5015	15	08:05	48.383	11.98	275.20	28.35	75.50	airgun	
	3833	5124	15	09:00	19.338	19.34	272.99	28.35	75.58	airgun	
	3834	5125	15	09:00	49.347	19.41	272.97	28.35	75.58	airgun	
	3835	5126	15	09:01	19.356	19.46	272.95	28.35	75.58	airgun	
	3836	5127	15	09:01	49.364	19.52	272.93	28.35	75.58	airgun	
	3837	5128	15	09:02	19.373	19.58	272.91	28.35	75.58	airgun	
	3838	5129	15	09:02	49.382	19.64	272.89	28.35	75.58	airgun	
	3839	5130	15	09:03	19.391	19.70	272.87	28.35	75.58	airgun	
	3840	5131	15	09:03	49.399	19.77	272.86	28.35	75.58	airgun	
	3841	5132	15	09:04	19.408	19.84	272.84	28.35	75.58	airgun	
	3842	5133	15	09:04	49.417	19.91	272.83	28.35	75.58	airgun	
	3843	5134	15	09:05	19.426	19.98	272.82	28.35	75.59	airgun	
	3844	5135	15	09:05	49.434	20.04	272.81	28.35	75.59	airgun	
noise	3855		15	10:00	02.299						
noise	3866		15	11:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	Event Tme da	hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
E7 noi	3877		15	12:00	02.299						
noise	3958		15	13:00	02.299						
	3959	327	15	13:01	28.670	41.09	270.49	28.35	75.80	25.00	516
noise	3970		15	14:00	02.299						
	3971	339	15	14:01	25.038	28.11	269.88	28.34	75.67	25.00	562
noise	3982		15	15:00	02.299						
noise	3993		15	16:00	02.299						
noise	4004		15	17:00	02.299						
noise	4015		15	18:00	02.299						
noise	4026		15	19:00	02.299						
noise	4037		15	20:00	02.299						
noise	4048		15	21:00	02.299						
noise	4059		15	22:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
E4	4070	397	15	23:00	18.278	01.34	150.29	28.33	75.38	00.82	194
	4071	398	15	23:02	18.454	01.74	146.61	28.33	75.37	00.82	150
	4072	399	15	23:04	16.459	02.14	144.14	28.33	75.37	00.82	335
	4090	427	16	00:00	19.653	13.90	136.60	28.25	75.29	00.82	35
	4091	428	16	00:02	17.720	14.33	136.57	28.25	75.28	00.82	54
	4092	429	16	00:04	18.580	14.77	136.50	28.25	75.28	00.82	47
noise	4103		16	01:00	02.299						
	4104	447	16	01:01	52.804	26.88	136.59	28.17	75.19	25.00	634
noise	4115		16	02:00	02.299						
	4116	459	16	02:01	29.250	40.09	137.20	28.08	75.11	25.00	491
noise	4134		16	03:00	02.299						
noise	4145		16	04:00	02.299						
noise	4156		16	05:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
A4	4167	5319	16	06:00	11.474	18.97	146.82	28.20	75.28	airgun	
	4168	5320	16	06:00	41.482	18.90	146.86	28.20	75.28	airgun	
	4169	5321	16	06:01	11.491	18.83	146.90	28.20	75.28	airgun	
	4170	5322	16	06:01	41.500	18.76	146.92	28.20	75.28	airgun	
	4171	5323	16	06:02	11.509	18.69	146.95	28.20	75.28	airgun	
	4172	5324	16	06:02	41.518	18.63	146.97	28.20	75.28	airgun	
	4173	5325	16	06:03	11.526	18.56	146.99	28.20	75.28	airgun	
	4174	5326	16	06:03	41.534	18.48	147.04	28.20	75.28	airgun	
	4175	5327	16	06:04	11.544	18.41	147.08	28.20	75.28	airgun	
	4176	5328	16	06:04	41.552	18.34	147.13	28.20	75.28	airgun	
	4177	5329	16	06:05	11.561	18.27	147.17	28.21	75.28	airgun	
	4178	5330	16	06:05	41.569	18.20	147.21	28.21	75.28	airgun	
	4189	5439	16	07:00	12.521	10.14	153.75	28.26	75.34	airgun	
	4190	5440	16	07:00	42.530	10.06	153.93	28.26	75.34	airgun	
	4191	5441	16	07:01	12.538	09.98	154.10	28.26	75.34	airgun	
	4192	5442	16	07:01	42.547	09.90	154.27	28.26	75.34	airgun	
	4193	5443	16	07:02	12.556	09.81	154.43	28.26	75.34	airgun	
	4194	5444	16	07:02	42.565	09.74	154.55	28.26	75.34	airgun	
	4195	5445	16	07:03	12.574	09.66	154.69	28.27	75.34	airgun	
	4196	5446	16	07:03	42.582	09.57	154.84	28.27	75.34	airgun	
	4197	5447	16	07:04	12.591	09.49	155.00	28.27	75.34	airgun	
	4198	5448	16	07:04	42.604	09.41	155.13	28.27	75.34	airgun	
	4199	5449	16	07:05	12.609	09.33	155.26	28.27	75.34	airgun	
	4200	5450	16	07:05	42.617	09.26	155.35	28.27	75.34	airgun	
A8	4211	5559	16	08:00	13.571	02.21	230.29	28.33	75.40	airgun	
	4212	5560	16	08:00	43.580	02.21	232.69	28.33	75.40	airgun	
	4213	5561	16	08:01	13.589	02.22	235.08	28.33	75.40	airgun	
	4214	5562	16	08:01	43.602	02.23	237.41	28.33	75.40	airgun	
	4215	5563	16	08:02	13.606	02.24	239.63	28.33	75.40	airgun	
	4216	5564	16	08:02	43.615	02.24	241.68	28.33	75.40	airgun	
	4217	5565	16	08:03	13.624	02.25	243.67	28.33	75.40	airgun	
	4218	5566	16	08:03	43.632	02.26	245.56	28.33	75.40	airgun	
	4219	5567	16	08:04	13.642	02.27	247.45	28.34	75.40	airgun	
	4220	5568	16	08:04	43.650	02.28	249.34	28.34	75.40	airgun	
	4221	5569	16	08:05	13.659	02.30	251.14	28.34	75.40	airgun	
	4222	5570	16	08:05	43.668	02.31	252.95	28.34	75.40	airgun	
	4233	5679	16	09:00	14.622	09.63	309.30	28.40	75.46	airgun	
	4234	5680	16	09:00	44.630	09.71	309.36	28.40	75.46	airgun	
	4235	5681	16	09:01	14.638	09.78	309.41	28.40	75.46	airgun	
	4236	5682	16	09:01	44.647	09.85	309.47	28.40	75.46	airgun	
	4237	5683	16	09:02	14.656	09.93	309.53	28.40	75.46	airgun	
	4238	5684	16	09:02	44.665	10.01	309.59	28.40	75.46	airgun	
	4239	5685	16	09:03	14.673	10.08	309.65	28.40	75.46	airgun	
	4240	5686	16	09:03	44.682	10.16	309.71	28.40	75.46	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	Event # NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	4241	5687	16	09:04	14.691	10.24	309.75	28.40	75.46	airgun	
	4242	5688	16	09:04	44.700	10.32	309.79	28.40	75.46	airgun	
	4243	5689	16	09:05	14.708	10.41	309.81	28.40	75.46	airgun	
	4244	5690	16	09:05	44.717	10.50	309.82	28.40	75.46	airgun	
	4255	5799	16	10:00	15.675	19.34	312.52	28.46	75.53	airgun	
	4256	5800	16	10:00	45.684	19.43	312.54	28.46	75.53	airgun	
	4257	5801	16	10:01	15.693	19.52	312.55	28.46	75.53	airgun	
	4258	5802	16	10:01	45.702	19.61	312.57	28.46	75.53	airgun	
	4259	5803	16	10:02	15.710	19.70	312.59	28.46	75.53	airgun	
	4260	5804	16	10:02	45.719	19.78	312.62	28.46	75.53	airgun	
	4261	5805	16	10:03	15.728	19.86	312.66	28.47	75.53	airgun	
	4262	5806	16	10:03	45.737	19.93	312.70	28.47	75.53	airgun	
	4263	5807	16	10:04	15.746	20.00	312.74	28.47	75.53	airgun	
	4264	5808	16	10:04	45.755	20.07	312.78	28.47	75.53	airgun	
	4265	5809	16	10:05	15.764	20.15	312.82	28.47	75.53	airgun	
	4266	5810	16	10:05	45.773	20.22	312.84	28.47	75.53	airgun	
	4277	5919	16	11:00	16.743	28.37	314.41	28.52	75.59	airgun	
	4278	5920	16	11:00	46.753	28.44	314.42	28.52	75.59	airgun	
	4279	5921	16	11:01	16.761	28.51	314.45	28.52	75.59	airgun	
	4280	5922	16	11:01	46.770	28.59	314.47	28.52	75.59	airgun	
	4281	5923	16	11:02	16.779	28.66	314.50	28.52	75.59	airgun	
	4282	5924	16	11:02	46.788	28.74	314.52	28.52	75.59	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
A1 noi	4293		16	12:00	02.299						
	4304	5940	16	13:00	18.851	23.37	357.93	28.55	75.39	airgun	
	4305	5941	16	13:00	48.860	23.31	357.91	28.55	75.39	airgun	
	4306	5942	16	13:01	18.872	23.26	357.90	28.55	75.39	airgun	
	4307	5943	16	13:01	48.878	23.20	357.89	28.55	75.39	airgun	
	4308	5944	16	13:02	18.886	23.15	357.89	28.55	75.39	airgun	
	4309	5945	16	13:02	48.895	23.09	357.90	28.55	75.39	airgun	
	4310	5946	16	13:03	18.904	23.04	357.92	28.55	75.39	airgun	
	4311	5947	16	13:03	48.913	22.98	357.94	28.55	75.39	airgun	
	4312	5948	16	13:04	18.921	22.93	357.96	28.55	75.39	airgun	
	4313	5949	16	13:04	48.930	22.88	357.99	28.55	75.39	airgun	
	4314	5950	16	13:05	18.939	22.83	357.99	28.55	75.39	airgun	
	4315	5951	16	13:05	48.948	22.78	358.00	28.55	75.39	airgun	
	4326	6060	16	14:00	19.905	16.82	358.74	28.50	75.39	airgun	
	4327	6061	16	14:00	49.914	16.77	358.74	28.50	75.39	airgun	
	4328	6062	16	14:01	19.923	16.73	358.75	28.50	75.39	airgun	
	4329	6063	16	14:01	49.932	16.68	358.77	28.49	75.39	airgun	
	4330	6064	16	14:02	19.940	16.64	358.77	28.49	75.39	airgun	
	4331	6065	16	14:02	49.949	16.59	358.77	28.49	75.39	airgun	
	4332	6066	16	14:03	19.958	16.55	358.77	28.49	75.39	airgun	
	4333	6067	16	14:03	49.966	16.50	358.76	28.49	75.39	airgun	
	4334	6068	16	14:04	19.975	16.45	358.77	28.49	75.39	airgun	
	4335	6069	16	14:04	49.984	16.40	358.79	28.49	75.39	airgun	
	4336	6070	16	14:05	19.993	16.35	358.81	28.49	75.39	airgun	
	4337	6071	16	14:05	50.001	16.30	358.84	28.49	75.39	airgun	
	4348	6180	16	15:00	20.960	10.74	359.93	28.44	75.38	airgun	
	4349	6181	16	15:00	50.966	10.69	359.96	28.44	75.38	airgun	
	4350	6182	16	15:01	20.975	10.63	359.98	28.44	75.38	airgun	
	4351	6183	16	15:01	50.983	10.58	359.99	28.44	75.38	airgun	
	4352	6184	16	15:02	20.993	10.53	000.01	28.44	75.38	airgun	
	4353	6185	16	15:02	51.001	10.47	000.04	28.44	75.38	airgun	
	4354	6186	16	15:03	21.010	10.42	000.02	28.44	75.38	airgun	
	4355	6187	16	15:03	51.018	10.37	359.99	28.44	75.38	airgun	
	4356	6188	16	15:04	21.027	10.31	359.95	28.44	75.38	airgun	
	4357	6189	16	15:04	51.036	10.26	359.90	28.44	75.38	airgun	
	4358	6190	16	15:05	21.045	10.21	359.88	28.44	75.38	airgun	
	4359	6191	16	15:05	51.053	10.15	359.87	28.44	75.38	airgun	
	4370	6300	16	16:00	22.009	04.37	010.01	28.38	75.37	airgun	3
noise	4371		16	16:01	32.009						
noise	4381		16	17:00	02.299						
noise	4392		16	18:00	02.299						
noise	4403		16	19:00	02.299						
noise	4414		16	20:00	02.299						
noise	4425		16	21:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	Event Tme da	hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
noise	4436		16	22:00	02.299						
noise	4447		16	23:00	02.299						
noise	4458		17	00:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
E8	4476	494	17	01:00	14.179	14.40	315.80	28.44	75.49	00.82	58
	4477	495	17	01:02	15.012	14.87	315.75	28.44	75.49	00.82	58
	4478	496	17	01:04	14.778	15.33	315.76	28.44	75.49	00.82	56
noise	4489		17	02:00	02.299						
	4490	516	17	02:01	23.897	28.19	315.47	28.52	75.58	25.00	570
noise	4501		17	03:00	02.299						
	4502	528	17	03:01	25.223	41.90	315.14	28.61	75.68	25.00	384
noise	4513		17	04:00	02.299						
	4514	540	17	04:01	27.150	55.73	314.97	28.70	75.79	25.00	361

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	da August of	Event Tme hrmn	sec 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
A8	4525	6462	17	04:59	55.735	50.96	313.93	28.66	75.76	airgun	
	4526	6463	17	05:00	05.738	50.94	313.93	28.66	75.76	airgun	
	4527	6464	17	05:00	15.741	50.92	313.93	28.66	75.76	airgun	
	4528	6465	17	05:00	25.747	50.90	313.93	28.66	75.76	airgun	
	4529	6466	17	05:00	35.747	50.88	313.93	28.66	75.76	airgun	
	4530	6467	17	05:00	45.750	50.86	313.93	28.66	75.76	airgun	
	4531	6468	17	05:00	55.754	50.84	313.93	28.66	75.76	airgun	
	4532	6469	17	05:01	05.756	50.82	313.93	28.66	75.76	airgun	
	4533	6470	17	05:01	15.759	50.80	313.93	28.66	75.76	airgun	
	4534	6471	17	05:01	25.764	50.78	313.94	28.66	75.76	airgun	
	4535	6472	17	05:01	35.765	50.76	313.94	28.66	75.76	airgun	
	4536	6473	17	05:01	45.767	50.74	313.94	28.66	75.76	airgun	
	4537	6474	17	05:01	55.773	50.72	313.94	28.66	75.76	airgun	
	4538	6475	17	05:02	05.773	50.69	313.94	28.66	75.76	airgun	
	4539	6476	17	05:02	15.776	50.67	313.95	28.66	75.76	airgun	
	4540	6477	17	05:02	25.779	50.65	313.95	28.66	75.76	airgun	
	4541	6478	17	05:02	35.782	50.63	313.95	28.66	75.76	airgun	
	4542	6479	17	05:02	45.785	50.61	313.95	28.66	75.76	airgun	
	4543	6480	17	05:02	55.789	50.59	313.96	28.66	75.75	airgun	
	4544	6481	17	05:03	05.791	50.57	313.96	28.66	75.75	airgun	
	4545	6482	17	05:03	15.794	50.56	313.95	28.66	75.75	airgun	
	4546	6483	17	05:03	25.797	50.54	313.95	28.66	75.75	airgun	
	4547	6484	17	05:03	35.800	50.52	313.95	28.66	75.75	airgun	
	4548	6485	17	05:03	45.806	50.51	313.95	28.66	75.75	airgun	
	4549	6486	17	05:03	55.806	50.49	313.95	28.66	75.75	airgun	
	4550	6487	17	05:04	05.809	50.47	313.95	28.66	75.75	airgun	
	4551	6488	17	05:04	15.811	50.46	313.95	28.66	75.75	airgun	
	4552	6489	17	05:04	25.815	50.44	313.94	28.66	75.75	airgun	
	4553	6490	17	05:04	35.817	50.42	313.94	28.66	75.75	airgun	
	4554	6491	17	05:04	45.821	50.41	313.94	28.66	75.75	airgun	
	4555	6492	17	05:04	55.824	50.39	313.94	28.66	75.75	airgun	
	4556	6493	17	05:05	05.826	50.37	313.94	28.66	75.75	airgun	
	4557	6494	17	05:05	15.829	50.36	313.94	28.66	75.75	airgun	
	4558	6495	17	05:05	25.832	50.34	313.94	28.66	75.75	airgun	
	4559	6496	17	05:05	35.835	50.33	313.94	28.66	75.75	airgun	
	4560	6497	17	05:05	45.838	50.31	313.93	28.66	75.75	airgun	
	4571	6822	17	05:59	56.790	44.05	314.28	28.62	75.71	airgun	
	4582	7182	17	06:59	57.837	37.29	315.05	28.58	75.65	airgun	
	4593	7542	17	07:59	58.881	30.47	316.19	28.54	75.60	airgun	
	4604	7902	17	08:59	59.931	23.59	317.51	28.50	75.54	airgun	
	4615	8262	17	10:00	00.978	17.09	318.48	28.46	75.50	airgun	
	4616	8263	17	10:00	10.981	17.08	318.48	28.46	75.50	airgun	
	4617	8264	17	10:00	20.984	17.06	318.48	28.46	75.50	airgun	
	4618	8265	17	10:00	30.987	17.04	318.48	28.46	75.50	airgun	

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
	4619	8266	17	10:00	40.990	17.02	318.48	28.46	75.50	airgun	
	4620	8267	17	10:00	50.993	17.01	318.48	28.46	75.50	airgun	
	4621	8268	17	10:01	00.996	16.99	318.49	28.46	75.50	airgun	
	4622	8269	17	10:01	10.999	16.97	318.49	28.46	75.50	airgun	
	4623	8270	17	10:01	21.001	16.95	318.49	28.46	75.50	airgun	
	4624	8271	17	10:01	31.004	16.94	318.46	28.46	75.50	airgun	
	4625	8272	17	10:01	41.008	16.92	318.47	28.46	75.50	airgun	
	4626	8273	17	10:01	51.024	16.90	318.47	28.46	75.50	airgun	
	4627	8274	17	10:02	01.013	16.89	318.47	28.46	75.50	airgun	
	4628	8275	17	10:02	11.016	16.87	318.47	28.46	75.50	airgun	
	4629	8276	17	10:02	21.019	16.85	318.48	28.46	75.50	airgun	
	4630	8277	17	10:02	31.022	16.83	318.48	28.46	75.50	airgun	
	4631	8278	17	10:02	41.025	16.81	318.48	28.46	75.50	airgun	
	4632	8279	17	10:02	51.028	16.79	318.49	28.46	75.50	airgun	
	4633	8280	17	10:03	01.031	16.77	318.49	28.46	75.50	airgun	
	4634	8281	17	10:03	11.038	16.76	318.50	28.46	75.50	airgun	
	4635	8282	17	10:03	21.037	16.74	318.51	28.46	75.50	airgun	
	4636	8283	17	10:03	31.039	16.72	318.52	28.46	75.50	airgun	
	4637	8284	17	10:03	41.043	16.70	318.53	28.46	75.50	airgun	
	4638	8285	17	10:03	51.046	16.68	318.53	28.46	75.50	airgun	
	4639	8286	17	10:04	01.048	16.66	318.54	28.46	75.50	airgun	
	4640	8287	17	10:04	11.051	16.64	318.55	28.46	75.50	airgun	
	4641	8288	17	10:04	21.054	16.62	318.56	28.46	75.50	airgun	
	4642	8289	17	10:04	31.057	16.60	318.57	28.46	75.49	airgun	
	4643	8290	17	10:04	41.060	16.58	318.58	28.46	75.49	airgun	
	4644	8291	17	10:04	51.062	16.56	318.58	28.46	75.49	airgun	
	4645	8292	17	10:05	01.065	16.54	318.59	28.45	75.49	airgun	
	4646	8293	17	10:05	11.068	16.52	318.59	28.45	75.49	airgun	
	4647	8294	17	10:05	21.071	16.51	318.60	28.45	75.49	airgun	
	4648	8295	17	10:05	31.075	16.49	318.60	28.45	75.49	airgun	
	4649	8296	17	10:05	41.078	16.47	318.59	28.45	75.49	airgun	
	4650	8297	17	10:05	51.080	16.46	318.60	28.45	75.49	airgun	
noise	4661		17	11:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event WHOI	# NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
E5 noi	4672		17	12:00	02.299						
	4690	556	17	13:00	15.423	10.13	180.84	28.25	75.38	00.82	65
	4691	557	17	13:02	15.890	10.54	181.09	28.25	75.38	00.82	64
	4692	558	17	13:04	16.777	10.97	181.10	28.25	75.38	00.82	58
noise	4713		17	14:00	02.299						
noise	4724		17	15:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
NOISE	4735		17	16:00	02.299						
noise	4746		17	17:00	02.299						
noise	4757		17	18:00	02.299						
noise	4768		17	19:00	02.299						
noise	4779		17	20:00	02.299						
noise	4790		17	21:00	02.299						
noise	4801		17	22:00	02.299						
noise	4812		17	23:00	02.299						
noise	4823		18	00:00	02.299						
noise	4834		18	01:00	02.299						
noise	4845		18	02:00	02.299						
noise	4846		18	02:10	02.307						
noise	4857		18	03:00	02.299						
noise	4868		18	04:00	02.299						
noise	4869		18	04:10	02.307						
noise	4880		18	05:00	02.299						
noise	4891		18	06:00	02.299						
noise	4892		18	06:10	02.307						
noise	4903		18	07:00	02.299						
noise	4914		18	08:00	02.299						
noise	4915		18	08:10	02.307						
noise	4926		18	09:00	02.299						
noise	4937		18	10:00	02.299						
noise	4938		18	10:10	02.307						
noise	4949		18	11:00	02.299						
noise	4960		18	12:00	02.299						
noise	4961		18	12:10	02.307						
noise	4972		18	13:00	02.299						
noise	4983		18	14:00	02.299						
noise	4984		18	14:10	02.307						
noise	4995		18	15:00	02.299						
noise	5006		18	16:00	02.299						
noise	5007		18	16:10	02.307						
noise	5018		18	17:00	02.299						
noise	5029		18	18:00	02.299						
noise	5040		18	19:00	02.299						
noise	5051		18	20:00	02.299						
noise	5062		18	21:00	02.299						
noise	5073		18	22:00	02.299						
noise	5084		18	23:00	02.299						
noise	5095		19	00:00	02.299						
noise	5106		19	01:00	02.299						
noise	5117		19	02:00	02.299						
noise	5128		19	03:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
noise	5139		19	04:00	02.299						
noise	5150		19	05:00	02.299						
noise	5161		19	06:00	02.299						
noise	5172		19	07:00	02.299						
noise	5183		19	08:00	02.299						
noise	5194		19	09:00	02.299						
noise	5205		19	10:00	02.299						
noise	5216		19	11:00	02.299						
noise	5227		19	12:00	02.299						
noise	5238		19	13:00	02.299						
noise	5249		19	14:00	02.299						
noise	5260		19	15:00	02.299						
noise	5271		19	16:00	02.299						
noise	5282		19	17:00	02.299						
noise	5293		19	18:00	02.299						
noise	5304		19	19:00	02.299						
noise	5315		19	20:00	02.299						
noise	5326		19	21:00	02.299						
noise	5337		20	01:00	02.299						
noise	5348		20	02:00	02.299						
noise	5359		20	03:00	02.299						
noise	5370		20	04:00	02.299						
noise	5381		20	05:00	02.299						
noise	5392		20	06:00	02.299						
noise	5403		20	07:00	02.299						
noise	5414		20	08:00	02.299						
noise	5425		20	09:00	02.299						
noise	5436		20	10:00	02.299						
noise	5447		20	11:00	02.299						
noise	5458		20	12:00	02.299						
noise	5469		20	13:00	02.299						
noise	5480		20	14:00	02.299						
noise	5491		20	15:00	02.299						
noise	5502		20	16:00	02.299						
noise	5513		20	17:00	02.299						
noise	5524		20	18:00	02.299						
noise	5535		20	19:00	02.299						
noise	5546		20	20:00	02.299						
noise	5557		20	21:00	02.299						
noise	5568		20	22:00	02.299						
noise	5579		21	01:00	02.299						
noise	5590		21	02:00	02.299						
noise	5601		21	03:00	02.299						
noise	5612		21	04:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	Event Tme da hrmn sec August of 1989	Range (km.) Event	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#) total
noise	5623		21 05:00 02.299						
noise	5634		21 06:00 02.299						
noise	5645		21 07:00 02.299						
noise	5656		21 08:00 02.299						
noise	5667		21 09:00 02.299						
noise	5678		21 10:00 02.299						
noise	5689		21 11:00 02.299						
noise	5700		21 12:00 02.299						
noise	5711		21 13:00 02.299						
noise	5722		21 14:00 02.299						
noise	5733		21 15:00 02.299						
noise	5744		21 16:00 02.299						
noise	5755		21 17:00 02.299						
noise	5766		21 18:00 02.299						
noise	5777		21 19:00 02.299						
noise	5788		21 20:00 02.299						
noise	5799		21 21:00 02.299						
noise	5810		21 22:00 02.299						
noise	5821		21 23:00 02.299						
noise	5832		22 00:00 02.299						
noise	5843		22 01:00 02.299						
noise	5854		22 02:00 02.299						
noise	5865		22 03:00 02.299						
noise	5876		22 04:00 02.299						
noise	5887		22 05:00 02.299						
noise	5898		22 06:00 02.299						
noise	5909		22 07:00 02.299						
noise	5920		22 08:00 02.299						
noise	5931		22 09:00 02.299						
noise	5942		22 10:00 02.299						
noise	5953		22 11:00 02.299						
noise	5964		22 12:00 02.299						
noise	5975		22 13:00 02.299						
noise	5986		22 14:00 02.299						
noise	5997		22 15:00 02.299						
noise	6008		22 16:00 02.299						
noise	6019		22 17:00 02.299						
noise	6030		22 18:00 02.299						
noise	6041		22 19:00 02.299						
noise	6052		22 20:00 02.299						
noise	6063		22 21:00 02.299						
noise	6074		22 22:00 02.299						
noise	6085		22 23:00 02.299						
noise	6096		23 00:00 02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	# NOARL	Event Tme da	hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
noise	6107		23	01:00	02.299						
noise	6118		23	02:00	02.299						
noise	6129		23	03:00	02.299						
noise	6140		23	04:00	02.299						
noise	6151		23	05:00	02.299						
noise	6162		23	06:00	02.299						
noise	6173		23	07:00	02.299						
noise	6184		23	08:00	02.299						
noise	6195		23	09:00	02.299						
noise	6206		23	10:00	02.299						
noise	6217		23	11:00	02.299						
noise	6228		23	12:00	02.299						
noise	6239		23	13:00	02.299						
noise	6250		23	14:00	02.299						
noise	6261		23	15:00	02.299						
noise	6272		23	16:00	02.299						
noise	6283		23	17:00	02.299						
noise	6294		23	18:00	02.299						
noise	6305		23	19:00	02.299						
noise	6316		23	20:00	02.299						
noise	6327		23	21:00	02.299						
noise	6338		23	22:00	02.299						
noise	6349		23	23:00	02.299						
noise	6360		24	00:00	02.299						
noise	6371		24	01:00	02.299						
noise	6382		24	02:00	02.299						
noise	6393		24	03:00	02.299						
noise	6404		24	04:00	02.299						
noise	6415		24	05:00	02.299						
noise	6426		25	03:00	02.299						
noise	6437		25	04:00	02.299						
noise	6448		25	05:00	02.299						
noise	6459		26	15:00	02.299						
noise	6470		26	21:00	02.299						
noise	6481		26	23:00	02.299						
noise	6492		27	01:00	02.299						
noise	6503		27	03:00	02.299						
noise	6514		27	05:00	02.299						
noise	6525		27	07:00	02.299						
noise	6536		27	09:00	02.299						
noise	6547		27	11:00	02.299						
noise	6558		27	13:00	02.299						
noise	6569		27	15:00	02.299						
noise	6580		27	17:00	02.299						

Table 2 Borehole Array ROSE file summary

Line #	Event # WHOI	NOARL	da	Event Tme hrmn	sec	Range (km.)	Azimuth (deg.)	Lat. (deg. N.)	Long. (deg. W.)	Size (kg.)	Clipp (#)
			August of		1989	Event					total
noise	6591		27	19:00	02.299						
noise	6602		27	21:00	02.299						
noise	6613		27	23:00	02.299						
noise	6624		28	01:00	02.299						
noise	6635		28	03:00	02.299						

Table 3 Summary of channel numbers used

Channel number	Satellite number	Satellite depth (mbsf)	Receiver depth (mbsf)	Component orientation
1	1	10	10	Vertical
2	1	10	10	Transverse
3	1	10	10	Radial
4	2	40	40	Vertical
5	2	40	40	Transverse
6	3	40	40	Radial
7	3	70	70	Vertical
8	3	70	70	Transverse
9	1	10	8.87	Hydrophone
10	4	100	100	Vertical
11	4	100	100	Transverse
12	4	100	100	Radial

Table 4 Summary of Optical disks used

Optical disk name	windows during which optical files recorded: day Aug.	hr. min. GMT	day Aug.	hr. min. GMT	comments
Disk00	11	05:39	11	13:56	on Melville
Disk01	11	14:06	12	15:03	on Melville
Disk02	12	15:33	12	11:00	on Melville
Disk03	12	12:09	13	01:01	on Melville
Disk04	13	02:03	13	14:03	on Melville
Disk05	13	17:06	19	11:00	in BCU
Disk06	19	12:00	19	21:00	in BCU
Disk07	20	01:00	28	03:01	in BCU
WorkDisk00 to WorkDisk18					Used as backup / working copies for Disk00 to Disk07 and for files edited by CGGEDIT

Table 5 Summary of clipped data points by range and source

This table shows the number of clipped data points in each channel. It is presented by increasing and source. The explosive data is presented first then the airgun data.

Column #	Description of Data
1	WHOI event number.
2	NOARL event number.
3	Number of samples per channel in the ROSE file.
4	Range in kilometers of the source from the borehole receiver.
5	Size of the source in kilograms if for explosives or airgun for airgun source.
6-17	Number of clipped samples per channel in the ROSE file.
18	Total number of clipped points in channels 1 to 12 for the ROSE file.
19	Total number of clipped samples for channels 1, 2, 3, 7, 8, 10, 11, and 12.

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
902	92	14885	.492	0.82	1			55					146	5			207	6
903	93	15056	.694	0.82				18.					190	5			213	5
904	94	14987	1.064	0.82				31			1		175	8			215	9
4070	397	16563	1.344	0.82				42					146	6			194	6
890	89	15123	1.370	0.82				39					140	4			183	4
905	95	15001	1.525	0.82				38					161	4			203	4
4071	398	14762	1.744	0.82	1			30					114	5			150	6
889	88	15100	1.782	0.82				61					196	6		1	264	7
4072	399	13673	2.145	0.82	1			174					151	5	4		335	10
888	87	14831	2.282	0.82				39					147	4			190	4
907	96	14872	2.427	0.82				53					138	4			195	4
887	86	14824	2.728	0.82	1			58					204	4		2	269	7
908	97	15081	2.905	0.82	2			98					133	4		2	239	8
886	85	15095	3.177	0.82	1			55					136	2		1	195	4
909	98	15039	3.394	0.82	1			83					151	3		5	243	9
885	84	15161	3.651	0.82				69					155	1		1	226	2
910	99	75001	3.863	0.82				62					164	2			228	2
884	83	14862	4.091	0.82				73					164	2		1	240	3
883	82	14969	4.547	0.82				74					131				205	
882	81	14878	5.004	0.82			1	85					145	1			232	2
881	80	15173	5.486	0.82			1	80				2	149				232	3
880	79	14791	5.945	0.82			1	58					124			1	184	2
879	78	15220	6.391	0.82				78				1	91				170	1
878	77	14902	6.885	0.82				29					53				82	
877	76	14969	7.344	0.82	4			33			1	4	73	2	5	7	129	23
4690	556	16463	10.132	0.82		3		6				7	43		4	2	65	16
4691	557	15122	10.540	0.82		3	1	6				8	42		3	1	64	16
4692	558	13413	10.970	0.82				4	1			8	41		3	1	58	12
4090	427	16787	13.901	0.82		4		19					12				35	4
4091	428	15119	14.327	0.82		4		39					11				54	4
4476	494	16461	14.402	0.82		5		37				1	15				58	6
4092	429	13092	14.766	0.82		2		27					18				47	2
4477	495	14984	14.874	0.82		4		33					21				58	4
4478	496	13553	15.329	0.82		5		34					17				56	5
3091	276	34612	17.533	25	10	22	60	324		12	23	1	348	12	5	26	843	159
4104	447	31012	26.884	25	9	32		233	13	3		25	301	3	15		634	84
3971	339	34452	28.108	25	11	25	29	181		7		11	276	3	6	13	562	98
4490	516	34593	28.188	25	6	34		186	11	4		21	286	4	18		570	83
691	28	75001	31.327	25	6	55	45	190	27	1	9	33	483	11	19	10	889	188
689	26	15001	33.218	25	19	20	15	138	9		10	31	201	1	23	15	482	134
687	25	15000	34.147	25	14	22	14	89	8		3	33	212		23	12	430	121
2974	115	44918	34.992	25	18		35	72	4	36	2		196			32	395	87

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
685	24	15001	35.093	25	14	18	16	98	7		3	30	197		23	15	421	119
2972	114	15001	36.025	25	15		37	76	2	37	1		205			32	405	85
683	23	15001	36.041	25	23	28	16	93	12		3	37	227		29	19	487	155
681	22	15000	36.972	25	13	24	11	88	13		1	34	216		30	17	447	130
2970	113	15001	37.045	25	14		28	89	3	40			151			38	363	80
670	21	15896	37.923	25	13	22	13	104	12			32	180		28	12	416	120
2968	112	15000	38.084	25	12		33	74	2	45			151			34	351	79
668	20	15000	38.845	25	11	19	17	119	13			40	168		27	16	430	130
2966	111	15000	39.176	25	5		22	106	1	30			143			30	337	57
666	19	15000	39.738	25	5	24	13	92	10			32	194		25	13	408	112
4116	459	33626	40.086	25	1	24		253	9			27	153		24		491	76
2964	110	15001	40.199	25	3		29	69		39			137			31	308	63
664	18	15000	40.704	25	5	20	15	115	7			31	133		20	13	359	104
3959	327	33674	41.090	25	6	11	16	282		5		3	171		7	15	516	58
2962	109	15000	41.254	25	2		33	107		44			148			27	361	62
662	17	15001	41.578	25	4	20	12	109	10			31	145		22	9	362	98
4502	528	34085	41.895	25	7	29		137	7			27	163		14		384	77
2960	108	15001	42.271	25	4		28	100		38			149			20	339	52
660	16	15001	42.500	25	4	23	17	162	10			30	150		21	9	426	104
2958	107	15000	43.277	25	3		23	91	1	24			132			13	287	39
658	15	15001	43.401	25	3	27	16	148	9			33	161		17	8	422	104
2956	106	15000	44.311	25	2		19	208	4	12			157			12	414	33
656	14	15000	44.320	25	2	26	12	137	7		1	24	156		14	9	388	88
654	13	15001	45.233	25	3	20	16	119	7		2	21	175		15	8	386	85
2934	105	3695	45.268	25	1		21	91		18			91			10	232	32
652	12	15001	46.162	25	7	16	17	118	8			26	182		18	9	401	93
2932	104	15000	46.357	25			19	150	3	17			174			15	378	34
650	11	15000	47.052	25	7	17	14	117	7			29	177		19	8	395	94
2930	103	15000	47.392	0.82									6				6	
3024	247	33762	47.636	25	11		25	146		3	1	1	190			29	406	67
648	10	15000	47.966	25	10	19	14	150	6			36	188		21	6	450	106
637	8	35136	49.745	25	2	19	14	164	3			36	179		14	5	436	90
635	7	15000	50.865	25	1	21	14	123	4			37	205		23	6	434	102
633	6	15001	51.647	25	1	18	14	181	4			32	198		16	3	467	84
4514	540	33498	55.728	25		23		104	2			20	194		18		361	61
617	5	6153	59.914	25		13	10	88	1			4	92				208	27
2002	1781	3751	.072	airgun				6					7				13	
2001	1780	3751	.099	airgun				2					7				9	
2003	1782	3753	.109	airgun				9					4				13	
2000	1779	3750	.158	airgun				7					7				14	
2004	1783	3753	.171	airgun				5					3				8	
1999	1778	3749	.228	airgun				7					4				11	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
2005	1784	3753	.242	airgun				7					3				10	
1998	1777	3749	.300	airgun				5					5				10	
2006	1785	3753	.315	airgun				7					3				10	
1997	1776	3750	.373	airgun				1					2				3	
2007	1786	3753	.388	airgun				10					2				12	
1227	1106	3751	.389	airgun				9					6				15	
1226	1105	4566	.393	airgun				10					5				15	
1228	1107	3752	.393	airgun				7					5				12	
1229	1108	3751	.404	airgun				10					7				17	
1230	1109	3752	.422	airgun				8					6				14	
1231	1110	3752	.445	airgun				11					4				15	
1996	1775	3749	.449	airgun				5					3				8	
2008	1787	3753	.463	airgun				3					2				5	
1232	1111	3752	.472	airgun				10					7				17	
1233	1112	3751	.502	airgun				8					6				14	
1995	1774	3749	.525	airgun				6					4				10	
1234	1113	3752	.534	airgun				10					6				16	
2588	2223	3751	.536	airgun									1				1	
1215	1099	2185	.538	airgun				9					6				15	
2009	1788	3753	.538	airgun				9					4				13	
2590	2225	3752	.538	airgun									1				1	
2590	2225	3752	.538	airgun									1				1	
2587	2222	3750	.563	airgun				7					2				9	
1235	1114	3752	.566	airgun				9					5				14	
2591	2226	3752	.570	airgun				8					2				10	
2591	2226	3752	.570	airgun				8					2				10	
1214	1098	3750	.573	airgun				7					8				15	
1236	1115	3752	.600	airgun				7					5				12	
1994	1773	3749	.601	airgun				5					5				10	
2586	2221	3750	.602	airgun				5					4				9	
2592	2227	3752	.610	airgun									1				1	
2592	2227	3752	.610	airgun									1				1	
1213	1097	3750	.611	airgun				8					6				14	
2010	1789	3753	.615	airgun				7					3				10	
1237	1116	3752	.634	airgun				7					6				13	
1212	1096	3750	.649	airgun				9					8				17	
2585	2220	3750	.658	airgun									1				1	
2593	2228	3753	.661	airgun									2				2	
2593	2228	3753	.661	airgun									2				2	
1238	1117	3752	.670	airgun				9					5				14	
1993	1772	3749	.678	airgun				2					3				5	
1211	1095	3751	.686	airgun				8					7				15	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
2011	1790	3753	.692	airgun				8					6				14	
1239	1118	3752	.708	airgun				6					6				12	
1210	1094	3750	.721	airgun				7					5				12	
2584	2219	3749	.723	airgun				1					7				8	
2594	2229	3753	.734	airgun				4					3				7	
2594	2229	3753	.734	airgun				4					3				7	
1240	1119	3753	.747	airgun				6					6				12	
1992	1771	3750	.755	airgun				5					3				8	
1209	1093	3750	.759	airgun				8					7				15	
2012	1791	3753	.769	airgun				7					5				12	
1241	1120	3752	.786	airgun				7					5				12	
2583	2218	3750	.794	airgun				7					15				22	
1208	1092	3750	.796	airgun				7					6				13	
2595	2230	3753	.816	airgun				5					3				8	
2595	2230	3753	.816	airgun				5					3				8	
1242	1121	3752	.829	airgun				7					6				13	
1207	1091	3750	.832	airgun				7					6				13	
1991	1770	3749	.833	airgun				6					4				10	
2013	1792	3753	.846	airgun				5					4				9	
1206	1090	3750	.871	airgun				7					7				14	
1243	1122	3752	.871	airgun				6					6				12	
2582	2217	3749	.875	airgun									4				4	
1990	1769	3749	.909	airgun				3					3				6	
1205	1089	3751	.911	airgun				7					9				16	
1244	1123	3752	.914	airgun				6					4				10	
2014	1793	3753	.923	airgun				5					5				10	
1204	1088	3748	.954	airgun				8					7				15	
1245	1124	3752	.956	airgun				5					3				8	
2581	2216	3749	.962	airgun									2				2	
1989	1768	3749	.987	airgun				3					3				6	
1203	1087	3752	.998	airgun				7					9				16	
1246	1125	3753	.999	airgun				5					3				8	
2015	1794	3753	.999	airgun				7					4				11	
1247	1126	3752	1.041	airgun				6					3				9	
1202	1086	3750	1.044	airgun				5					7				12	
2580	2215	3749	1.046	airgun									3				3	
1988	1767	3749	1.064	airgun				6					2				8	
2016	1795	3753	1.075	airgun				4					5				9	
1248	1127	3752	1.087	airgun				5					3				8	
1201	1085	3750	1.089	airgun				6					7				13	
1249	1128	3752	1.132	airgun				6					4				10	
2579	2214	3749	1.133	airgun				4					12				16	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
1200	1084	3750	1.134	airgun				7					5				12	
1987	1766	3749	1.141	airgun				1					1				2	
2599	2234	3754	1.148	airgun				6					6				12	
2599	2234	3754	1.148	airgun				6					6				12	
2017	1796	3753	1.150	airgun				6					6				12	
1250	1129	3753	1.179	airgun				5					4				9	
1199	1083	3750	1.180	airgun				5					6				11	
1986	1765	3750	1.218	airgun				1					2				3	
2018	1797	3753	1.224	airgun				1					6				7	
1198	1082	3749	1.226	airgun				6					4				10	
1251	1130	3752	1.226	airgun				5					4				9	
2578	2213	3748	1.228	airgun				6					21				27	
2600	2235	3753	1.247	airgun				3					8				11	
2600	2235	3753	1.247	airgun				3					8				11	
1197	1081	3750	1.273	airgun				6					3				9	
1252	1131	3752	1.278	airgun				3					3				6	
1985	1764	3749	1.295	airgun				1					2				3	
2019	1798	3753	1.300	airgun									3				3	
1196	1080	3750	1.321	airgun				7					4				11	
2577	2212	3749	1.327	airgun									5				5	
1253	1132	3753	1.329	airgun				1					3				4	
2601	2236	3753	1.349	airgun				3					4				7	
2601	2236	3753	1.349	airgun				3					4				7	
1984	1763	3749	1.371	airgun									3				3	
1195	1079	3750	1.372	airgun				3					2				5	
2020	1799	3753	1.376	airgun				2					4				6	
1254	1133	3752	1.386	airgun									3				3	
2576	2211	3749	1.406	airgun									2				2	
1194	1078	3750	1.423	airgun				3					2				5	
2602	2237	3754	1.428	airgun				5					6				11	
2602	2237	3754	1.428	airgun				5					6				11	
1255	1134	3753	1.445	airgun									3				3	
1983	1762	3749	1.447	airgun				1					3				4	
2021	1800	3753	1.452	airgun				2					1				3	
1193	1077	3750	1.476	airgun				5					3				8	
2575	2210	3749	1.485	airgun				4					13				17	
1256	1135	3753	1.506	airgun									1				1	
2603	2238	3753	1.507	airgun				3					6				9	
2603	2238	3753	1.507	airgun				3					6				9	
1982	1761	3749	1.525	airgun									4				4	
2022	1801	3753	1.528	airgun				1					2				3	
1192	1076	3749	1.530	airgun				3					4				7	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
1257	1136	3752	1.568	airgun									2				2	
2574	2209	3749	1.574	airgun									1				1	
1191	1075	3750	1.586	airgun				3					5				8	
2604	2239	3753	1.596	airgun									8				8	
2604	2239	3753	1.596	airgun									8				8	
1981	1760	3749	1.603	airgun									2				2	
2023	1802	75000	1.603	airgun									7				7	
1258	1137	3753	1.627	airgun									1				1	
1190	1074	3750	1.643	airgun				3					3				6	
2573	2208	3749	1.664	airgun									5				5	
1980	1759	3750	1.683	airgun									3				3	
2605	2240	3754	1.686	airgun				1					11				12	
2605	2240	3754	1.686	airgun				1					11				12	
1259	1138	3752	1.687	airgun									1				1	
1189	1073	3749	1.700	airgun									4				4	
1260	1139	3753	1.745	airgun									1				1	
2572	2207	3749	1.755	airgun									2				2	
1188	1072	3750	1.757	airgun				3					5				8	
1979	1758	3749	1.762	airgun									2				2	
2606	2241	3753	1.777	airgun				1					9				10	
2606	2241	3753	1.777	airgun				1					9				10	
1261	1140	3752	1.801	airgun									2				2	
1187	1071	3750	1.811	airgun									4				4	
1978	1757	3749	1.843	airgun									2				2	
2571	2206	3749	1.846	airgun				3					15				18	
1262	1141	3753	1.853	airgun									4				4	
1186	1070	3750	1.864	airgun									6				6	
2607	2242	3753	1.868	airgun									3				3	
2607	2242	3753	1.868	airgun									3				3	
1263	1142	3752	1.904	airgun									5				5	
1185	1069	3749	1.917	airgun									8				8	
1977	1756	3749	1.924	airgun									2				2	
2570	2205	3749	1.942	airgun									6				6	
1264	1143	3752	1.952	airgun									5				5	
2608	2243	3755	1.960	airgun				1					12				13	
2608	2243	3755	1.960	airgun				1					12				13	
1184	1068	3750	1.969	airgun									8				8	
1265	1144	3753	2.000	airgun									5				5	
1976	1755	3749	2.007	airgun									1				1	
1183	1067	3750	2.023	airgun									7				7	
2569	2204	3748	2.039	airgun									6				6	
1266	1145	3752	2.046	airgun									5				5	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
2609	2244	3752	2.053	airgun				1					14				15	
2609	2244	3752	2.053	airgun				1					14				15	
1182	1066	3750	2.077	airgun									7				7	
1975	1754	3749	2.088	airgun									2				2	
1267	1146	3752	2.092	airgun									5				5	
1181	1065	3749	2.133	airgun									4				4	
1268	1147	3752	2.136	airgun									8				8	
2568	2203	3749	2.141	airgun									4				4	
2610	2245	3754	2.151	airgun				1					12				13	
2610	2245	3754	2.151	airgun				1					12				13	
1974	1753	3749	2.168	airgun									1				1	
1269	1148	3753	2.183	airgun									9				9	
1180	1064	3750	2.191	airgun									4				4	
1270	1149	3752	2.231	airgun									4				4	
2567	2202	3748	2.244	airgun									3				3	
1973	1752	3749	2.248	airgun									3				3	
1179	1063	3750	2.249	airgun									3				3	
2611	2246	2388	2.252	airgun									6				6	
2611	2246	2388	2.252	airgun									6				6	
1271	1150	3752	2.282	airgun									5				5	
1178	1062	3749	2.308	airgun									2				2	
1972	1751	3749	2.324	airgun									1				1	
1272	1151	3753	2.332	airgun									3				3	
2566	2201	3749	2.333	airgun									1				1	
1177	1061	3750	2.364	airgun									2				2	
1273	1152	3752	2.382	airgun									2				2	
1971	1750	3749	2.400	airgun									2				2	
1176	1060	3750	2.422	airgun									2				2	
2565	2200	3749	2.424	airgun									1				1	
1274	1153	3752	2.433	airgun									2				2	
1970	1749	3750	2.475	airgun									4				4	
1175	1059	3749	2.476	airgun									2				2	
1275	1154	3753	2.483	airgun									2				2	
1174	1058	3750	2.529	airgun									3				3	
2622	2249	3998	2.529	airgun									5				5	
2564	2199	3748	2.532	airgun									13				13	
1276	1155	3752	2.534	airgun									3				3	
1969	1748	3749	2.551	airgun									6				6	
1277	1156	3752	2.582	airgun									4				4	
1173	1057	3750	2.583	airgun									3				3	
1968	1747	3749	2.626	airgun									3				3	
1172	1056	3750	2.633	airgun									3				3	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
1278	1157	3753	2.633	airgun									7				7	
2623	2250	3753	2.637	airgun									2				2	
2563	2198	3749	2.639	airgun									4				4	
1171	1055	3750	2.683	airgun									3				3	
1279	1158	3752	2.684	airgun									9				9	
1967	1746	3750	2.701	airgun									2				2	
2624	2251	3754	2.724	airgun									3				3	
1170	1054	3750	2.731	airgun									5				5	
1280	1159	3752	2.733	airgun									8				8	
2562	2197	3749	2.736	airgun									14				14	
1966	1745	3749	2.775	airgun									3				3	
1169	1053	3749	2.779	airgun									7				7	
1281	1160	3753	2.781	airgun									6				6	
2625	2252	3753	2.812	airgun									5				5	
1168	1052	3750	2.827	airgun									6				6	
1282	1161	3752	2.832	airgun									10				10	
2561	2196	3748	2.836	airgun									5				5	
1965	1744	3749	2.851	airgun									2				2	
1167	1051	3750	2.874	airgun									6				6	
1283	1162	3753	2.883	airgun									5				5	
2626	2253	3753	2.891	airgun									6				6	
1166	1050	3750	2.919	airgun									6				6	
1964	1743	3749	2.926	airgun									4				4	
1284	1163	3752	2.935	airgun									3				3	
2560	2195	3748	2.955	airgun									1				1	
3789	4884	5444	2.963	airgun									10				10	
1165	1049	3750	2.964	airgun									4				4	
2627	2254	3753	2.970	airgun									6				6	
1285	1164	3752	2.988	airgun									3				3	
1963	1742	3749	3.003	airgun									3				3	
1164	1048	3750	3.009	airgun									4				4	
3790	4885	3753	3.020	airgun									13				13	
1286	1165	3753	3.040	airgun									1				1	
1163	1047	3750	3.051	airgun									2				2	
2628	2255	3754	3.057	airgun									5				5	
2559	2194	3748	3.074	airgun									1				1	
1962	1741	3750	3.078	airgun									3				3	
3791	4886	3752	3.085	airgun									7				7	
1162	1046	3750	3.094	airgun									3				3	
1287	1166	3752	3.095	airgun									2				2	
1161	1045	3750	3.136	airgun									3				3	
2629	2256	3753	3.145	airgun									6				6	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
1288	1167	3753	3.147	airgun									2				2	
1961	1740	3749	3.155	airgun									3				3	
3792	4887	3753	3.155	airgun									6				6	
2558	2193	3749	3.166	airgun									4				4	
1160	1044	3750	3.176	airgun									5				5	
1289	1168	3752	3.200	airgun									3				3	
1159	1043	3750	3.218	airgun									4				4	
3793	4888	3753	3.227	airgun									7				7	
1960	1739	3749	3.235	airgun									1				1	
1290	1169	3752	3.251	airgun									2				2	
2630	2257	3754	3.252	airgun									1				1	
2557	2192	3748	3.257	airgun									1				1	
1158	1042	3750	3.262	airgun									4				4	
1291	1170	3753	3.301	airgun									3				3	
3794	4889	3753	3.302	airgun									8				8	
1157	1041	3751	3.305	airgun									3				3	
1959	1738	3749	3.313	airgun									1				1	
1156	1040	3749	3.349	airgun									6				6	
1292	1171	3752	3.349	airgun									2				2	
2556	2191	3750	3.351	airgun									5				5	
2631	2258	3754	3.362	airgun									1				1	
3795	4890	3753	3.374	airgun									5				5	
1958	1737	3749	3.393	airgun									1				1	
1155	1039	3750	3.394	airgun									6				6	
1293	1172	3752	3.398	airgun									2				2	
1154	1038	3750	3.440	airgun									7				7	
1294	1173	3753	3.443	airgun									1				1	
2555	2190	3749	3.444	airgun									6				6	
3796	4891	3753	3.445	airgun									4				4	
2632	2259	3753	3.459	airgun									3				3	
1957	1736	3749	3.473	airgun									2				2	
1153	1037	3750	3.485	airgun									6				6	
1295	1174	3752	3.489	airgun									1				1	
3797	4892	3753	3.511	airgun									5				5	
2554	2189	3749	3.525	airgun									1				1	
1152	1036	3750	3.530	airgun									4				4	
1296	1175	3752	3.534	airgun									3				3	
2633	2260	3754	3.555	airgun									4				4	
3798	4893	3752	3.574	airgun									3				3	
1151	1035	3750	3.575	airgun									2				2	
1297	1176	3753	3.581	airgun									2				2	
2553	2188	3749	3.609	airgun									2				2	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
1150	1034	3750	3.620	airgun									2				2	
1298	1177	3752	3.631	airgun									4				4	
1955	1734	3750	3.635	airgun									1				1	
3799	4894	3753	3.636	airgun									3				3	
2634	2261	3754	3.655	airgun									4				4	
1149	1033	3750	3.665	airgun									2				2	
1299	1178	3752	3.682	airgun									3				3	
3800	4895	2026	3.700	airgun									2				2	
1148	1032	3750	3.711	airgun									2				2	
1954	1733	3749	3.715	airgun									2				2	
1300	1179	3753	3.735	airgun									2				2	
2552	2187	3747	3.742	airgun									4				4	
2635	2262	3753	3.753	airgun									4				4	
1147	1031	3750	3.755	airgun									4				4	
1301	1180	3752	3.788	airgun									2				2	
1953	1732	6827	3.795	airgun									2				2	
1146	1030	3750	3.799	airgun									3				3	
2636	2263	3753	3.833	airgun									2				2	
1145	1029	3750	3.842	airgun									2				2	
1302	1181	3753	3.842	airgun									2				2	
3778	4775	2154	3.847	airgun									25				25	
2551	2186	3749	3.850	airgun									5				5	
1144	1028	3750	3.885	airgun									2				2	
1303	1182	3752	3.897	airgun									1				1	
3777	4774	3750	3.906	airgun									24				24	
2637	2264	3754	3.913	airgun									4				4	
1143	1027	3750	3.928	airgun									2				2	
2550	2185	3750	3.950	airgun									4				4	
1304	1183	3753	3.954	airgun									1				1	
3776	4773	3749	3.962	airgun				1					30				31	
1142	1026	3750	3.970	airgun									3				3	
1305	1184	3752	4.011	airgun									3				3	
2638	2265	3753	4.012	airgun									4				4	
1141	1025	3750	4.014	airgun									3				3	
3775	4772	3750	4.016	airgun									28				28	
1140	1024	3750	4.057	airgun									5				5	
2549	2184	3749	4.060	airgun									1				1	
1306	1185	3753	4.066	airgun									4				4	
3774	4771	3750	4.070	airgun									15				15	
1139	1023	3750	4.105	airgun									3				3	
2639	2266	3753	4.113	airgun									4				4	
1307	1186	3752	4.121	airgun									2				2	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
3773	4770	3750	4.124	airgun									8				8	
1138	1022	3750	4.152	airgun									4				4	
2548	2183	3749	4.160	airgun									1				1	
1308	1187	3753	4.176	airgun									2				2	
3772	4769	3749	4.183	airgun									12				12	
2640	2267	3753	4.193	airgun									1				1	
1137	1021	3750	4.202	airgun									4				4	
1309	1188	3752	4.231	airgun									2				2	
3771	4768	3750	4.249	airgun									7				7	
1136	1020	3750	4.252	airgun									3				3	
2641	2268	3754	4.272	airgun									4				4	
2547	2182	3746	4.275	airgun									1				1	
1310	1189	3752	4.284	airgun									2				2	
1135	1019	3750	4.304	airgun									3				3	
3770	4767	3749	4.314	airgun									8				8	
1311	1190	3753	4.339	airgun									1				1	
1134	1018	3749	4.355	airgun									2				2	
4370	6300	8750	4.370	airgun									3				3	
3769	4766	3749	4.381	airgun									8				8	
2642	2269	3755	4.389	airgun									1				1	
1312	1191	3752	4.392	airgun									1				1	
1133	1017	3750	4.404	airgun									3				3	
2545	2180	3750	4.409	airgun									2				2	
1313	1192	3753	4.447	airgun									1				1	
3768	4765	3750	4.447	airgun									17				17	
1132	1016	3750	4.452	airgun									2				2	
2544	2179	3749	4.491	airgun									1				1	
1314	1193	3752	4.500	airgun									1				1	
1131	1015	3750	4.501	airgun									2				2	
1940	1723	3748	4.506	airgun									1				1	
2643	2270	3753	4.508	airgun									1				1	
3767	4764	5348	4.511	airgun									10				10	
1130	1014	3750	4.552	airgun									2				2	
1315	1194	3753	4.555	airgun									1				1	
2543	2178	3748	4.580	airgun									3				3	
2644	2271	3753	4.599	airgun									1				1	
1129	1013	3750	4.605	airgun									2				2	
1316	1195	3752	4.608	airgun									1				1	
1128	1012	3749	4.659	airgun									1				1	
1317	1196	3753	4.659	airgun									1				1	
1318	1197	3752	4.711	airgun									1				1	
1127	1011	3750	4.712	airgun									1				1	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sat. 1,3, 4, no hyd
2542	2177	3748	4.739	airgun									1				1	
1319	1198	3752	4.762	airgun									1				1	
1126	1010	3749	4.767	airgun									1				1	
2646	2273	3753	4.780	airgun									1				1	
1320	1199	3753	4.811	airgun									1				1	
1125	1009	3751	4.824	airgun									1				1	
2541	2176	3749	4.840	airgun									3				3	
1321	1200	3752	4.860	airgun									1				1	
2647	2274	3754	4.870	airgun									1				1	
1124	1008	3749	4.882	airgun									1				1	
1322	1201	3752	4.908	airgun									1				1	
1123	1007	3750	4.937	airgun									1				1	
2540	2175	3750	4.950	airgun									1				1	
1323	1202	3752	4.956	airgun									1				1	
2648	2275	3753	4.972	airgun									1				1	
1324	1203	3753	5.003	airgun									1				1	
1121	1005	3750	5.039	airgun									1				1	
1325	1204	3752	5.050	airgun									1				1	
2539	2174	3748	5.060	airgun									1				1	
2649	2276	3754	5.076	airgun									1				1	
2650	2277	3753	5.163	airgun									3				3	
1118	1002	3750	5.164	airgun									1				1	
2538	2173	3748	5.170	airgun									1				1	
1117	1001	3750	5.192	airgun									1				1	
2651	2278	3754	5.249	airgun									3				3	
2537	2172	3747	5.283	airgun									2				2	
2536	2171	3750	5.320	airgun									2				2	
1333	1212	3753	5.476	airgun									1				1	
2654	2281	3753	5.544	airgun									1				1	
2533	2168	3748	5.602	airgun									1				1	
2532	2167	3748	5.707	airgun									3				3	
2656	2283	3753	5.729	airgun									1				1	
2657	2284	3754	5.814	airgun									3				3	
2530	2165	3749	5.903	airgun									1				1	
2658	2285	3753	5.920	airgun									2				2	
2528	2163	3748	6.092	airgun									3				3	
2527	2162	3749	6.196	airgun									1				1	
2661	2288	3754	6.200	airgun									1				1	
2526	2161	3748	6.321	airgun									1				1	
2663	2290	3753	6.414	airgun									1				1	
1916	1699	3749	6.449	airgun									1				1	
1362	1233	3752	6.519	airgun									1				1	

Table 5 Summary of LFASE Clipped Data Points

shot numbers WHOI	shot numbers NORDA	number of samples	range (km)	shot size (kg)	Channel number 1	2	3	4	5	6	7	8	9	10	11	12	total all chan	total of sar. 1,3, 4, no hyd
1364	1235	3752	6.614	airgun									1				1	
2666	2293	3754	6.709	airgun									1				1	
2672	2299	3754	7.260	airgun									1				1	
2516	2151	3749	7.328	airgun									1				1	
2674	2301	3754	7.469	airgun									1				1	
3346	3302	3752	9.802	airgun									1				1	
3347	3303	3751	9.803	airgun									1				1	
3340	3296	3751	9.814	airgun									1				1	
3339	3295	3751	9.816	airgun									1				1	
3338	3294	3751	9.818	airgun									1				1	
3337	3293	6856	9.819	airgun									1				1	
3491	3873	3322	9.913	airgun									1				1	
3485	3867	3751	9.915	airgun									1				1	
3486	3868	3751	9.915	airgun									1				1	
3488	3870	3751	9.915	airgun									1				1	
3489	3871	3752	9.915	airgun									1				1	
3490	3872	3751	9.915	airgun									1				1	
3487	3869	3751	9.916	airgun									1				1	
3482	3864	3751	9.917	airgun									1				1	
3483	3865	3751	9.917	airgun									1				1	
3484	3866	3751	9.918	airgun									1				1	
3481	3863	3751	9.919	airgun									1				1	
3480	3862	4165	9.922	airgun									1				1	
3205	2573	6073	10.033	airgun									2				2	
3206	2574	3751	10.037	airgun									2				2	
3207	2575	3751	10.041	airgun									1				1	
3208	2576	3752	10.047	airgun									2				2	
3209	2577	3751	10.050	airgun									1				1	
3210	2578	3751	10.056	airgun									2				2	
3211	2579	3751	10.060	airgun									1				1	
3212	2580	3752	10.066	airgun									2				2	
3228	2694	3751	10.070	airgun									1				1	
3213	2581	3751	10.073	airgun									2				2	
3214	2582	3751	10.081	airgun									1				1	
3215	2583	3752	10.088	airgun									1				1	
3568	4342	4698	10.089	airgun									2				2	
3569	4343	3752	10.089	airgun									2				2	
3570	4344	3751	10.092	airgun									2				2	
3571	4345	3751	10.093	airgun									2				2	
3572	4346	3751	10.096	airgun									2				2	
3573	4347	3751	10.096	airgun									2				2	
3216	2584	1412	10.097	airgun									1				1	

Table 5 Summary of LFASE Clipped Data Points

shot numbers		number	range	shot	Channel number												total	total of
WHOI	NORDA	of samples	(km)	size (kg)	1	2	3	4	5	6	7	8	9	10	11	12	all chan	sat. 1,3, 4, no hyd
3574	4348	3751	10.097	airgun									2				2	
3575	4349	3751	10.098	airgun									2				2	
3576	4350	3751	10.100	airgun									2				2	
3577	4351	3752	10.100	airgun									2				2	
3578	4352	3751	10.101	airgun									2				2	
3579	4353	2788	10.103	airgun									2				2	
3447	3633	3583	10.112	airgun									1				1	
3446	3632	3751	10.116	airgun									1				1	
3445	3631	3751	10.117	airgun									1				1	
3444	3630	3752	10.118	airgun									1				1	
3443	3629	3751	10.119	airgun									3				3	
3442	3628	3751	10.122	airgun									2				2	
3441	3627	3751	10.123	airgun									1				1	
3440	3626	3751	10.125	airgun									1				1	
3439	3625	3751	10.127	airgun									2				2	
3437	3623	3750	10.129	airgun									1				1	
3438	3624	3751	10.129	airgun									1				1	
3436	3622	3905	10.132	airgun									1				1	
1626	1430	0	25.500	airgun											603		603	603
1630	1434	2048	25.735	airgun							214	214	214	214	214	214	1284	1070

Appendix A Scale Factors for CGG Data

by R. A. Stephen June 30, 1989

This appendix summarizes the processing of numbers from the CGG Multilock array. Table 1 summarizes the LFASE data acquisition flow. Table 2 summarizes the various numbers used in processing.

CGG Format

CGG data values are 16 bit binary words as follows:

$G_0\ G_1\ G_2\ G_3\ S\ M_1\ M_2\ M_3\ M_4\ M_5\ M_6\ M_7\ M_8\ M_9\ M_{10}\ M_{11}$

This is sometimes referred to as A12G4. G has a maximum decimal value of 11 corresponding to 11 stages of 6 dB gain. S is the sign bit. The voltage on input to the digitizer and gain ranging amplifiers in mV, from the CGG manual, is:

$$V(mV) = 2.44 * M/(2**G) \qquad (1)$$

The actual analog to digital converter is a Burr-Brown ADC 10HT. From their specification sheet the least significant bit is 2.44141 mV but only three digits are significant. Keeping the six figure number, the maximum voltage on input to the digitizer and gain ranging section is 5.00 * (10**3) mV. (M = 2**11-1, G = 0, V = 2.44141 * 2**11-1 / (2**0)) = 4,997.57 or 5.00 * (10**3) to three significant digits.) The smallest detectable voltage on input to this section is 1.19 * (10**(-3)) mV (M = 1, G = 11, V = 2.44141 * 1/ (2**11) = 0.00119209 or 1.19 * (10**(-3)) to three significant digits.) If accuracy greater than three significant digits is required, a more careful study of the analog to digital converter is necessary.

Michigan Data

During the Michigan field test, we used equation (1) to convert from CGG format (A12G4) to floating point numbers in VAX/ROSE format (LaTraille et al., 1983). So, the numbers in the ROSE format files from Michigan represent the input to the digitizer in mV. What we really want is ground velocity for the geophones and pressure for the hydrophone.

For geophone channels there is a fixed gain preamplifier with 66 dB gain or a factor of 2.00 * 10**3 (10**(66/20)) = 1,995.26 or 2.00 * (10**3) to three significant digits). So, the maximum electrical signal that can be recorded out of the geophones is 2.50 mV and the minimum electrical signal is 0.597 nV. The nominal geophone sensitivity for an L-15LBTW long travel geophone with a 4.5 Hz natural frequency and 600 ohm coil damped at 60 per cent is 0.831 V/in/sec or $3.272 * 10^1$ V/m/sec or $3.272 * 10^4$ mV/m/sec (1 inch = 2.540 cm). There are two geophones on each channel, so the total sensitivity is $6.544 * 10^4$ mV/m/sec. So, to get ground velocity from Michigan ROSE format numbers we use:

$$\text{velocity (nm/sec)} = V(mV) / (6.544 * 10**(-5) * 1995.26) \qquad (2)$$
$$= V(mV) / (1.3057 * 10**(-1))$$

(V(mV) comes from equation (1).) So the maximum detectable ground motion (peak) is 3.83 * (10**4) nm/sec and the minimum detectable signal (peak) is 0.915 * (10**(-2)) nm/sec.

For hydrophone channels there are two preamplifier gain strategies. The first is to use 34 dB in the hydrophone preamp and 20 dB in the DTU for a total of 54 dB. In the second, we use -12 dB in the hydrophone preamp and 66 dB in the DTU for a total of 54 dB. In either case, the gain is a factor of 501 (10** (54/20) = 501.187). So the maximum electrical signal that can be recorded from the hydrophone is 9.97 mV and the minimum is 2.38 nV. The nominal hydrophone sensitivity for an OAS E-2SD is -87 dB re 1 V/μbar or 4.47 * (10**(-5)) V/μbar (10** (-87/20) * 1.0 = 4.46683 * (10**(-5))) or 4.47 * (10**(-2)) mV/μbar. (Since 1 Pascal = 1 NT/m^2 = 10 dyne/cm^2 and 1 bar = 10^6 dyne/cm^2, 1 Pascal = 10**(-5) bar.) In units of Pascals, the sensitivity is 4.47 * (10**(-1)) mV/Pascal (4.47 * (10**(-2)) mV/μbar = 4.47 * 10^4 mV/bar = 4.47 * (10**(-1)) mV/Pascal). So to get pressure in microPascals from Michigan ROSE format numbers we used:

$$\text{pressure (microPa)} = V\text{ (mV)}/(4.46683 * (10**(-7)) * 501.187)$$
$$= V\text{ (mV)}/(2.23871 * (10**(-4))) \qquad (3)$$

So the maximum detectable pressure level (peak) is 22.3 * (10**6) microPa and the minimum detectable level (peak) is 5.32 microPa.

Dress Rehearsal and LFASE Data

In order to save space, maintain accuracy, and stay in the traditional ROSE format we decided after Michigan to change the VAX format from floating point to I*4 (32 bit). To do this we chose to store CGG numbers (A12G4) multiplied by 2**11. So the storage number is:

$$STO = M *(2**(-G))*(2**11) \qquad (4)$$

The largest stored number will be 4,192,256 and the smallest will be 1. The input voltage to the digitizer will be:

$$V\text{ (mV)} = STO * 2.44141 / (2**11) \qquad (5)$$

This will give the same value as (1) so that all of the discussion on Michigan data is still valid once this change has been made.

All our LFASE processing code contain a subroutine that applies all of the scale factors. Output from this section is 32 bit floating point numbers representing velocity in nm/sec for the geophone channels (channels 1-8, 10-12) and pressure in microPa for the hydrophone channel (9).

TABLE 1.
LFASE Data Acquisition Flow Chart

Ground Velocity[4] (nm/sec)	Pressure[4] (microPa)
Geophone Sensitivity (6.544 x 10** mV/m/sec)	Hydrophone Sensitivity (-87 dB re 1 V/μbar)
Geophone Output[3] (same as input to amp/filter in nV)	Hydrophone Output[3] (same as input to amp/filter in nV)
Amplifier/Filter Stage[2] (x 1995.26 gain)	Amplifier/Filter Stage[2] (x 501.187 gain)

Digitizer
(-input to digitizer
is same as output of
amp/filter quoted in mV)

Optical Disk[1]
(-output of digitizer is
recorded in A12G4 format)

VAX Disk[1]
(-A12G4 is converted to
ROSE format as I*4)

1 The numbers on optical disk and VAX disk are in different formats: A12G4 on optical disk and I*4 on VAX. The integer value is obtained by M*(2**(-G))*(2**11).

2 The output of the amplifier/filter section is quoted in mV and is obtained from the integer value by multiplying by 2.44141 / (2**11).

3 Input to the amplifier/filter section is quoted in mV and is obtained from (2) by multiplying by 1,000,000 / 1995.26 for geophones and by 1,000,000 / 501.187 for hydrophones.

4 Actual velocities and pressure are obtained from the geophone and hydrophone sensitivities.

Note: the CGG Multilock screen output is frequently quoted as input to the amp/filter section in nV (3). They always assume a gain of 2000 for both geophone and hydrophone channels. Both hydrophone configurations have an effective gain of 501.2 but CGG processing on the Multilock screen assumes a gain of 2000, so these numbers are a factor of 4 too small.

References

LaTraille, S.L., 1983, Archiving and exchange of a computerized marine seismic database: the ROSE data archive system. HIG-83-3, Data Report 43, Hawaii Institute of Geophysics, Univ. of Hawaii, Honolulu. 146 pp.

Table 2. SUMMARY OF LFASE NUMBERS (U)

(U)	Processing State	Formula	Largest Positive Number	Smallest Positive Number (LSB)
(U)	CGG Format	A12G4	0000+11111111111	1011+00000000001
(U)	WHOI/ROSE Format	STO=M x 2**(-G)*(2**11)	4,192,256 [1]	1
(U)	Input to digitizer V(mV) and Michigan Data	V(mV)=STO*2.44141/(2**11)	5.00	1.19μV
(U)	Input to amp/filters (geophone)	V_g(mV)=V(mV)/1,995.26	2.50 mV	0.597 nV [2]
(U)	Input to amp/filters (hydrophone)	V_n(mV)=V(mV)/501.187	9.97 mV	2.38 nV [2]
(U)	Ground Velocity	vel (nm/sec)=V(mV)/(1.3057 x (10**(-1)))	3.83*(10**4) nm/sec	0.915*(10**(-2)) nm/sec
(U)	Pressure	p(microPa)=V(mV)/(2.23871 x (10**(-4)))	22.3*(10**6) microPa	5.32*(10**(0)) microPa

(U) [1] The most negative number is -4,194,304 (0000100000000000 in A12G4 where 1 indicates a negative sign).

(U) [2] Multilock numbers.