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PRELIMINARY ANALYSIS REPORT

ALEUTIAN ISLANDS EXPERIMENT

OCEAN-BOTTOM SEISMOGRAPHIC EXPERIMENTS

Prepared by

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TEXAS INSTRUMENTS INCORPORATED
Science Services Division
P. O. Box 5621
Dallas, Texas 7 222

Effective Date of Contract: 5 April 1967
Contract Expiration Date: 31 July 1968
Amount of Contract: $1,054,991

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ADVANCED RESEARCH PROJECTS AGENCY
Nuclear Test Detection Office
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and accomplished under the technical direction of the
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ABSTRACT

A preliminary model of the crustal structure across the Aleutian Ridge in the vicinity of Amchitka is presented. Data from two inline-reversed refraction profiles utilizing shot and Ocean-Bottom Seismograph (OBS) arrays along a northeast-southwest line through Amchitka were used to determine the structure. The analysis was limited to first-arrival data, most of which was Moho-refracted; however, some upper-crust refractors were identified immediately beneath Amchitka.

Observed traveltimes were corrected to a reference plane 4.5 km below sea level to minimize lateral velocity variations associated with the large changes in water depth and the changes in subwater crustal velocities along the profiles.

Calculations assuming plane constant-velocity dipping layers give a Moho depth of 15 km at the north end of the Petrel Bank (northeast of Amchitka). The depth increases to over 40 km at Amchitka then decreases to 12 km in the Pacific (southwest of Amchitka). Moho velocity of 8.0 to 8.1 km/sec was obtained for the area. Also, 4.9- and 6.2-km/sec refractors at depths of about 1 and 10 km were identified beneath Amchitka.

Shot depths were determined from hydroacoustic data by using the bubble-pulse method and converting traveltime data to depths (using an average velocity of 4900 ft/sec). A detailed discussion of these methods, including an error analysis, is presented.

Routine analysis of all OBS recordings was performed and a preliminary bulletin prepared. A total of 2734 station events was observed, 306 of which were associated with the 35 explosions and 198 associated with earthquakes having known epicenters.

TABLE OF CONTENTS

APPENDIXES

ILLUSTRATIONS

ILLUSTRATIONS (CONTD)

ILLUSTRATIONS (CONTD)

ILLUSTRATIONS (CONTD)

ILLUSTRATIONS (CONTD)

TABLES

SECTION I
SUMMARY

The 1967 Aleutian Islands Ocean-Bottom-Seismograph (OBS) Data Collection and Analysis Program was conducted between 5 April 1967 and 31 January 1968. The program consisted of three tasks: unit and equipment preparation, field operations, and data analysis. Unit and equipment preparation and field operations are discussed in detail in the Operations Report.[1] This report presents the data-analysis program.

The basic objective of the Aleutian Islands program was to determine the structure in the Amchitka area (i.e., across the Aleutian Ridge). The resulting structure then could be studied to determine its effect on traveltime anomalies (and resulting location bias) observed from the LONGSHOT explosion, which was detonated on Amchitka on 29 October 1965.

A preliminary model of the structure in the Amchitka area, which was obtained using standard refraction methods, is presented in Section II. Data analysis is continuing, and a refined model incorporating results of the secondary-arrival data and of additional analysis methods will be presented at a later date.

Three additional studies were conducted under the data-analysis program:

- Determination of the charge depths using hydroacoustic traveltime recordings and bubble-pulse-period measurements (Section III)
- Determination of the average unit drop and rise velocities (Appendix A)

- Compilation of a bulletin reporting all arrival times recorded by the OBS units and including amplitude and period measurements (Appendix B); the bulletin also associates arrivals with events which had a known epicenter within 10° of Amchitka or which had a magnitude of 5 or larger

Results of these studies are included in this report.

Data used in the crustal analysis were collected in three phases. The inline refraction profile configurations for Phases I, II, and III are presented in Figures I-1, I-2, and I-3, respectively. Phase-I and Phase-III OBS instrument arrays and shot arrays were designed to divide the structure across the Aleutian Ridge into four segments, each of which could be approximated by plane dipping-layer solutions. Phase-II instruments were deployed primarily to record upper-mantle arrivals from the CHASE VI explosion. CHASE VI did not detonate; however, some useful information was obtained from the eight 5-ton explosions detonated during Phase II.

The data collected were transcribed onto 16-mm film; timing corrections to compensate for head misalignment of the tape recorder and for digital clock drift were determined; and the data quality for each station was evaluated. The explosion recordings then were edited onto digital tape and played back, and arrival times were picked. Traveltimes for each arrival were determined and input to a series of four computer programs which reduced the data using standard refraction-analysis methods. The first program corrects the data to a reference plane, which is necessary because of the large lateral velocity variations in the uppermost 4 to 5 km below sea level due to significant changes in water depth and structural environment (Figure I-4). The reference plane was chosen to approximate the water bottom on either side of the Aleutian Ridge. The second program generates traveltime plots of the original (raw), corrected, and reduced data; the third calculates least-squares straight-line fits to the data. The final program resolves reverse-profile information to obtain the velocity, dip, and depth of a refractor.

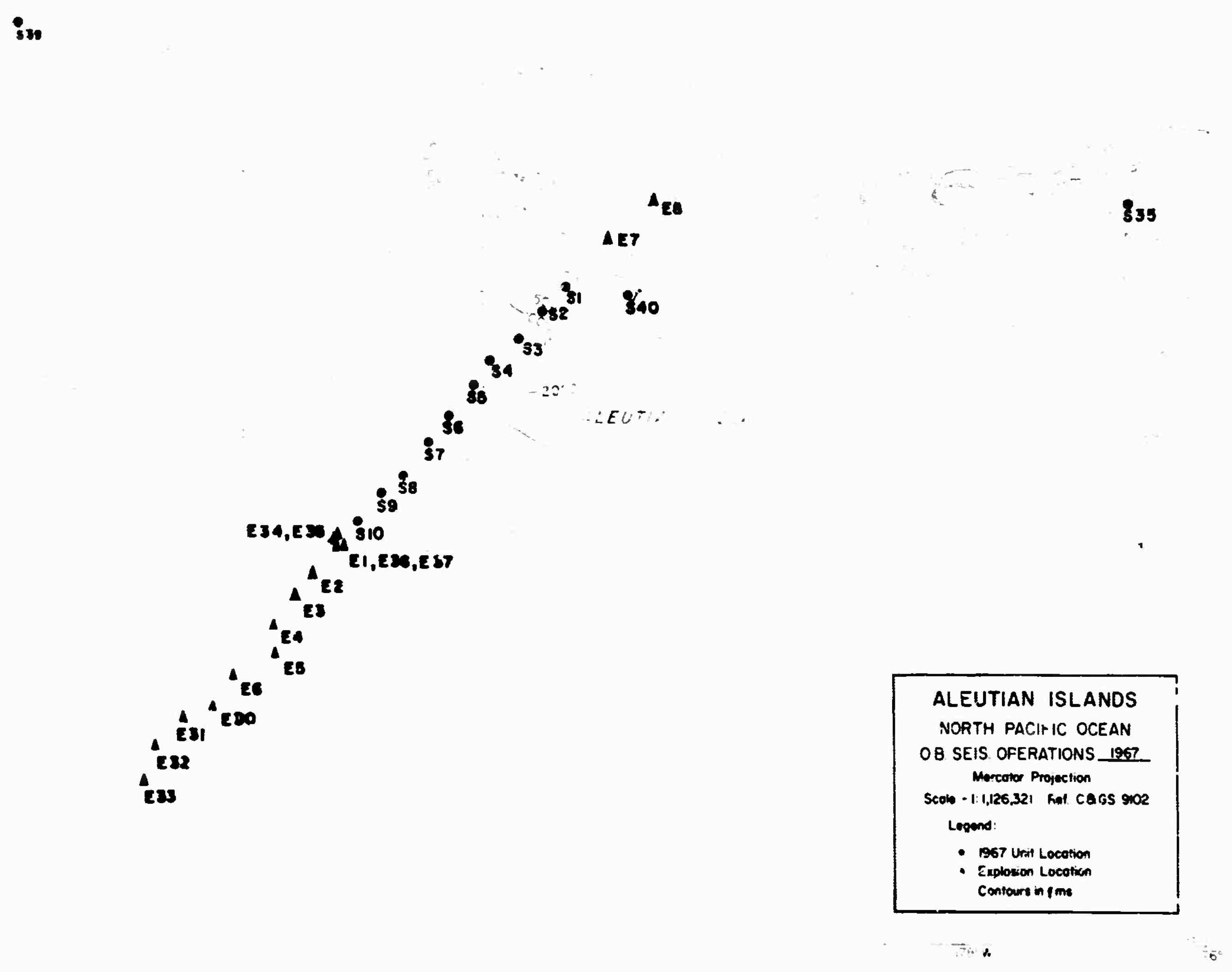

Figure I-1. Phase-I Station and Explosion Locations

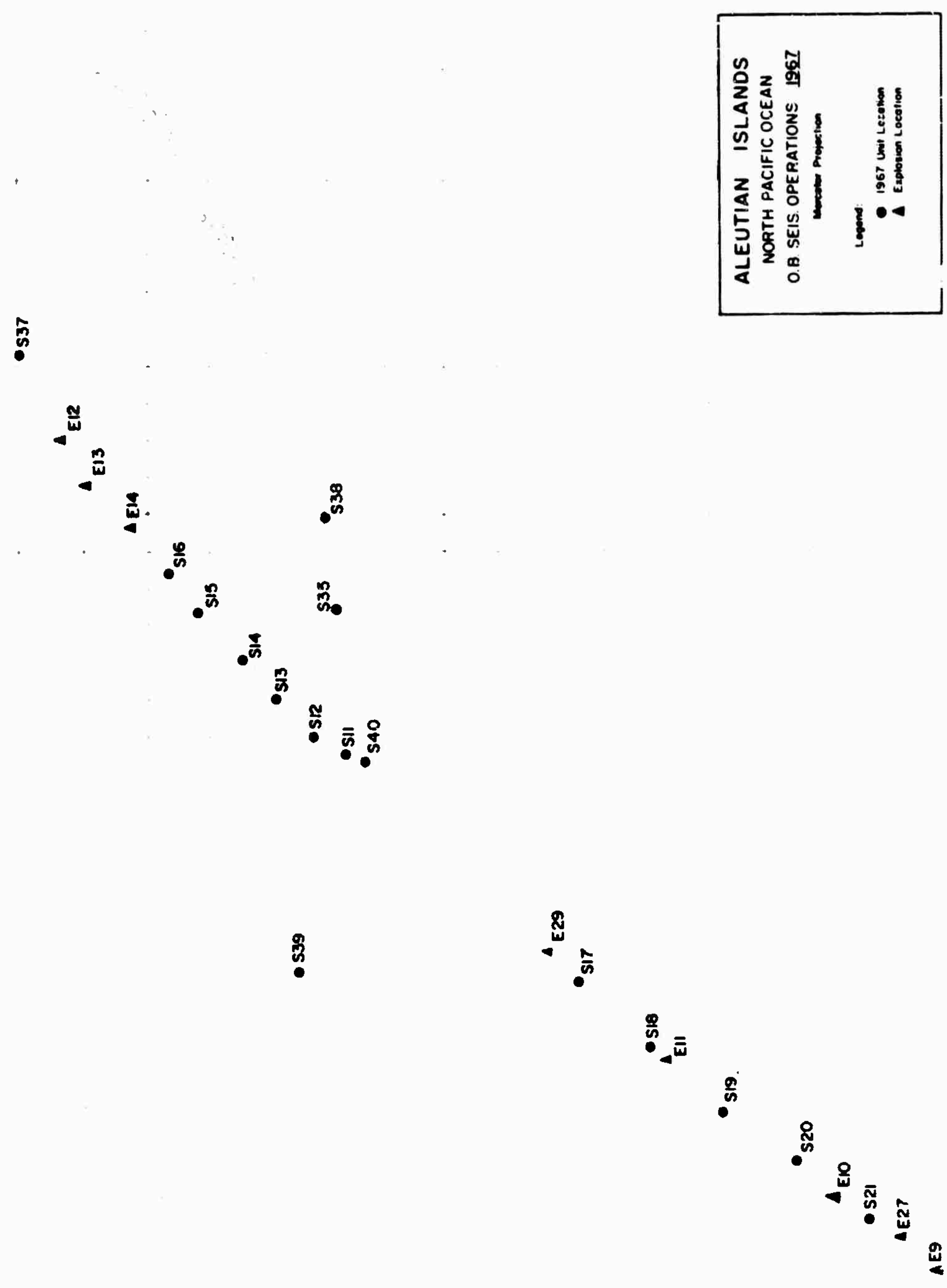

Figure I-2. Phase-II Station and Explosion Locations

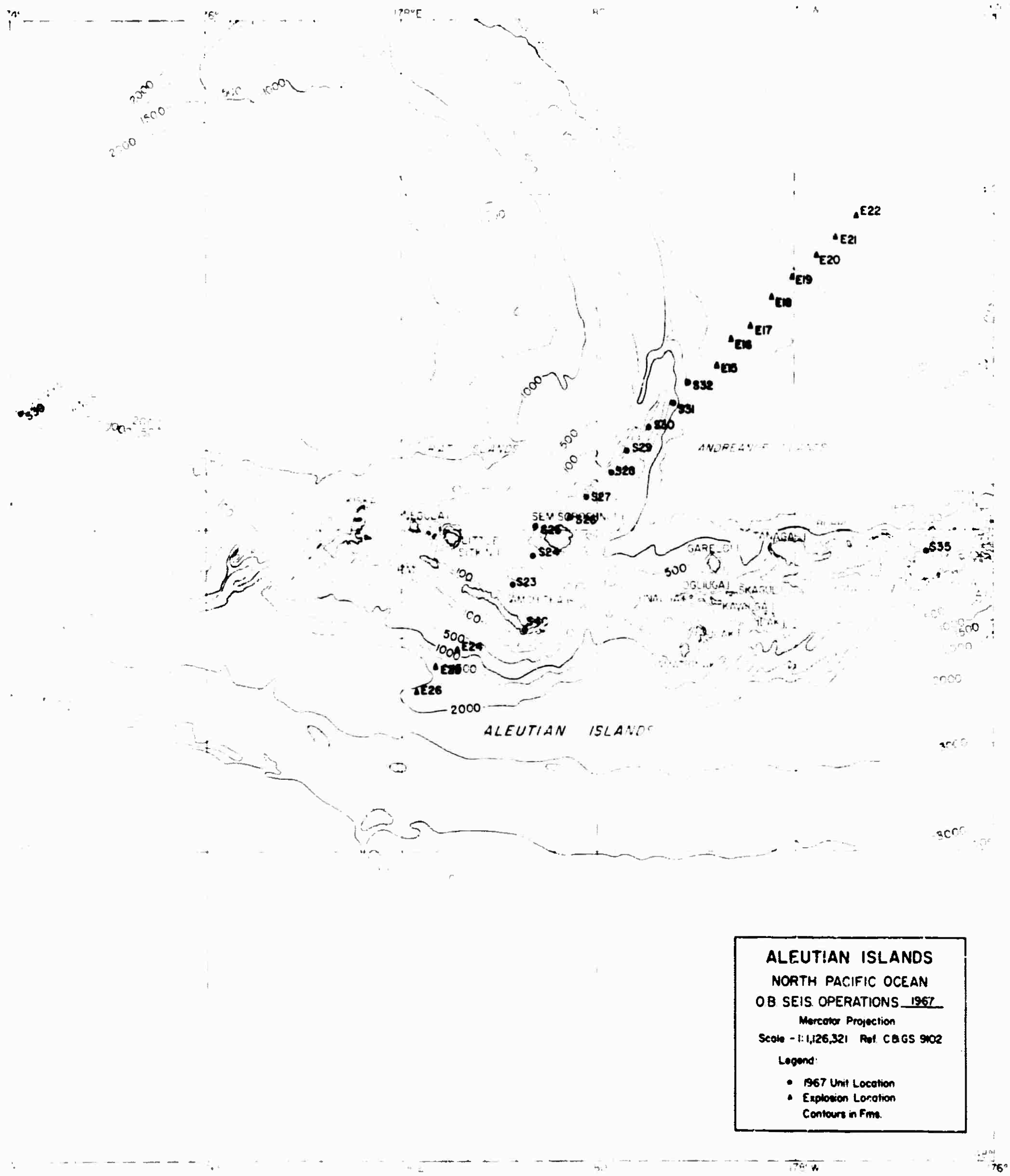

Figure I-3. Phase-III Station and Explosion Locations

This data analysis is iterative in nature. Using information from literature, the arrival-time data are reduced and crustal parameters estimated. The data then are recycled using the output of the previous iteration. In this analysis, the arrival-time data were cycled through the computer programs three times — first estimate, first iteration, and second iteration.

The first-estimate results allowed the arrival times to be separated into three groups (Pn, Pg, and S) on the basis of refractor velocity. The measured refractor velocities then were used in the first iteration to recompute the time corrections. Line fits were made, and the Pg arrivals were separated into two groups (Pg and shallow Pg). The measured refractor velocities then were used in the second iteration to recompute the time corrections. Dips and depths of the refractors were computed from measured apparent velocities and intercept times using the second-iteration output. The model computation assumes plane constant-velocity dipping layers.

The preliminary model is shown in Figure I-5 (X4 vertical exaggeration). Also shown are the areas of single (one-way) coverage and double (reverse) coverage. The resolved Moho velocity is 8.03 km/sec under the Phase-I array and 8.09 km/sec under the Phase-III array. A reverse-time mistie of the Phase-III reverse profile indicates that this segment cannot be represented accurately by a single-plane dipping layer. The one-way coverage under the two shot arrays was resolved by assuming that the Moho P-wave velocity was the same as that determined under the stations for Phases I and III, respectively. Measurements from Phase-II data gave a Moho P-wave velocity of about 8.0 km/sec, which tends to justify this assumption. Moho depth at the northern end of the Petrel Bank was about 15 km, which agrees with Shor's results for the Aleutian Basin.[2,3] Near Amchitka, the depth increases to over 40 km. Due to the shot-receiver geometry, coverage was lacking directly beneath Amchitka. At the southern end of the Phase-I array (Pacific Basin), the Moho depth is about 12 km, which is consistent with normal oceanic structure.

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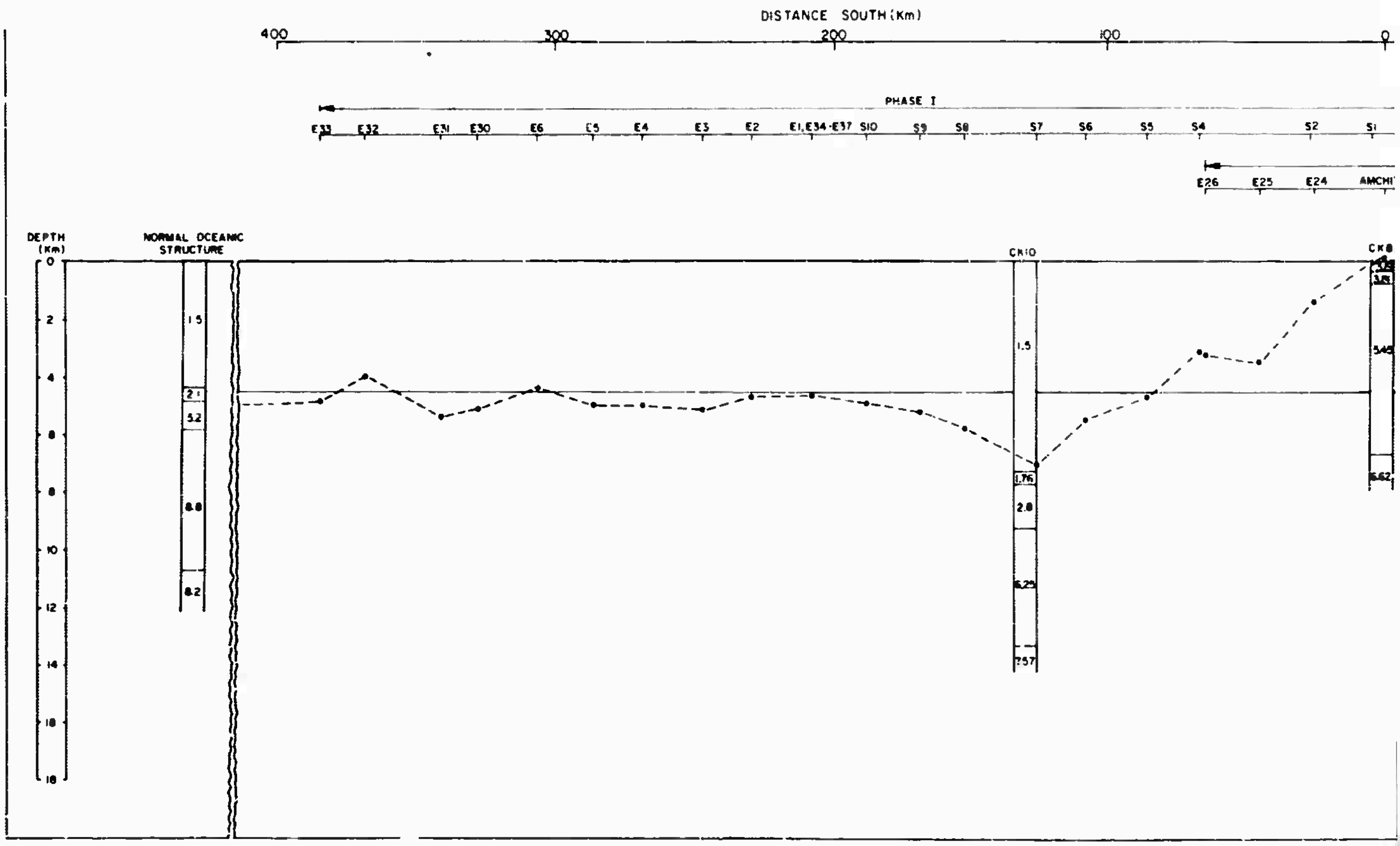


DISTANCE SOUTH (Km)
400
300
200
100
0
PHASE I
E33 E32 E31 E30 E6 E5 E4 E3 E2 E1,E34-E37 S10 S9 S8 S7 S6 S5 S4 S2 S1
E26 E25 E24 AMCHIT
DEPTH (Km)
NORMAL OCEANIC STRUCTURE
CK10
CK8

A

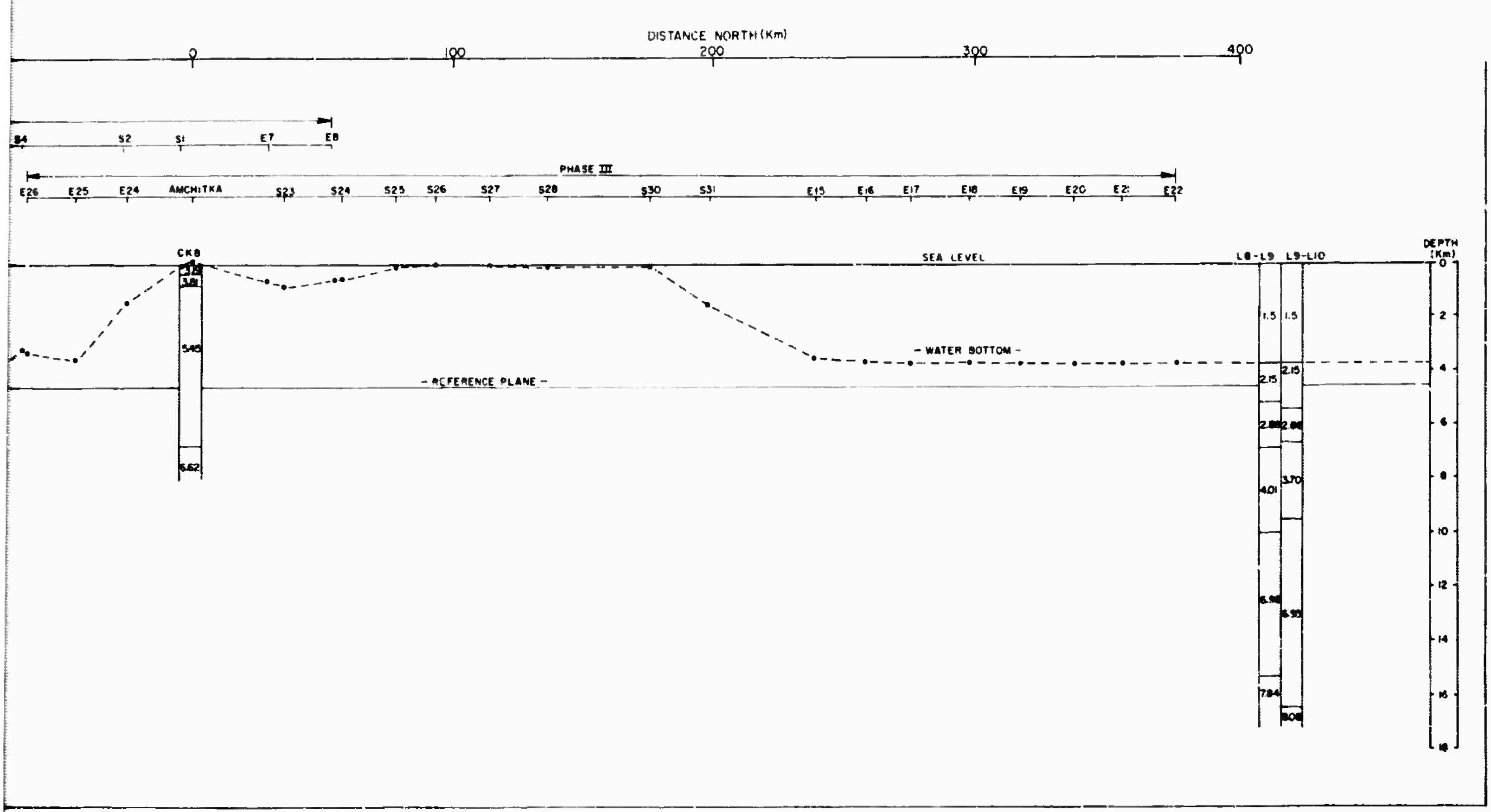
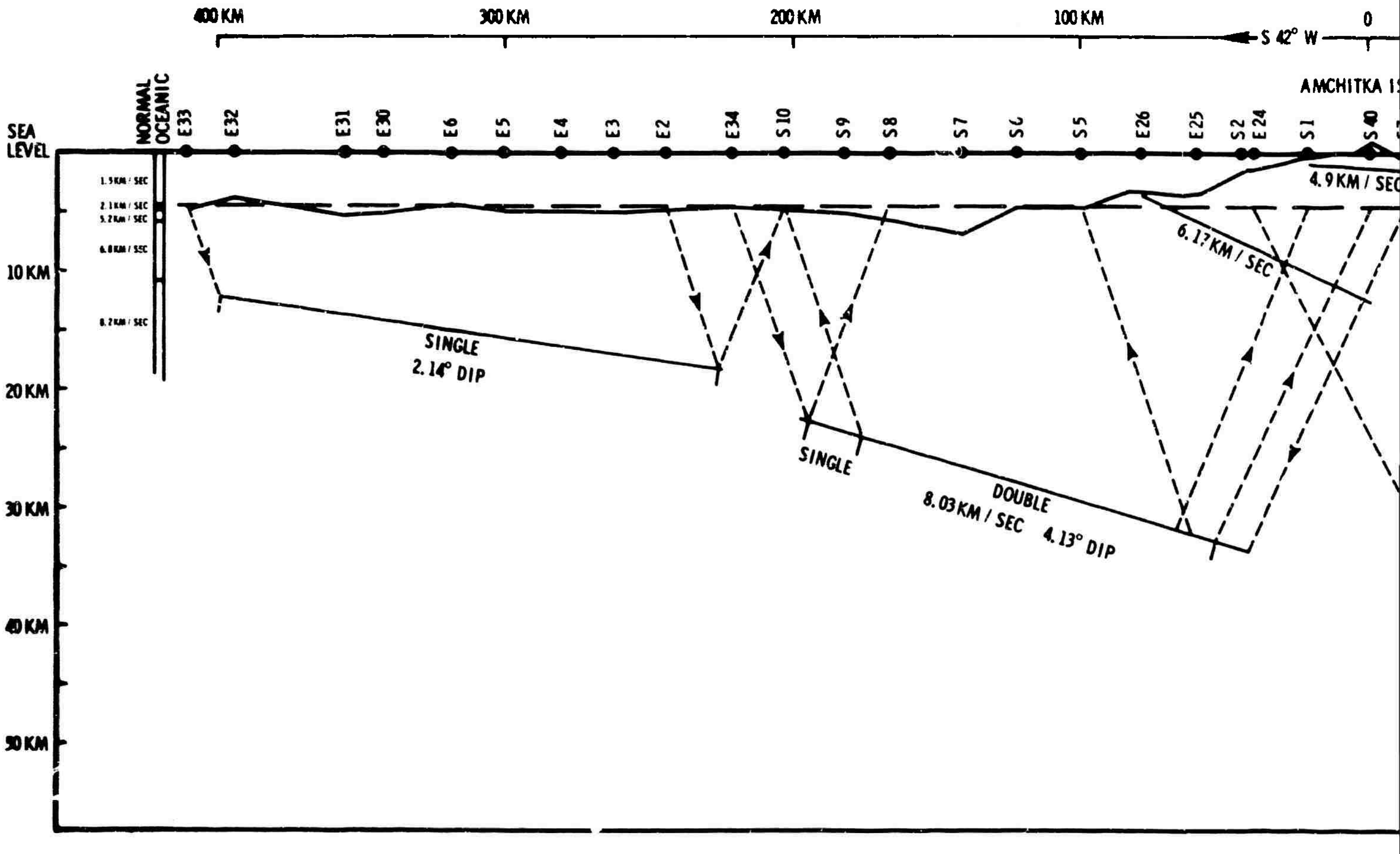


Figure I-4. Water Bottom Profile for Phases I and III with Shor's Published Sections (X10 vertical exaggeration)

B



400 KM
300 KM
200 KM
100 KM
S 42° W
0
AMCHITKA IS
NORMAL OCEANIC
E33
E32
E31
E30
E6
E5
E4
E3
E2
E34
S10
S9
S8
S7
S5
E26
E25
S2
E24
S1
S40
SEA LEVEL
1.5 KM / SEC
2.1 KM / SEC
5.2 KM / SEC
6.8 KM / SEC
8.2 KM / SEC
10 KM
20 KM
30 KM
40 KM
50 KM
4.9 KM / SEC
6.17 KM / SEC
SINGLE
2.14° DIP
SINGLE
DOUBLE
8.03 KM / SEC 4.13° DIP

A

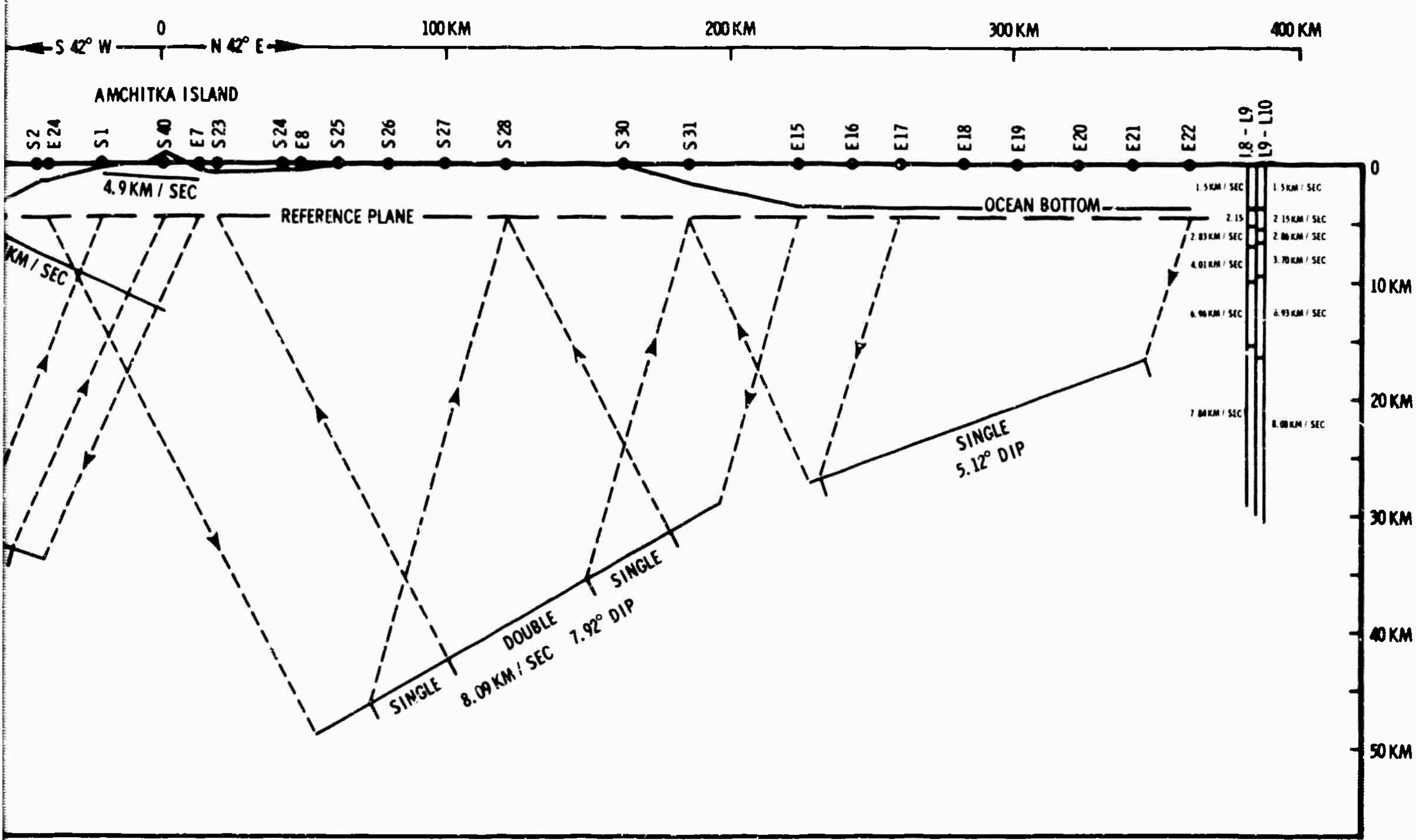


Figure I-5. Preliminary Model Based on First Arrivals (X4 vertical exaggeration)

The analysis discussed in this report concentrated on first arrivals, most of which were Moho refractions. However, some Pg first arrivals were observed; and two Pg refractors having velocities of 4.9 and 6.17 km/sec and depths of about 1 and 10 km were identified on the Aleutian Ridge (Figure I-5). In addition, a well-defined S-wave from the Moho refractor with an average velocity of 4.64 km/sec was observed in the Phase-I data. This arrival was a P-to-S conversion at depth, but the picks were not precise enough to estimate the point of conversion.

The present model is, of course, a simplified estimate of the actual crustal structure. The data suggest that the Moho probably is more complicated than the 4-plane dipping layers used to represent it in this study. Consequently, different techniques (e.g., the time-term method) are being used to give another representation of the data. Also, little information about crustal layering has been obtained from first arrivals. Since most of the crustal refractions are secondary arrivals, a thorough study of all secondary arrivals has been initiated. Lack of knowledge of crustal velocities has two effects: errors in the subwater velocities used to correct traveltimes to the reference plane causes an error in the estimated Moho dip and an error in the average crustal velocity (which is used to convert intercept times to depths) causes the Moho depth estimate to be either too large or too small, depending on whether the velocity used was too high or too low.

The hydroacoustic data collected from hydrophones located beneath the buoy suspending the charge and at the ship were analyzed to determine charge depths. Data were recorded on a Honeywell Visicorder and on a tape recorder, but the tape recorder data were not usable because of crossfeed between channels. Thus, all analysis was conducted using the Visicorder records.

Two methods were used to estimate charge depths:

- Bubble-pulse periods at the ship and buoy hydrophones were measured and depth estimates obtained using the Willis formula[4]

- Traveltimes to the buoy hydrophone were determined and converted to depths using a velocity of 4900 ft/sec

A comparison of the depths obtained from the buoy and ship hydrophones showed that the buoy-hydrophone depth estimates were affected by vertical migration of the bubble and, therefore, were considered to be less accurate than the ship-hydrophone depth estimates. Depths determined from bubble-pulse measurements agreed generally with those determined from the travel-time data for the same shots. (The average absolute difference was 19 ft, which is within measurement accuracy.)

An error analysis showed that both a precise value of the thermodynamic constant (K) in Willis' formula and accurate timing are necessary to obtain accurate depth estimates using the bubble-pulse method. A 2-percent error in K causes a 16-ft error in depth at 620 ft. Depths determined from the ship and buoy hydrophones using the bubble pulse are estimated to have ± 25- and ± 35-ft accuracies, respectively (except for the shallow shots where surface effects are significant). Depths estimated from traveltime data are calculated to have ± 25-ft accuracy.

Depth measurements were used to estimate the percentage stretch of the nylon line used to suspend the buoy. (The unstretched line length was measured on the ship prior to charge launch so that the stretch factor could be obtained.) The average stretch was 22 percent, which is considerably higher than that expected from the manufacturers' specifications.[5] This stretch factor was used to compute charge depth when no hydroacoustic data were available.

Average drop and rise velocities were determined by dividing water depth at a station location by the drop and rise times, respectively. Water depth was obtained from fathometer recordings; drop and rise times were estimated from field-log information and by observing the recorded data. Drop and rise velocities were 5.7 ± 0.3 ft/sec and 4.1 ± 0.3 ft/sec, respectively.

The preliminary bulletin lists arrival times for all events recorded by the OBS units. Also included are arrival times from the land stations which were used in the crustal analysis. Epicenter-to-station distances; azimuths; and the arrival phase type, periods, and ground amplitudes are reported. Arrivals were associated with events which had known epicenters within 10° of the OBS units and with events (at all distances) which had a magnitude greater than 5.0. A total of 501 associated arrivals (including the 35 explosions detonated during the experiment) was identified.

SECTION II

CRUSTAL ANALYSIS

A. INTRODUCTION

This study's objective was to determine crustal structure across the Aleutian Ridge and, subsequently, to utilize this model in analyzing seismic traveltime anomalies observed in data obtained from the LONGSHOT experiment on Amchitka.

Data for the crustal study were obtained primarily from OBS recordings made during the 1967 Aleutian Islands Experiment. A few additional arrival times were used from the portable stations (S36 through S40) and the U.S. Coast & Geodetic Survey station at Adak, Alaska. Arrival times from the portable stations were supplied by the Geotech division of Teledyne Industries, Inc.; arrival times at Adak were obtained directly from the station. Station information is listed in Table II-1.

Thirty-five 5-ton explosions were detonated during field operations. Explosion information is listed in Table II-2.

Field data were collected in three phases. Phase I (Figure I-1) consisted of a line (S42°W, 182 km long) of 10 OBS units just south of Amchitka, crossing the Aleutian Trench. Sixteen explosions (20-km spacing) were detonated during this phase: 14 explosions inline to the south and two explosions inline north of Amchitka. Five of the southern shots were fired at approximately the same location (E1) but at different depths. The best recorded shot, E34, was used in the study. The total profile length was 440 km.

The profile for Phase II (Figure I-2) extends north and south of Amchitka. Six OBS units were launched and three explosions detonated inline (N42°E) north of Amchitka with a spacing of 100 km between explosions.

Table II-1

STATION INFORMATION

	Station	Unit	Drop Date (1968)	Location Latitude	Location Longitude	Water Depth (fm)
Phase I	S1	21	31 Aug.	51°25'12"N	178°45'00"E	187
	S2	19	1 Sept.	51°16'24"N	178°32'00"E	785
	S3	13	1 Sept.	51°09'18"N	178°20'24"E	1920
	S4	1	1 Sept.	51°01'00"N	178°06'48"E	1784
	S5	20	1 Sept.	50°53'15"N	177°59'42"E	2580
	S6	18	2 Sept.	50°45'00"N	177°46'00"E	2980
	S7	15	2 Sept.	50°36'20"N	177°37'00"E	3840
	S8	22	2 Sept.	50°26'12"N	177°22'42"E	3150
	S9	24	2 Sept.	50°20'42"N	177°13'12"E	2850
	S10	25	3 Sept.	50°11'48"N	177°02'12"E	2690
Phase II	S11	16	24 July	51°50'00"N	179°21'30"E	320
	S12	21	25 July	52°12'48"N	179°55'42"E	36
	S13	5	25 July	52°51'06"N	179°03'24"W	1500
	S14	22	26 July	53°32'00"N	178°00'00"W	2030
	S15	20	26 July	54°10'06"N	176°58'00"W	2025
	S16	15	26 July	54°47'48"N	175°50'30"W	2000
	S17	24	4 Aug.	47°24'48"N	173°36'24"E	2760
	S18	18	5 Aug.	45°59'00"N	172°02'48"E	3020
	S19	19	5 Aug.	44°30'30"N	170°26'54"E	720
	S20	13	6 Aug.	43°03'48"N	169°03'54"E	2740
	S21	25	7 Aug.	41°34'36"N	167°42'12"E	2840
Phase III	S23	24	10 July	51°41'00"N	179°09'30"E	460
	S24	1	10 July	51°51'00"N	179°21'24"E	325
	S25	15	10 July	52°02'50"N	179°23'54"E	101
	S26	18	11 July	52°05'06"N	179°44'24"E	32
	S27	19	11 July	52°13'00"N	179°56'00"E	36
	S28	20	11 July	52°21'00"N	179°50'40"W	95
	S29	[illegible]	12 July	52°29'36"N	179°40'54"W	62
	S30	22	12 July	52°38'00"N	179°27'00"W	60
	S31	21	12 July	52°46'30"N	179°12'24"W	862
	S32	2	12 July	52°53'54"N	179°01'48"W	1749

	Station	Place	Latitude	Longitude	Elev. (km)
Land Stations	S35	Adak Island	51°51'48"N	176°39'18"W	~ 0.1
	S36	Bethel, Alaska	60°46'44"N	161°53'01"W	~ 0.1
	S37	St. Paul Island	57°09'15"N	170°13'05"W	~ 0.1
	S38	Atka Island	52°12'07"N	174°12'42"W	~ 0.1
	S39	Shemya Island	52°43'47"N	174°06'33"E	~ 0.1
	S40	Amchitka Island	51°23'22"N	179°20'33"E	~ 0.1

Table II-2

EXPLOSION INFORMATION

	Event	Event Depth (ft)	Date (1968)	Detonation Time (GCT)	Location		Water Depth (fm)
					Latitude	Longitude	
Phase I	E1	619	8 Sept.	20:45:02.7	50°04'30"N	176°52'00"E	2527
	E2	610	3 Sept.	04:37:02.3	49°55'06"N	176°39'48"E	2580
	E3	616	6 Sept.	05:25:01.5	49°47'30"N	176°31'06"E	2810
	E4	617	6 Sept.	19:51:12.9	49°39'50"N	176°21'06"E	2735
	E5	618	6 Sept.	23:10:02.4	49°30'48"N	176°12'24"E	2715
	E6	621	7 Sept.	02:36:01.2	49°23'24"N	176°02'00"E	2400
	E7	621	5 Sept.	01:35:02.8	51°38'15"N	179°05'12"E	345
	E8	611	3 Sept.	22:30:02.1	51°49'30"N	179°20'36"E	305
	E30	604	7 Sept.	06:19:02.7	49°12'42"N	175°51'00"E	2820
	E31	620	8 Sept.	06:05:02.0	49°10'06"N	175°38'36"E	2950
	E32	616	8 Sept.	02:35:01.9	48°58'00"N	175°24'15"E	2190
	E33	612	7 Sept.	20:57:01.3	48°49'30"N	175°18'30"E	2675
	E34	1048	8 Sept.	22:30:02.8	50°04'42"N	176°52'00"E	2530
	E35	273	9 Sept.	01:00:01.4	50°04'48"N	176°51'18"E	2560
	E36	190	9 Sept.	04:45:01.5	50°03'24"N	176°54'40"E	2550
	E37	70	9 Sept.	06:45:00.6	50°03'42"N	176°52'48"E	2575
Phase II	E9	636	7 Aug.	21:35:03.8	40°04'42"N	166°23'36"E	3040
	E10	608	9 Aug.	03:55:02.2	42°17'54"N	168°19'06"E	2890
	E11	603	11 Aug.	00:25:01.8	45°44'00"N	171°40'42"E	3085
	E12	647	27 July	20:30:05.2	56°31'36"N	172°15'54"W	520
	E13	637	27 July	07:31:05.6	56°03'12"N	173°29'48"W	1775
	E14	637	27 July	01:40:05.3	55°24'18"N	174°44'24"W	1955
	E27	629	8 Aug.	04:40:03.7	40°51'36"N	167°02'18"E	2970
	E29	615	11 Aug.	20:36:02.2	48°05'40"N	174°27'30"E	2850
Phase III	E15	747	16 July	20:48:05.4	53°00'12"N	178°46'12"W	1930
	E16	755	17 July	02:20:06.1	53°09'12"N	178°37'06"W	2000
	E17	676	17 July	22:03:04.8	53°14'48"N	178°24'50"W	2015
	E18	678	18 July	01:[illegible]6:05.4	53°24'42"N	178°12'30"W	2020
	E19	679	18 July	03:30:05.5	53°31'20"N	178°00'00"W	2028
	E20	670	18 July	06:21:05.4	53°39'06"N	177°46'00"W	2030
	E21	669	18 July	23:25:05.5	53°45'54"N	177°32'54"W	2035
	E22	672	19 July	02:37:05.2	53°53'50"N	177°20'36"W	2035
	E24	660	20 July	00:32:05.6	51°16'40"N	178°35'24"E	760
	E25	664	20 July	05:05:05.4	51°10'30"N	178°20'30"E	1925
	E26	665	20 July	07:50:05.5	51°01'36"N	178°10'42"E	1785

South of Amchitka, five OBS units were launched on this line with a spacing of 200 km between units. Five explosions were detonated in the area: two inline to the south, one to the north, and two within the profile. Total profile length was approximately 1900 km. The primary purpose of Phase II was to record upper-mantle refractions from the CHASE VI explosion, which did not detonate.

The Phase-III array (Figure I-3) was similar to that of Phase I but was located north of Amchitka on the Petrel Bank. Ten OBS units were dropped in a line N42°E north of Amchitka with a 20-km spacing. The explosion program consisted of eight explosions inline to the north and three explosions inline to the south of Amchitka. Total profile length was 441 km. Recording periods for the three phases of the Aleutian Islands Experiment are shown in Figure II-1.

The Scripps Institute of Oceanography made seismic refraction profiles in the Bering Sea and the Gulf of Alaska in 1956, 1957, and 1961. Interpretation of these data was presented by Shor.[2,3] Figure I-4 gives a profile of the water bottom along a portion of the OBS refraction line (Phases I and III). Four of Shor's seismic profiles (CK8, CK10, L8-L9, and L9-L10) gave the sections shown in this figure; a normal oceanic section also is shown.

Sections L8-L9 and L9-L10 show that the Aleutian Basin is similar to a normal oceanic section but has low-velocity layers about 4 km thicker than normal and a depth to the mantle about 5 km greater than normal.

Section CK10 in the Aleutian Trench south of Adak has layers with velocities of 6.3 km/sec and 7.6 km/sec. The 7.6-km/sec velocity seems lower than normal for mantle velocity; however, Shor points out that very possibly only crustal arrivals were obtained on this profile.[2]

Section CK8 on the Aleutian Ridge near Adak shows relatively thin layers of low-velocity (3.2-km/sec and 3.8-km/sec) material overlaying a 5.5-km/sec layer. At a depth of about 7 km, crustal material with an oceanic crustal velocity of 6.6 km/sec was found. The mantle was not detected.

It is apparent that large lateral-velocity variations are present along the OBS refraction profile, since the water depth varies from a few meters to over 7 km and previous work by Shor[2] indicates that shallow high-velocity layers (5.5 km/sec) exist under the Aleutian Ridge.

B. DATA QUALITY

Quality of the seismic data recorded during the 1967 Aleutian Islands Experiment was generally good. However, there were problems caused by high ambient noise levels (especially for shallow-water units) and instrument malfunctions. A total of 31 unit drops was made during the three phases of the operation, and 27 units were recovered. Data from four of the 27 units could not be used in the crustal study analysis. Units S18 and S24 had faulty tape drives which precluded accurate timing. The digital clock in S4, when compared to the WWV recording, indicated an abnormal drift which was not consistent with the recorded time of event arrivals. All traces of S20 had very low amplitude, and the time could not be read from the clock trace. The cause of the low amplitude was not determined. Test tapes before unit drop and after recovery indicated that the unit was functioning properly.

Recordings from Phase I comprise the best data. The background noise level was low, and there were few mechanical problems. Data recorded during Phases II and III had lower quality, primarily due to high noise levels (2 to 10 Hz). Also, there were more mechanical problems. Table II-3 shows which explosions were recorded at each station.

Five of the nine units in Phase I recorded all of the explosions, three recorded all but one, and one unit (S9) recorded all but two. During Phase III, three of the eight units recorded all explosions, two others recorded most, and three recorded only a few. Since the units at each end of the Phase-III profile recorded all explosions, it appears that the arrivals at poorer stations were obscured by the high noise levels. The Phase-II array can be divided into those units dropped north of Amchitka and those units

Table II-3

EXPLOSION RECORDINGS USED IN CRUSTAL STUDY

	Station	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17	E18	E19	E20	E21	E22	E24	E25	E26	E27	E29	E30	E31	E32	E33	E34	E35	E36	E37
Phase I	S1	X		X	X	X	X	X	X																				X	X	X	X	X	X	X	X
	S2	X	X	X	X	X	X	X	X																				X	.	X	X	X	X	X	X
	S4		X	X	X	X	X	X	X																				X	X	X	X	X	X	X	
	S5	X	X	X	X	X	X	X	X																				X	X	X	X	X	X	X	X
	S6	X	X	X	X	X	X	X	X																				X	X	X	X	X	X	X	X
	S7	X	X	X	X	X	X	X	X																				X	X	X	X	X	X	X	X
	S8	X	X	X	X	X	X	X	X																				X	X	X	X	X		X	X
	S9	X		X	X	X	X	X																					X	X	X	X	X	X	X	X
	S10	X	X	X	X	X	X	X	X																				X	X	X	X	X	X	X	X
Phase II	S11											X	X	X	X													X								
	S12												X																							
	S14												X	X	X																					
	S15												X	X	X																					
	S16												X	X	X																					
	S17										X	X																X								
	S18									X	X	X															X	X								
	S19									X	X	X															X	X								
	S20																																			
	S21									X	X	X															X	X								
Phase III	S23															X	X	X	X	X	X	X	X	X	X	X										
	S24*																																			
	S25															X		X			X				X	X										
	S26																							X												
	S27															X	X							X												
	S28															X	X	X	X	X	X	X	X	X	X											
	S30															X	X	X	X	X	X	X		X												
	S31															X	X	X	X	X	X	X	X	X	X	X										
Land Stations	S35	X	X	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X			X					X	X	X
	S36												X	X						X	X				X						X					
	S37												X	X	X			X			X	X														
	S38		X		X	X		X					X	X	X	X	X	X	X	X	X	X	X	X	X	X		X								
	S39		X					X																X	X	X					X	X	X			
	S40	X	X	X	X	X	X	X								X	X		X					X	X	X			X	X			X		X	

Data not used

dropped south of Amchitka. Four units recorded all three northern explosions, and one unit recorded only one. These explosions were fired before units were dropped south of Amchitka. Four of the five units in the southern part recorded all five southern explosions, and one recorded three explosions. In addition, unit S11 of the northern profile recorded two of the southern explosions. Note, however, that two of the southern units had instrument problems.

In summary, problems that affected the data quality were

- High-amplitude noise (2 to 10 Hz)
- Periodically stopping tape drive
- Tape take-up reel malfunction
- Digital clock malfunction

One additional factor which greatly affects all data, regardless of unit performance and background noise, is the WWV timing signal applied at the beginning and end of each set of data. In many instances, the recording of WWV was noisy and the amplitude very large, making it difficult to distinguish the minute marks. The recording of a secondary time enhanced the ability to determine reset times and clock drift. Without the secondary time, some data would have had very little value.

Table II-4 gives a brief description of data recorded by each unit and unit problems.

C. PRELIMINARY DATA HANDLING

Magnetic tapes containing data recorded in the field were shipped to Dallas for processing at the end of each phase of the experiment. All data recorded on magnetic tape were transcribed on 16-mm film for routine analysis. No frequency filtering was done, but the X10 and X100 channels were attenuated to avoid trace-overlapping on the film. A total of 298 complete or partial usable days was transcribed. The results of the routine data analysis are reported in Appendix B.

Table II-4

EXPLOSION RESULTS

Unit	Description
	Phase I
S1	Recorded all explosions except E2. Noise prevented picking initial arrivals. Data showed 2-Hz oscillation and 5- to 10-Hz background noise on H_1 and H_2. Vertical trace was dead on all channels.
S2	Recorded all explosions. All data were good. H_2 X1 and X10 appeared dead. General background noise was in the 1- to 2-Hz range.
S3	Not recovered.
S4	Recorded all explosions. Seismic data were very good but could not be used due to the digital clock malfunction. Clock drift could not be determined. Z X100 contained much 10-Hz noise. General background noise was in the 1- to 2-Hz range.
S5	Recorded all explosions. Data quality was very good. Background noise ranged from 1 to 5 Hz. Some low-level 5- to 10-Hz noise appeared on H_1 and H_2.
S6	Recorded all explosions. Data quality was good. The tape drive stopping periodically affected the timing of the initial arrival of explosion E4. General background noise ranged from 1 to 2 Hz.
S7	Recorded all explosions. Data quality was very good. General background noise ranged from 1 to 3 Hz. H_1 and H_2 at X100 were clipped.
S8	Recorded all explosions except E35. Data quality was fair. Amplitudes of all traces appeared too low. All traces including the digital clock and 12.5-Hz reference channel appeared dead intermittently.
S9	Recorded all explosions except E2 and E8, which were not recorded due to a slow tape drive during the first two recording days. Data were very good. Background noise normally was 1 to 3 Hz, with some small-amplitude 10-Hz noise.
S10	Recorded all explosions. Data quality was very good. Background noise ranged from 1 to 3 Hz.
	Phase II
S11	Recorded all explosions from the nor... and two from the south. Data were similar to S23 data. General background noise was 1 to 3 Hz. Periodical all traces were affected by 7- to 9-Hz noise.
S12	Recorded explosion E12 only. Z trace was ... on X1, X10, and X100. Much of the data exhibited high-level 5- to 10-Hz noise.
S13	Not recovered.
S14	Recorded all northern explosions. Data quality was fair. Noise ranged from 3 to 5 Hz, with occasional ringing on all traces. Amplitudes on all traces appeared low.
S15	Recorded all northern explosions. Data quality was good. Amplitudes on all vertical traces appeared low. Background noise ranged from 1 to 3 Hz.
S16	Recorded all northern shots. Data quality was good. Background noise normally was 1 to [illegible] Hz.
S17	Recorded three of five southern explosions. The take-up reel did not function properly. All traces were dead or had a very low amplitude over much of the recording period. When the unit appeared to be operating properly, H_1 and H_2 were oscillating and only the vertical appeared normal. Vertical noise ranged from 1 to 3 Hz.
S18	Recorded all southern explosions. Data contained bursts of 10-Hz noise and periodic 2-Hz oscillations. Background noise was low, and data were good when instruments were not oscillating. A faulty tape drive during recording of WWV prevented reading time of the digital clock trace, thus clock drift could not be determined.
S19	Recorded all southern explosions. Data quality was only fair. Majority of data contained 2-Hz oscillations with numerous bursts of 8- and 10-Hz noise.
S20	All traces had very low amplitudes. The clock-trace amplitude was too low to read.
S21	Recorded all southern explosions. Data quality was good. Background noise ranged from 2 to 3 Hz.
	Phase III
S23	Recorded all explosions. Data quality was good. Traces P, Z, and H_1 X10 were dead. Background noise was 1 to 3 Hz, with some 5- to 10-Hz noise present.
S24	Data could not be used due to a faulty tape drive. Clock time could be determined only intermittently.
S25	Five of the eleven explosions were recorded, but only three could be timed very accurately. Noise in the 5- to 10-Hz range was present most of the time.
S26	Only one explosion recorded. Approximately three-fourths of the data had high-level 5- to 10-Hz noise.
S27	Five explosions were recorded, two being very emergent. A, H_1, and H_2 X1 and X10 traces had high-level 12-Hz noise. Noise on the pressure trace was high.
S28	Recorded all but explosion E26, which was obscured by noise. Background noise ranged from 1 to 3 Hz, with some 5-Hz noise present.
S29	Not recovered.
S30	Recorded eight explosions. Due to extreme tilt of the unit, all channels except the pressure channel did not function properly. All arrival times were picked from the pressure channel. Z, H_1, and H_2 channels oscillated at about 2 Hz.
S31	Recorded all explosions. Data quality was good. Very little 5- to 10-Hz background noise was present. The digital clock did not count days.
S32	Not recovered.

Timing errors due to digital clock drift and/or misalignment of the recording heads were determined. Head misalignment can occur when the recording heads are skewed with respect to the direction of tape movement or when the two head banks are spaced incorrectly. Errors due to head misalignment were determined using either the amplifier "shut-off" pulse or the daily calibration pulse. All channels are referenced to channel 12. It is assumed that the error between channel 12 and the clock channel (channel 14) is negligible, which is reasonable because the two heads are physically close together. This assumption must be made because the amplifier "shut-off" pulse is not recorded on channel 14. An example of head misalignment due to the recording heads being skewed is shown in Figure II-2. Errors resulting from incorrectly spaced head banks were not encountered in this experiment. Table II-5 lists the errors for each unit and each drop. The maximum error for any channel was 0.4 sec, and the maximum variation of error for one channel of a single unit dropped more than once was 0.2 sec.

A secondary timing pulse was recorded on the first horizontal channel to enhance the capability for determining station reset time (i.e., zero time on the digital clock) when the noise level on WWV was excessively high (Figure II-3). The capability to determine reset times was greatly increased except during Phase I when vibrations from the ship and rough seas caused the secondary timing system to lose synchronization with WWV.

Digital clock drift for each drop was determined by comparing the WWV and secondary time at the end of the recording period to the time recorded by the digital clock. Corrections for clock drift were made assuming that the drift was linear over the recording period. Clock drift for each unit drop is listed in Table II-5.

Table II-5

RESET TIMES, CLOCK DRIFTS, AND CHANNEL CORRECTIONS

Station	Unit	Corrected Reset Time (GCT)				Clock Drift (Sec)	Channel Head-Misalignment Corrections (Sec)										
		Day	Hr	Min	Sec		1	2	3	4	5	6	8	9	10	11	15
S1	21	243	23	04	59.9	+0.1	-0.1	-0.1	0.0	-0.1	+0.1	-0.2	+0.1	+0.2	0.0	+0.2	+0.3
S2	19	244	01	25	00.0	0.0	0.0	-0.1	0.0	-0.2	+0.1	-0.1	-0.2	+0.1	0.0	0.0	+0.2
S4	1	244	05	55	00.0	*	0.0	-0.1	0.0	-0.1	+0.1	-0.1	-0.1	+0.1	-0.1	+0.1	+0.2
S5	20	244	20	20	00.3	-0.1	-0.1	-0.2	0.0	-0.2	0.0	-0.2	-0.2	+0.1	0.0	+0.2	+0.3
S6	18	245	00	40	00.0	-0.6	-0.2	-0.4	-0.2	-0.3	-0.1	-0.2	-0.1	+0.1	0.0	+0.2	+0.3
S7	15	245	05	35	00.0	-0.1	+0.2	-0.1	+0.3	-0.1	+0.3	-0.1	-0.1	+0.3	-0.1	+0.3	+0.4
S8	22	245	18	05	00.4	0.0	-0.2	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	+0.1	0.0	+0.2	+0.2
S9	24	245	21	15	00.4	+0.7	+0.3	-0.1	+0.3	-0.1	+0.4	-0.1	-0.1	+0.2	0.0	+0.4	+0.5
S10	25	246	00	20	00.0	0.0	0.0	-0.2	+0.1	-0.2	0.0	-0.1	-0.1	0.0	0.0	+0.1	+0.2
S11	16	205	21	15	00.6	+0.6	0.0	-0.2	0.0	-0.1	+0.1	-0.1	-0.1	+0.1	0.0	+0.2	+0.3
S12	21	206	05	04	59.5	-4.3	-0.1	-0.2	-0.1	-0.2	0.0	-0.2	-0.1	+0.1	-0.1	+0.2	+0.3
S14	22	207	00	15	00.3	-0.4	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	0.0	0.0	+0.1	+0.1
S15	20	207	05	14	59.9	+0.3	0.0	-0.2	0.0	-0.1	+0.1	-0.1	-0.1	+0.1	0.0	+0.2	+0.3
S16	15	207	18	35	00.0	0.0	+0.3	-0.1	-0.3	-0.1	+0.4	-0.1	-0.1	+0.3	0.0	+0.3	+0.4
S17	24	216	19	00	00.5	0.0	0.0	-0.1	0.0	-0.1	+0.1	-0.1	0.0	+0.1	0.0	+0.1	+0.2
S18	18	217	05	05	00.1	*	-0.1	-0.1	-0.1	-0.1	+0.2	-0.1	-0.1	+0.2	-0.1	+0.3	+0.3
S19	19	217	17	35	00.0	0.0	+0.1	-0.1	+0.1	-0.2	+0.1	-0.1	-0.1	+0.1	-0.1	+0.1	+0.2
S20	13					**											
S21	25	218	23	39	59.8	+0.1	+0.2	-0.1	+0.2	-0.1	+0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1
S23	24	190	23	30	00.4	+0.1	0.0	-0.2	+0.1	-0.2	+0.2	-0.1	-0.1	+0.2	0.0	+0.3	+0.4
S24	1	191	03	40	00.0	-2.8	0.0	-0.2	0.0	-0.1	+0.1	-0.1	-0.1	+0.1	0.0	+0.2	+0.1
S25	15	191	20	20	00.3	-1.5	+0.1	-0.1	+0.1	-0.1	+0.2	-0.1	0.0	+0.2	0.0	+0.3	+0.3
S26	18	192	02	00	01.2	-24.4	-0.4	-0.4	-0.2	-0.3	-0.1	-0.2	-0.2	0.0	0.0	+0.1	+0.3
S27	19	192	06	09	59.1	-0.2	+0.1	0.0	+0.1	0.0	+0.2	-0.1	-0.1	+0.2	0.0	+0.2	+0.4
S28	20	192	20	50	00.1	-0.8	-0.1	-0.1	0.0	-0.1	+0.1	-0.1	-0.1	+0.2	-0.1	+0.3	+0.3
S30	22	193	01	44	59.6	+0.5	-0.2	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	+0.1	-0.1	+0.1	+0.2
S31	21	193	04	30	01.2	+0.2	0.0	-0.2	0.0	-0.1	+0.1	-0.1	-0.1	+0.2	0.0	+0.2	+0.3

* Digital clock faulty after release

** Trace amplitude too low to read time

Individual clock drifts ranged from 0.0 sec to 24.4 sec; however, only four clocks had drifts greater than 0.8 sec. Clock drift could not be determined for drops S4, S18, and S20; but analysis of event arrival times recorded at S4 and S18 indicated that the clocks were drifting. The clock in S4 became faulty between its release from anchor and recovery on the surface. Analysis of arrival times revealed an error of approximately 4.0 sec, but WWV indicated a drift of 2 min, 46 sec at the end of the recording. A faulty tape drive during the recording of WWV prevented the determination of clock drift for S18. Station S26 (Phase III) used clock 18 which had a drift of 24.4 sec, and the same clock used at station S18 (Phase II) had considerable drift. Clock 18 was not used for Phase-I operation. Clock 1 at station S24 (Phase III) had a drift of 2.8 sec, and the same clock at station S4 (Phase I) showed a large drift. Clock 1 was used in Phase-II operation at station S20; however, all traces for S20 had such low amplitude that time could not be read on the clock channel to determine the amount of drift. Clock 13 at station S12 (Phase II) had a drift of 4.3 sec. The same clock was used at station S3 (Phase I), but that unit was not recovered.

Film seismograms were scanned and edit times were picked for each explosion recorded at each unit. The field data were digitized at a sample rate of 31.25 msec (giving a 16.0-Hz Nyquist frequency). Both unfiltered and filtered playbacks (Figure II-4) were made for each digital record, with the filtered playbacks attenuated sufficiently to allow timing of secondary arrivals. Two filters were used in making the playbacks: one had a 2.25- to 5.0-Hz passband, the other a 2.25- to 7.0-Hz passband. The playbacks were used to pick arrival times for input to programs for determining crustal structure. After all arrival times were picked, times were punched on cards and processed through the time conversion program to convert the clock times into GCT time. A flow chart of preliminary data handling is shown in Figure II-5.

D. DATA REDUCTION

Since the shots and receivers are not located on the same plane, the data must be reduced to a common plane for interpretive purposes. In deep water, the downward-traveling energy from the shot includes a considerable path length through the water (3 to 4 sec) because the shot is relatively near the surface; whereas the returning energy has no path through the water since the receiver rests directly on the ocean bottom. If the water depth at the shot and receiver were equal, then the time through the water could be simply removed from the raw traveltimes. Then refractor depths computed from intercept times would be depths below the ocean bottom. However, as discussed earlier, large water-depth variations are present in the area. Previous work indicates high-velocity material under the Aleutian Ridge[2,3]; therefore, the large lateral-velocity variation present in the upper 4 or 5 km must be taken into account if the raw traveltimes are to be interpreted.

The method used here is to reduce the raw traveltimes to traveltimes below a reference plane by stripping off the time from shot to reference plane and station to reference plane. The method is shown in Figure II-6. Two corrections are applied for each shot-receiver configuration. The receiver correction requires knowledge of the subwater velocity (V_2) and the refractor velocity (V_n), while the shot correction requires, in addition, the water velocity (V_1). The subwater correction velocity is used to strip off time from the water bottom to the reference plane. Since the subwater velocity in the Aleutian Basin is low (2 km/sec) and is high (5.5 km/sec) on the Aleutian Ridge, it becomes necessary to apply a different subwater correction velocity (V_{2A} or V_{2B}) to stations or shots, depending on whether they are located on the ridge or in deep water. This is implemented by a decision plane. A depth below sea level is specified for the decision plane, and either V_{2A} (low subwater velocity) or V_{2B} (high subwater velocity) is used in the reference-plane-correction computation, depending on whether the water depth at the shot or station is above or below the decision-plane level.

Four programs have been written in Fortran IV for processing the refraction data on the IBM S/360 computer. The first program performs three basic operations:

- Computes and applies time corrections to reduce raw traveltimes to corrected traveltimes below a reference plane
- Computes shot-to-station epicentral distance
- Generates (optionally) time-distance plots of raw or corrected traveltime

Input to the program is a building block of data containing station number, geodetic coordinates, and water depth for each station; and shot number, geodetic coordinates, water depth, shot depth, and shot time for each shot. This building block of data, which needs to be made up only once, then is loaded into the core on each run to provide the necessary station and shot information. One control card containing the following information is read into the computer.

- V_1 — Water velocity
- V_{2A} — Subwater velocity (low)
- V_{2B} — Subwater velocity (high)
- V_n — Refractor velocity
- RP — Reference-plane depth
- DP — Decision-plane depth
- V_{RED} — Velocity used to compute reduced traveltime t_R, i.e.,

$$t_R = t - \frac{\Delta}{V_{RED}}$$

where

t = traveltime corrected to RP
Δ = distance

The input data are read in from cards, each card giving station number, shot number, and GMT arrival time of the picked phase. The program then computes, prints, and punches on cards the following information:

- Shot-to-station distance
- Raw traveltime
- Traveltime below the reference plane (corrected traveltime)
- Reduced traveltime

The second program generates the following types of time-distance plots for the CalComp plotter:

- Raw traveltimes vs distance
- Corrected traveltimes vs distance
- Reduced traveltimes vs distance

Cards output from the correction program are input to this program. One control card is read in to scale the plots to the desired size.

The third program computes least-squares line fits to both the raw times and corrected times. It gives one line fit assuming no error in distance, one assuming no error in time, and a maximum-likelihood fit assuming both variables in error. Input to this program also are the cards output from the correction program.

The fourth program computes dip, depth, and velocity of the refractor for a reversed profile assuming plane dipping constant-velocity layers and that the seismic ray obeys Snell's Law at the interface between two layers. Input to the program are updip velocity and intercept time and downdip velocity and intercept time.

E. DATA ANALYSIS

1. First Estimate

All data were processed through the correction program using velocities determined from previously published work on the general area.[2,3] This procedure give a first look at the arrival-time data and provides the starting point for separation of the data into velocity groups. Parameters for the first estimate were as follows:

- V_1 = 1.5 km/sec
- V_{2A} = 2.1 km/sec
- V_{2B} = 5.0 km/sec
- V_n = 8.0 km/sec
- RP = -4.5 km
- DP = -3.0 km
- V_{RED} = 8.0 km/sec

The correction error which results from an incorrect estimate of V_{2A} (the low subwater correction velocity) was minimized by choosing the reference-plane level to approximate the average water depth observed south of the ridge and in the Aleutian Basin. The correction error for the path in the water layer is small, since 1.5 km/sec is a good estimate of the water velocity. The estimate for V_{2B} (5.0 km/sec) is the average velocity from the surface to the reference plane using Shor's CK8 profile.[2,3]

All arrivals from Phases I, II, and III were processed through the correction program and then plotted. Separate plots were made by phase number (I, II, or III), arrival time (first or secondary), and shot location (north or south of the stations). Plots of the raw traveltimes are presented in Figures II-7 through II-16.

After examining the plots and running line fits on the data (one shot to all stations and all shots to one station), first arrivals were separated into two groups (Pn and Pg) on the basis of apparent velocity. First arrivals from shots E7 and E8 into S1, S2, and S40 (Figure II-9) and from shots E24, E25, and E26 into S23, S25, and S40 (Figure II-15) did not penetrate the mantle and were placed in the Pg group. Average velocity of these Pg arrivals was 6.3 km/sec. The majority of the first arrivals were refractions from the Moho, giving an average velocity of about 8 km/sec; hence, any information on the upper refractors necessarily must come from secondary arrivals.

Figures II-14 and II-16 show the secondary arrivals picked from individual recordings of Phase III. Each point represents a change in character (amplitude or frequency) observed on any one of the three components. Many of the arrivals were undoubtedly due to additional bounces in the water layer at the shot and/or receiver. Waveforms could not be visually correlated across the profile with confidence, precluding the determination of which points represented arrivals from the same refractor. The large number of picks shown indicates, in part, the structural complexity in the area (i.e., the deviation from plane homogeneous layering).

For Phase I, the picks were limited (Figures II-8 and II-10) to the first 10 or 15 sec after the initial P-phase and to a later arrival which showed a large change in amplitude.

Only the secondary arrivals which showed definite lineups were considered in the present study. Figure II-8 shows one such set of points. (A 4.6-km/sec velocity line was placed on the figure to show which points are under discussion.) Line fits to these points give a propagation velocity of about 4.6 km/sec. For a mantle P-wave velocity of 8.0 km/sec, the equivalent S-wave velocity (taking 0.25 as Poisson's ratio) is 4.62; those secondary arrivals were placed in the S group. A few secondary lineups were observed for Phases I and III (Figures II-8 and II-14) which showed Pn velocity. These were interpreted as a Pn refraction with one or more additional bounces in the water layer. Since these arrivals would add nothing to the crustal model computation, they were discarded.

2. First Iteration

After separating the arrivals into Pn, Pg, and S groups, the data were recycled through the correction program using the measured refractor velocities. The reference-plane elevation was raised to -3.5 km for the Pg arrivals, since the station-shot pairs which recorded Pg had a maximum water depth of 3.52 km.

Correction parameters for the three groups follow.

	V_1 (km/sec)	V_{2A} (km/sec)	V_{2B} (km/sec)	V_n (km/sec)	RP (km)	DP (km)	V_{RED} (km/sec)
Pn arrivals	1.5	2.1	5.0	8.0	-4.5	-3.0	8.0
Pg arrivals	1.5	2.1	5.0	6.3	-3.5	-3.0	8.0
S arrivals	1.5	1.5	2.9	4.6	-4. [illegible]	-3.0	5.0

CalComp plots of the raw times and corrected times were made and are presented in Figures II-17 through II-36. A comparison of the raw and corrected traveltime plots show the largest effect of the reference-plane correction was to lower the points by 2 to 4 sec. In addition, the standard deviation of a related set of points would be reduced. A list of line fits to raw and corrected times for six sets of points follows.

Points Used	Standard Deviation Raw (km)	Standard Deviation Corrected (km)
E34 to S9, S8, S7, S6, S5, S2, S1, S40	4.44	5.63
E7 to S5, S6, S7, S8, S9, S10	1.02	3.03
E24 to S28, S30, S31	1.83	1.13
E15 to S30, S28, S25, S23	2.50	2.33
E2, E3, E4, E5, E6, E30, E31, E32, E33 to S10	4.60	4.44
E16, E17, E18, E19, E20, E21, E22 to S31	0.58	0.56

The last four show that the standard deviation was reduced; however, the first two show an increase. The explanation for the increase is not certain; an incorrect (too low) subwater velocity might have been used or the structure could be complicated at depth. (That is, the traveltimes for the water leg to each station tend to compensate for the Moho structure, giving a "straight-line" appearance to the raw data.) It should be pointed out that the corrections applied reduced the largest variation, which was due to the extreme water-depth changes under this profile.

Line fits were run to determine apparent velocities, and a preliminary calculation of the model was made using the Pn arrivals and assuming an average velocity of 6.5 km/sec from the reference plane to the refractor. The refractor velocities were determined using the reverse profiles of Phases I and III. An inspection of the model allowed determination of the critical distance for the Pn refractions. First arrivals from E34 to S10 and E15 to S31 cannot be Pn refractions because the station-to-shot separation is much less than the critical distance. These points were removed and the line fits recomputed, giving an average Pn-refractor velocity of 8.05 km/sec, which was used in the next iteration.

Pg arrivals from Phase-III-south shots are shown in Figure II-28 (with velocity lines for reference). Although the station on Amchitka (540) was not on the line of the profile, it was included in the analysis because the three additional arrivals increased the sampling for the Pg refractor (from five to eight traveltime observations). Assuming an average velocity of 5.5 km/sec from reference plane to refractor, depths and true velocities were determined for the Pg arrivals. The average resolved velocity was 6.2 km/sec, which was used in the next iteration. Shots E26 and E25 were corrected to the reference plane previously using the low subwater correction velocity (2.1 km/sec). However, the 6.2-km/sec refractor in the vicinity of E26 and E25 is only 3.5 to 5. km deep, indicating that these shots are over the Aleutian Ridge and should be corrected using the high subwater correction velocity (5.0 km/sec). Therefore, the decision plane was lowered from -3.0 km to -3.524 km.

Arrivals from E7 to S1 and S2 and S1 to E7 and E8 gave an average velocity of 5.1 km/sec, indicating they did not penetrate the 6.2-km/sec refractor. This can be seen in Figure II-26 by comparing the apparent velocities with the two reference lines (5.0 km/sec and 6.0 km/sec). These arrivals were analyzed separately as shallow Pg arrivals.

3. Second Iteration

Using velocity measurements from the first iteration, the data were recycled through the correction program again using the following correction parameters:

	V_1 (km/sec)	V_{2A} (km/sec)	V_{2B} (km/sec)	V_n (km/sec)	RP (km)	DP (km)	V_{RED} (km/sec)
Pn arrivals	1.5	2.1	5.0	8.05	-4.5	-3.524	8.0
Pg arrivals	1.5	2.1	5.0	6.2	-3.5	-3.524	8.0
Shallow Pg arrivals	1.5	2.1	3.5	5.1	0.0	-0.1	8.0
S arrivals	1.5	1.5	2.9	4.6	-4.6	-3.524	5.0

CalComp plots were made, the corrected traveltimes and reduced traveltimes are shown in Figures II-37 through II-58.

It is interesting to note the pattern presented by the points representing all shots into one station (or one shot into all stations). For constant-velocity plane dipping layers, the pattern is simply a straight line. Points which deviate from this pattern are indicative of a lateral crustal velocity change or a crustal thickening beneath the point. In either case, the pattern is indicative of structural complexity along the profile.

If the same refractor is penetrated, the pattern from all shots into one station is the same as all shots into another station. An inspection of this pattern allows determination of the arrival-time picks which are unreliable (due to high noise background or weak signal strength). The similar patterns given by all shots into S10 (Figure II-38) and S7 indicate reliability of these arrival-time picks. As noted earlier and as indicated by the pattern differences between the first and second points, the first arrival from E34 to S10 cannot be a Pn refraction, since the separation was much less than the critical distance. The pattern shown by station S2 indicates that the last point was an unreliable pick and does not represent the true traveltime.

Figure II-40 shows the pattern of shots E7 and E8 into all stations. The similarity indicates the reliability of the picks, and the time offset (about 1.5 sec) between the two patterns is indicative of a large crustal thickness change (or crustal velocity change) from E7 to E8. This is not too surprising since the ray paths from E7 and E8 into the Phase-I instruments probably are penetrating the most complex part of the Aleutian Ridge structure (the root).

Figure II-42 shows the pattern of all shots into S31, S30, S28, S23, and S40 (Amchitka). S31 recorded all shots well; the first point (E15 to S31) did not penetrate the Pn refractor. Picks from S30 show some scatter.

The instrument was tilted, and only the pressure channel (which was noisy) could be used for picking first arrivals. The increasing time offset between the patterns indicates the increasing crustal thickness under the Petrel Bank toward Amchitka. S28 recorded all shots, and the pattern agrees well with S31. The two shots recorded by S27 appear much too early, indicating the unreliability of those picks. S25 also recorded only two shots; however, these appear to be good, and the time offset corresponds well with the other stations. S23 recorded all eight shots, but some scatter is shown due to the low signal-to-noise ratio. The three arrivals at S40 (Amchitka) must be considered unreliable because the pattern shows no resemblance to the others. The nearly straight-line pattern shown by S31 and S28 is indicative of the structural uniformity under the shots in this part of the Aleutian Basin.

4. The Model

Model computation assumes plane constant-velocity dipping layers. Reverse profile solutions are obtained using the methods of Steinhart and Meyer.[6] The shot and receiver lines (Phases I and III) were designed to divide the structure across the Aleutian Ridge into four segments, each of which could be approximated by a plane dipping layer. If the layer actually changes dip within the reversed profile (i.e., does not precisely fulfill the plane layer assumption), the best approximation will be obtained by using the closest shots available on either end into the line of receivers.

Line fits were run on the second-iteration output. For Phase I, depths and refractor velocity were computed using the reverse coverage from the closest shots, E34 on the south and E7 on the north. The average crustal velocity was taken to be 6.8 km/sec. The line fit for E34 to S9, S8, S7, S6, S5, S2, S1, and S40 yielded a slope of 0.1299, a velocity of 7.70 km/sec, and an intercept of 2.54 sec. The line fit for E7 to S5, S6, S7, S8, S9, and S10 yielded a slope of 0.1186, a velocity of 8.43 km/sec, and an intercept of 5.16 sec.

Results are shown in Figure I-5, with the areas of single and reverse coverage indicated. Dip of the layer is 4.1°, and the refractor velocity is 8.03 km/sec. The line fits and points used are shown in Figure II-59.

Apparent velocity and intercept time for the Phase-I shots were measured by fitting the southern shots to the closest receiver, i.e., E2, E3, E4, E5, E6, E30, E31, E32, and E33 to S10, yielding a slope of 0.1216, a velocity of 8.23 km/sec, and an intercept of 2.29 sec. Figure II-60 shows the line fit and points used. Dip and depth under the shots were computed by assuming that the refractor velocity (8.03 km/sec) derived from the reverse coverage of Phase I remains constant and applies to the area under the shots. The result is shown in Figure I-5. Dip of the layer is 2.1°, and the computed depth at E33 is 11.9 km (below sea level) which compares reasonably well with Moho depth in a normal oceanic section.

Next, depths and refractor velocity were computed using the reverse coverage from the closest shots, E15 on the north and E24 on the south, into the stations of Phase III. The line fit for E15 to S30, S28, S25, and S23 yielded a slope of 0.1366, a velocity of 7.32 km/sec, and an intercept of 3.24 sec. The line fit for E24 to S28, S30, and S31 yielded a slope of 0.1058, a velocity of 9.45 km/sec, and an intercept of 8.98 sec. This result is shown in Figure I-5. Dip of the layer is computed to be 11.2°, and the refractor velocity is 8.09 km/sec. The line fits and points used are shown in Figure II-61.

The method of determining dip, depths, and refractor velocity from a reverse profile uses the apparent up-dip velocity and intercept time and the apparent down-dip velocity and intercept time. Explicit knowledge of the actual distance between the two shots from which the arrival times were obtained is not required because the method assumes plane dipping constant-velocity layers across the profile.

For a single layer over a half-space, the reverse-profile solution can be obtained from the equations shown in Figure II-62. Note that the horizontal distance (R) between the pair of shots is not used to calculate dip, depths, and velocity. However, to provide quick verification of the solution, this distance is input to the program which computes the reverse-profile solution (dip, depths, and velocity) and subsequently determines another dip angle (dipcomp) using the two computed depths and the distance, i.e.,

$$\text{dipcomp} = \text{arc tan} \frac{h_{ou} - h_{od}}{R}$$

The dip and dipcomp angles should agree within experimental measurement.

Good agreement was obtained for the Phase-I reverse profile, where the solution dip was 4.17° and the dipcomp was 4.13°. For the Phase-III reverse profile, the solution dip was 11.2° and the dipcomp 7.9°, giving a 3.3° inconsistency.

The indicated traveltime from E24 to E15 is 2.5 sec less than the traveltime from E15 to E24 (Figure II-61). This does not imply an error in the data because there was no recording station located at either E24 or E15 and the 2.5-sec mistie was determined by simply projecting the line fits past the last recording station to intersect the computed shot distance. E15 is 38 km north of the northernmost station (S31) which recorded E24, and E24 is 59 km south of the southernmost station (S23) which recorded E15. Station S27 recorded first arrivals from shots E24 to the south and E15 and E16 to the north only, and they appeared to be 1 to 2 sec early. Since the unit reset time was questionable (the WWV signal was very noisy and the secondary timing signal was not recorded), these arrivals were not used in the analysis. It should be noted, however, that a mistie was present even with the use of S27 data.

Lines that fulfill the reciprocity requirements cannot be reasonably fitted to the data, indicating that plane layer approximation across this segment is an oversimplification. No attempt is made here to quantitatively explain the mistie, but certain contributory effects may be suggested. First, a lateral change in crustal velocity between the shot and receiver could occur; second, an upward warping of the refractor to the south of S25 would decrease the path length in the crust from E24 to the refractor; third, the traveltime plots (Figure II-61) indicate that a curved line (concave downward) or a series of straight lines could be fitted to the observed points. This implies that the refracted events are propagating through some zone of increasing velocity at depth or that the refractor interface has curvature. The total anomaly probably is due to a combination of these effects, and the complexity of the crust and crust-mantle interface is indicated.

Due to the limited number of observations, reverse coverage was obtained over a relatively small portion of the refractor. Unfortunately, two of the units in the Phase-III drop were not recovered; data could not be used from another because of a faulty tape drive; and several did not record all explosions due to the higher-than-normal noise level associated with the instruments located along Petrel Bank. Lack of additional data from Phase III precludes a good estimate of the model under the Petrel Bank, and the model shown under Phase-III stations (Figure I-5) is questionable.

Apparent velocity and intercept time under the Phase-III shots were measured by taking the northern shots into the closest receiver (S31). The line fit for S31 to E16, E17, E18, E19, E20, E21, and E22 yielded a slope of 0.1160, a velocity of 8.62 km/sec, and an intercept of 4.24 sec. Line fit and points used are shown in Figure II-63. Dip and depth under the shots were computed by assuming a true refractor velocity of 8.09 km/sec. As shown in Figure I-5, dip of the layer is 5.1°, and the computed depth at E22 is 15.3 km (below sea level). Shor's L9-L10 (about 40 km northeast of E22) gave a depth of 16.4 km and a velocity of 8.08 km/sec for the Moho refractor.[2,3]

Data from the southern shots of Phase III recorded at S23, S25, and S40 were used to determine depths and refractor velocities of the Pg arrivals. The reference plane was set at -3.5 km to place it above the refractor. Average velocity to the refractor was assumed to be 5.5 km/sec. The following line fits were obtained:

- S23 to E24, E25, and E26 — slope = 0.1567, velocity = 6.38 km/sec, intercept = 1.80 sec
- S40 to E24, E25, and E26 — slope = 0.1518, velocity = 6.58 km/sec, intercept = 1.43 sec
- E25 to S40, S23, and S25 — slope = 0.1686, velocity = 5.93 km/sec, intercept = 0.63 sec
- E26 to S40, S23, and S25 — slope = 0.1698, velocity = 5.88 km/sec, intercept = 0.01 sec

Resolving all pairs of line fits which gave reverses, the following velocities and dips were obtained:

- S23 and E2 — refractor velocity = 6.13 km/sec, dip = 4.23°
- S23 and E26 — refractor velocity = 6.10 km/sec, dip = 4.79°
- S40 and E25 — refractor velocity = 6.21 km/sec, dip = 5.68°
- S40 and E26 — refractor velocity = 6.18 km/sec, dip = 6.23°

Results are shown in Figure I-5 as one average line.

The reference plane for the shallow Pg arrivals was set at sea level, and an average crustal velocity to the refractor was taken s 3.8 km/sec. It should be noted that one traveltime (E7 to S1) is common to both apparent-velocity determinations and only three points are actually involved.

Table II-6

LINE FITS — PHASE II

Station	Shots	Aleutian Basin Shots			Pacific Shots			Phase
		Velocity (km/sec)	Slope	Intercept	Velocity (km/sec)	Slope	Intercept	
S11	E12, E13, E14	7.86	0.1272	7.72				Pn
S14	E12, E13, E14	7.99	0.1252	6.42				Pn
S15	E12, E13, E14	7.78	0.1285	5.70				Pn
S16	E12, E13, E14	7.97	0.1254	3.07				Pn
S37	E12, E13, E14	8.07	0.1239	5.76				Pn
S11	E11, E29				7.92	0.1263	2.82	Pn
S19	E9, E10, E27				8.53	0.1172	7.09	Pn
S21	E11, E29				8.04	0.1244	3.10	Pn
S37	E12, E13, E14	4.54	0.2202	6.380				S
S14-S15	E13	4.98	0.2009	17.974				S

However, in the interest of analyzing the data, a depth and velocity were computed using E7 and E8 recorded at S1, and E7 recorded at S1 and S2. The apparent velocities were 4.83 km/sec and 4.96 km/sec, respectively. Resolving the two apparent velocities gave a refractor velocity of 4.90 km/sec, with a dip of 0.92° for the refracting layer.

Velocity measurements were made for P- and S-wave arrivals recorded during Phase II. The maximum number of points for any one line fit was three, and in several cases only two points were available. Velocity, intercept time, and slope for each of the line fits are given in Table II-6.

Shots E12, E13, and E14 were recorded by stations S16, S15, S14, and S11 to the south and by S37 (St. Paul Island) to the north. The line fits for the three shots recorded by the southern stations show some variation in apparent velocity (from 7.78 km/sec to 7.99 km/sec), which is almost certainly due to the small number of samples (three) in each line fit. The average apparent velocity is 7.90 km/sec, which is the apparent velocity underneath the shots in the E14-to-E12 direction. Apparent velocity from the three shots to S37 is 8.07 km/sec underneath the shots in the E12 to E14 direction. This indicates that the Moho under the shots is dipping slightly northward and the true refractor velocity is 7.99 km/sec. Intercept times for each of the line fits indicate crustal thickening from the Aleutian Basin into Amchitka.

The water depth at E12 was 0.95 km, while E13 and E14 had water depths of 3.2 km and 3.6 km, respectively. Shots E12 and E13 were on the Continental Slope, where the water depth was increasing rapidly into the Aleutian Basin. The high subwater correction velocity was used in correcting these shots to the reference plane, while shot E14 was corrected using the low subwater correction velocity. If either of the correction velocities were slightly in error, the observed intercept times would be in error.

However, the resolved true velocity still would be very close to the actual true velocity for small dip angles, since the effect would be, essentially, to increase the apparent velocity for one direction while decreasing the apparent velocity a corresponding amount for the opposite direction.

Only two line fits could be made using S-wave arrivals: those for the three northern shots recorded at S37 and shot E13 recorded by S14 and S15. Apparent velocities determined were 4.54 km/sec and 4.98 km/sec, respectively. The 4.98-km/sec velocity is higher than normal and probably results from the inability to pick the S-wave onset exactly.

The three line fits for the Pacific shots show large variations, probably due to the emergent nature of the signals. Line fits for Phase II are based on three points at most, and the signals are generally weaker than those for Phases I and III because large distances are involved. Resulting velocity and intercept measurements could change considerably if one pick in the line fit were erroneous. With this in mind, some general remarks can be made by comparing Figure II-52 (Aleutian Basin shots) with Figure II-54 (Pacific shots). Reduction velocity is 8 km/sec in both figures. Reduced traveltimes for the shot-receiver pairs in the Aleutian Basin range from 2 to 8 sec, whereas those for the Pacific shots range from -1 to +4 sec. This implies that the Aleutian Basin has a thicker and lower-velocity crust than the Pacific, which is in agreement with other observations. One station (S11) on the Petrel Bank recorded shots from both the Aleutian Basin and Pacific. Reduced traveltimes to this station were greater than those of any other station (from each set of shots), indicating that the largest crustal thickness along that profile was in the vicinity of S11.

Four line fits were made for the secondary arrivals recorded during Phase I. Apparent velocities ranged from 4.48 km/sec to 4.70 km/sec with an average of 4.64 km/sec, indicating that these observed arrivals are Moho S-refractions. Apparent velocities, slopes, and intercepts are given in Table II-7. Due to the inability to pick the exact onset or the same point on the waveform between stations, the apparent velocities and intercepts given are not precise enough to determine the point at which the P-to-S conversion occurred.

Table II-7

LINE FITS — PHASE I, S-WAVE

Stations	Explosions	Velocity (km/sec)	Slope	Intercept
S6, S7, S8	E34	4.69	0.2129	6.465
S9	E5, E6, E30, E31, E32	4.48	0.2231	4.571
S40	E1, E4, E5, E6, E30, E31	4.69	0.2128	5.393
S1, S2, S5, S6, S9, S40	E30	4.70	0.2124	6.701

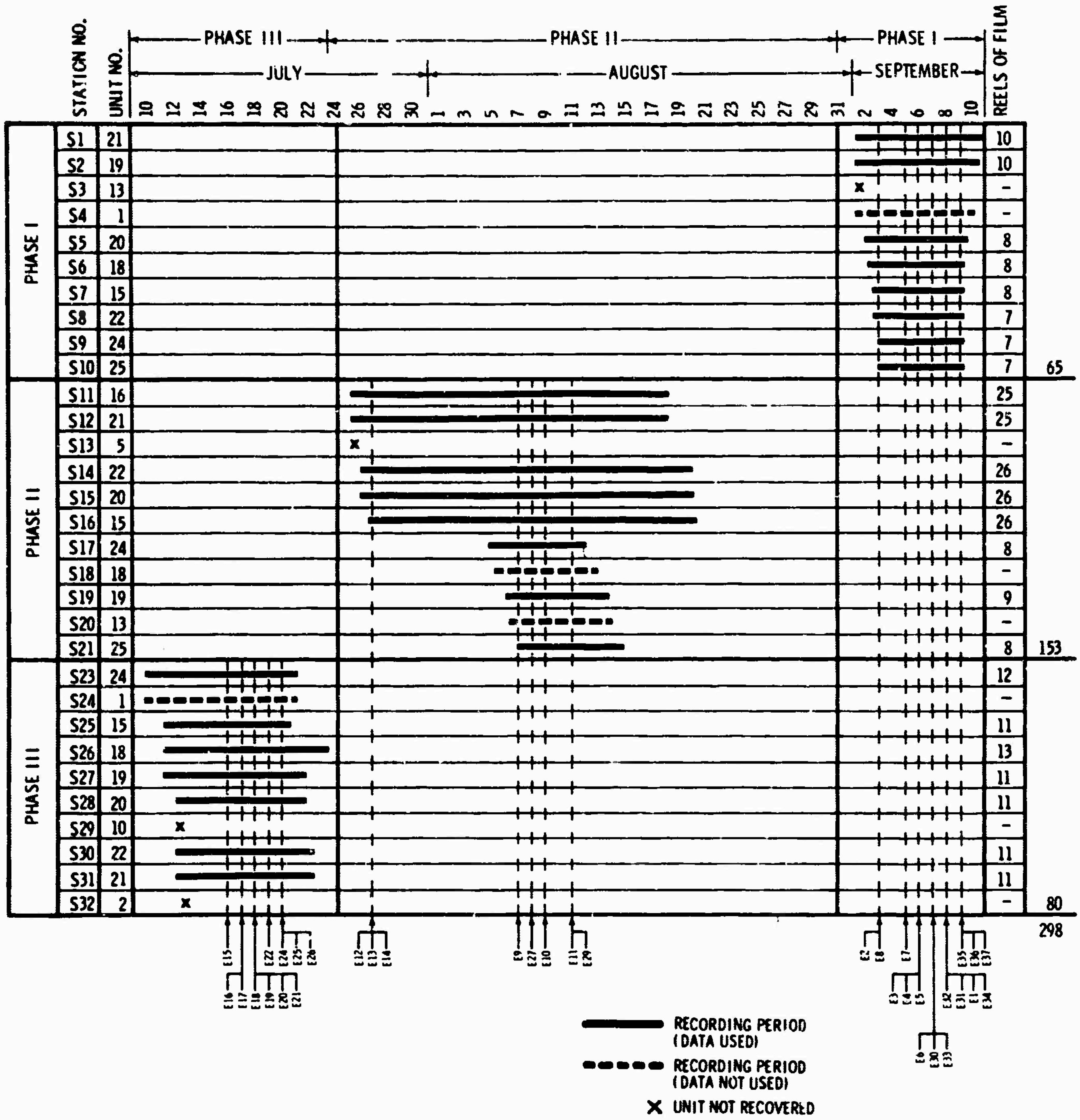


Figure II-1. OBS Recording Periods

Figure II-2. Playback of "Amplifier-Off" Pulse Showing Tape Recorder Head Misalignment

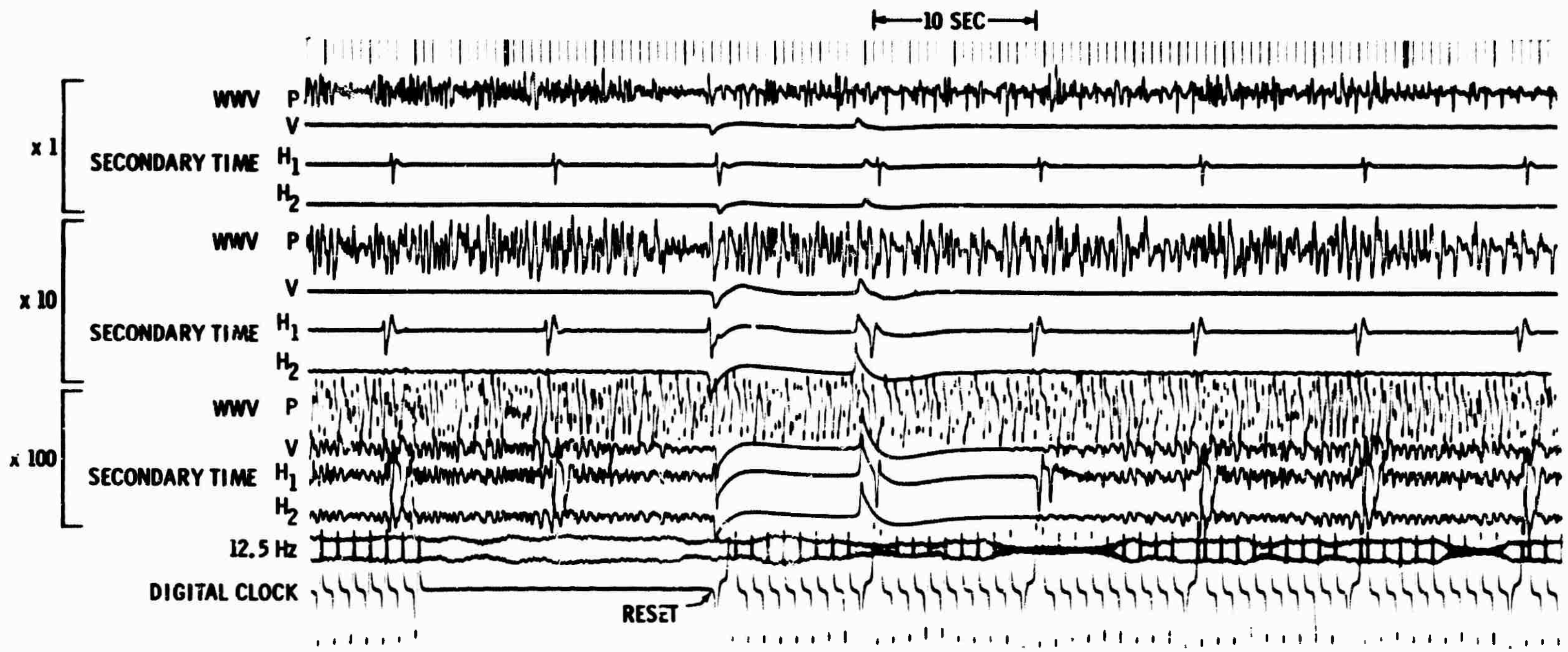


Figure II-3. Playback Showing Reset of OBS Digital Clock

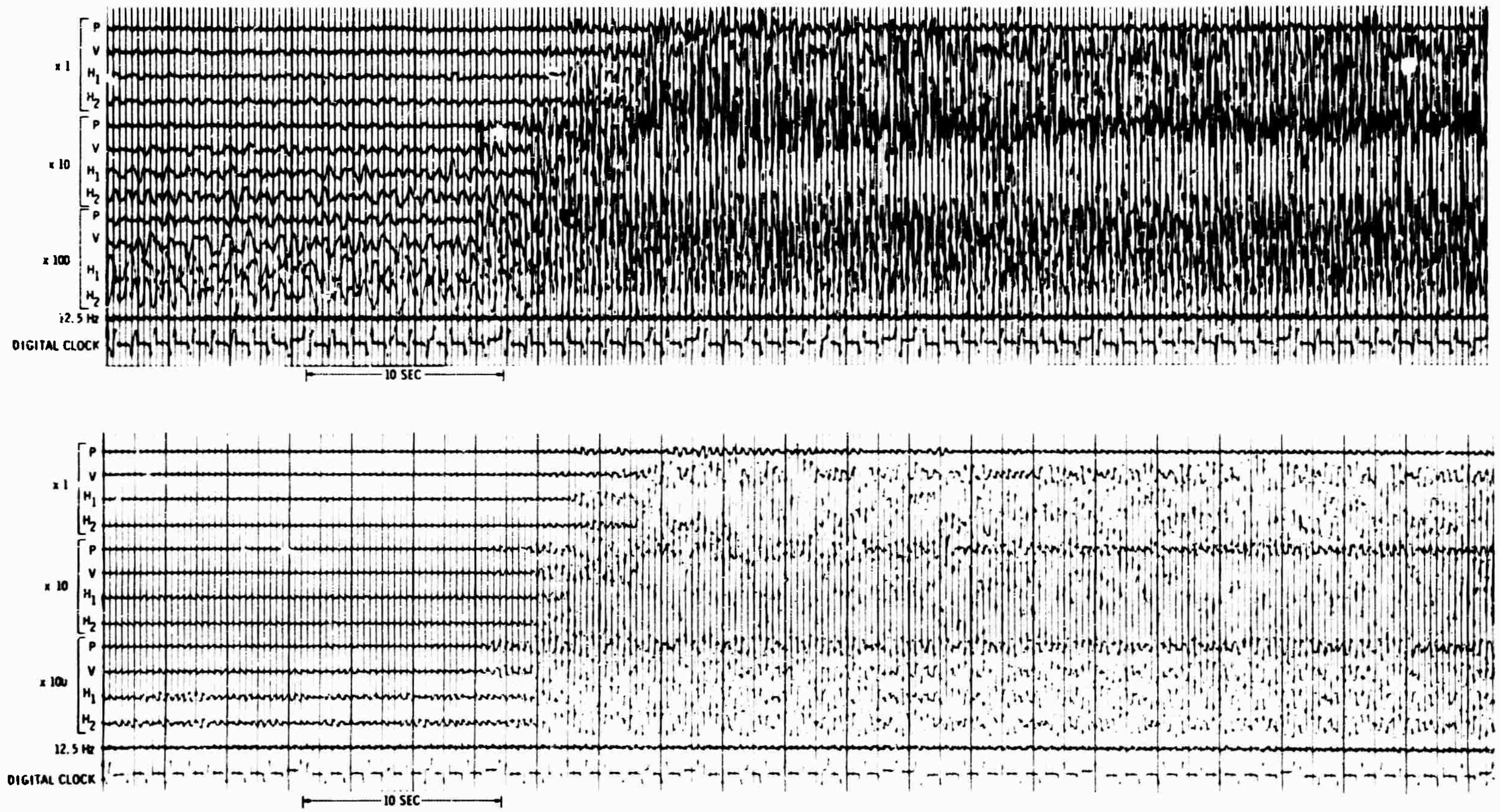


Figure II-4. Unfiltered (top) and Filtered Station-S31 Recording of E24 (low-cut 2.25-Hz, high-cut 5.0-Hz)

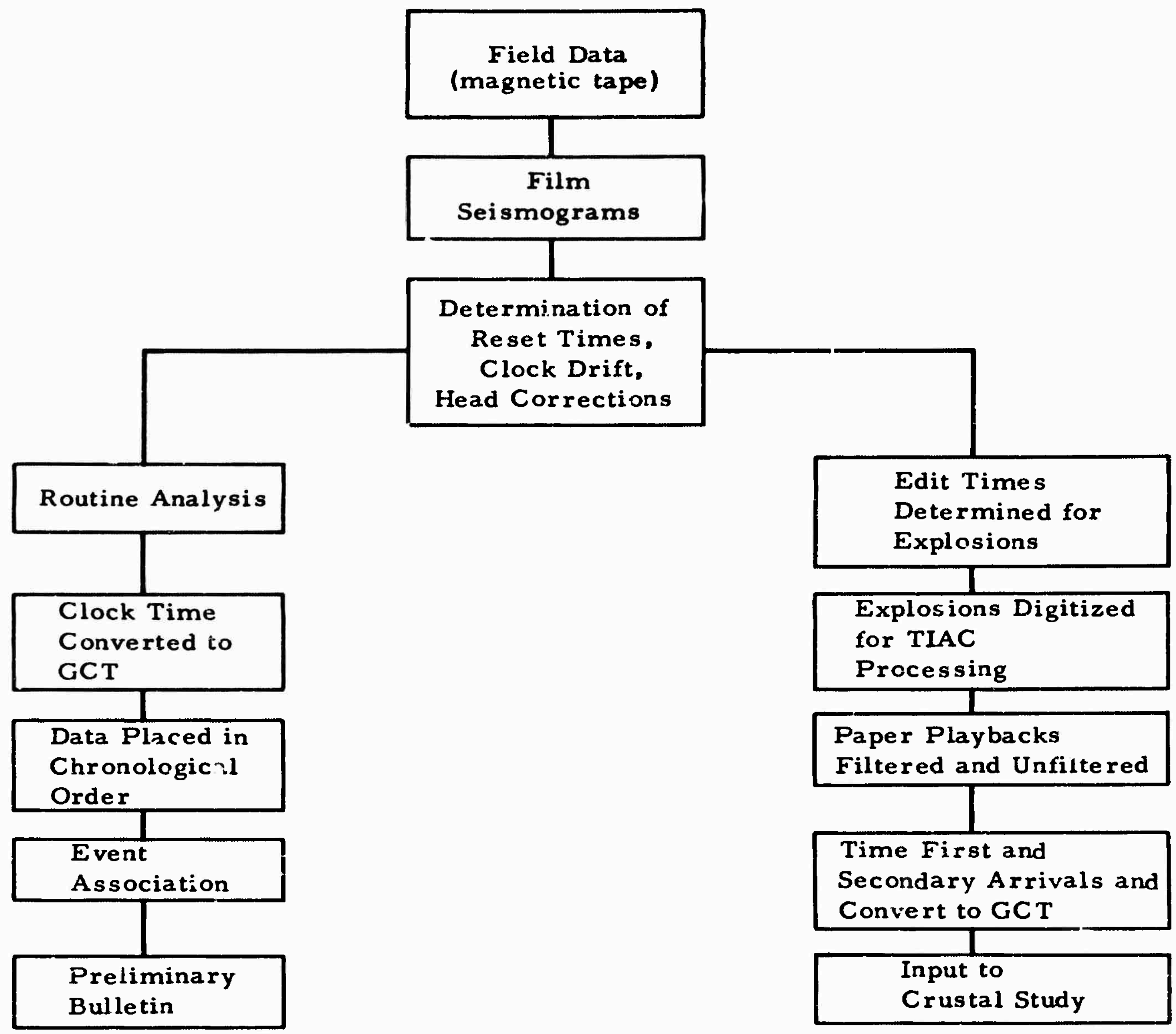
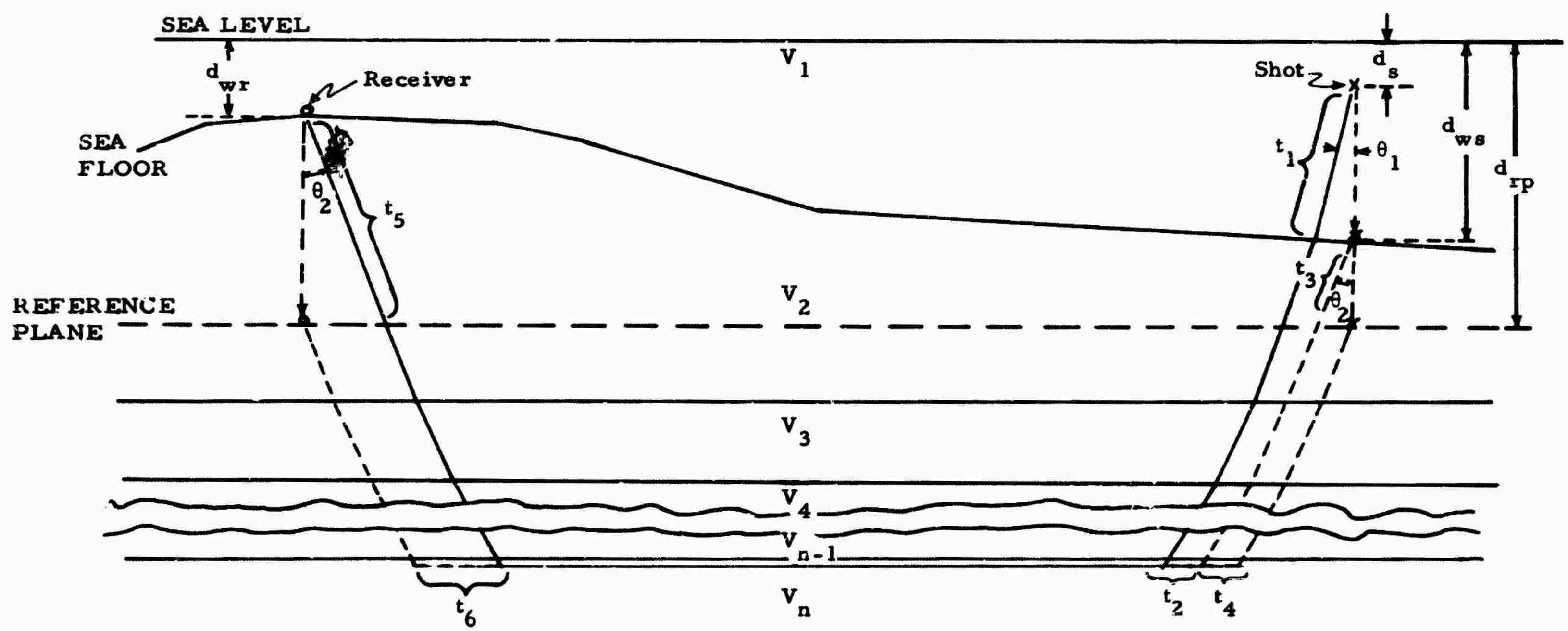


Figure II-5. Flow Chart of Preliminary Data Handling



$$\sin \theta_1 = \frac{V_1}{V_n} \quad \text{and} \quad \sin \theta_2 = \frac{V_2}{V_n}$$

RECEIVER CORRECTION

$$= -t_5 + t_6$$

$$= -\frac{(d_{rp} - d_{wr})}{V_2 \cos \theta_2} + \tan \theta_2 \frac{(d_{rp} - d_{wr})}{V_n}$$

$$= \frac{(d_{wr} - d_{rp}) \cos \theta_2}{V_2}$$

SHOT CORRECTION

$$= - t_1 + t_2 - t_3 + t_4$$

$$= -\frac{(d_{ws} - d_s)}{V_1 \cos \theta_1} + \frac{\tan \theta_1 (d_{ws} - d_s)}{V_n} - \frac{(d_{rp} - d_{ws})}{V_2 \cos \theta_2} + \frac{\tan \theta_2 (d_{rp} - d_{ws})}{V_n}$$

$$= \frac{(d_s - d_{ws}) \cos \theta_1}{V_1} + \frac{(d_{ws} - d_{rp}) \cos \theta_2}{V_2}$$

Figure II-6. Method of Reference-Plane Correction

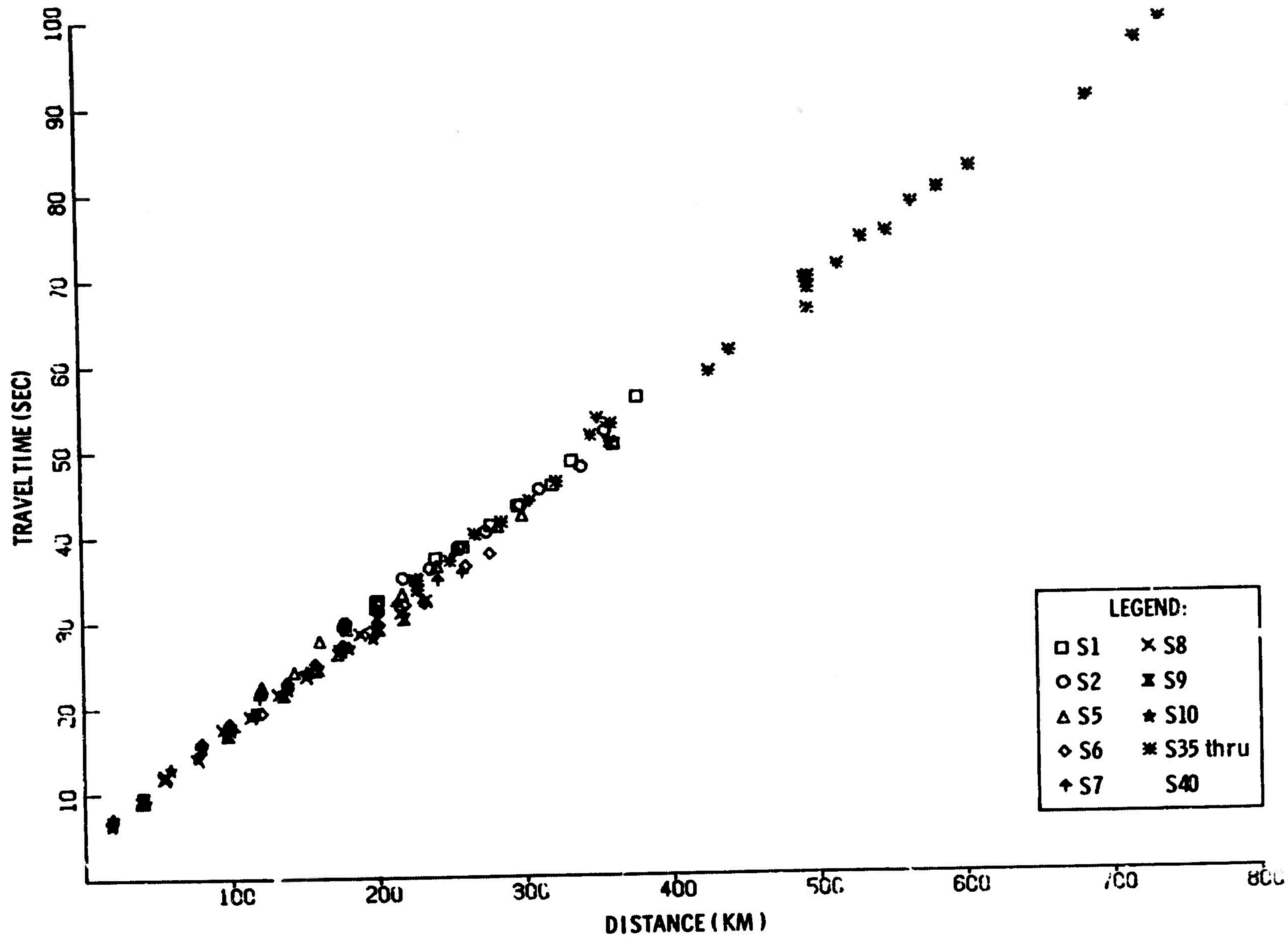


Figure II-7. First-Estimate Raw Traveltimes of First Arrivals from Phase I, South Shots

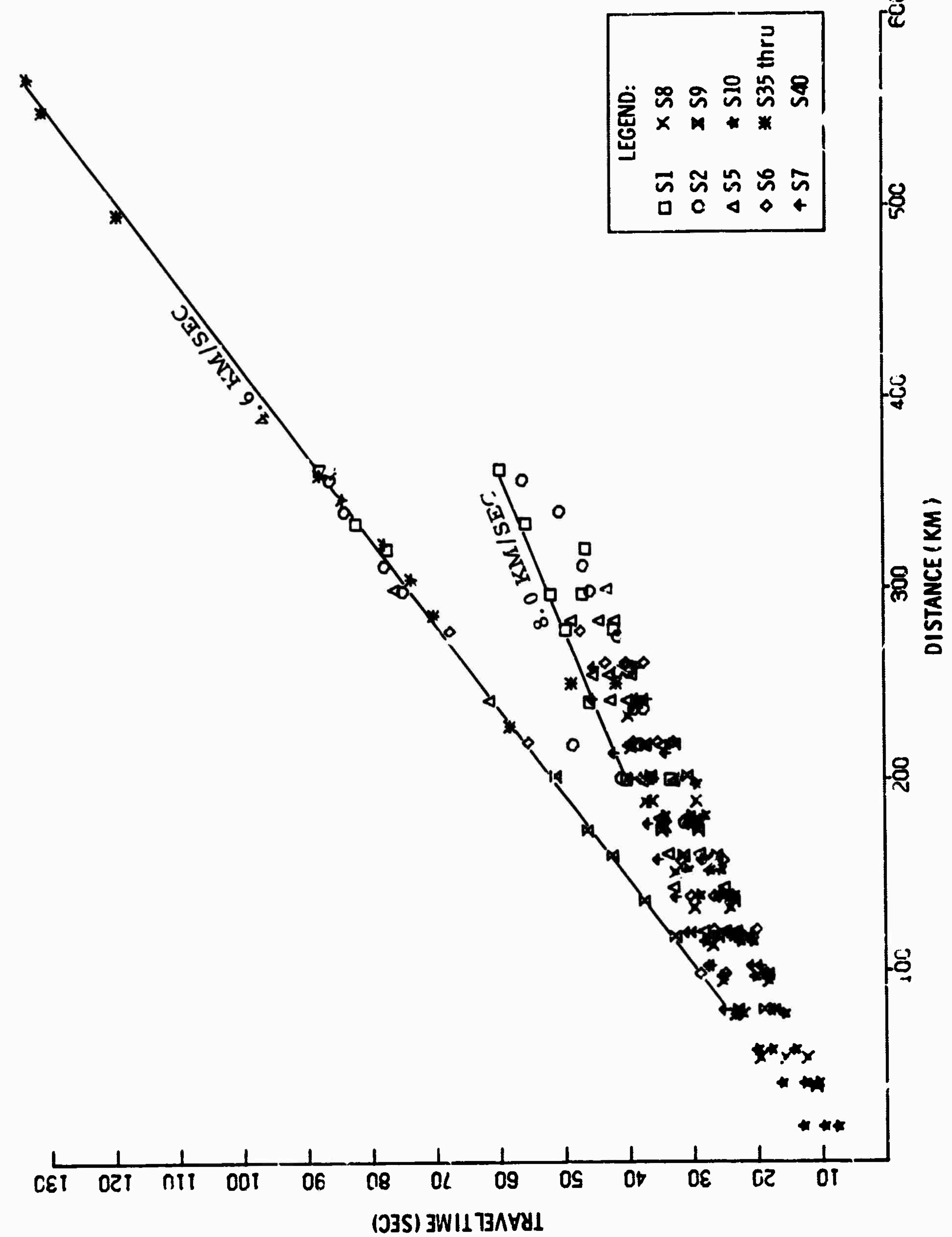


Figure II-8. First-Estimate Raw Traveltimes of Secondary Arrivals from Phase I, South Shots

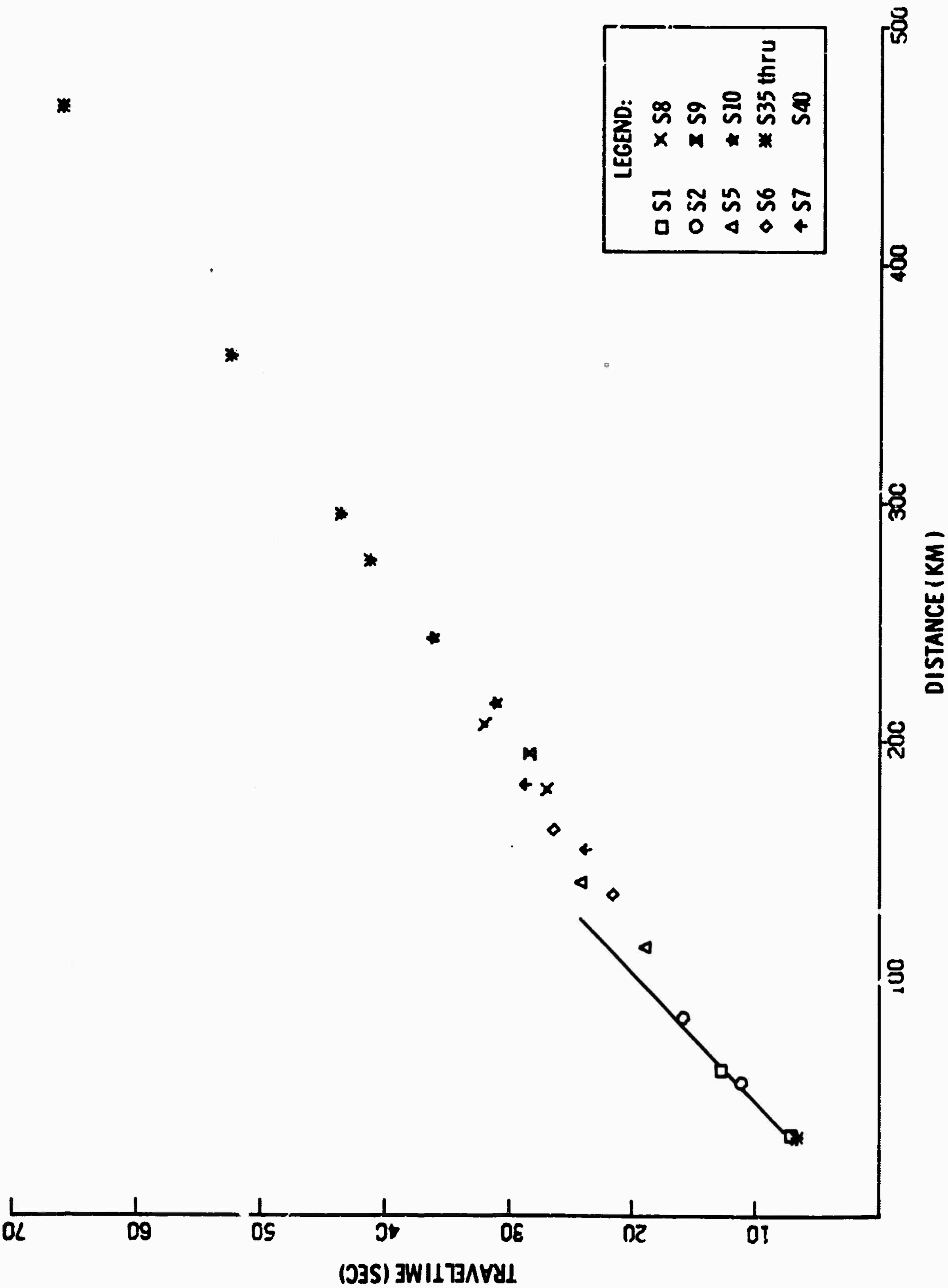


Figure II-9. First-Estimate Raw Traveltimes of First Arrivals from Phase I, North Shots

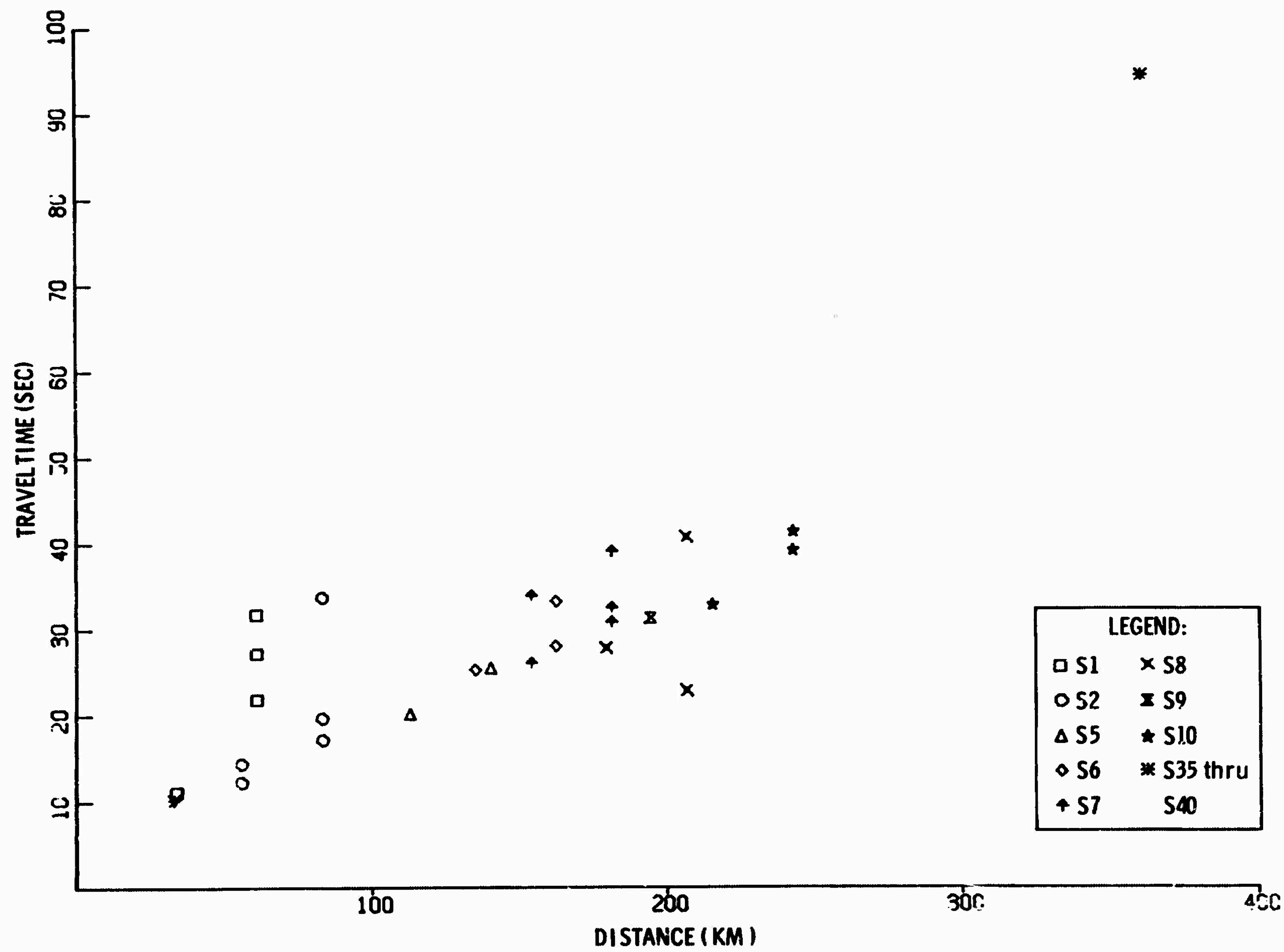


Figure II-10. First-Estimate Raw Traveltimes of Secondary Arrivals from Phase I, North Shots

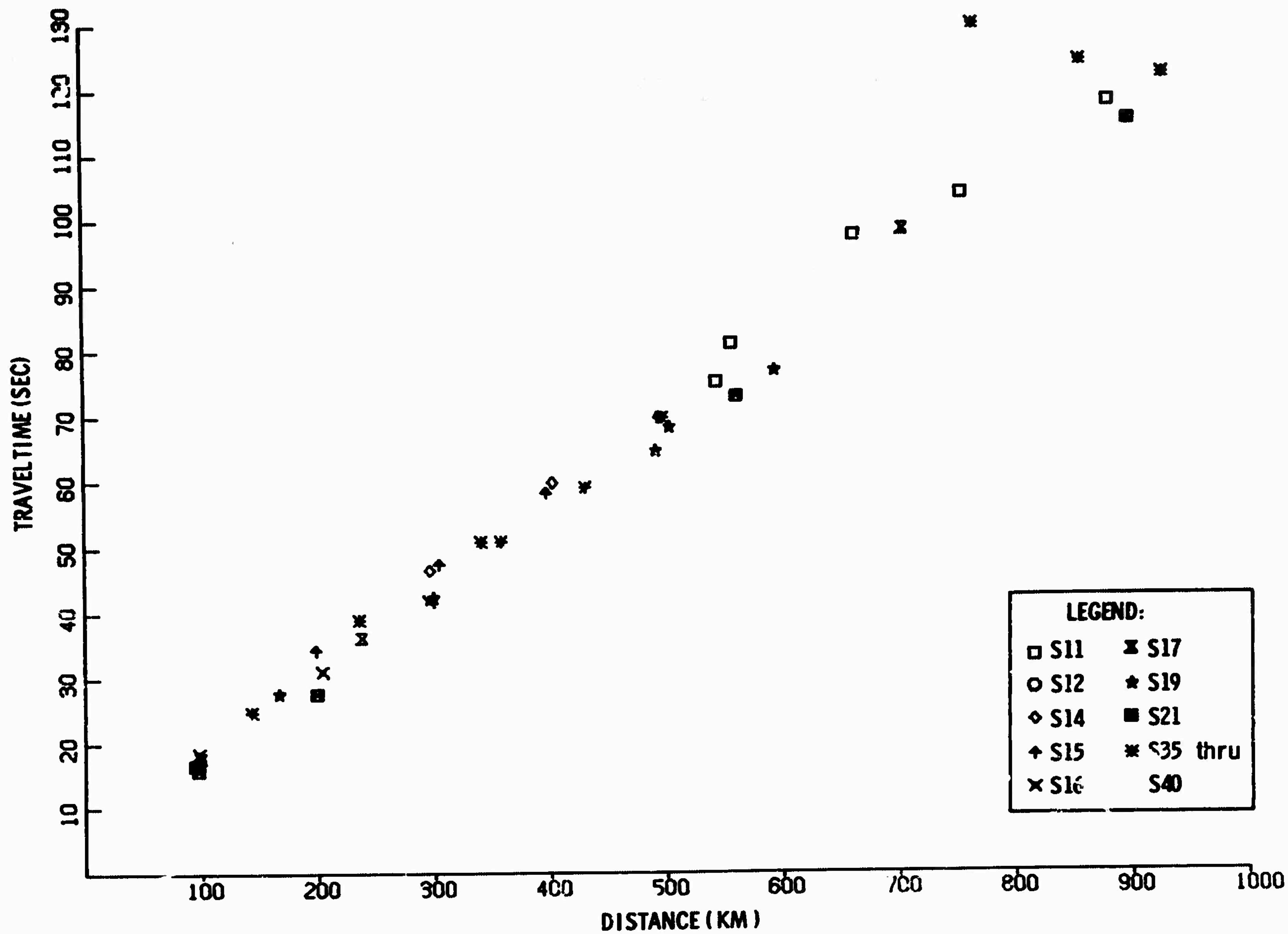


Figure II-11. First-Estimate Raw Traveltimes of First Arrivals from Phase II, All Shots

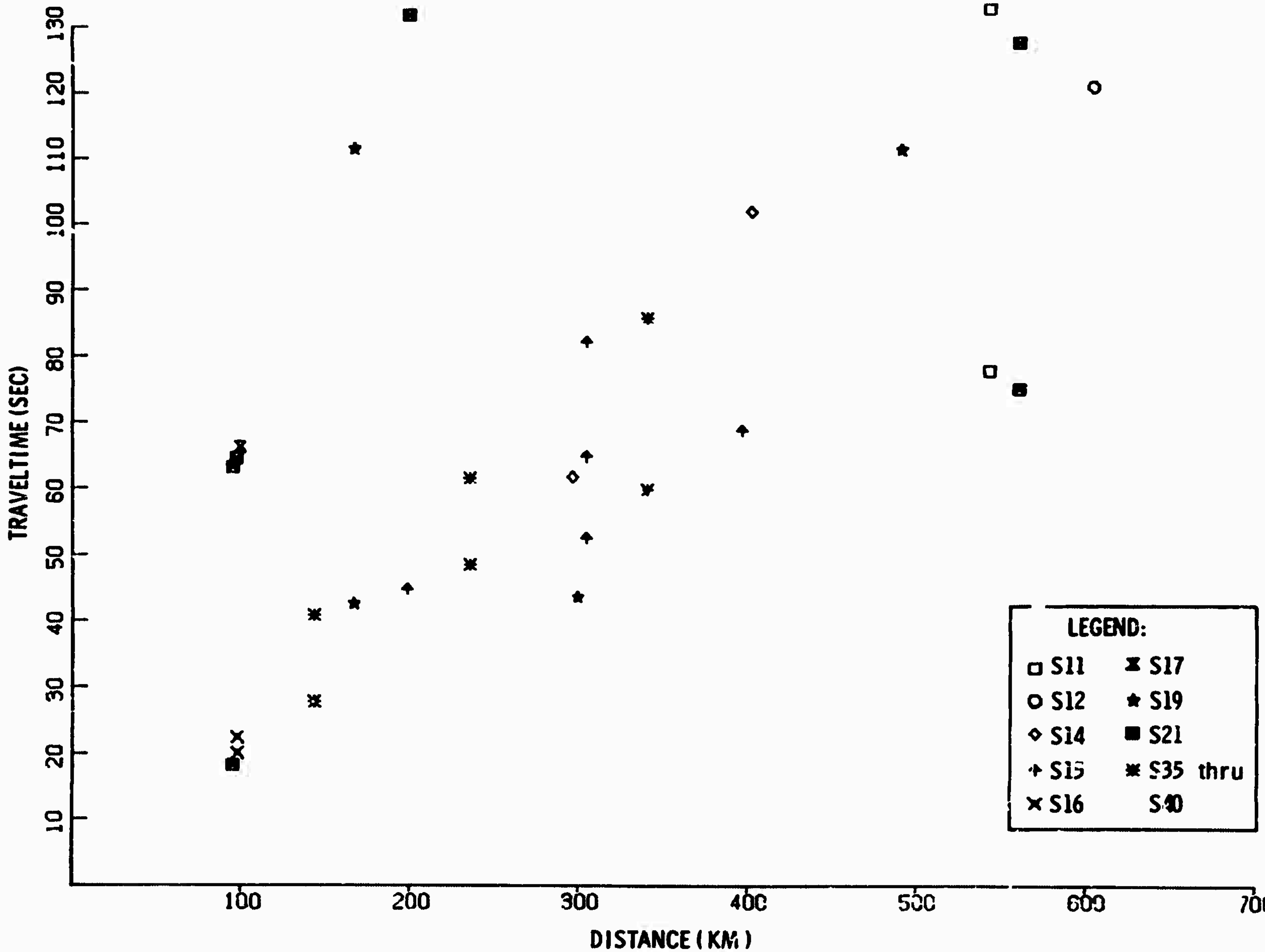


Figure II-12. First-Estimate Raw Traveltimes of Secondary Arrivals from Phase II, All Shots

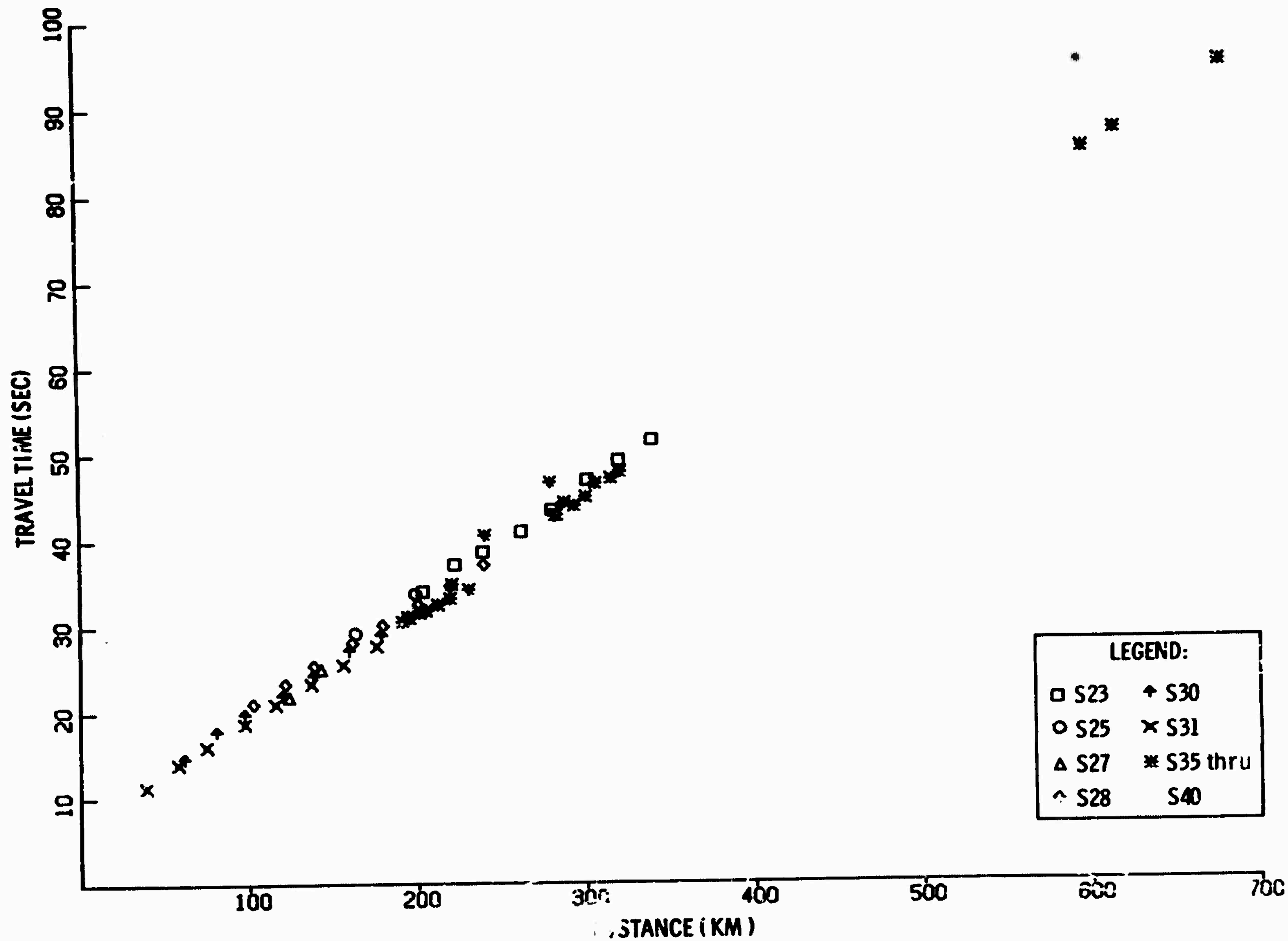


Figure II-13. First-Estimate Raw Traveltimes of First Arrivals from Phase III, North Shots

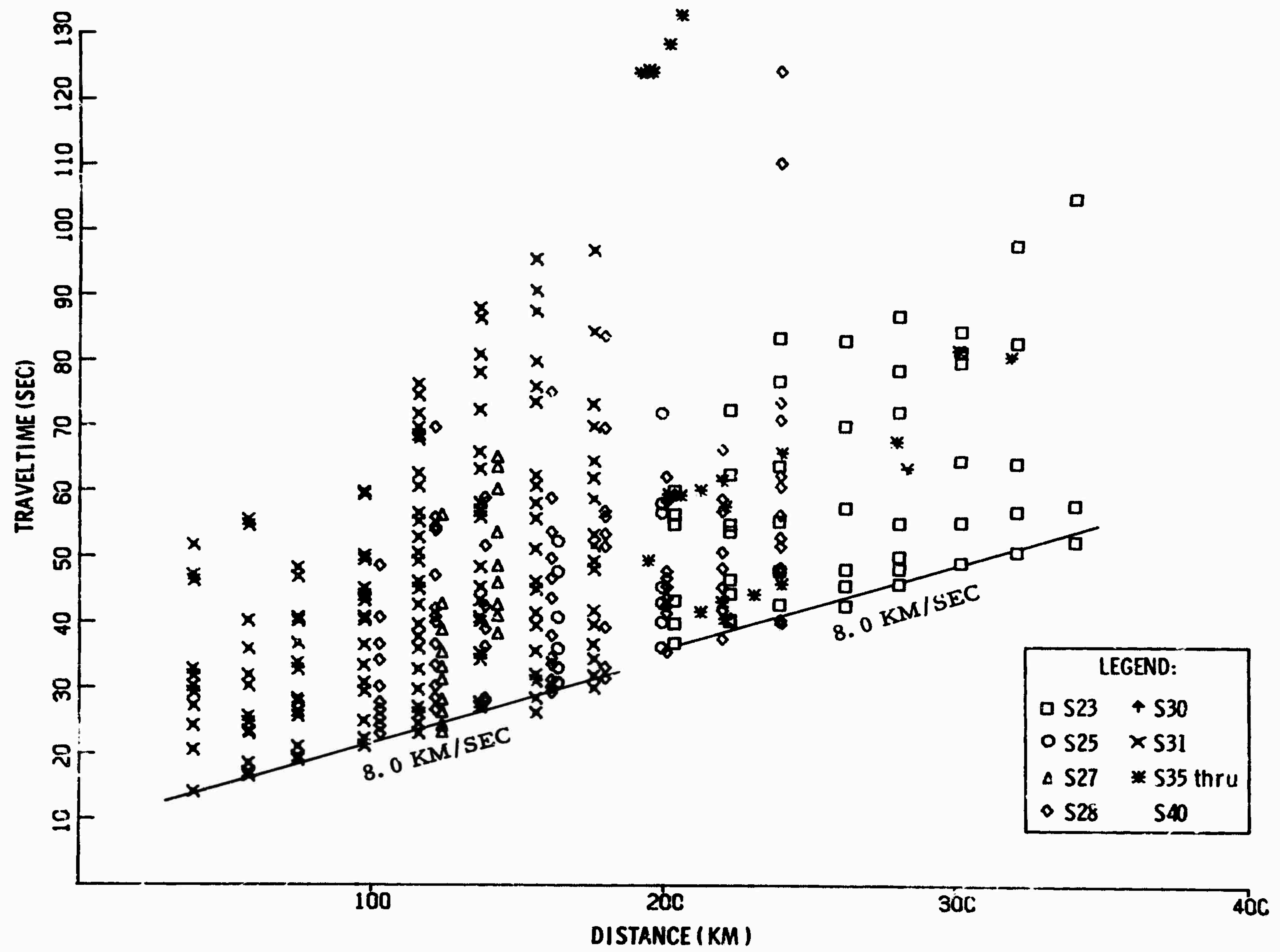


Figure II-14. First-Estimate Raw Traveltimes of Secondary Arrivals from Phase III, North Shots

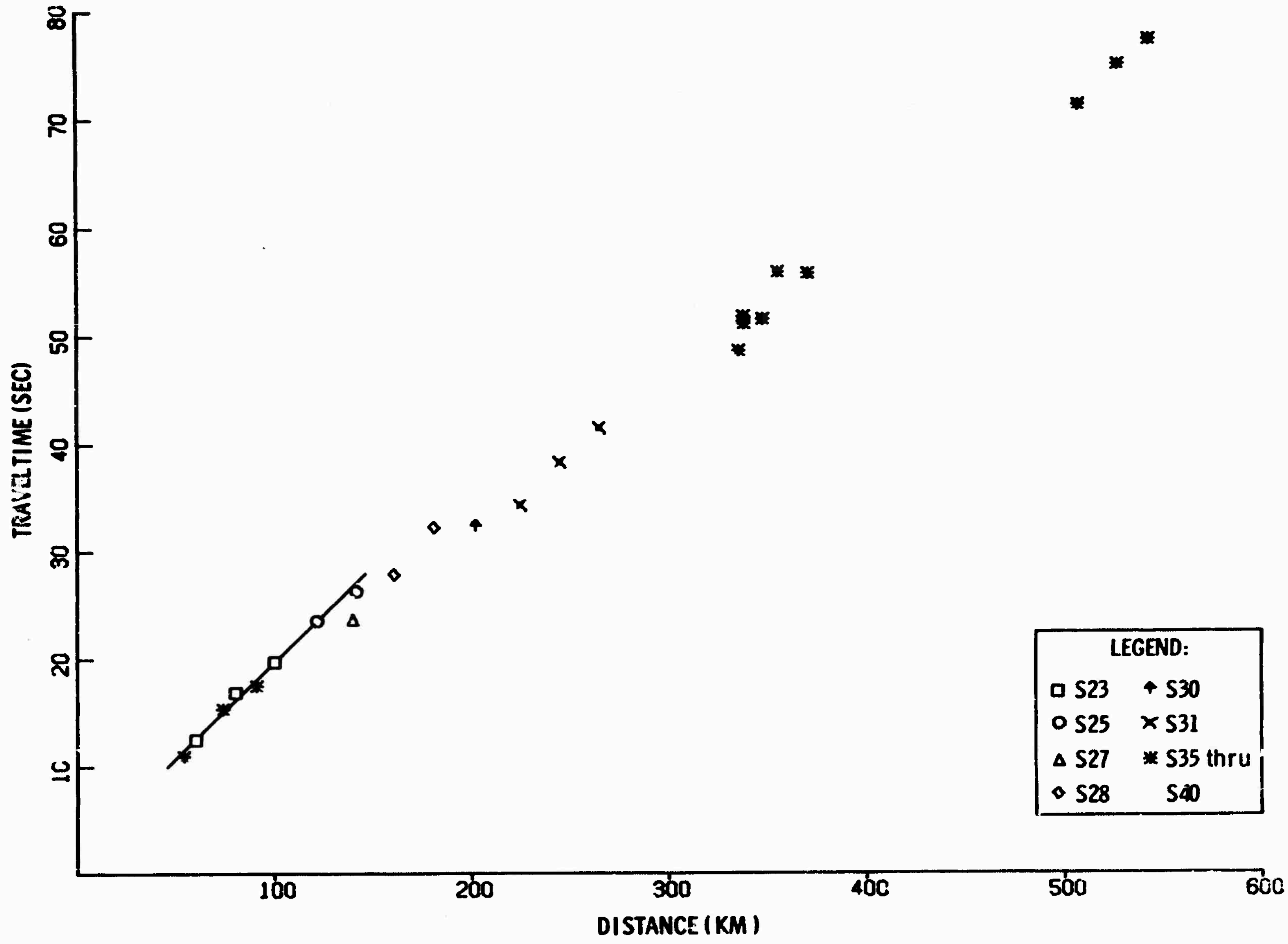


Figure II-15. First-Esti...atc Raw Traveltimes of First Arrivals from Phase III, South Shots

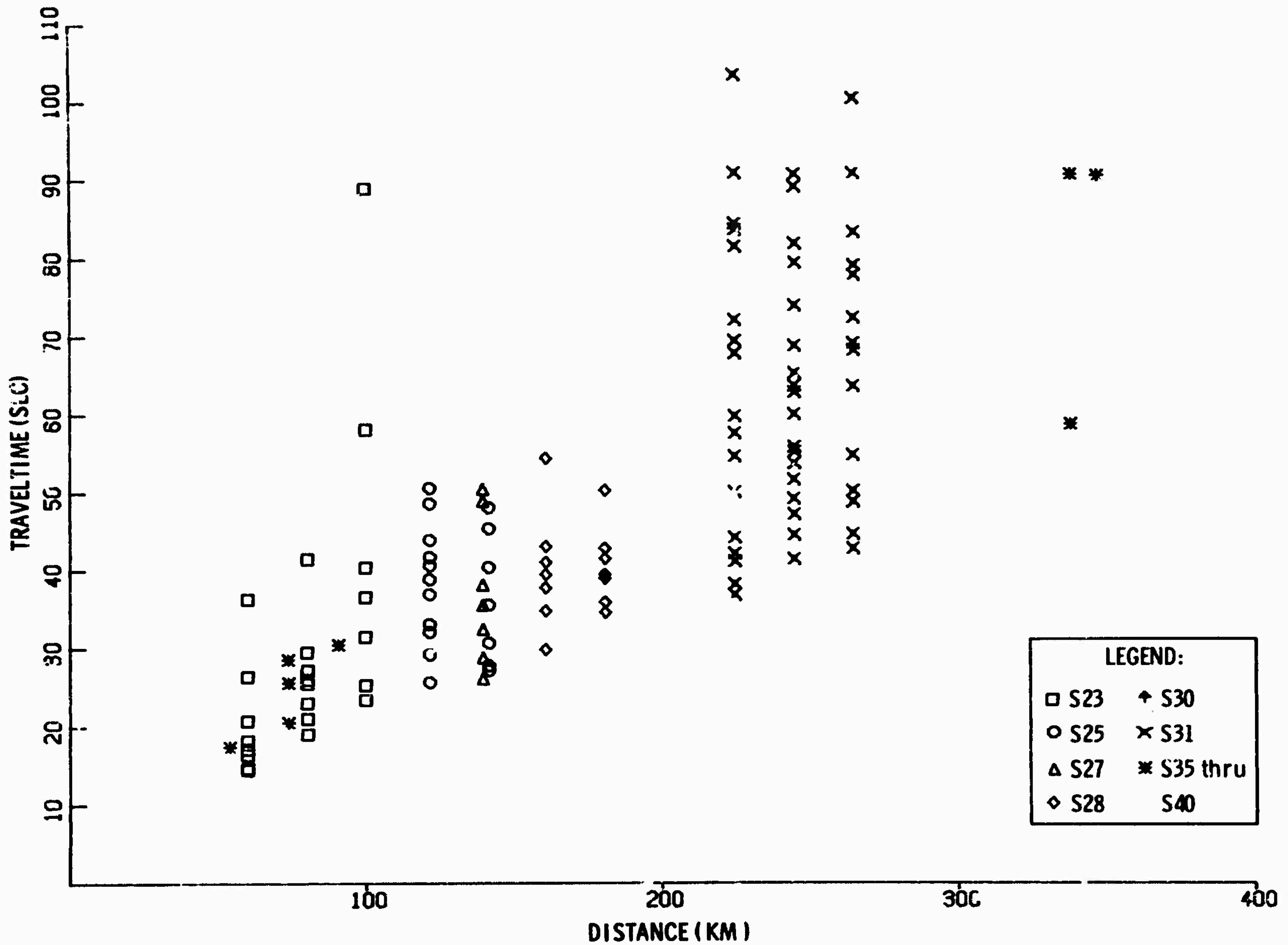


Figure II-16. First-Estimate Raw Traveltimes of Secondary Arrivals from Phase III, South Shots

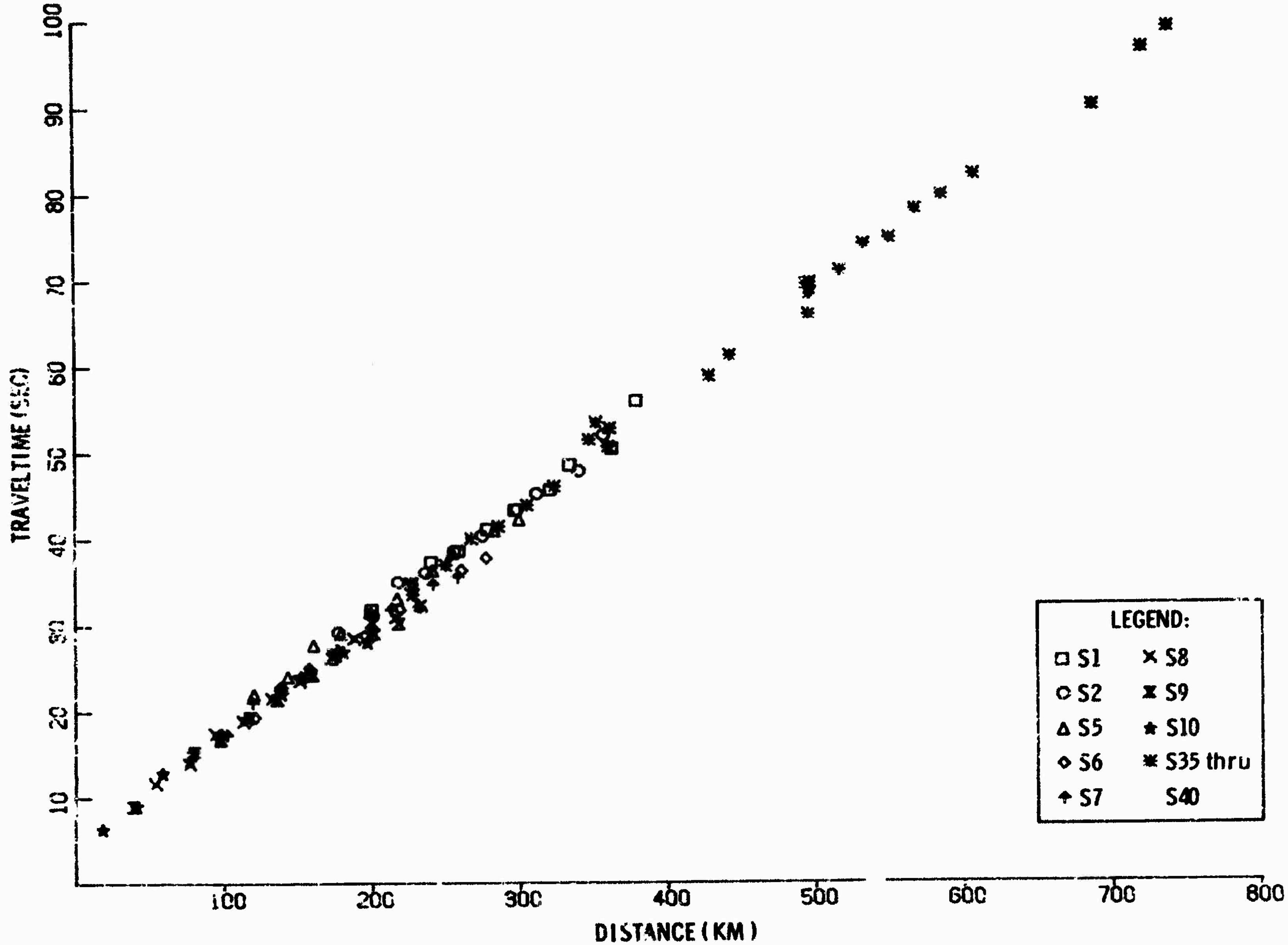


Figure II-17. First-Iteration Raw Traveltimes of Pn Arrivals from Phase I, South Shots

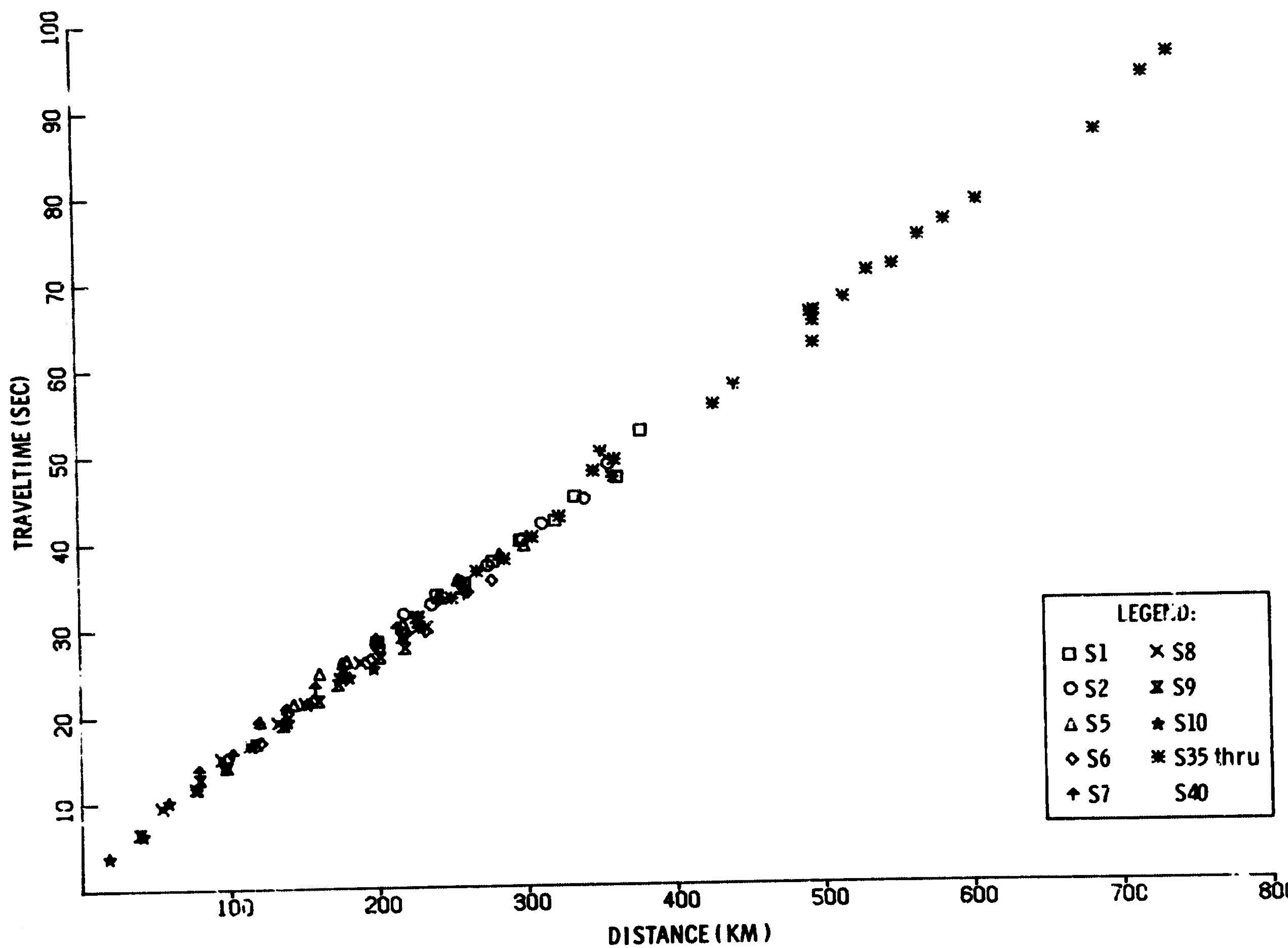


Figure II-18. First-Iteration Corrected Traveltimes of Pn Arrivals from Phase I, South Shots

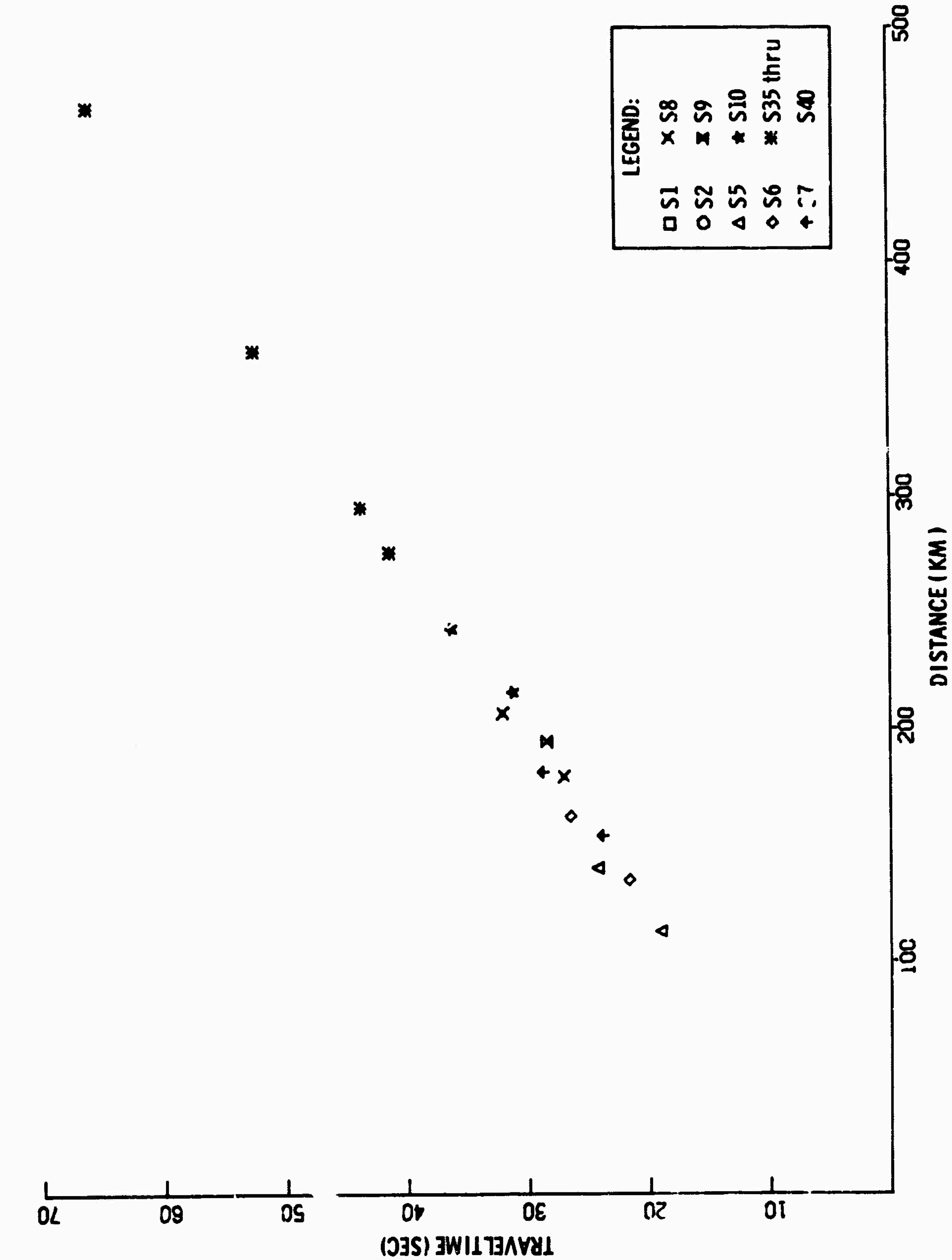


Figure II-19. First-Iteration Raw Traveltimes of Pn Arrivals from Phase I, North Shots

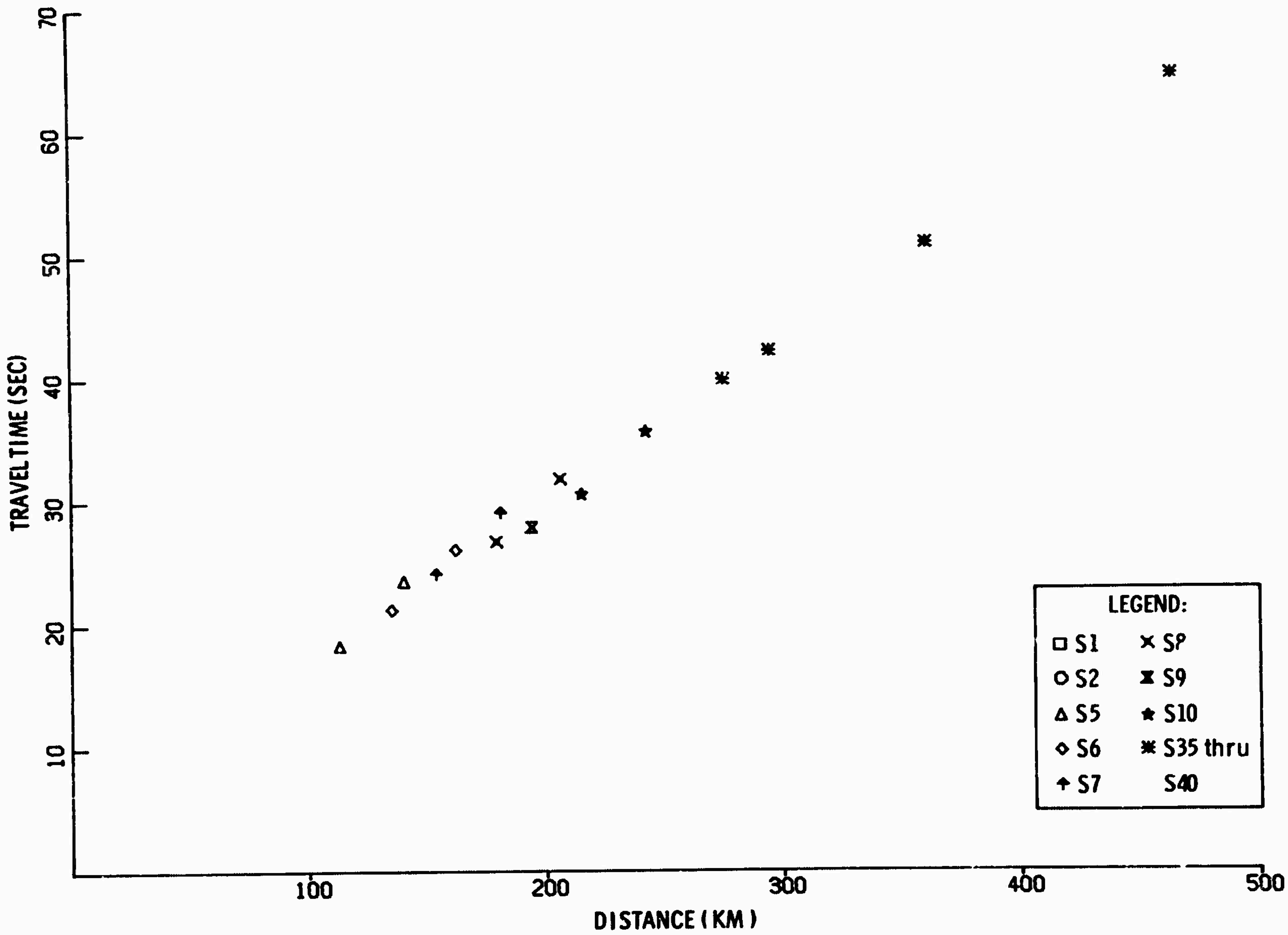


Figure II-20. First-Iteration Corrected Traveltimes of Pn Arrivals from Phase I, North Shots

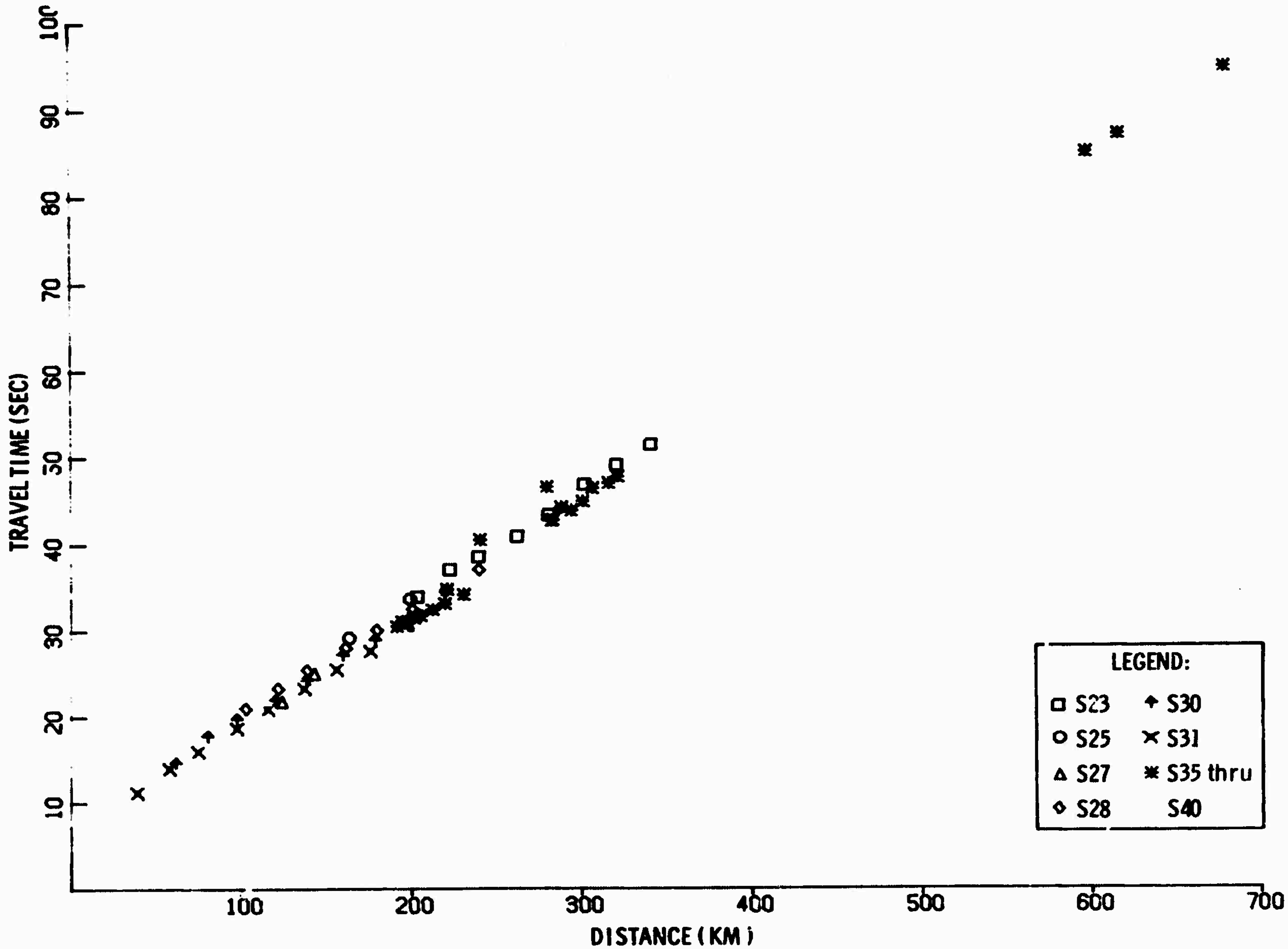


Figure II-21. First-Iteration Raw Traveltimes of Pn Arrivals from Phase III, North Shots

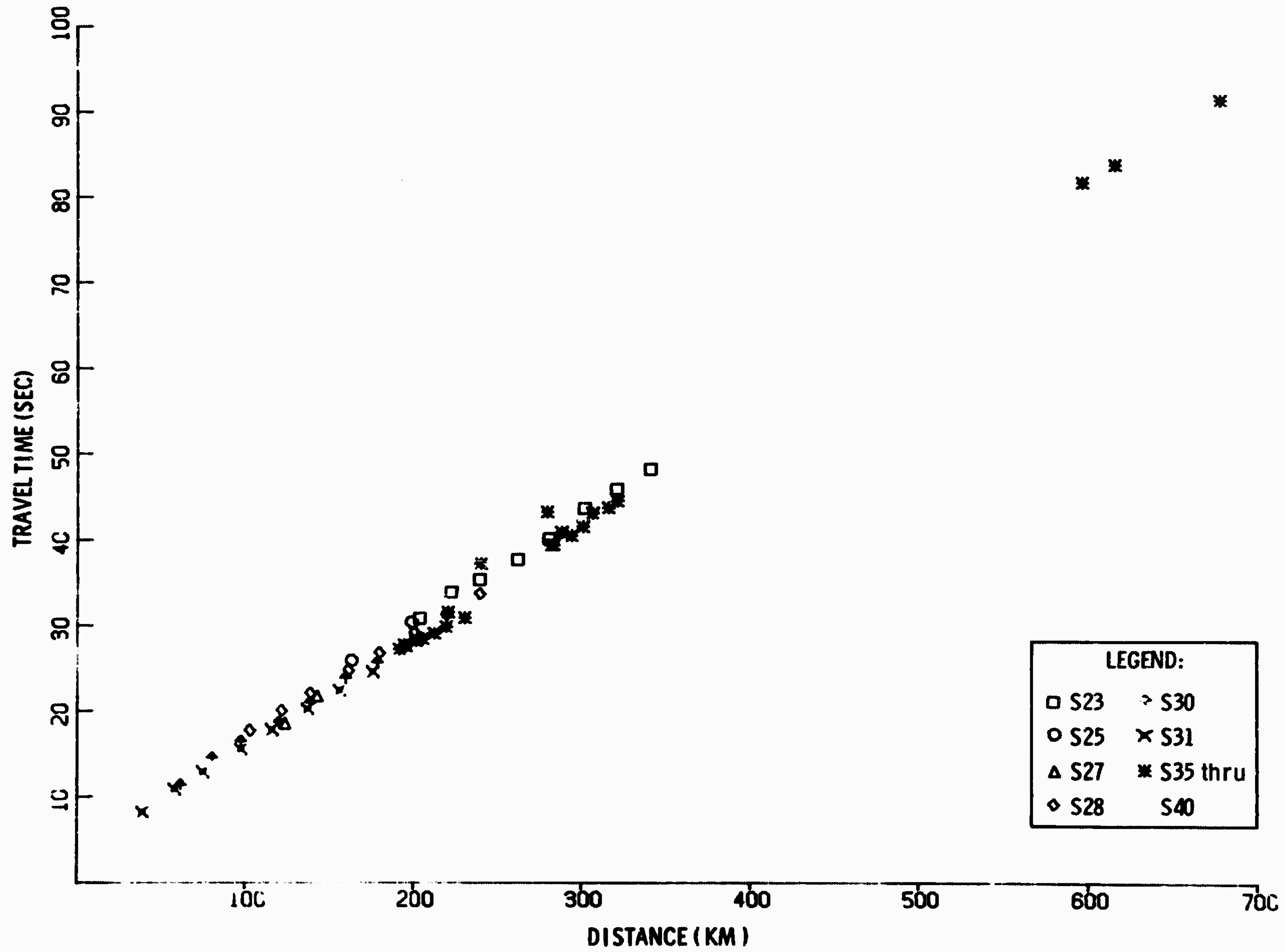


Figure II-22. First-Iteration Corrected Traveltimes of Pn Arrivals from Phase III, North Shots

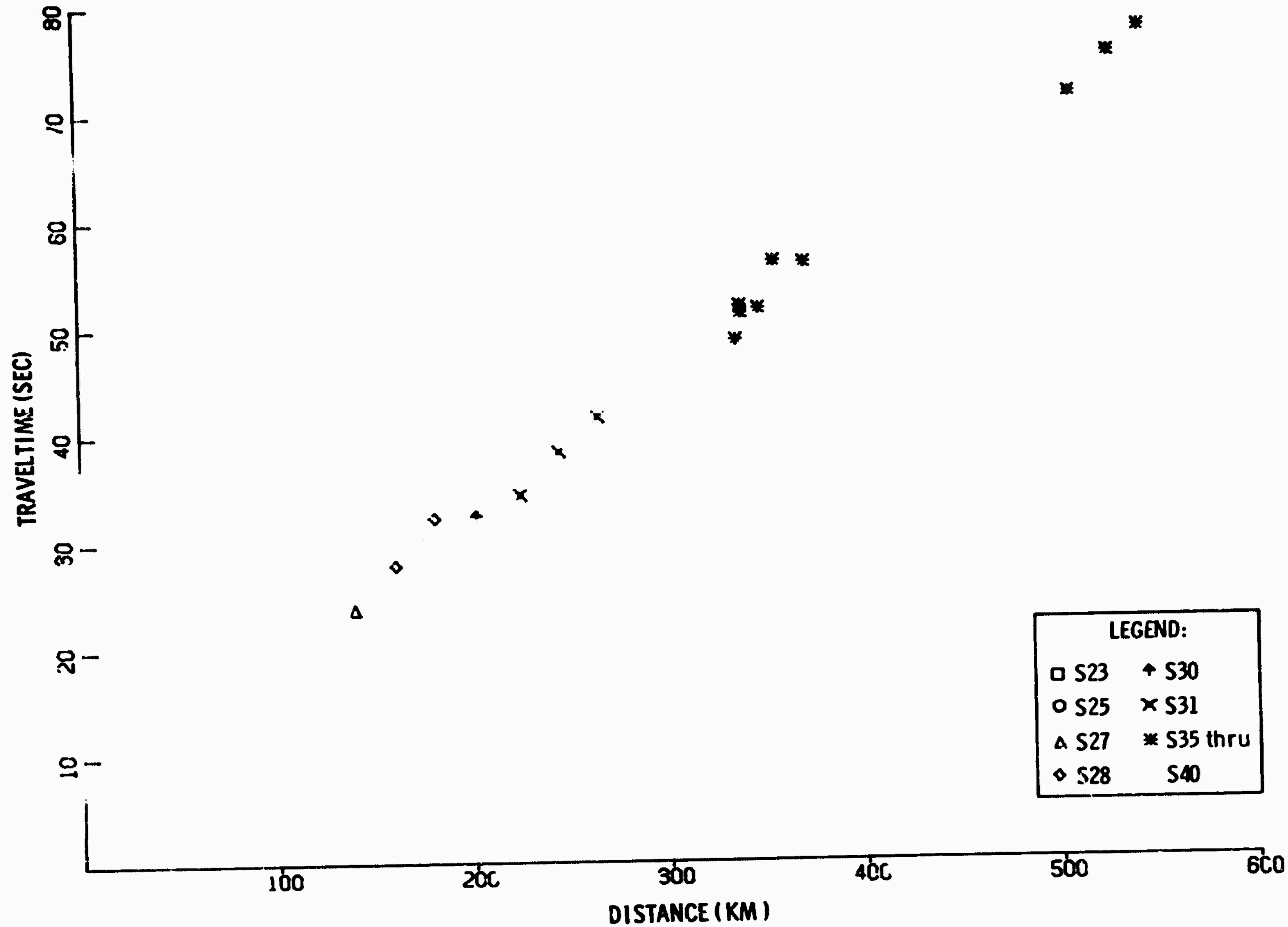


Figure II-23. First-Iteration Raw Traveltimes of Pn Arrivals from Phase III, South Shots

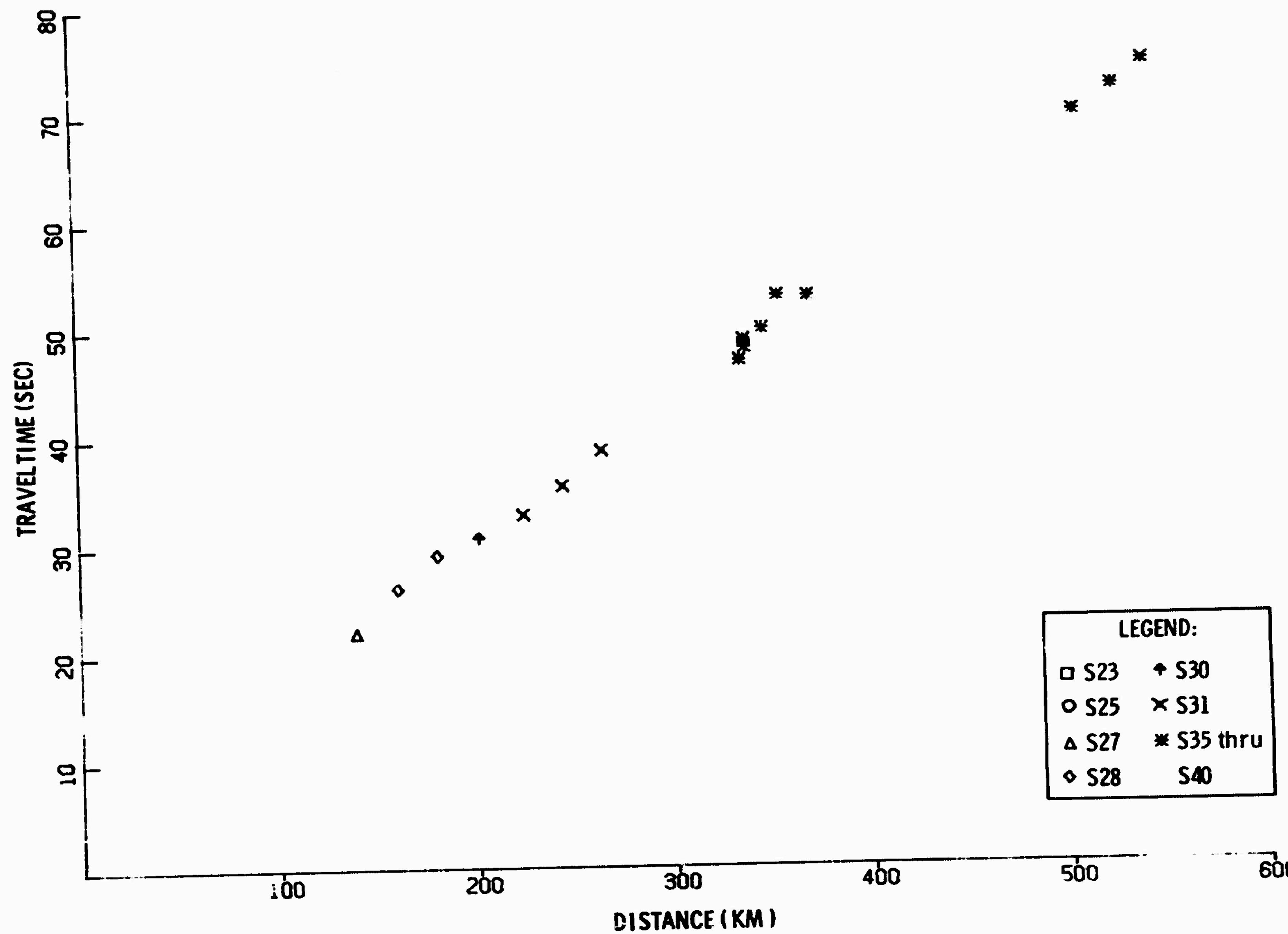


Figure II-24. First-Iteration Corrected Traveltimes of Pn Arrivals from Phase III, South Shots

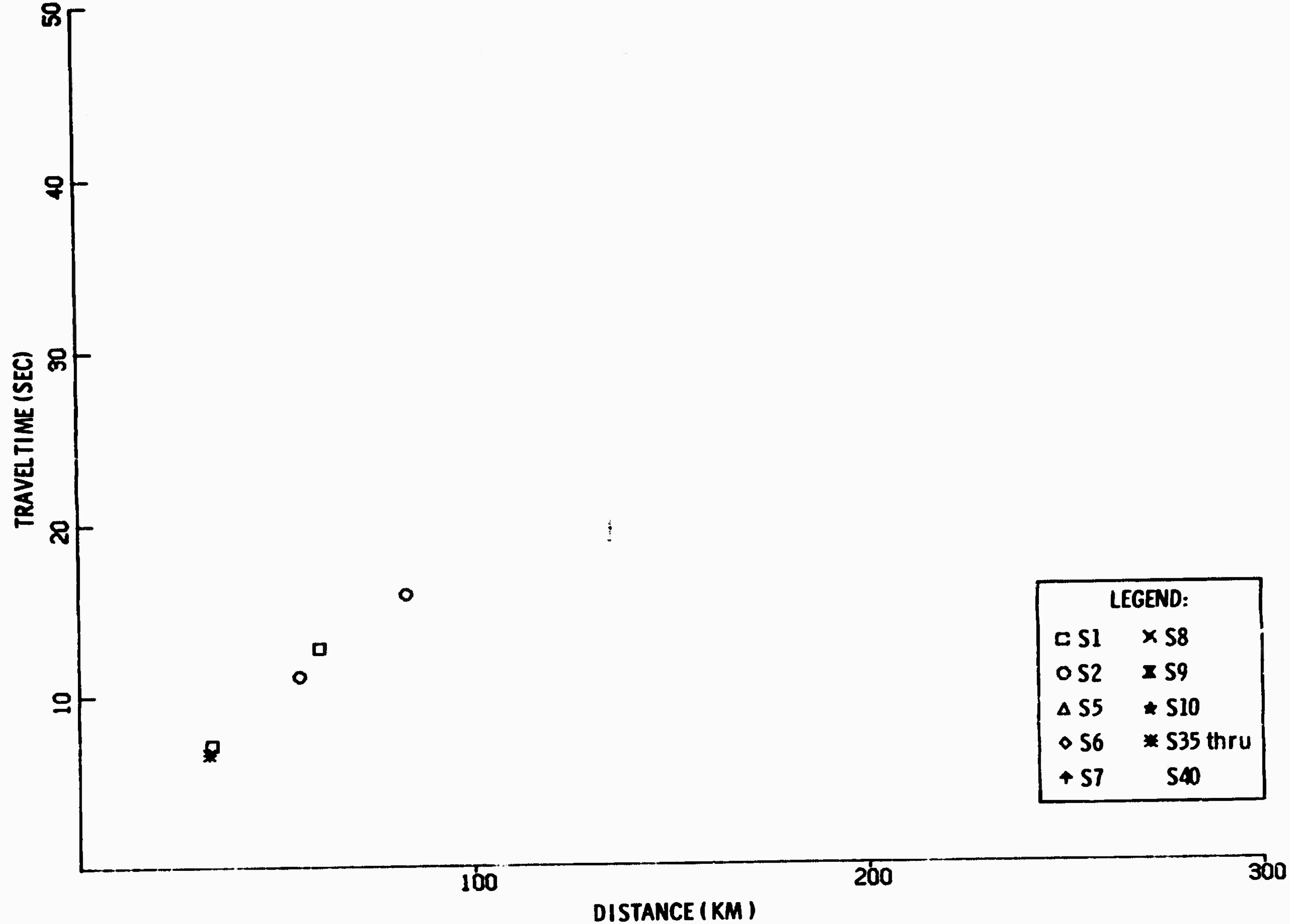


Figure II-25. First-Iteration Raw Traveltimes of Shallow Pg Arrivals from Phase I, North Shots

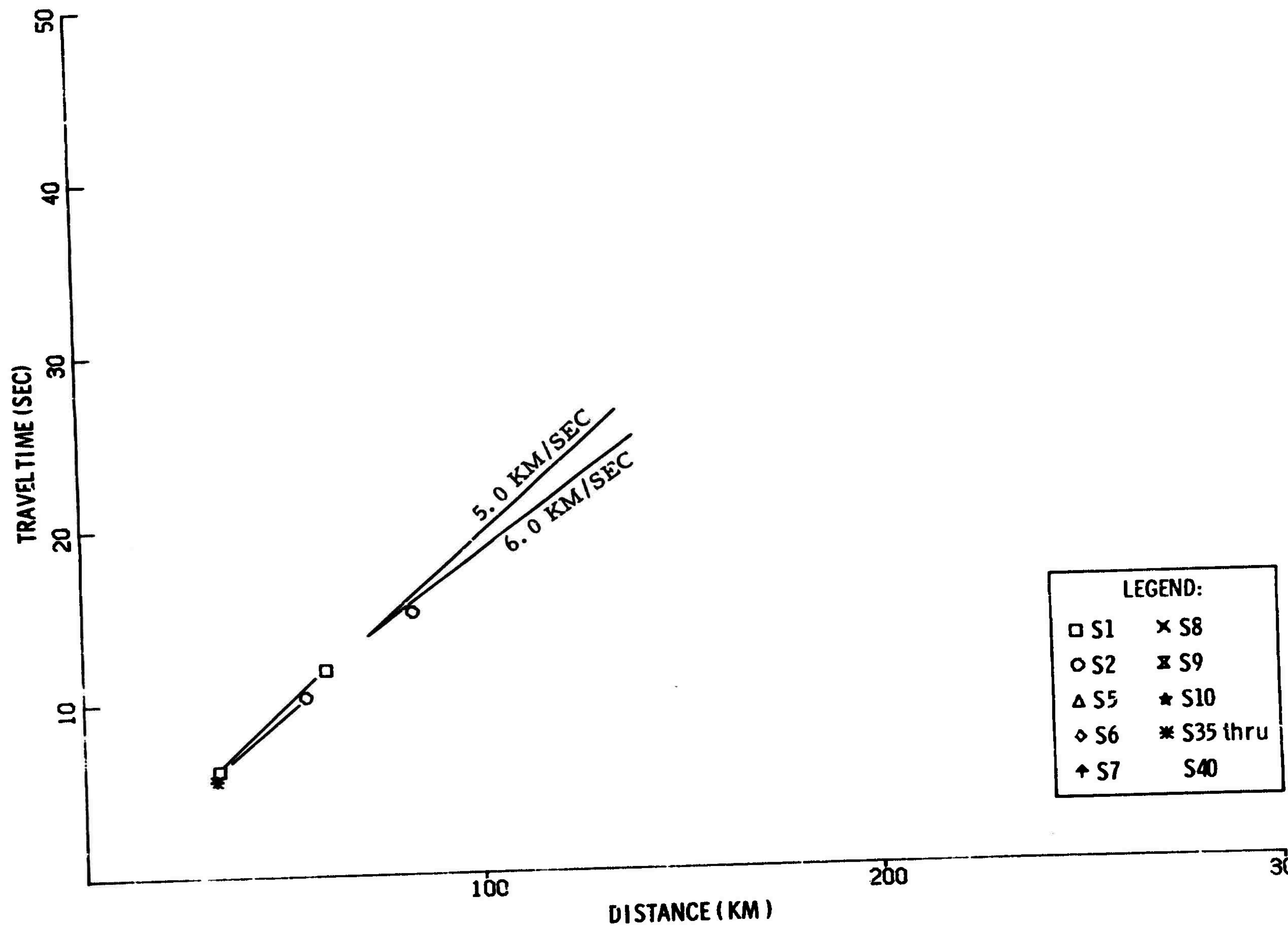


Figure II-26. First-Iteration Corrected Traveltimes of Shallow Pg Arrivals from Phase I, North Shots

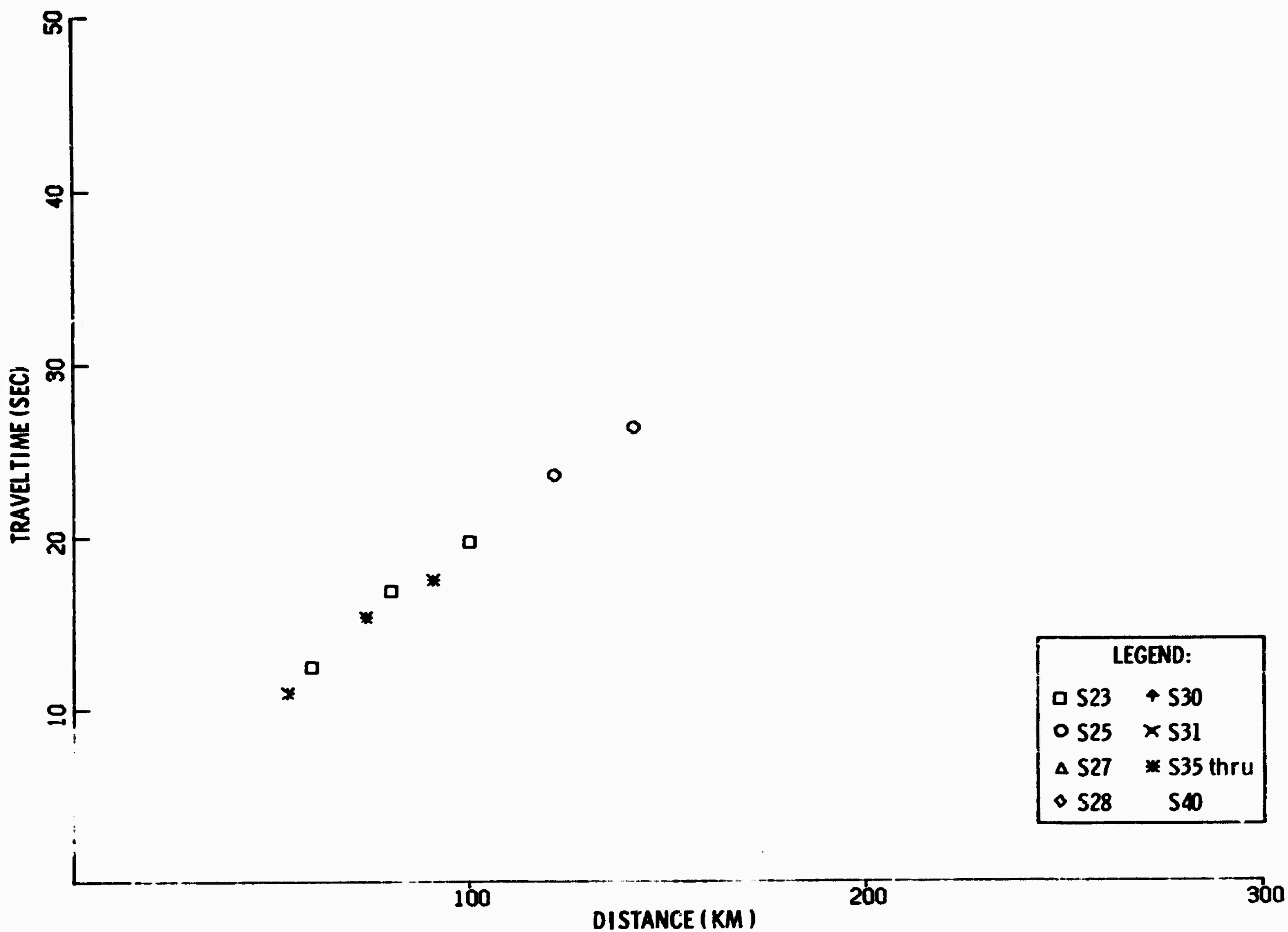


Figure II-27. First-Iteration Raw Traveltimes of Pg Arrivals from Phase III, South Shots

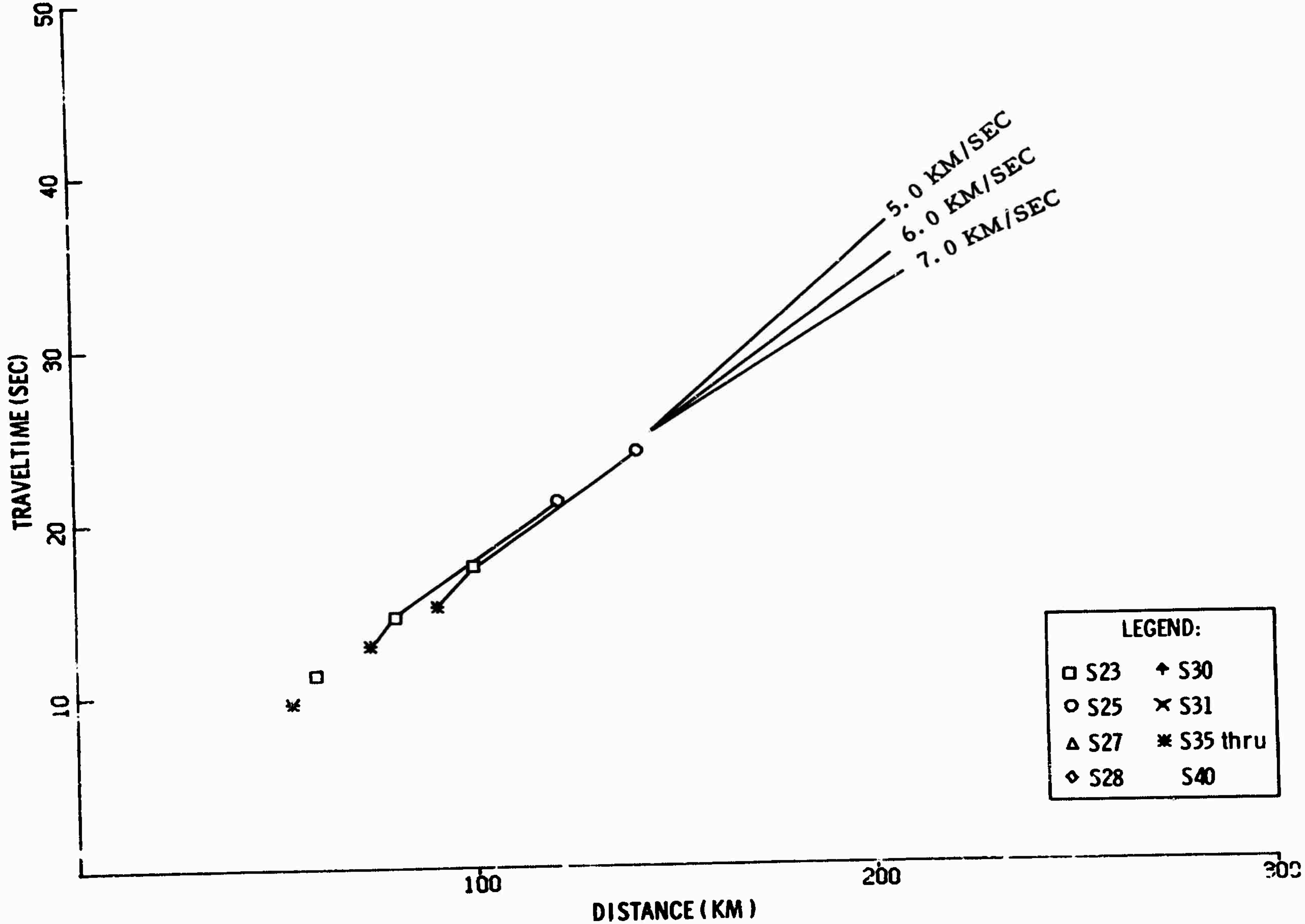


Figure II-28. First-Iteration Corrected Traveltimes of Pg Arrivals from Phase III, South Shots

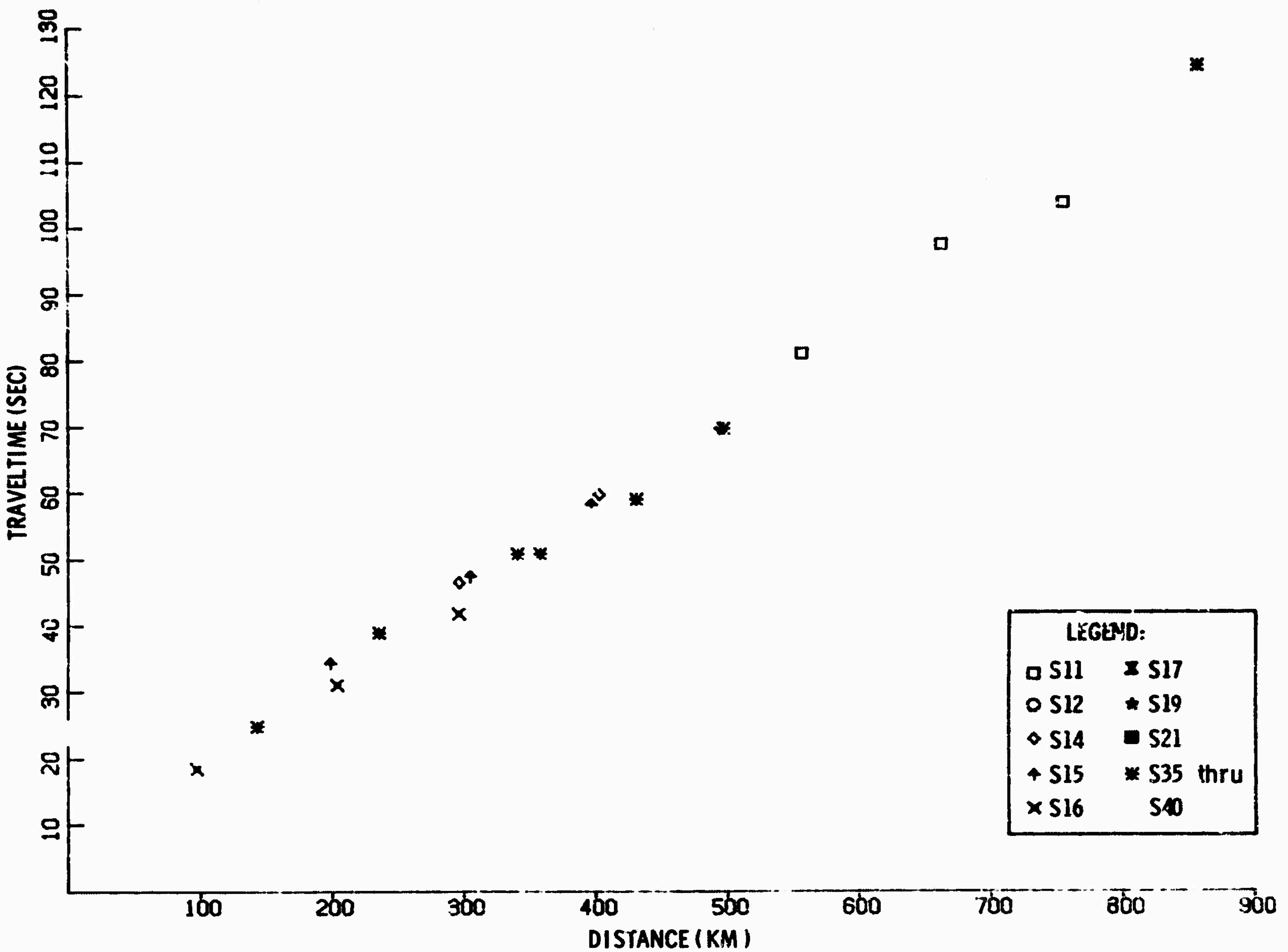


Figure II-29. First-Iteration Raw Traveltimes of Pn Arrivals from Phase II, Aleutian Basin Shots

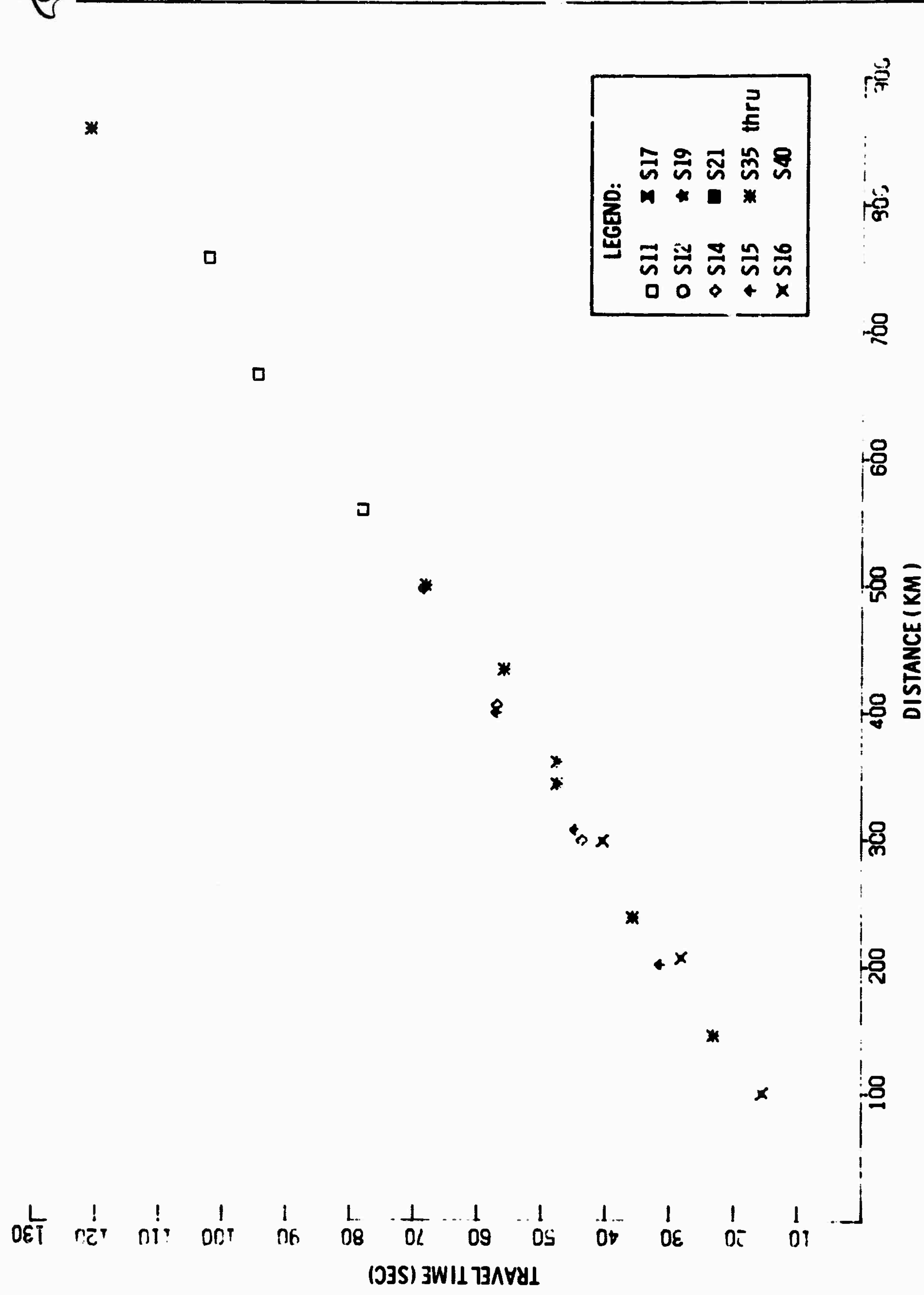


Figure II-30. First-Iteration Corrected Traveltimes of Pn Arrivals from Phase II, Aleutian Basin Shots

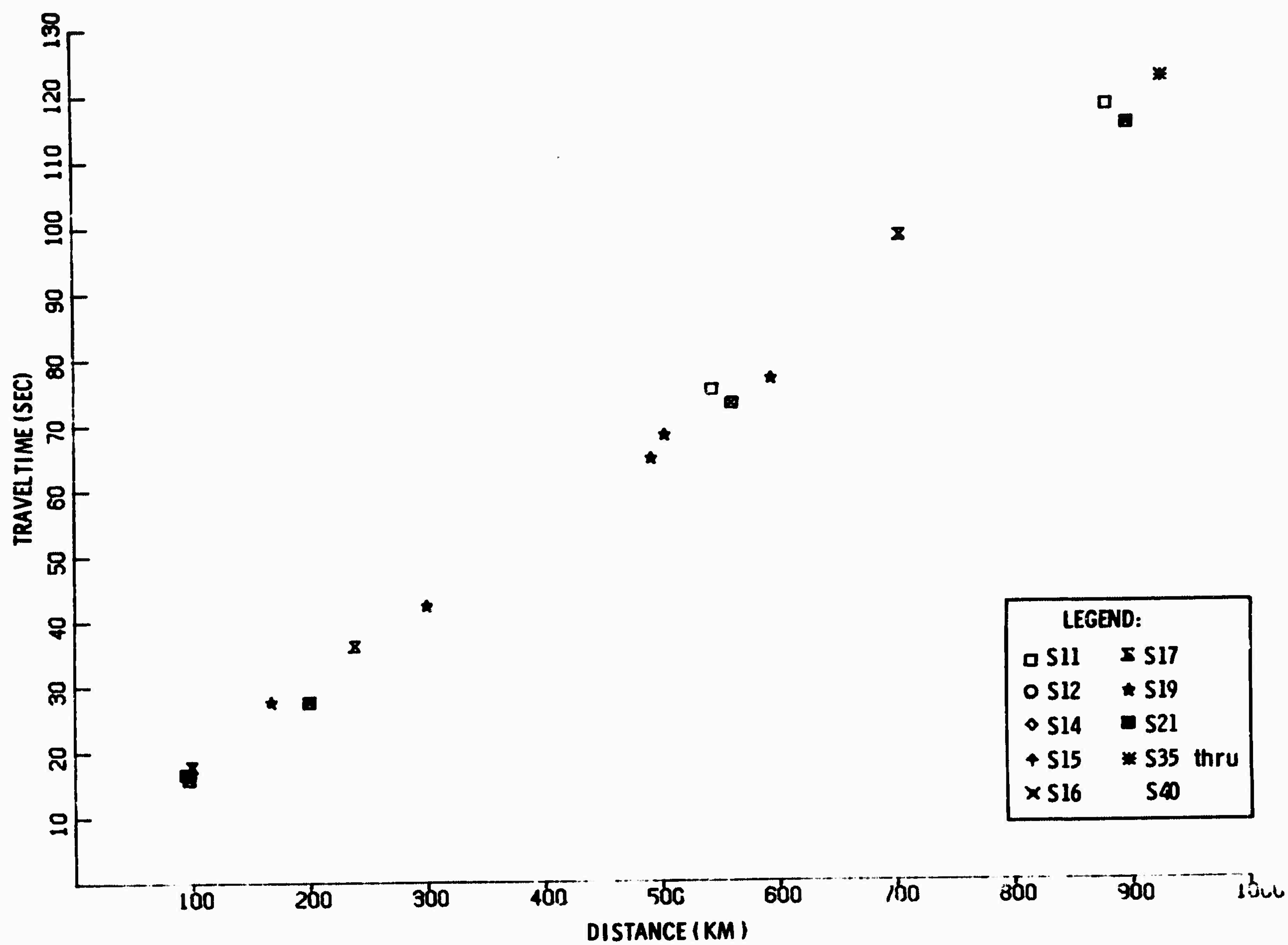


Figure II-31. First-Iteration Raw Traveltimes of Pn Arrivals from Phase II, Pacific Basin Shots

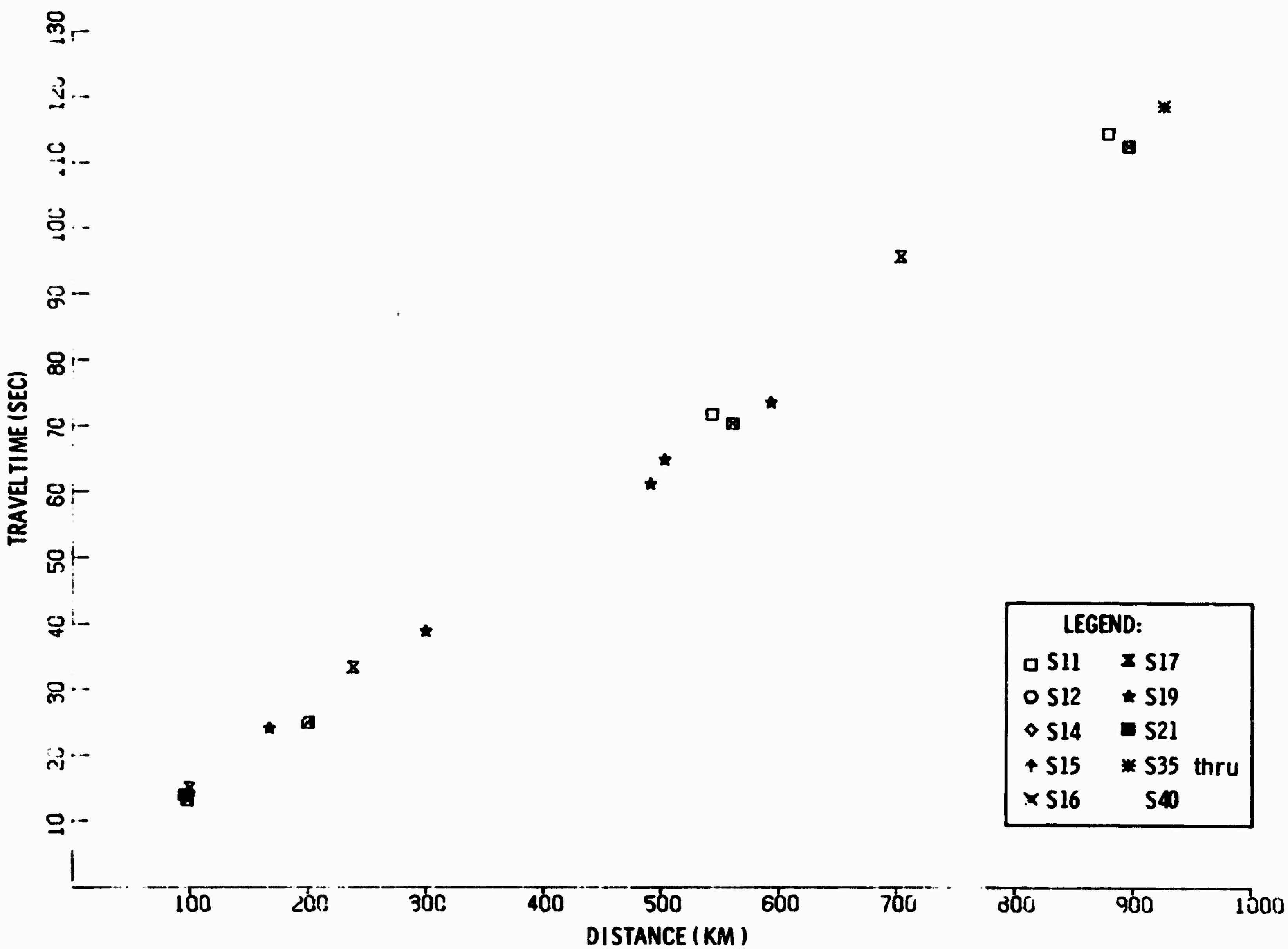


Figure II-32. First-Iteration Corrected Traveltimes of Pn Arrivals from Phase II, Pacific Basin Shots

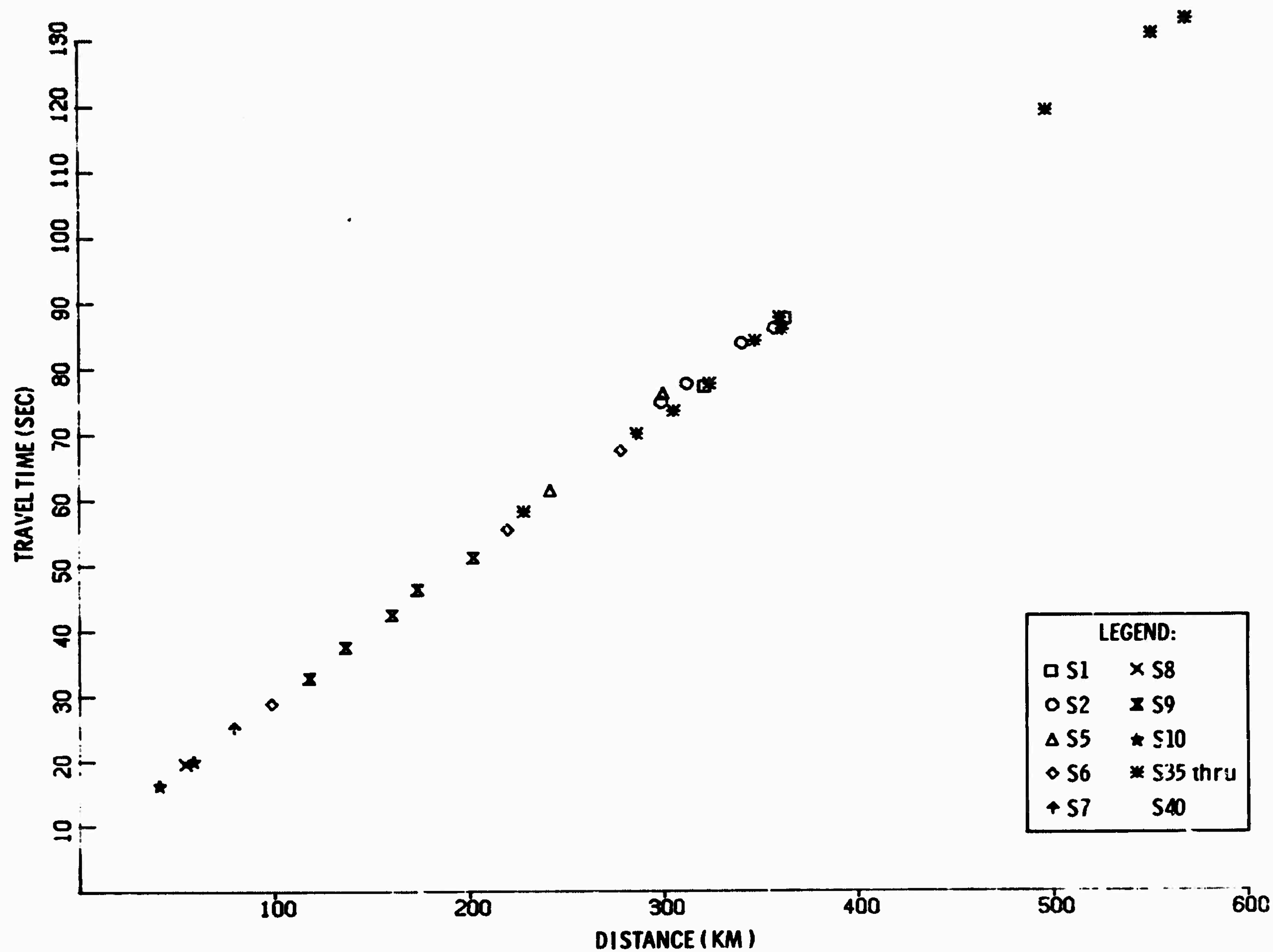


Figure II-33. First-Iteration Raw Traveltimes of S Arrivals from Phase I, South Shots

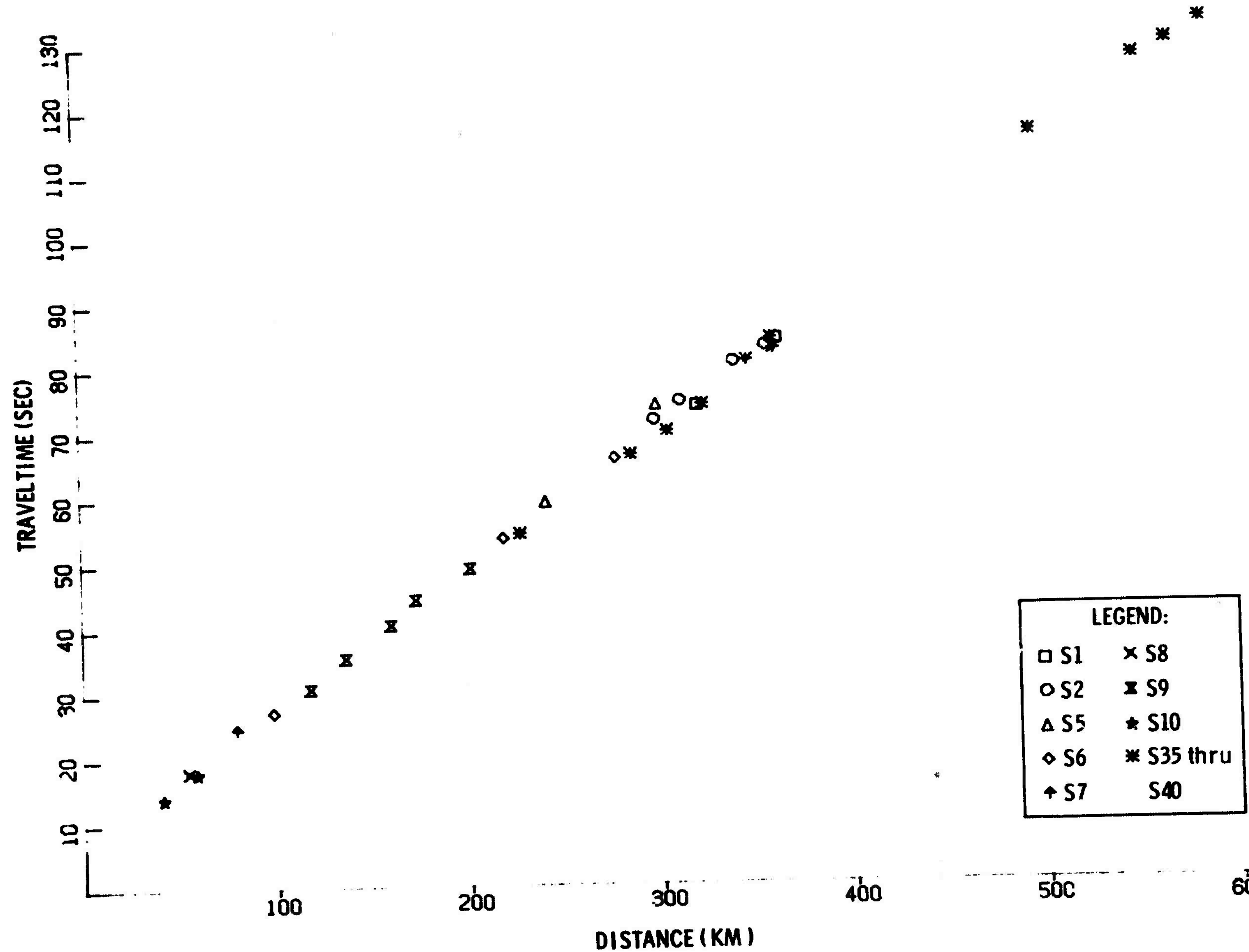


Figure II-34. First-Iteration Corrected Traveltimes of S Arrivals from Phase I, South Shots

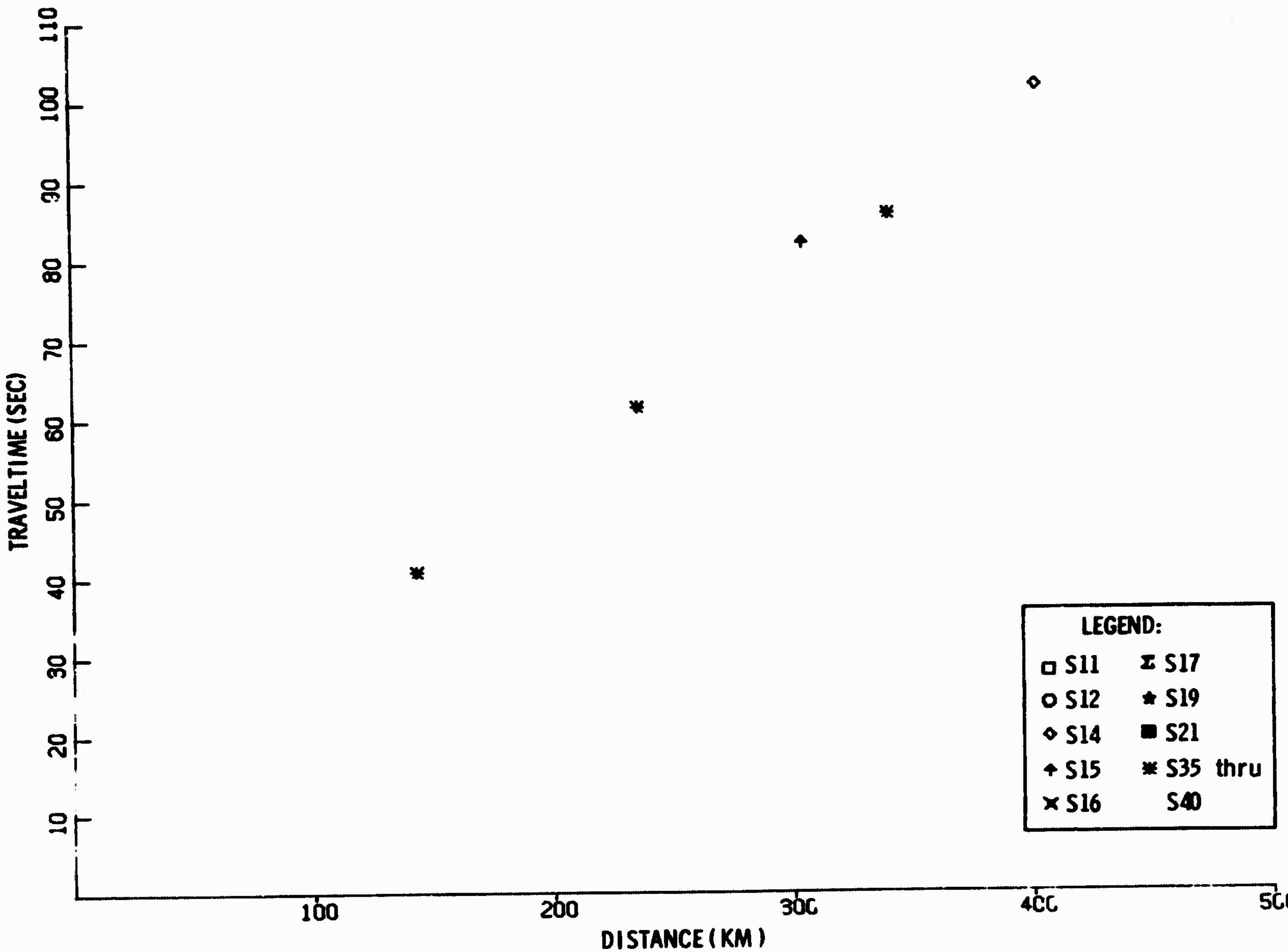


Figure II-35. First-Iteration Raw Traveltimes of S Arrivals from Phase II, Aleutian Basin Shots

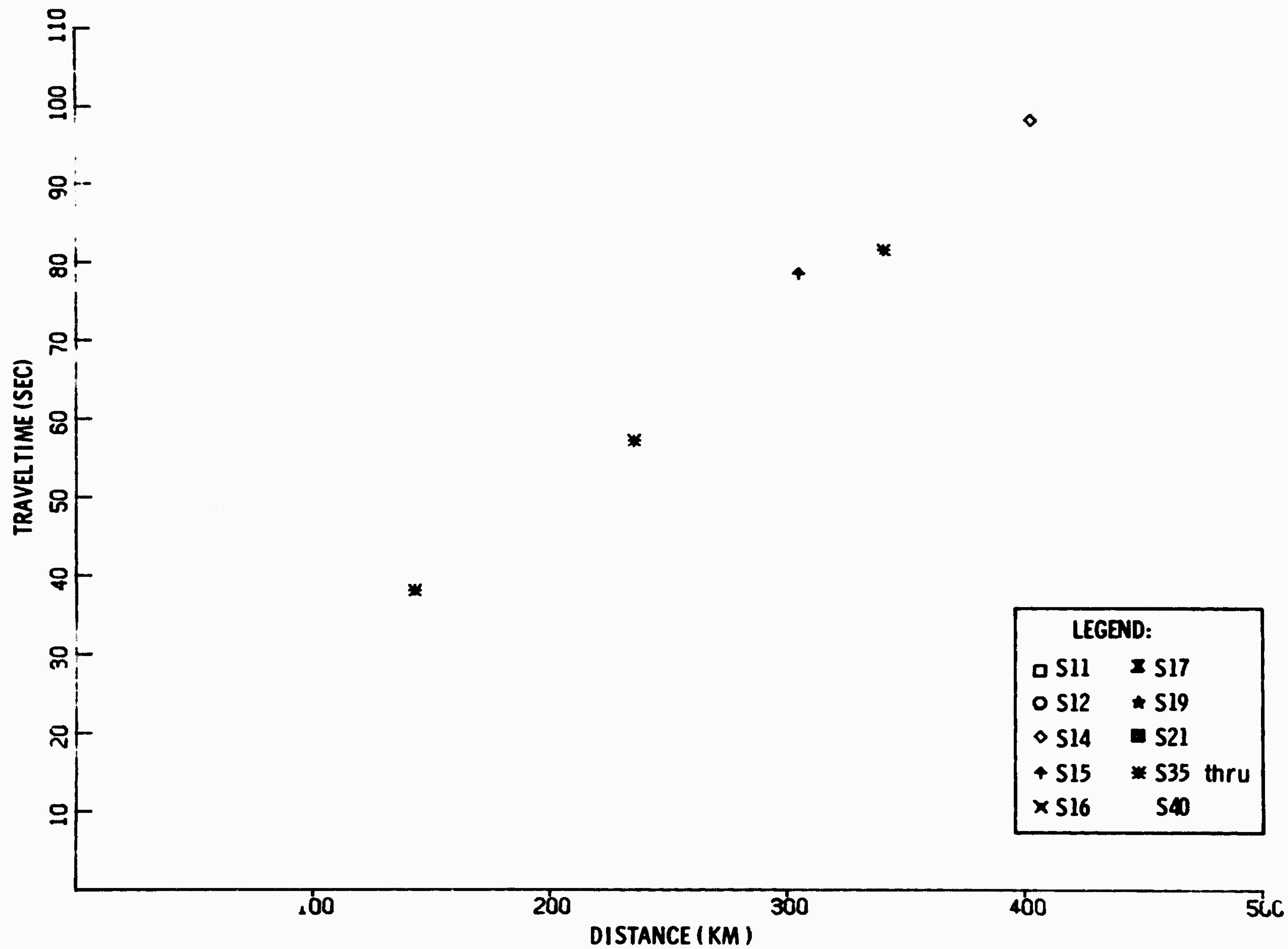


Figure II-36. First-Iteration Corrected Traveltimes of S Arrivals from Phase II, Aleutian Basin Shots

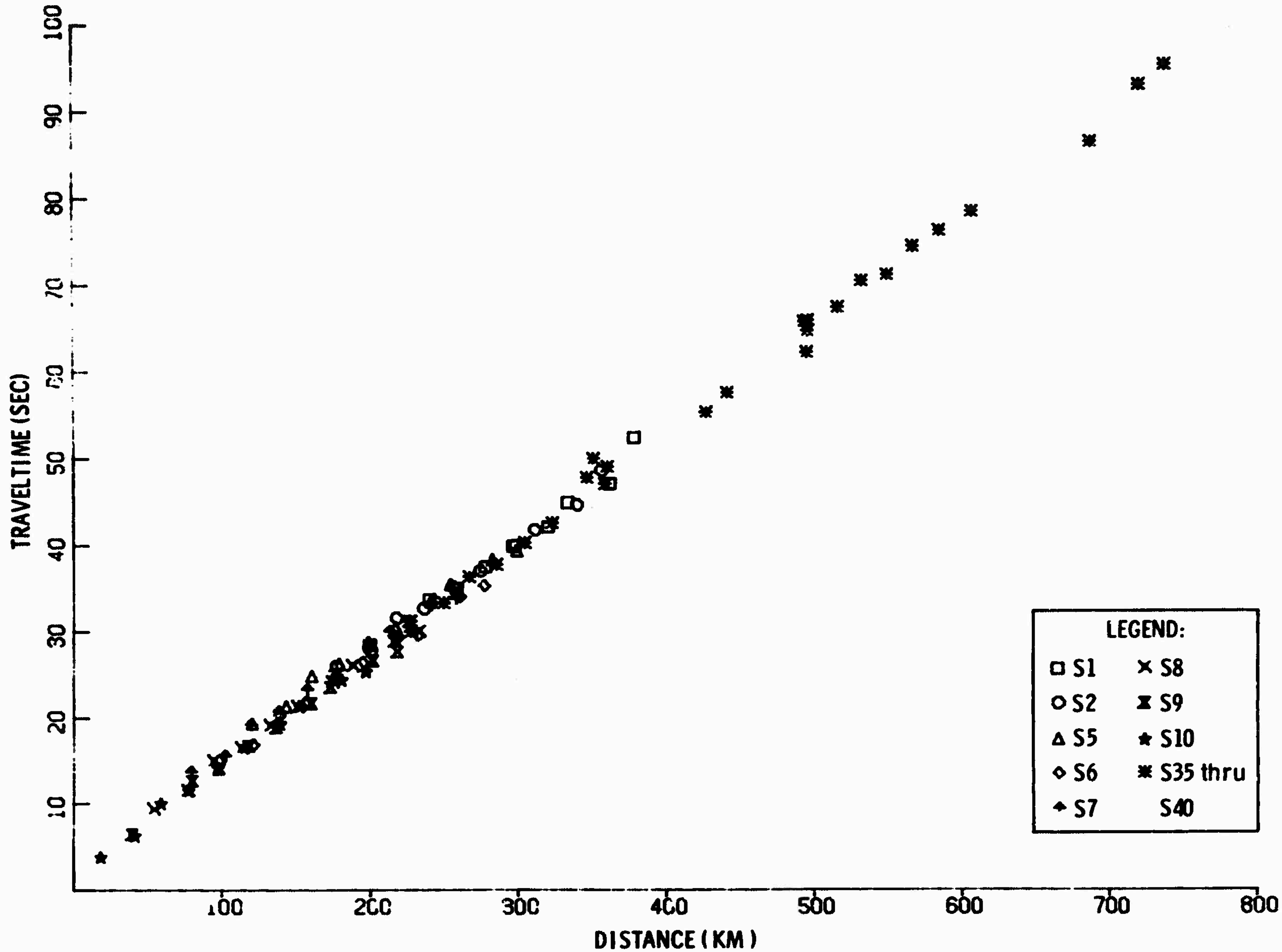


Figure II-37. Second-Iteration Corrected Traveltimes of Pn Arrivals from Phase I, South Shots

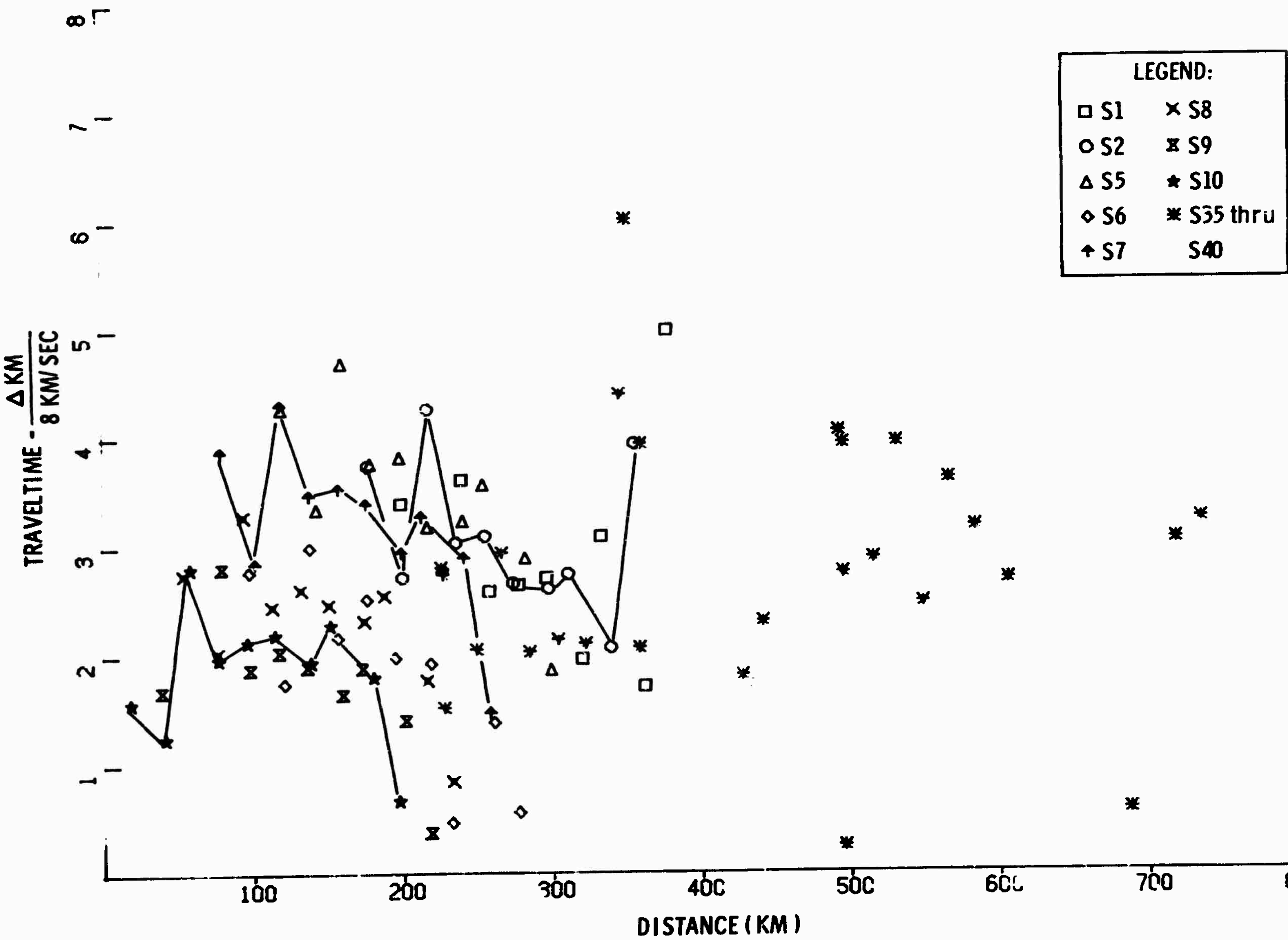


Figure II-38. Second-Iteration Reduced Traveltimes of Pn Arrivals from Phase I, South Shots

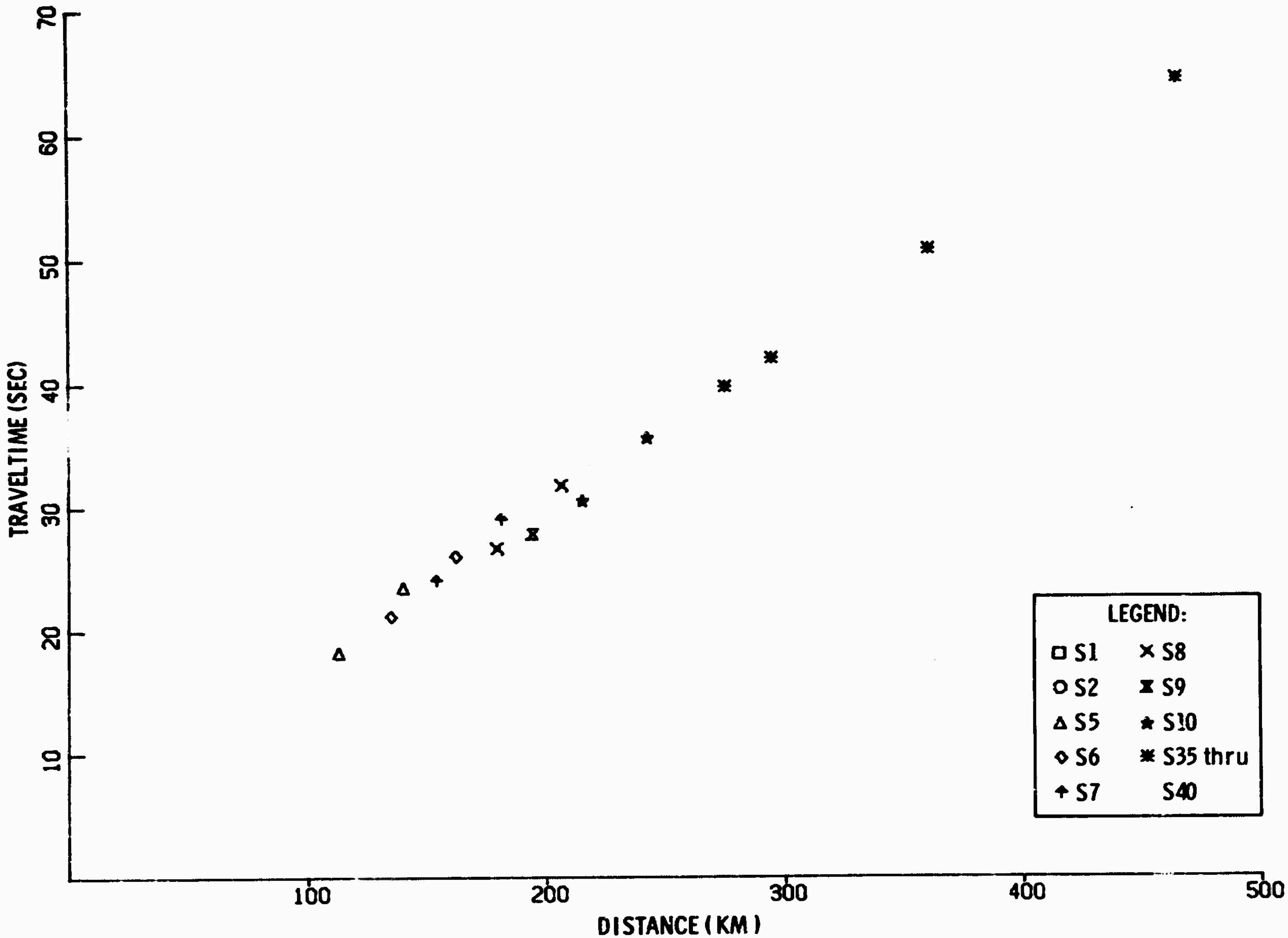


Figure II-39. Second-Iteration Corrected Traveltimes of Pn Arrivals from Phase I, North Shots

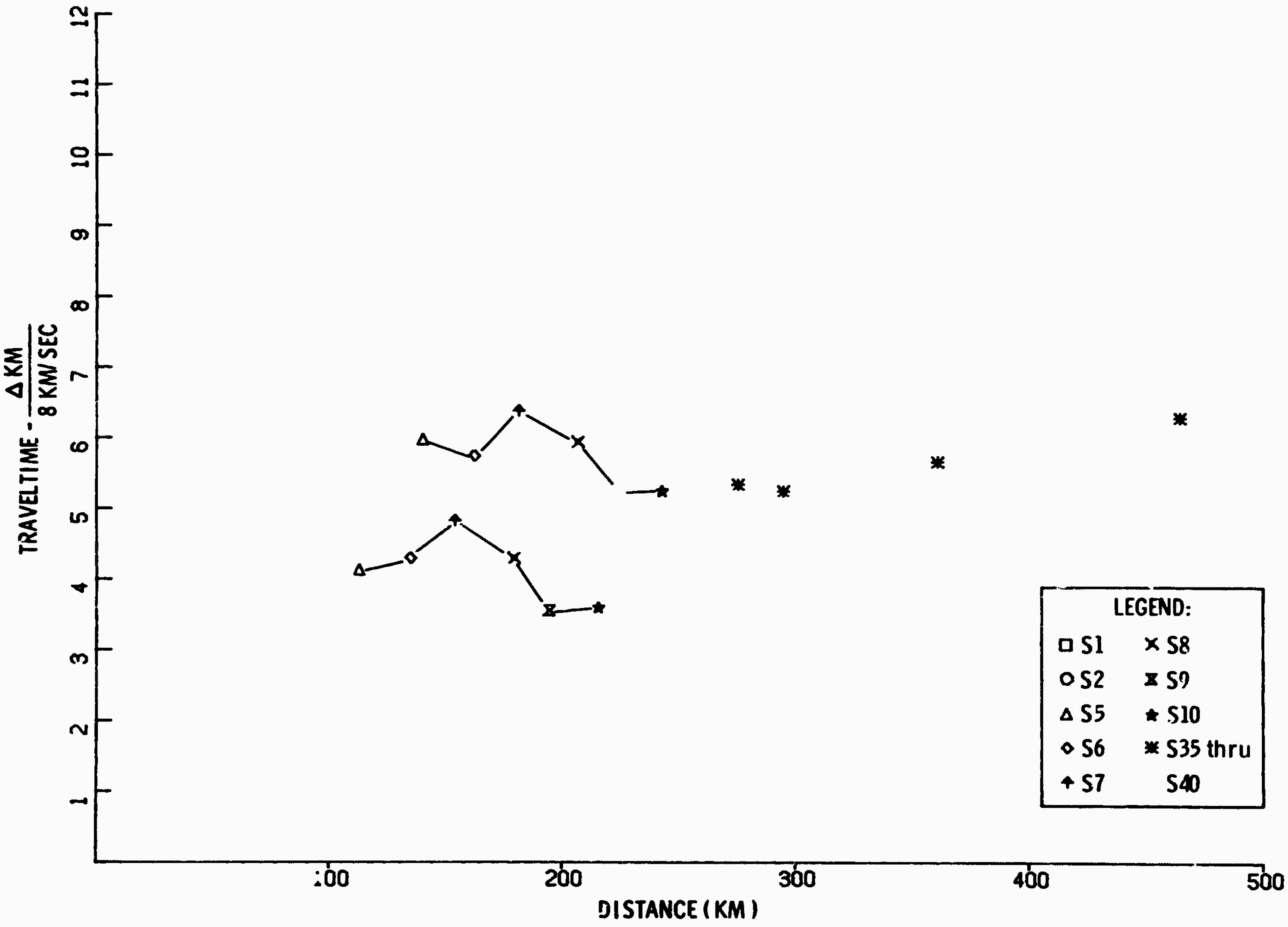


Figure II-40. Second-Iteration Reduced Traveltimes of Pn Arrivals from Phase I, North Shots

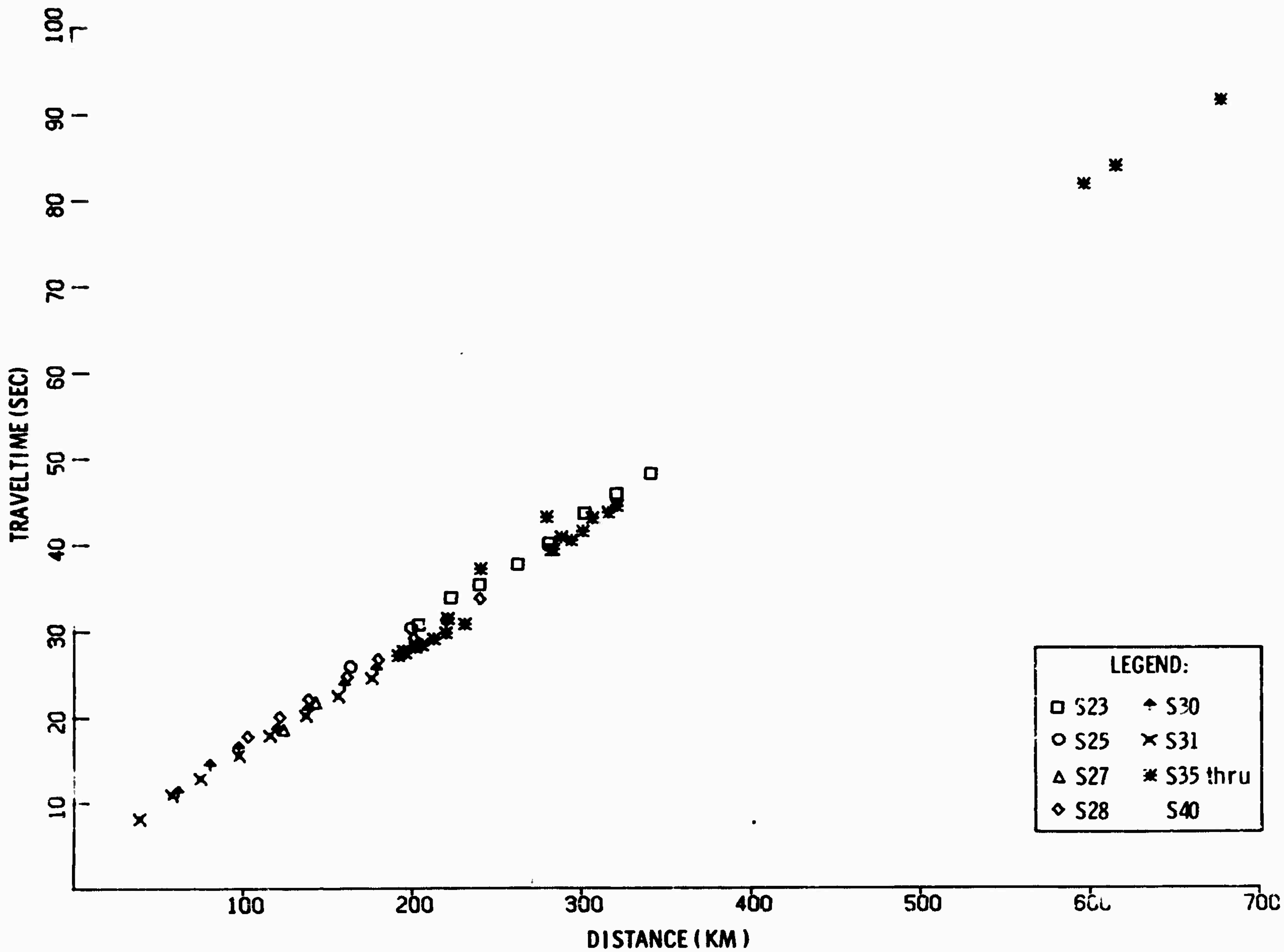


Figure II-41. Second-Iteration Corrected Traveltimes of Pn Arrivals from Phase III, North Shots

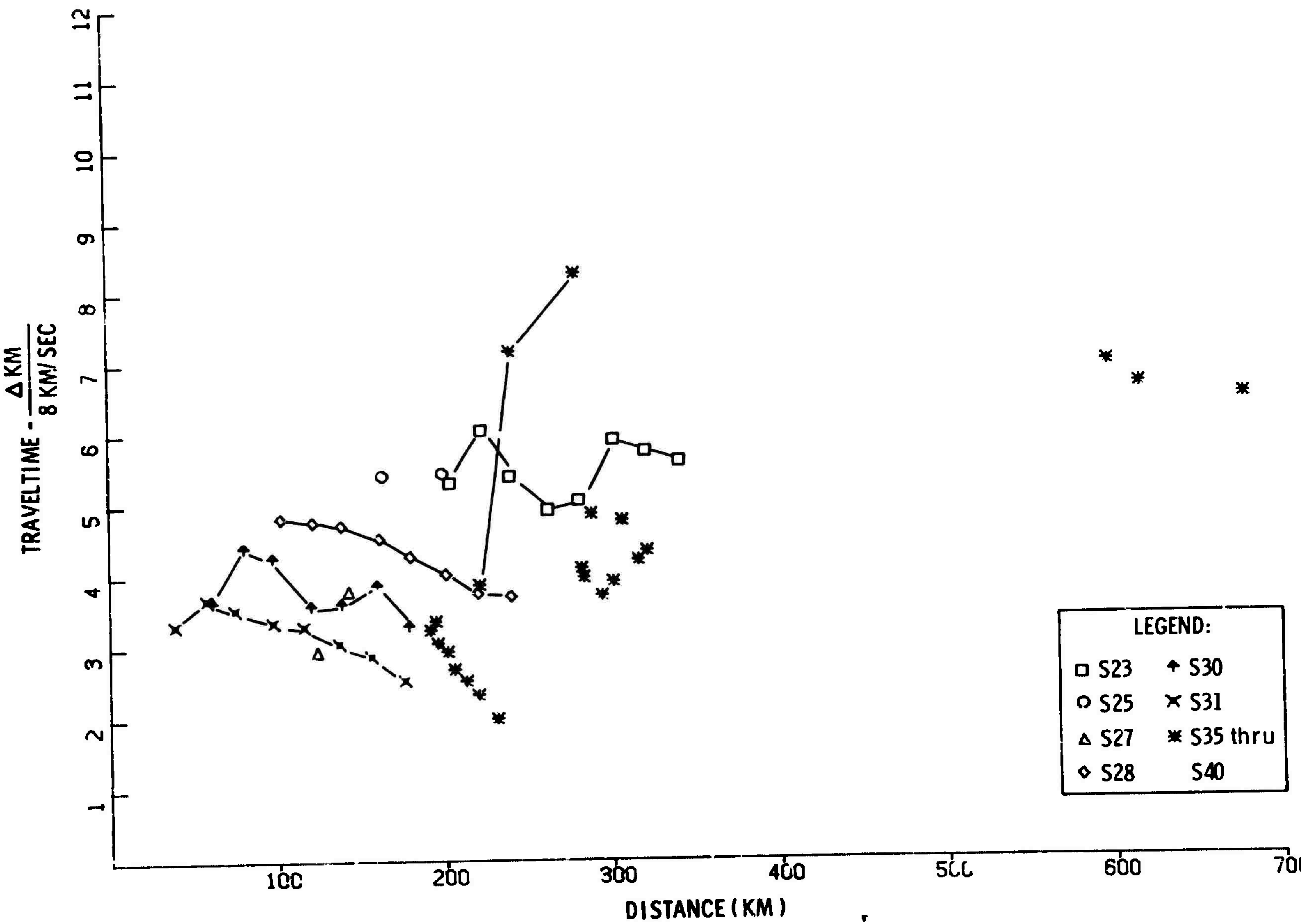


Figure II-42. Second-Iteration Reduced Traveltimes of Pn Arrivals from Phase III, North Shots

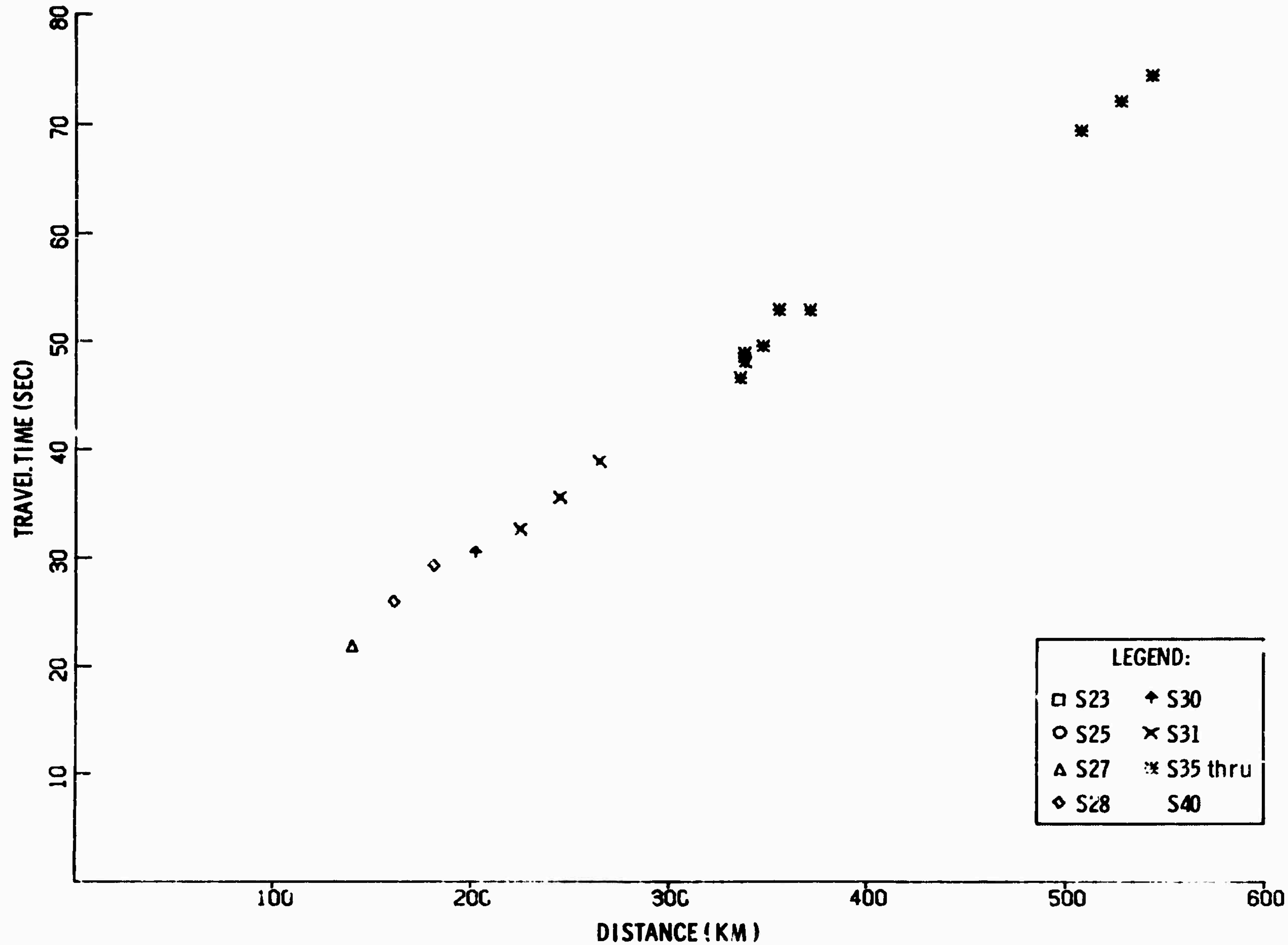


Figure II-43. Second-Iteration Corrected Traveltimes of Pn Arrivals from Phase III, South Shots

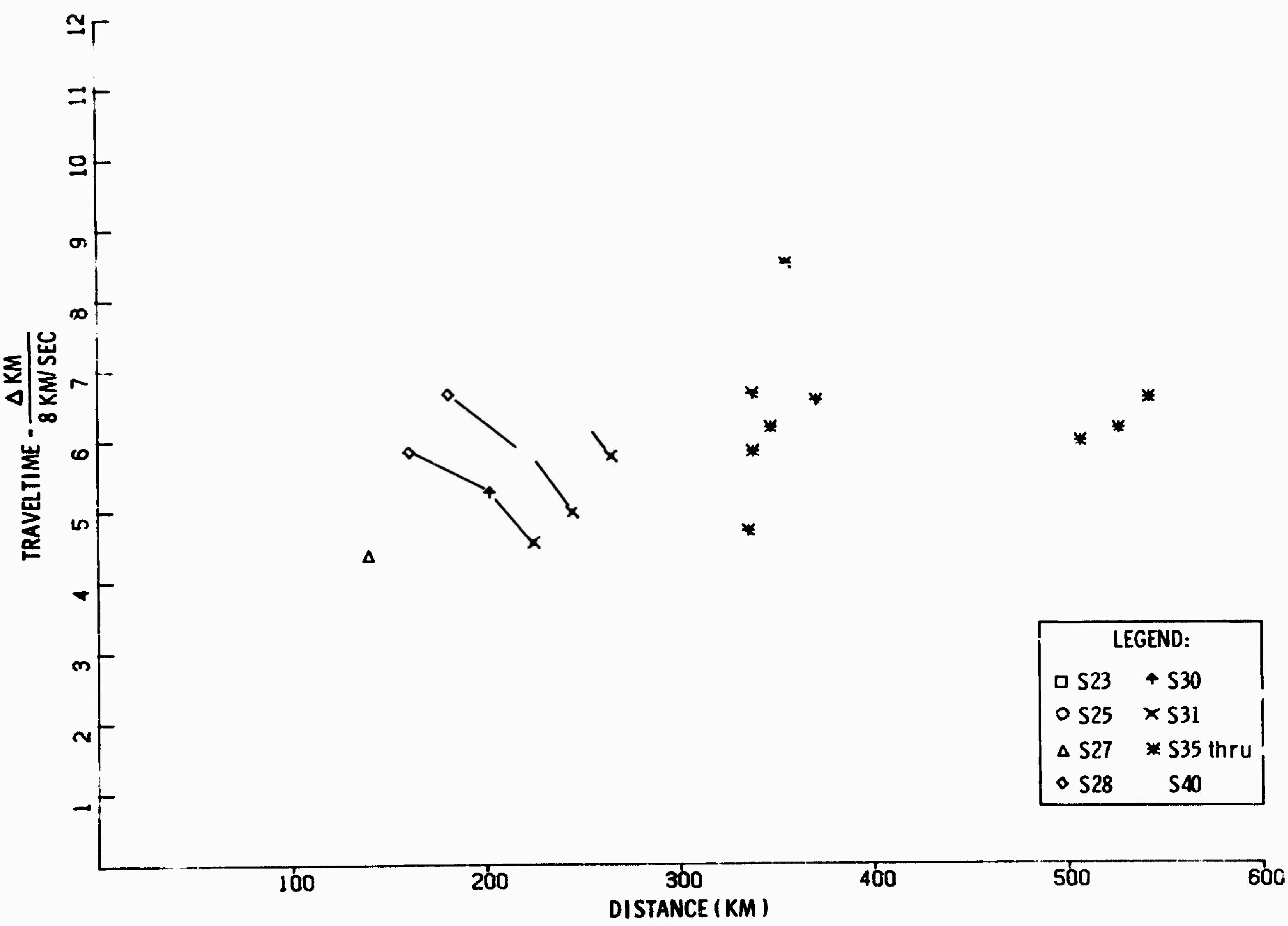


Figure II-44. Second-Iteration Reduced Traveltimes of Pn Arrivals from Phase III, South Shots

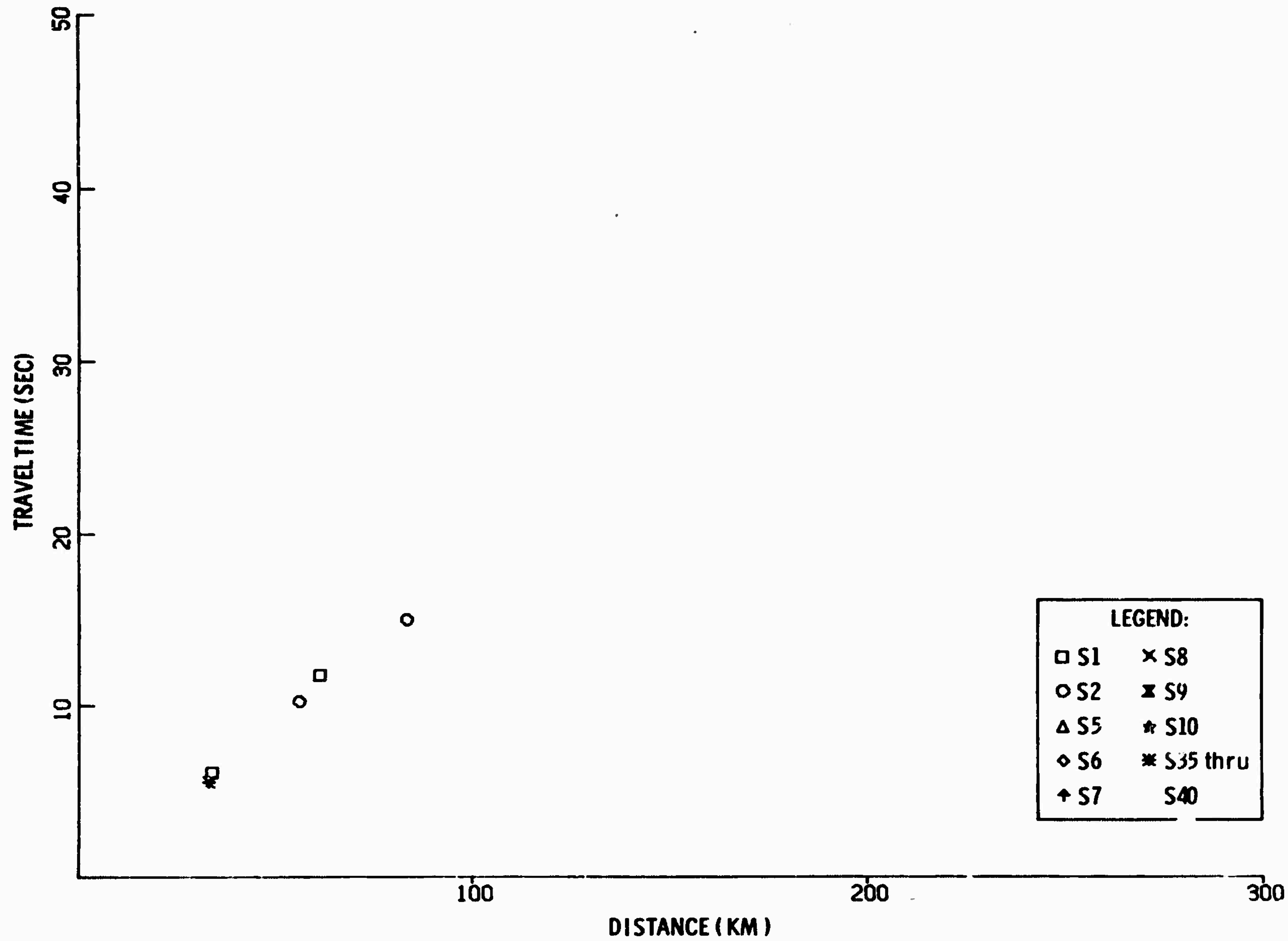


Figure II-45. Second-Iteration Corrected Traveltimes of Pg Arrivals from Phase I, North Shots

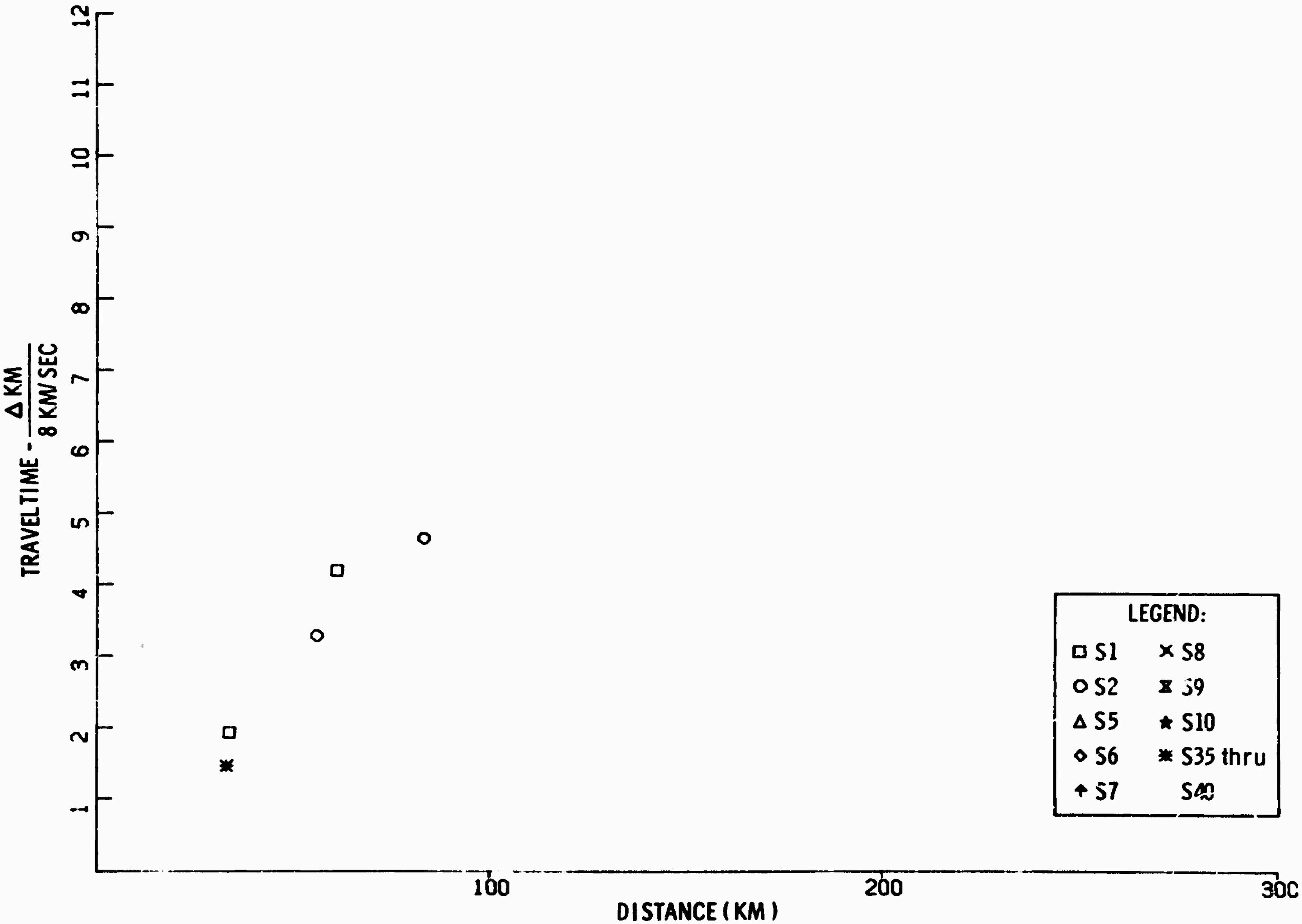


Figure II-46. Second-Iteration Reduced Traveltimes of Pg Arrivals from Phase I, North Shots

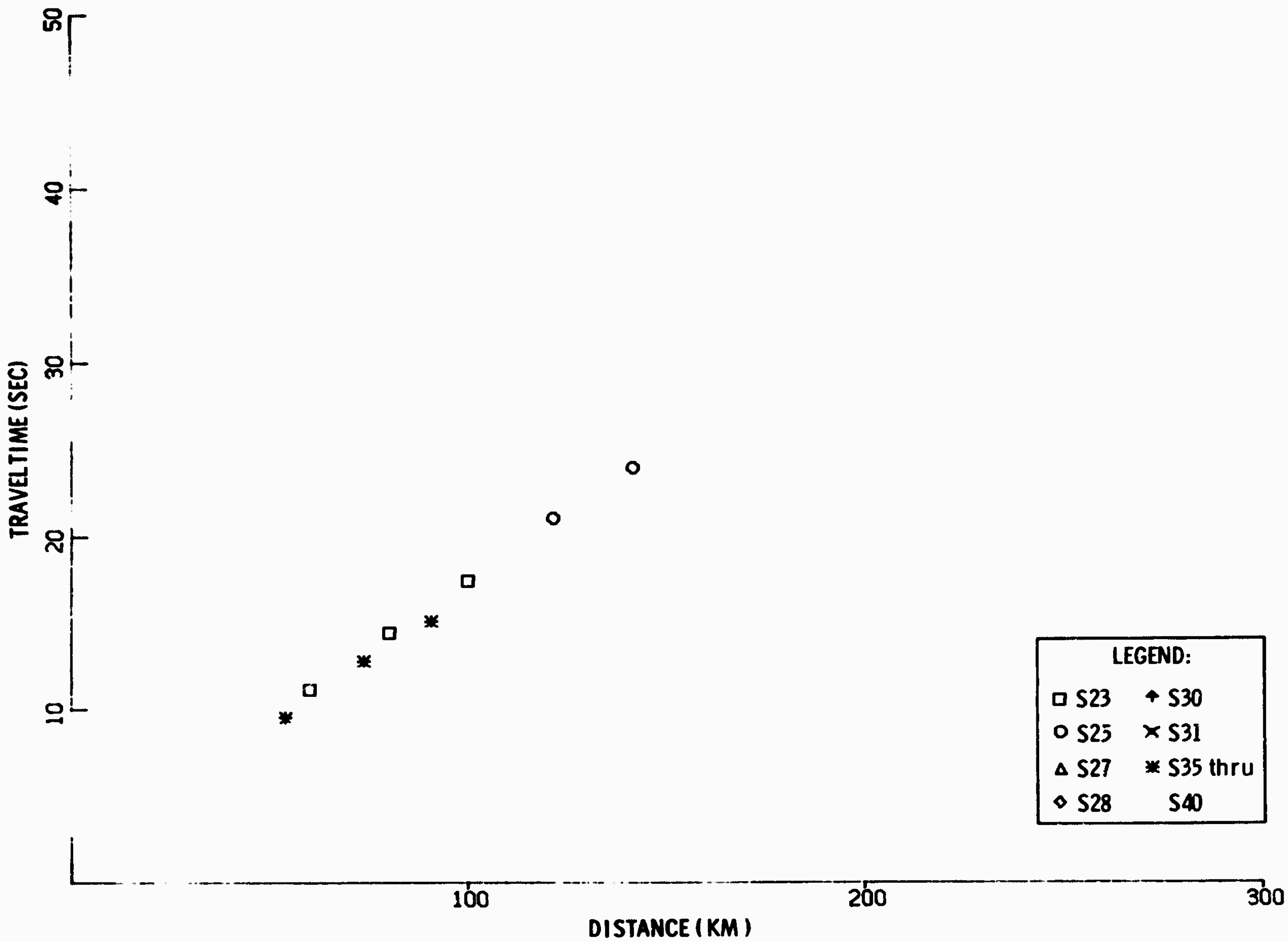


Figure II-47. Second-Iteration Corrected Traveltimes of Pg Arrivals from Phase III, South Shots

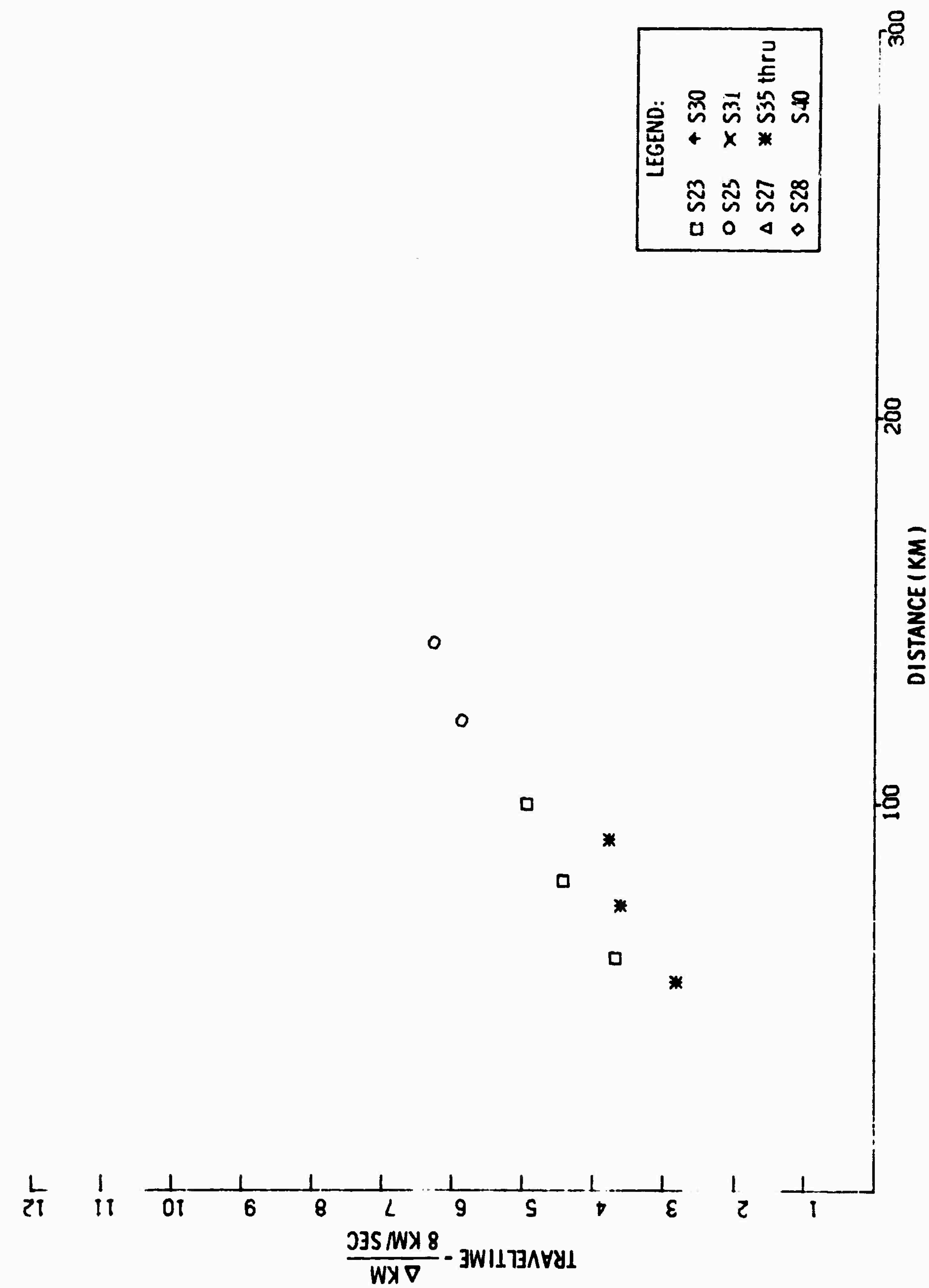


Figure II-48. Second-Iteration Reduced Traveltimes of Pg Arrivals from Phase III, South Shots

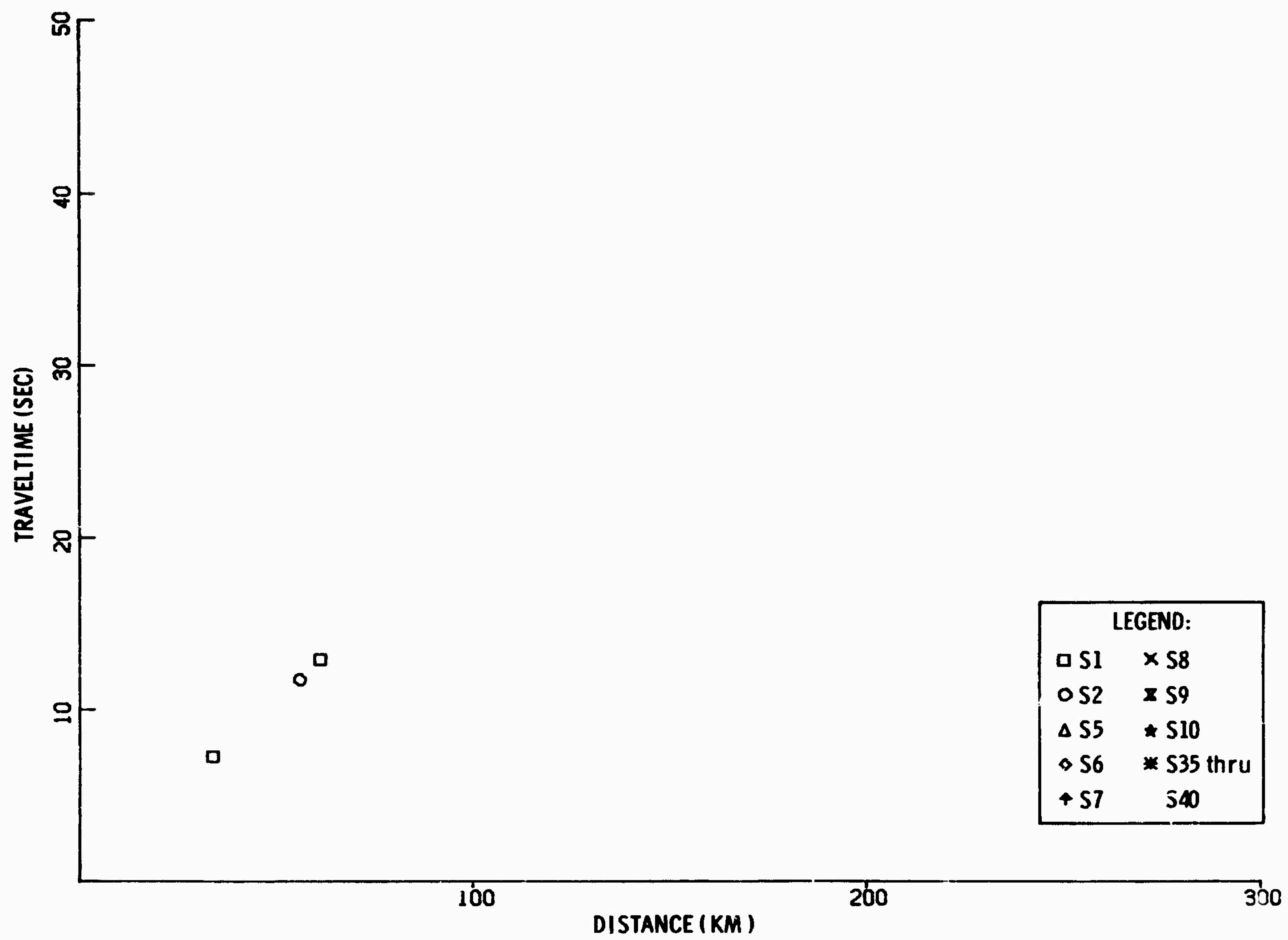


Figure II-49. Second-Iteration Corrected Traveltimes of Shallow Pg Arrivals from Phase I, North Shots

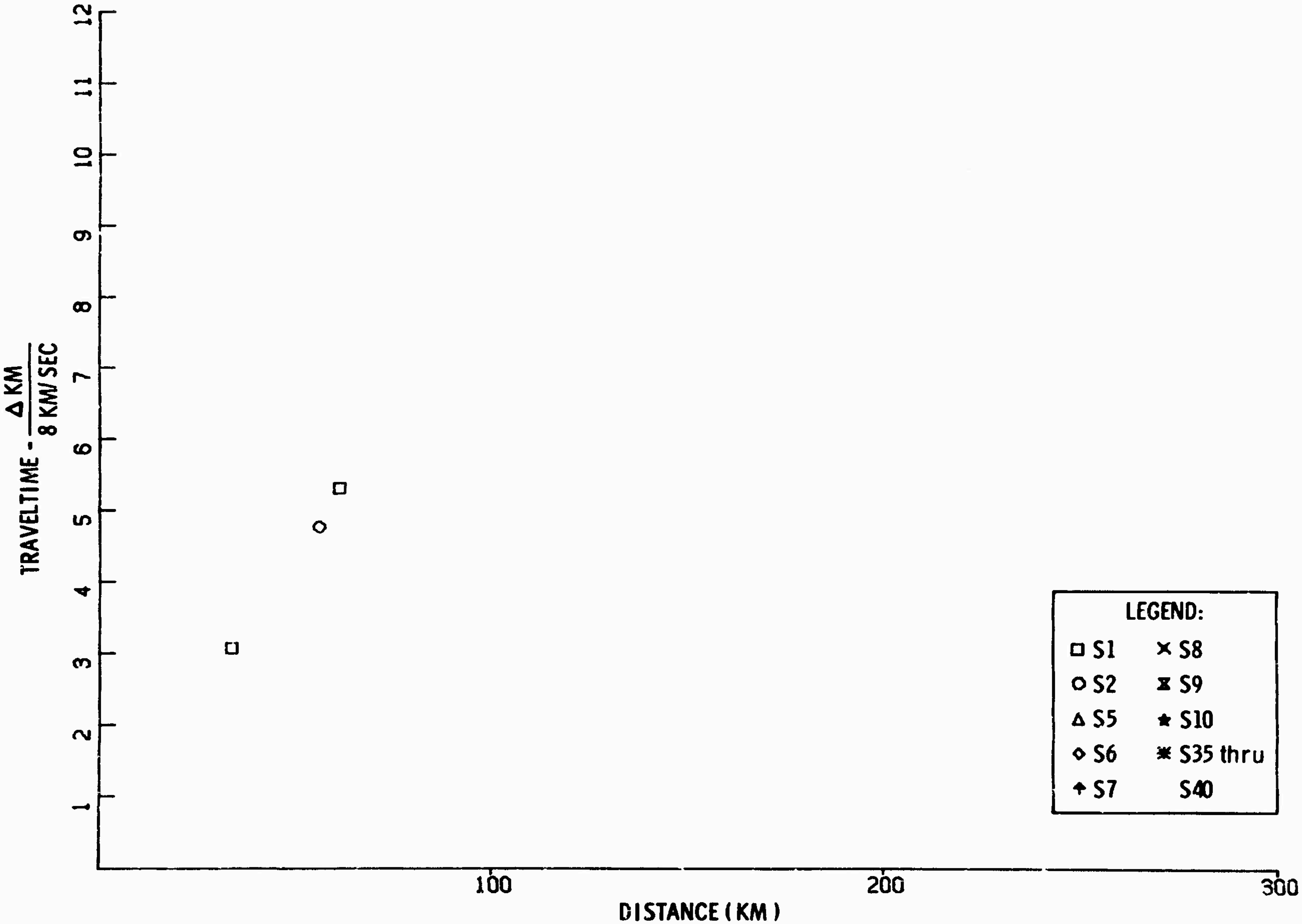


Figure II-50. Second-Iteration Reduced Traveltimes of Shallow Pg Arrivals from Phase I, North Shots

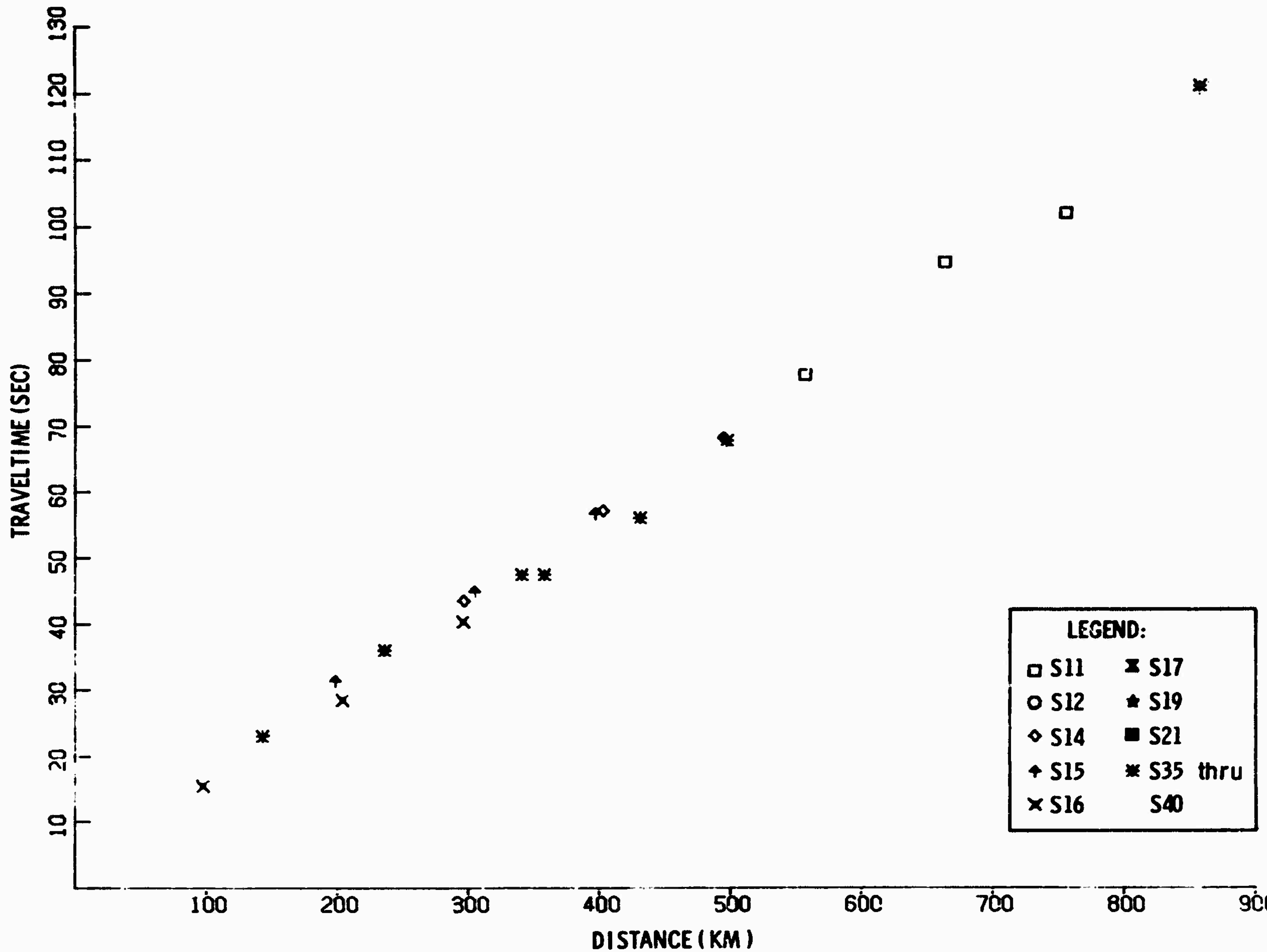


Figure II-51. Second-Iteration Corrected Traveltimes of Pn Arrivals from Phase II, Aleutian Basin Shots

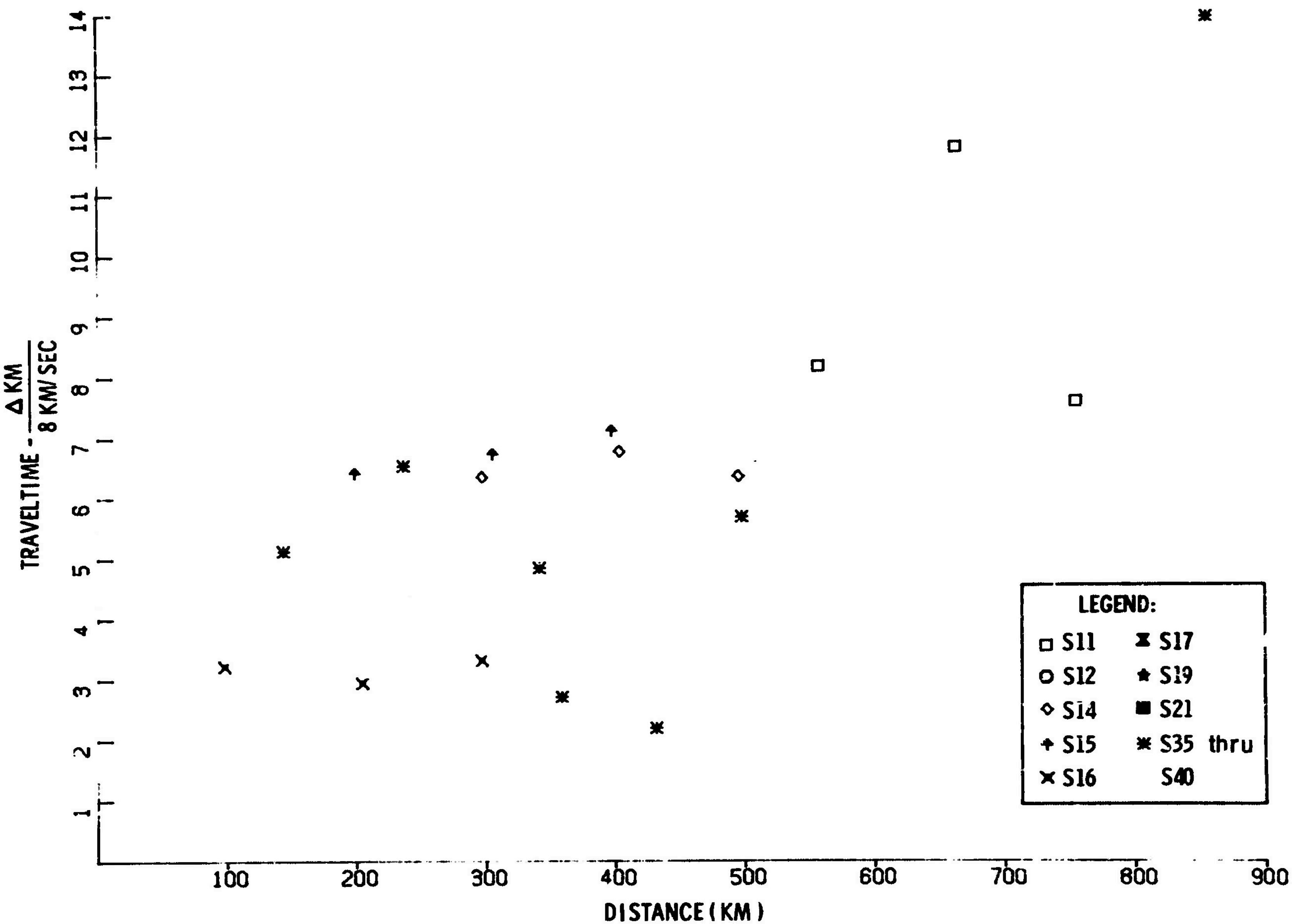


Figure II-52. Second-Iteration Reduced Traveltimes of Pn Arrivals from Phase II, Aleutian Basin Shots

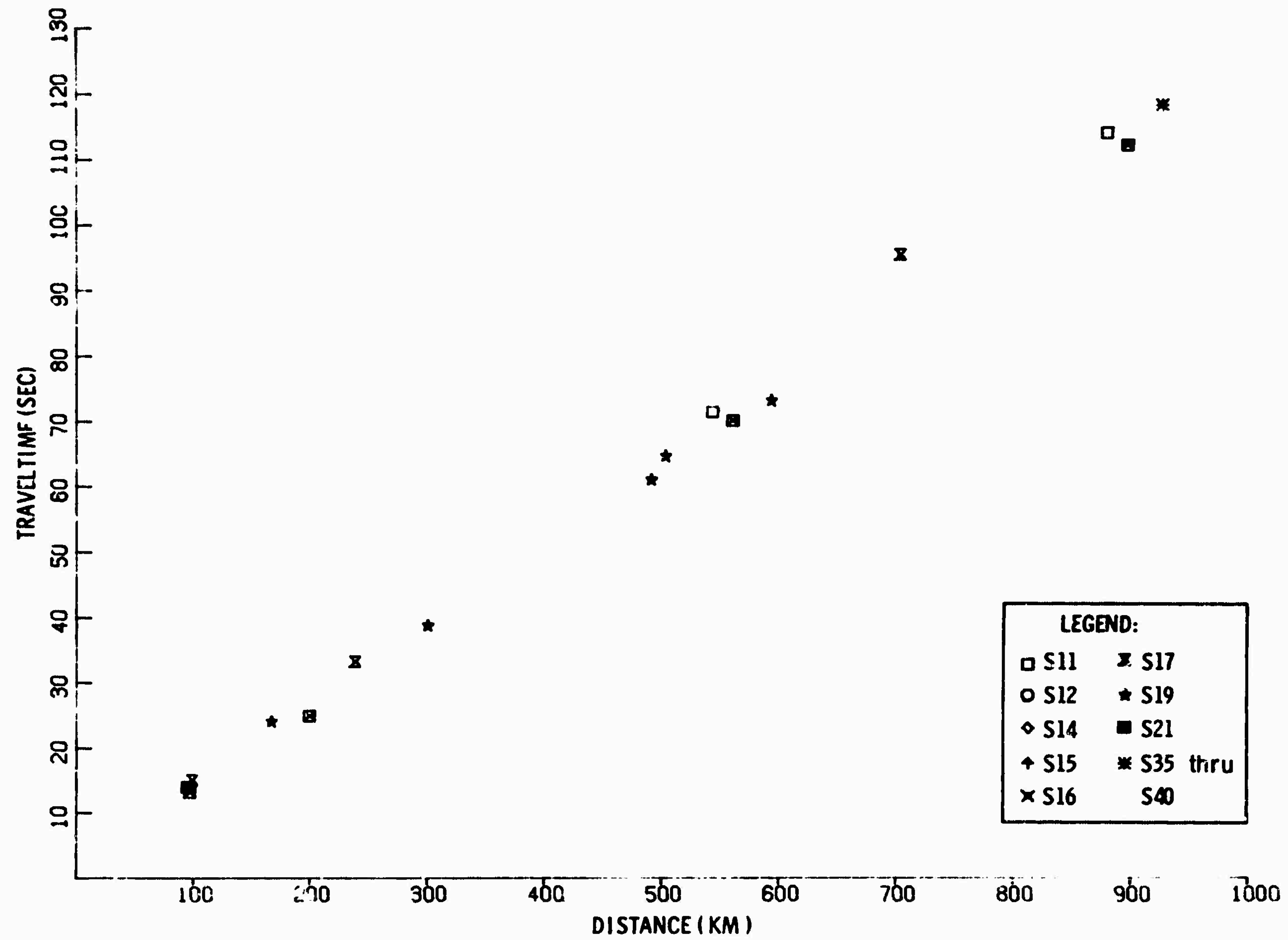


Figure II-53. Second-Iteration Corrected Traveltimes of Pn Arrivals from Phase II, Pacific Basin Shots

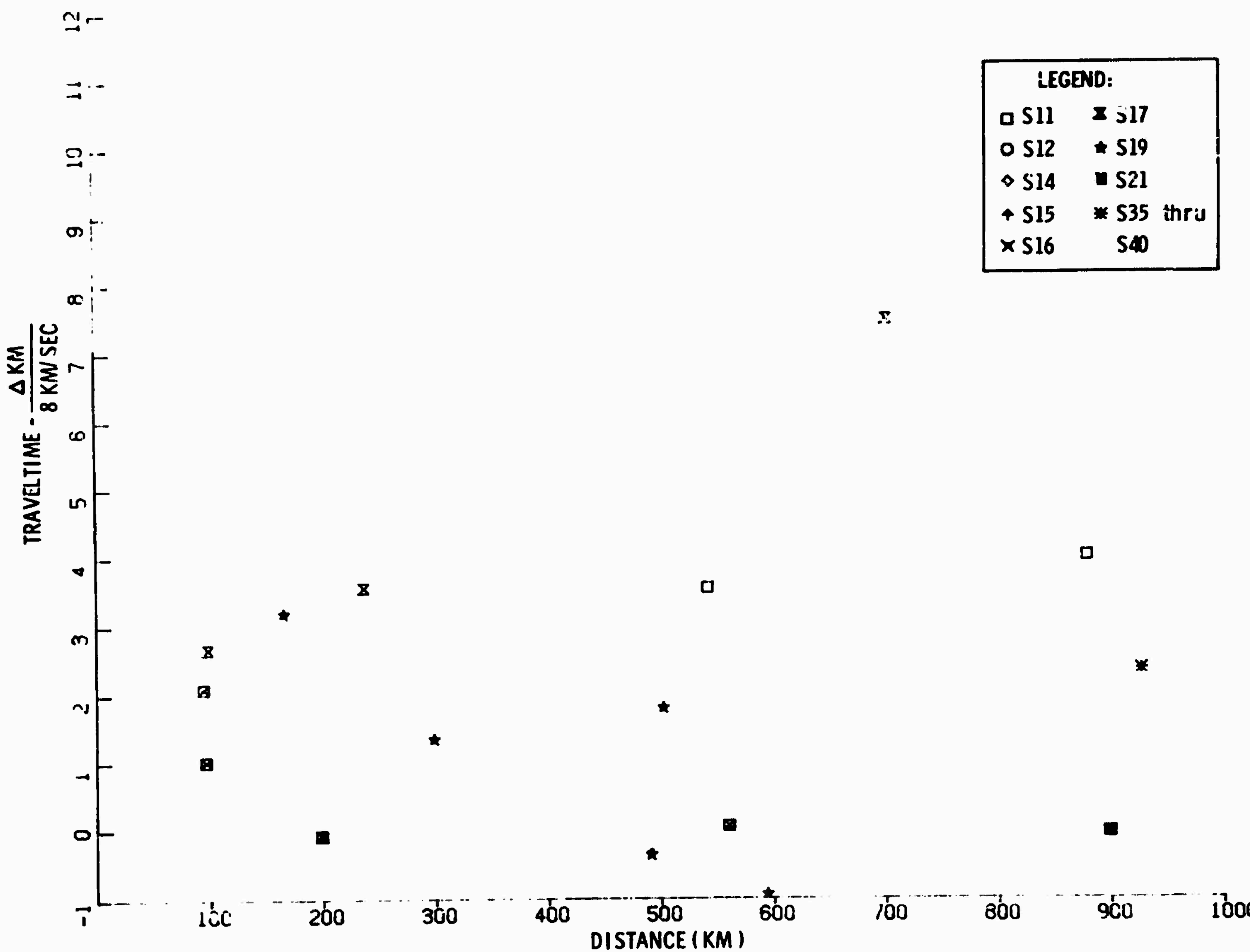


Figure II-54. Second-Iteration Reduced Traveltimes of Pn Arrivals from Phase II, Pacific Basin Shots

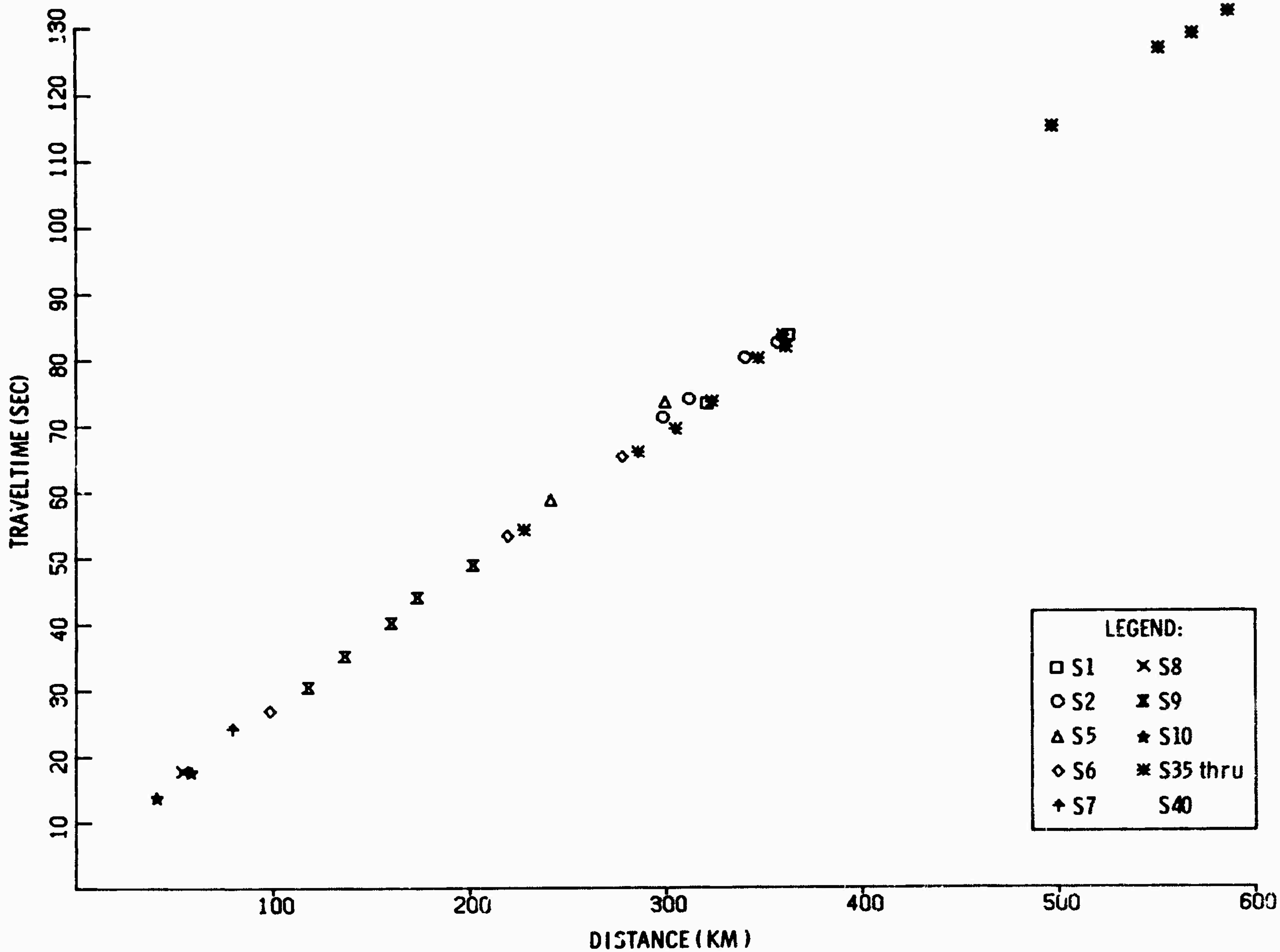


Figure II-55. Second-Iteration Corrected Traveltimes of S Arrivals from Phase I, South Shots

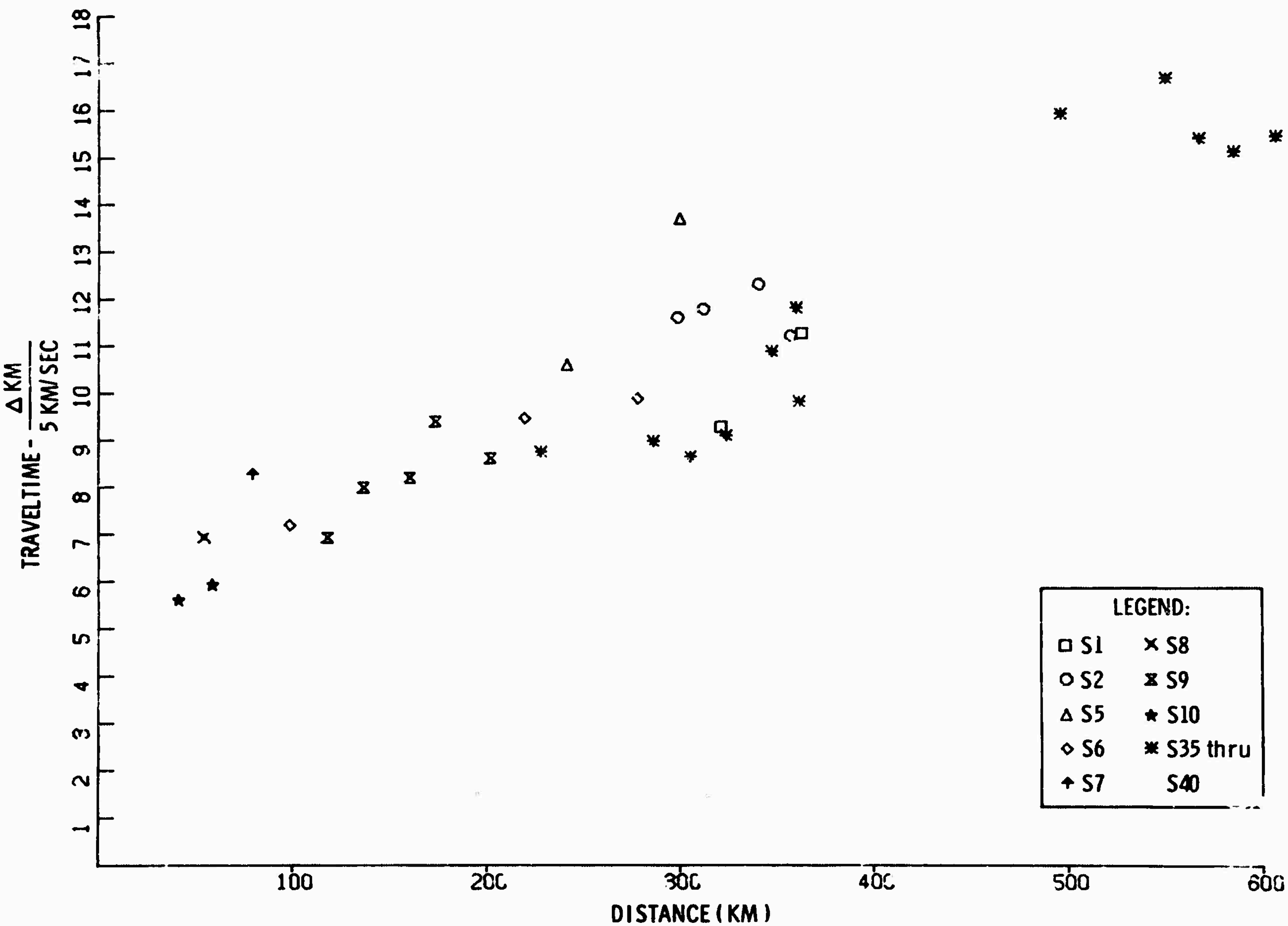


Figure II-56. Second-Iteration Reduced Traveltimes of S Arrivals from Phase I, South Shots

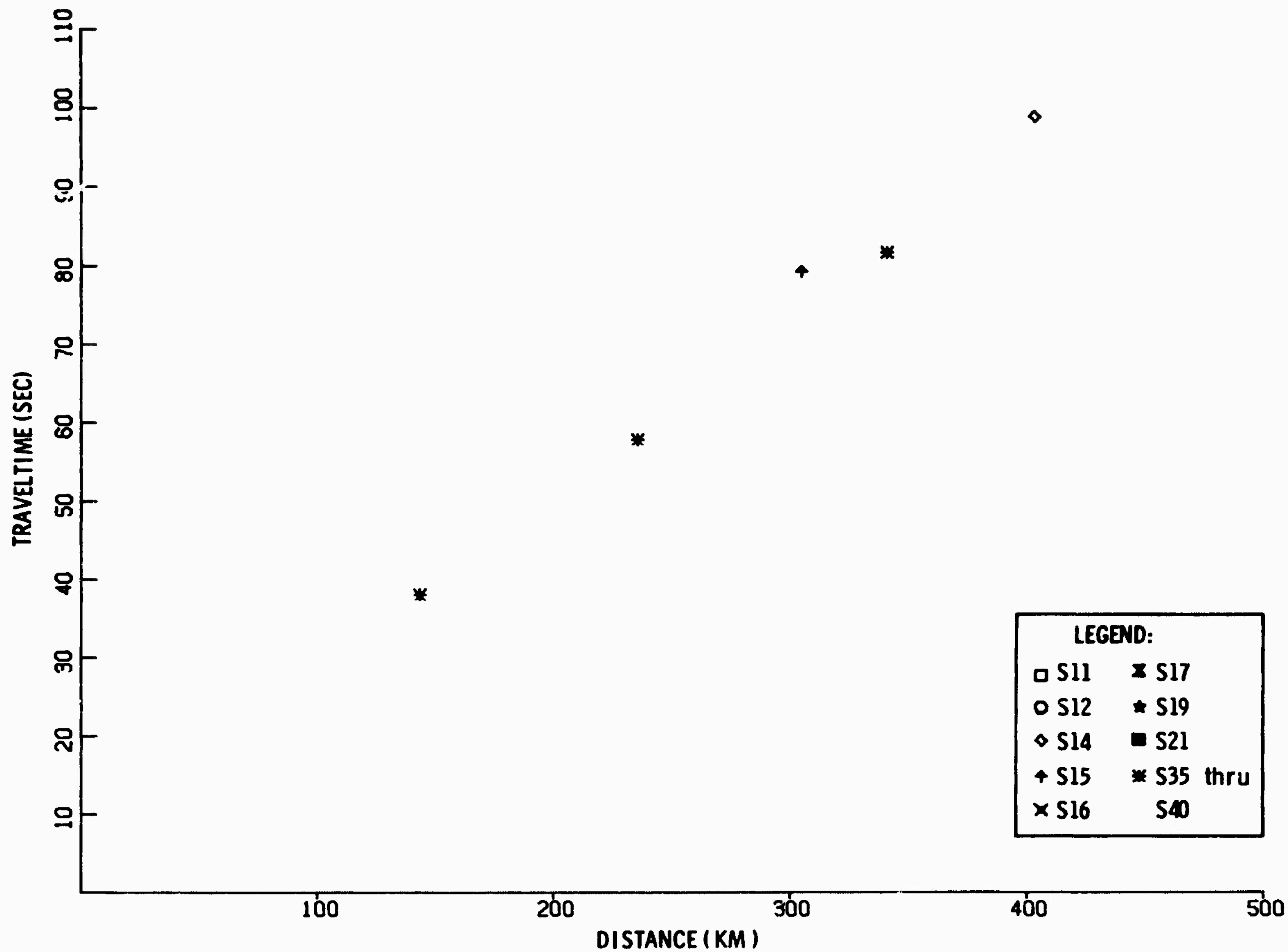


Figure II-57. Second-Iteration Corrected Traveltimes of S Arrivals from Phase II, Aleutian Basin Shots

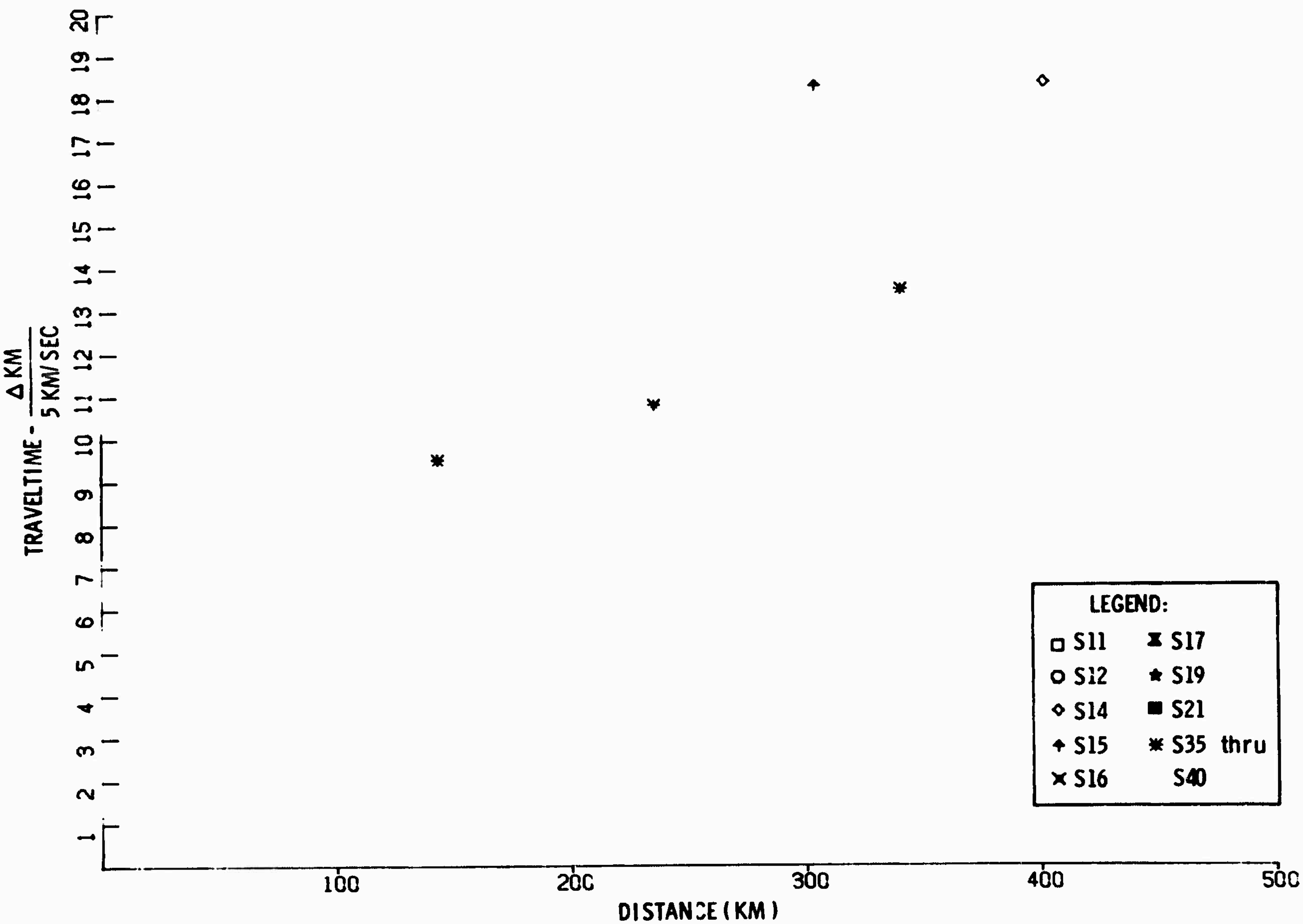


Figure II-58. Second-Iteration Reduced Traveltimes of S Arrivals from Phase II, Aleutian Basin Shots

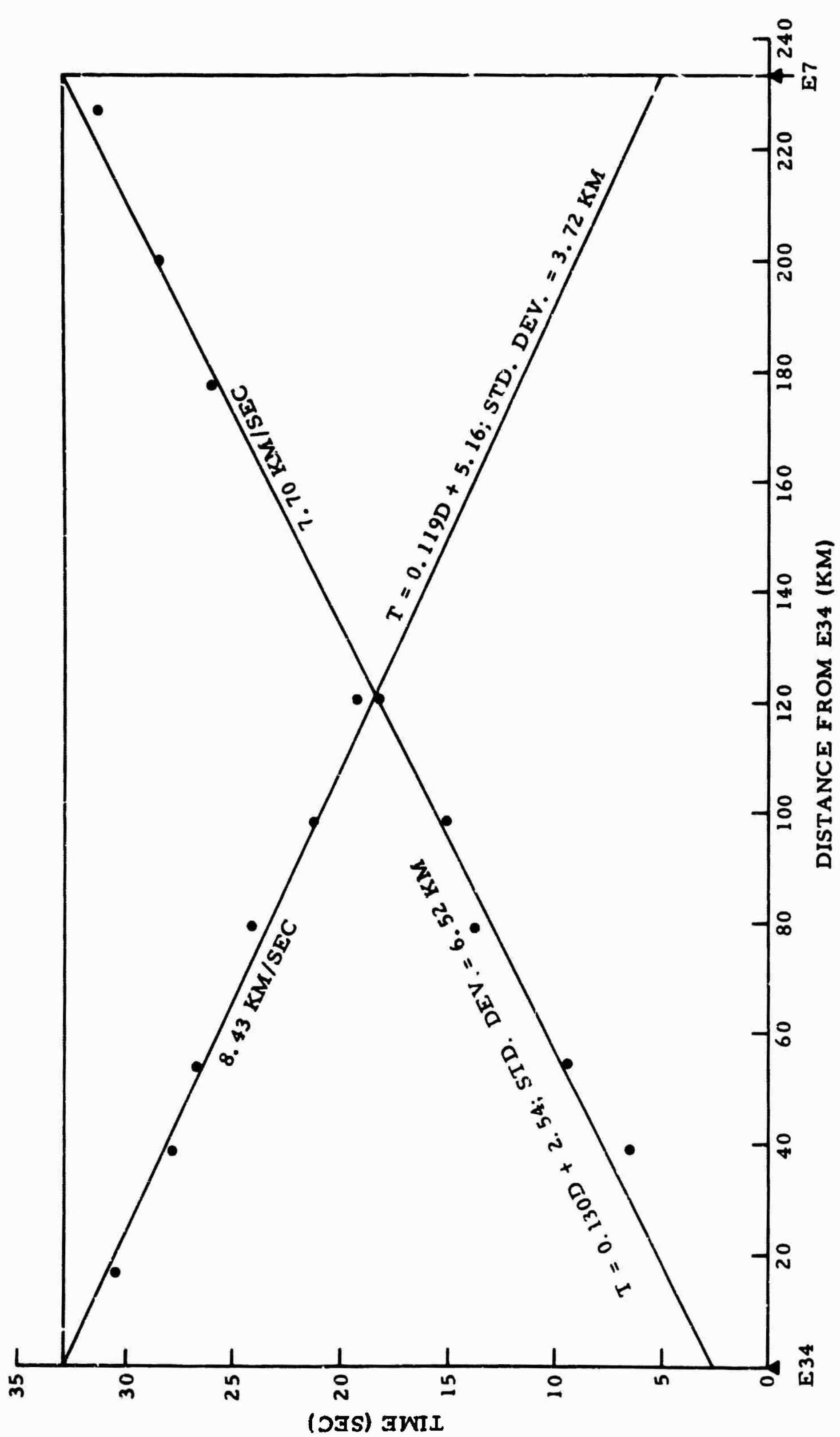


Figure II-59. Fitted Reverse Profile Between E34 and E7, Phase I

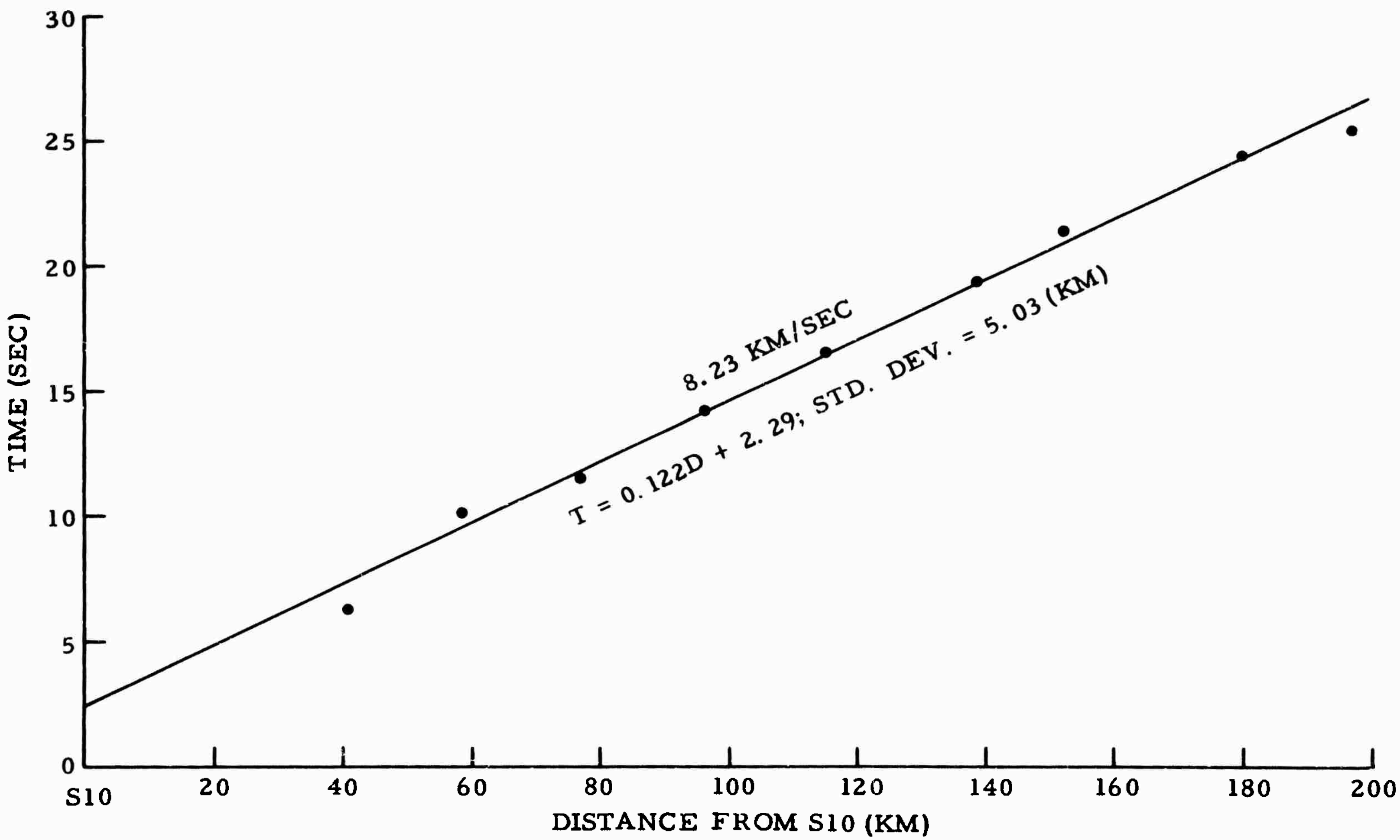


Figure II-60. Fitted Single Profile, Phase-I Shots into S10

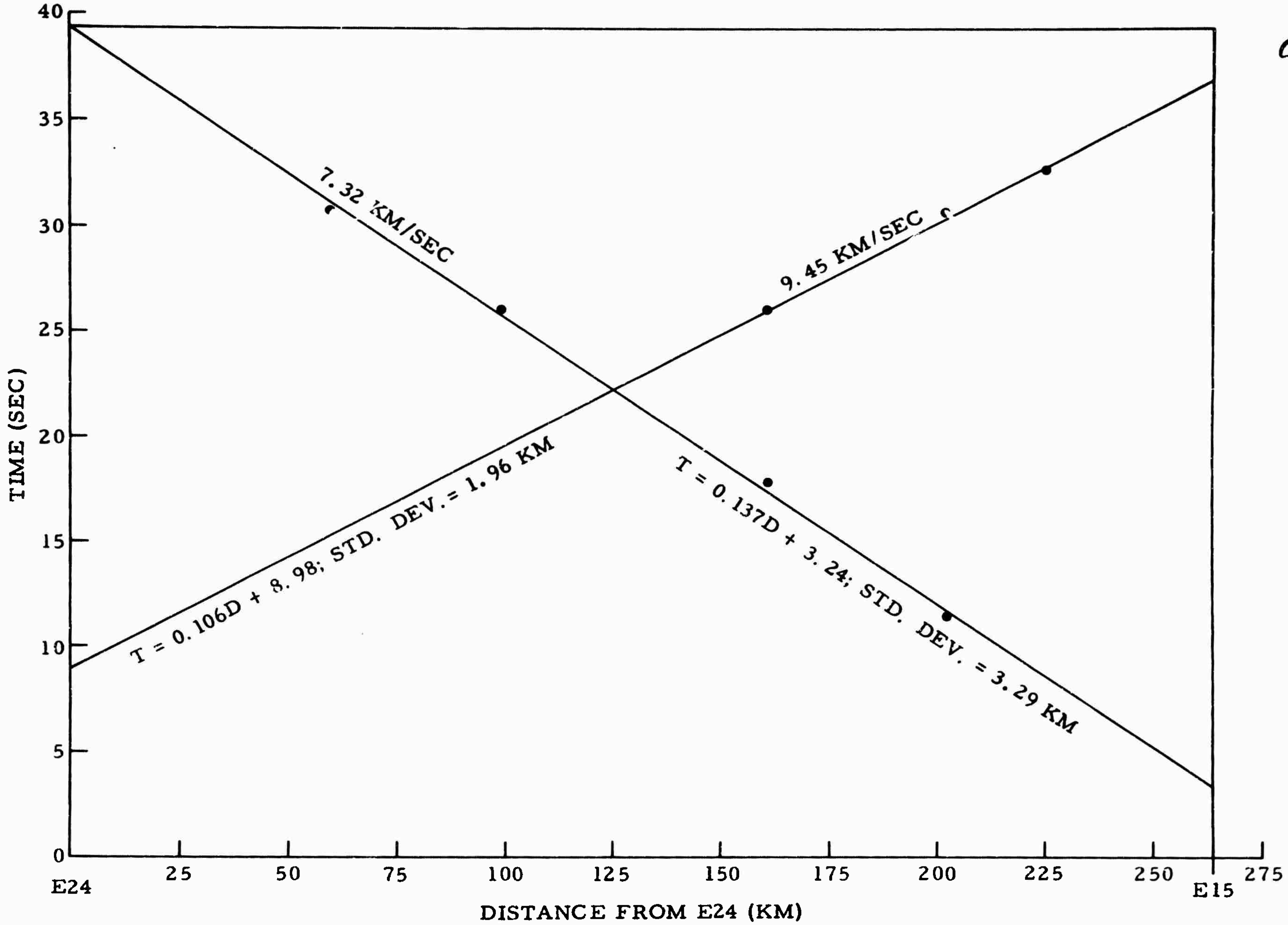
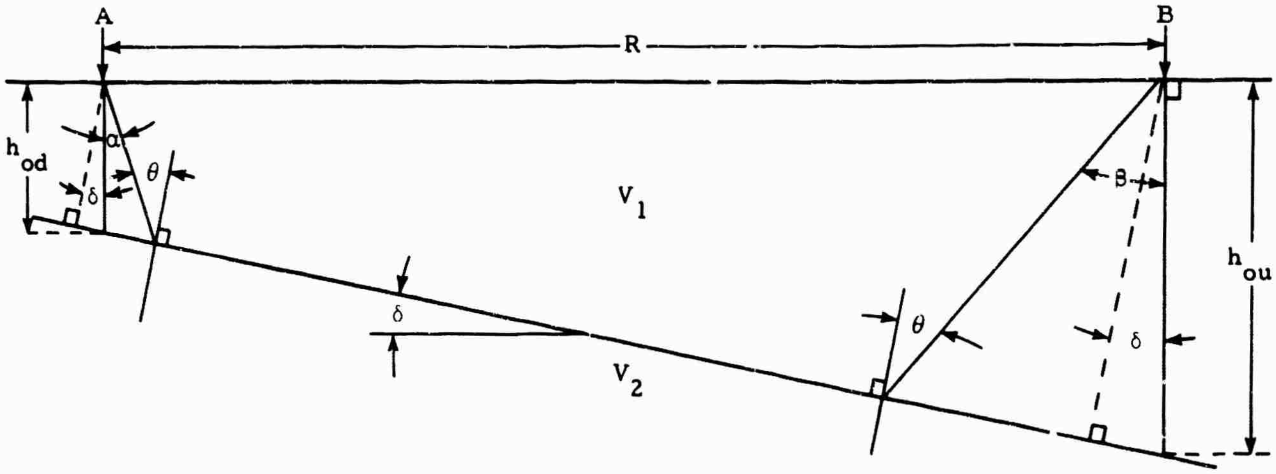


Figure II-61. Fitted Reverse Profile Between E24 and E15, Phase III



$$\sin \alpha = \frac{V_1}{V_{2u}} \qquad \sin \beta = \frac{V_1}{V_{2d}}$$

$$\theta = \frac{\alpha + \beta}{2}$$

$$V_2 = \frac{V_1}{\sin \theta}$$

$$\delta = \frac{\beta - \alpha}{2}$$

$$h_{od} = \frac{V_1 t_{od}}{2 \cos \theta \cos \delta} \qquad h_{ou} = \frac{V_1 t_{ou}}{2 \cos \theta \cos \delta}$$

where

- R = horizontal distance between A and B
- V_1 = velocity in layer 1
- V_2 = velocity in layer 2
- θ = critical angle defined by $\sin \theta = V_1/V_2$
- V_{2d} = apparent velocity in the A-to-B direction for waves traveling in layer 2
- V_{2u} = apparent velocity in the B-to-A direction for waves traveling in layer 2
- t_{od} = zero-distance intercept time at A
- t_{ou} = zero-distance intercept time at B
- δ = dip of the interface in degrees
- h_{od} = vertical depth to the interface at A
- h_{ou} = vertical depth to the interface at B

Figure II-62. Equations for Solving Reverse Profile

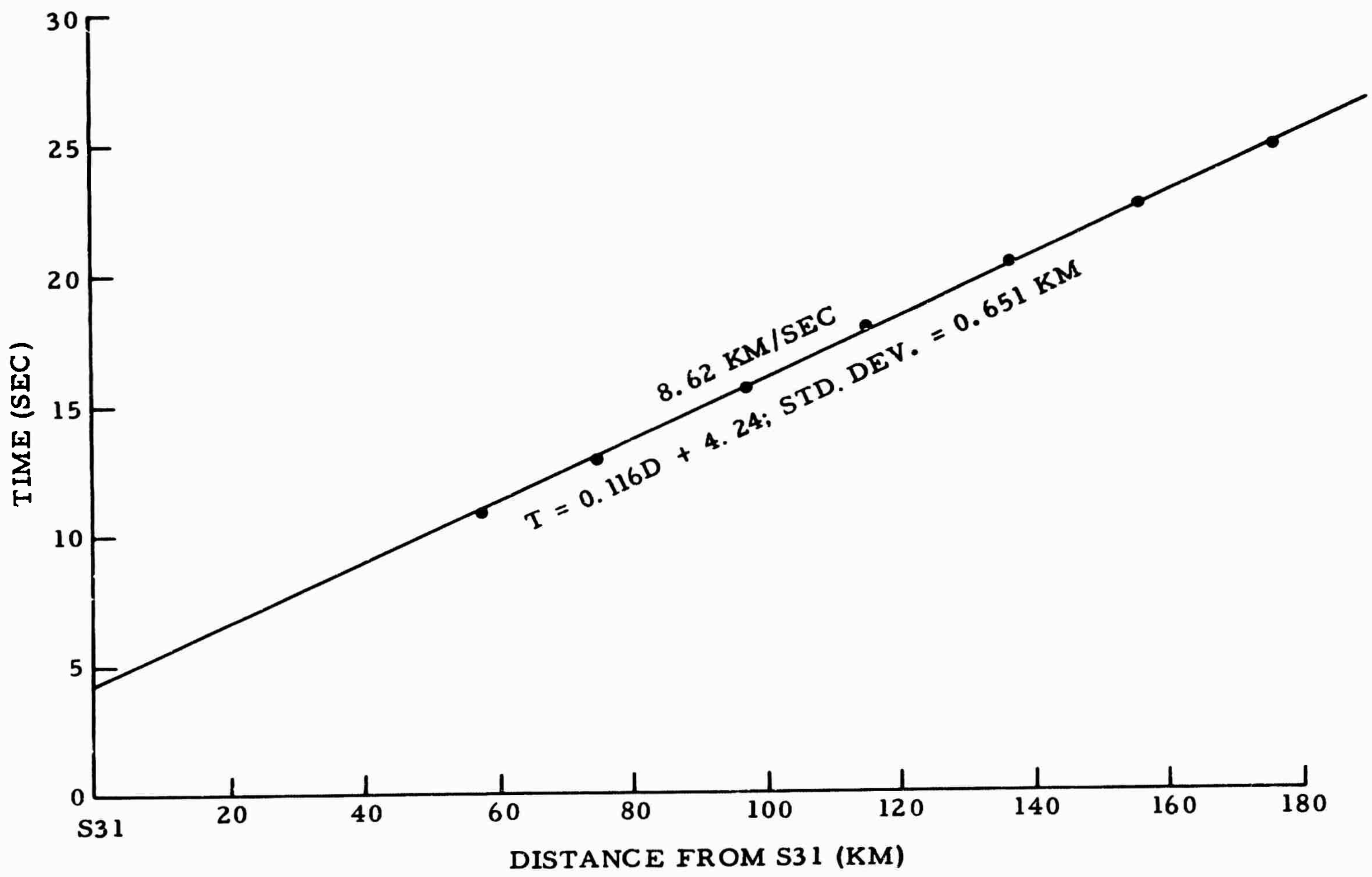


Figure II-63. Fitted Single Profile, Phase-III Shots into S31

SECTION III

CHARGE-DEPTH DETERMINATION

Thirty-five 5.35-ton charges detonated during this experiment provided the energy source for the crustal study. Results of an investigation into charge-depth determination by hydroacoustic data analysis are presented in this section. Methods employed in preparing and detonating the charges and in collecting and analyzing the hydroacoustic data also are presented.

A. OPERATION PROCEDURES

A total of 187 tons of explosive, prepackaged in 5.35-ton charges (Figure III-1), was used for this program. Each charge package was approximately 6 ft in each dimension and contained 213 cans (50 lb each) of Nitramon WW-EL explosive compound. Twenty charge packages were stored on the afterdeck of the M/V VIRGO and were moved into launch position on the A-frame assembly with the 17-ton crane. They were secured in this position by chains connected to padeyes on the deck while launch and detonation preparations were made. Table III-1 gives descriptions of the equipment and explosives used.

The charge-flotation assembly attached to the top of each charge consisted of the following items:

- Box buoy
- Charge-support line
- Line buoys
- Charge harness

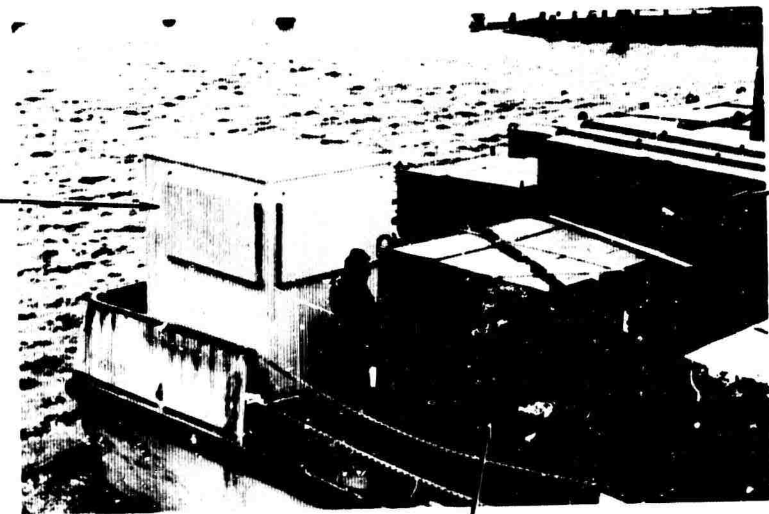


Figure III-1. 5.35-Ton Charge

Table III-1

EQUIPMENT AND EXPLOSIVES

Box buoy	Wooden container measuring 8 x 4 x 4 ft, reinforced with steel rods and containing styrofoam blocks; used to support the charge in the water before detonation
Charge-support line	1-1/2 in. nylon line connected between the box buoy and the charge harness
Line buoys	Three styrofoam blocks (10 x 20 x 36 in.) attached to the charge-support line at approximately 150-ft intervals to help slow the charge descent after launch
Charge harness	1-in. nylon line attached to the four corners of the charge cage and the charge-support line
Main charge	5.35-ton explosive consisting of 213 [illegible]0-lb and three 10-lb cans of Nitramon WW-EL oxidizing compound prepackaged in metal containers measuring 6 x 6 x 6 ft
Primers	Three EL 637 primers (7 lb)
Boosters	Three 1-lb water works boosters
Caps	Three SSS electric blasting caps
Firing line	6000 ft of 18 tc-WPR telephone wire wound on firing-line reel mounted on the rear of the ship's stack
Blaster	Model SCD-2000 BA-SIE electrical blaster
A-frame	Launch platform constructed of 4-in. pipe in an "A" shape, with measurements of 6 ft across the top and arm and 8 ft along the two legs and with bottom of the A-frame attached on swivels to the deck of the ship's stern. The charge is placed on the A-frame and is launched by raising the top of the A-frame with the crane

Prior to charge launching, a Geo Space Type MP-8 hydrophone (Figure III-2) was secured to the charge-support line just below the box buoy and the box buoy launched using the crane. Then the ship moved ahead slowly until the box buoy, charge-support line, and hydrophone cable were floating just aft of the ship.

All radar and transmitting equipment were secured after making a radar sweep to determine whether any ships were in the area. The shooter and safety engineer then removed the necessary primers, boosters, and caps from the explosive magazine.

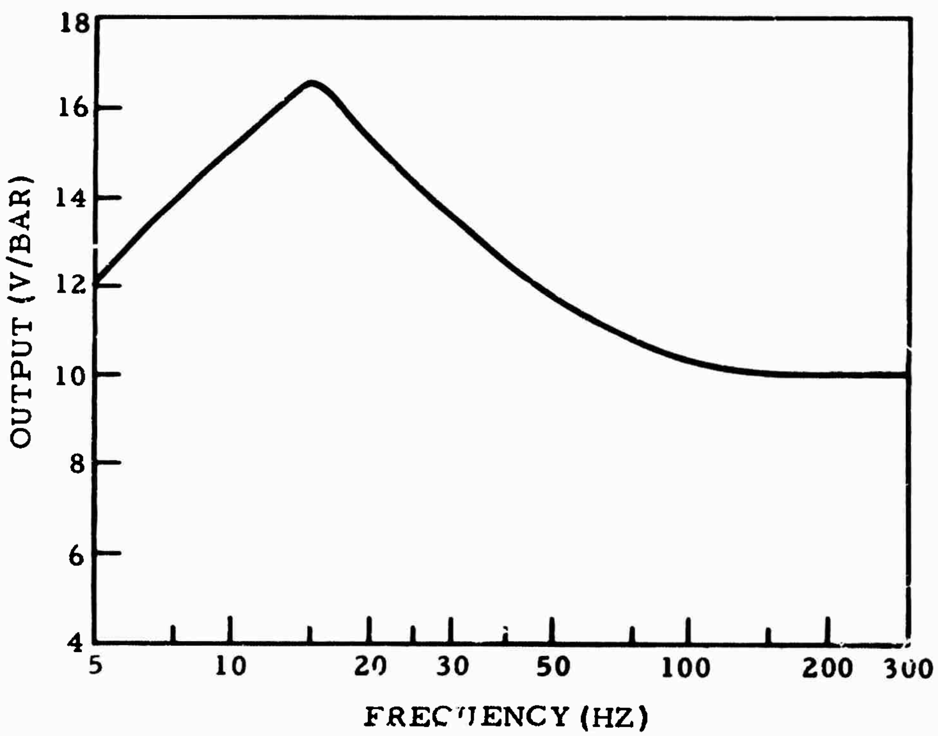
The blasting caps were placed in a lead-lined safety box, checked for continuity, and connected to the firing line. The charge was armed by placing the primers, boosters, and caps in the top layer of explosives.

Tie-down chains were removed and the charge launched by tilting the A-frame. As firing line and hydrophone cable were reeled out, the ship moved ahead until it was approximately 3/4 mi from the box buoy (Figure III-3). After another radar scan was made to insure that no ships were in the area, the hydroacoustic data-recording system (Figure III-4) was activated. Then, coincident with a WWV time signal, the charge was detonated by means of a BA-SIE Model SCD-2000 electrical blaster.

After detonation, the firing line was reeled in and all equipment secured on the afterdeck. The box buoy and charge-support line then were retrieved and the charge support line remeasured.

B. HYDROACOUSTIC DATA COLLECTION AND ANALYSIS

Approximately 5 sec prior to detonation of a charge, each of the two hydroacoustic data-recording units was activated. One unit consisted of a Minneapolis-Honeywell galvoamplifier and Model 906 Visicorder (12-channel paper recorder); the other unit was an Ampex Corporation Model 300 frequency-modulated tape recorder. A schematic diagram of the recording system is shown in Figure III-4.



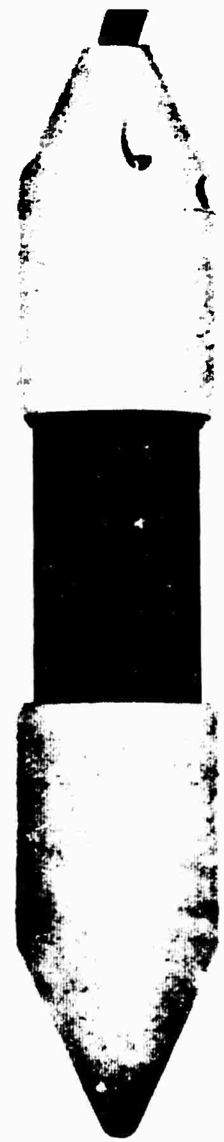


Figure III-2. Geo Space Corporation Type MP-8 Hydrophone with the Open Circuit Response Curve

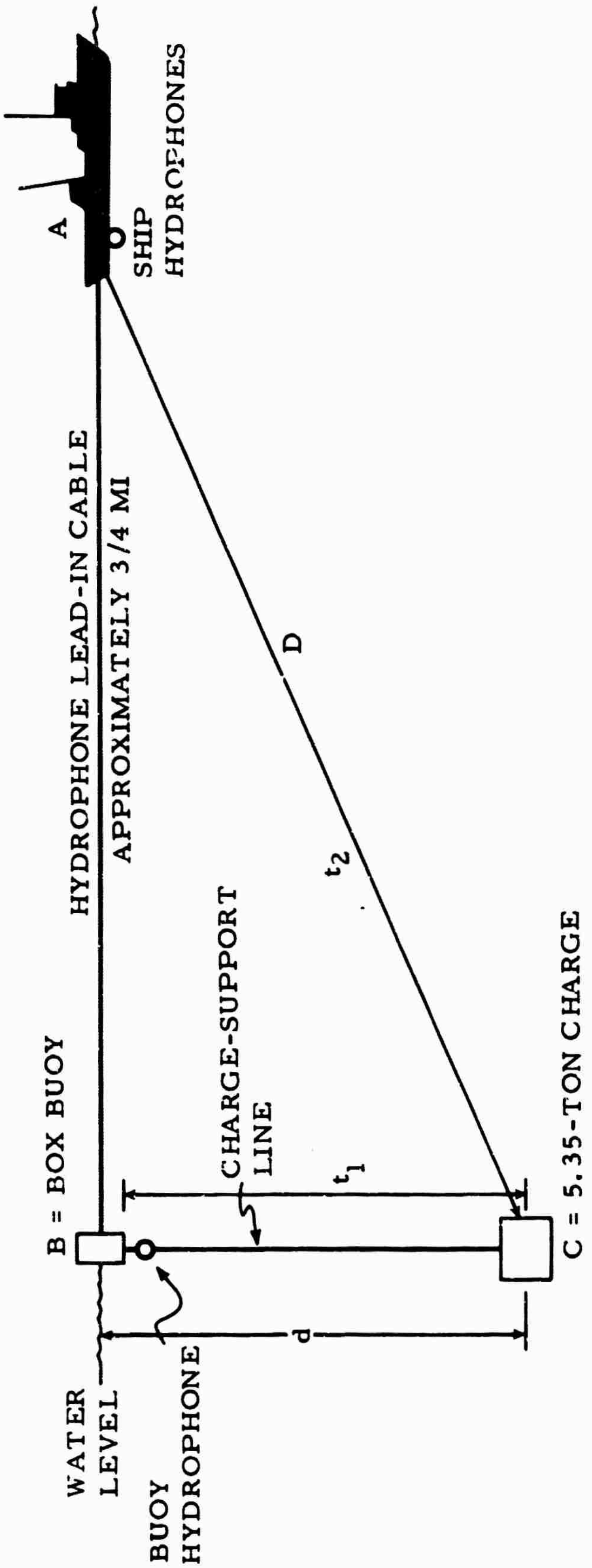


Figure III-3. 5.35-Ton Array Geometry

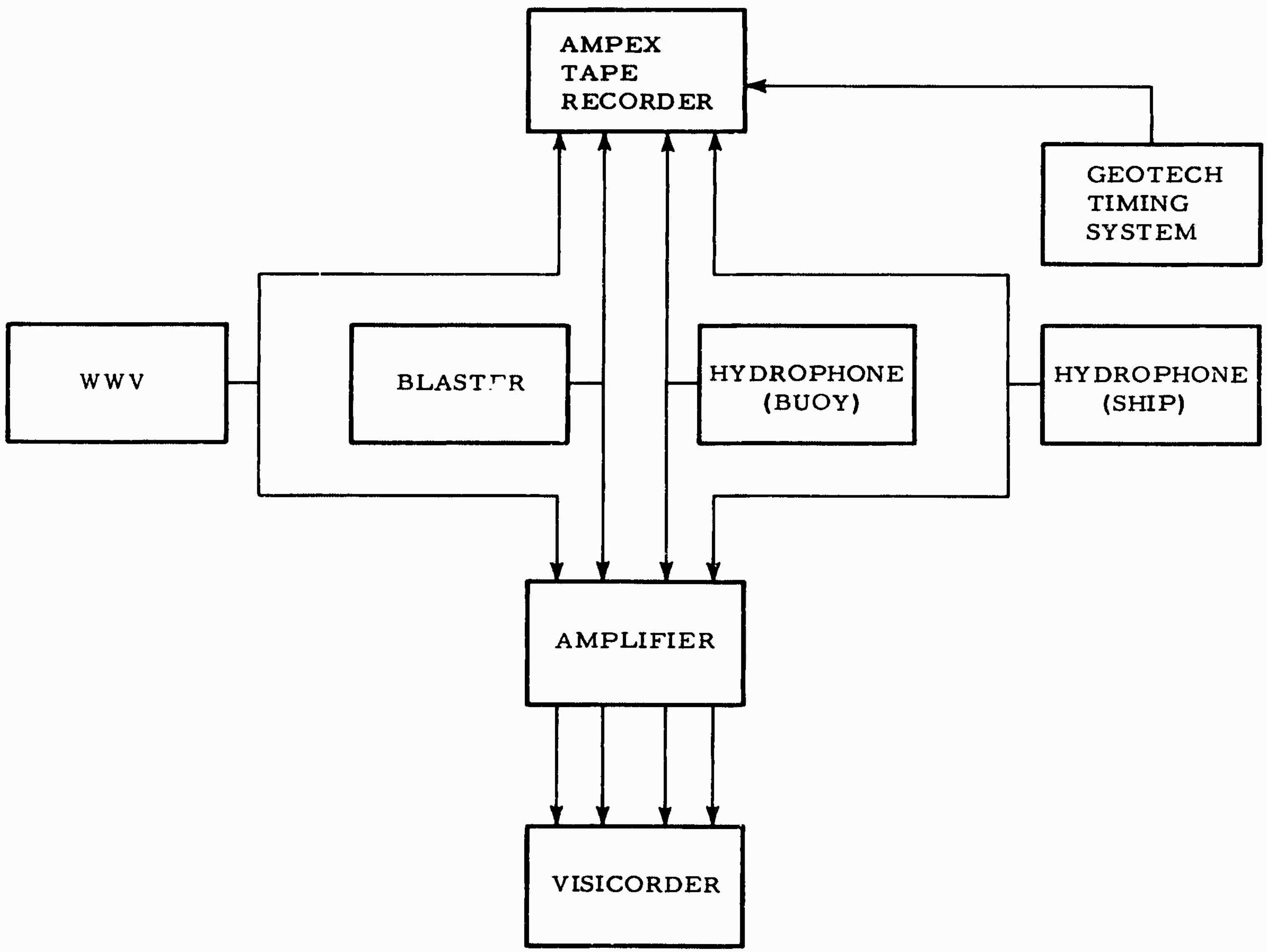


Figure III-4. Hydroacoustic Data-Recording System Block Diagram

Table III-2

RECORDING-SYSTEM PERFORMANCE

Event	Hydrophone Recordings				Remarks
	Ampex		Visicorder		
	Ship	Buoy	Ship	Buoy	
E1	Recorded	Not Recorded	Recorded	Not Recorded	Cable supply exhausted
E2	Recorded	Recorded	Recorded	Recorded	
E3	Recorded	Recorded	Recorded	Recorded	
E4	Recorded	Not Recorded	Recorded	Not Recorded	Cable broke
E5	Recorded	Recorded	Recorded	Recorded	
E6	Recorded	Not Recorded	Recorded	Not Recorded	Cable broke
E7	Recorded	Not Recorded	Recorded	Not Recorded	Cable broke
E8	Recorded	Recorded	Recorded	Recorded	
E9	Recorded	Recorded	Recorded	Recorded	
E10	Recorded	Not Recorded	Recorded	Not Recorded	Attempted vertical array
E11	Recorded	Not Recorded	Recorded	Not Recorded	Attempted vertical array
E12	Recorded	Recorded	Recorded	Recorded	
E13	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Technical problems
E14	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Technical problems
E15	Recorded	Not Recorded	Recorded	Not Recorded	Hydrophone separated from buoy
E16	Recorded	Recorded	Recorded	Not Recorded	No connection for Visicorder
E17	Recorded	Not Recorded	Not Recorded	Not Recorded	Hydrophone cable used for charge detonation
E18	Recorded	Not Recorded	Recorded	Not Recorded	Hydrophone cable used for charge detonation
E19	Recorded	Not Recorded	Recorded	Not Recorded	Hydrophone cable used for charge detonation
E20	Recorded	Not Recorded	Not Recorded	Not Recorded	Faulty connections
E21	Recorded	Recorded	Not Recorded	Not Recorded	Technical problems
E22	Recorded	Not Recorded	Recorded	Not Recorded	No buoy hydrophone attempted
E24	Recorded	Recorded	Not Recorded	Recorded	Only recorded buoy hydrophone
E25	Recorded	Recorded	Not Recorded	Recorded	Only recorded buoy hydrophone
E26	Recorded	Recorded	Not Recorded	Recorded	Only recorded buoy hydrophone
E27	Recorded	Not Recorded	Recorded	Not Recorded	Cable broke
E29	Recorded	Not Recorded	Recorded	Not Recorded	Attempted vertical array
E30	Recorded	Recorded	Recorded	Recorded	
E31	Recorded	Not Recorded	Recorded	Not Recorded	Cable supply exhausted
E32	Recorded	Not Recorded	Recorded	Not Recorded	Cable supply exhausted
E33	Recorded	Recorded	Recorded	Recorded	
E34	Not Recorded	Recorded	Not Recorded	Recorded	Shipwide power failure after detonation
E35	Recorded	Recorded	Recorded	Recorded	
E36	Recorded	Not Recorded	Recorded	Not Recorded	Array too large
E37	Recorded	Not Recorded	Recorded	Not Recorded	Array too large

The Visicorder was used to record the WWV time signal, the detonation pulse from the blaster, and, when available, the voltage outputs of the buoy hydrophone and a hydrophone at the stern of the ship. The Ampex tape recorder recorded not only the preceding data but also the signal from a Geotech Model 5400-A timing system and, when available, the voltage output of a hydrophone at the bow of the ship. The data recorded by the tape recorder was found to be unusable as a result of crossfeed in the lead-in cable and in the recording circuitry; therefore, the records from the Visicorder were used for all data analysis. Information concerning hydroacoustic data recorded by each system for each detonation and reasons for failure to record data are given in Table III-2.

All of the time measurements are dependent on the accurate determination of the paper recorder speed (Table III-3). Recording speeds are derived using careful measurement of the WWV time-signal intervals on each record. After the paper record speed is known, to convert distance measurements to accurate time increments, accurate distance measurements on the Visicorder paper record are necessary. To help set reliability limits on analysis results, the timing accuracy of each event was graded (Table III-3) according to the following code:

- Excellent (E): 1×10^{-3} sec timing capability
  - Record-speed setting of 25 in./sec
  - Good clarity of data traces
  - Strong, consistent time signal
- Good (G): 1×10^{-2} sec timing capability
  - Record-speed setting of 25 in./sec or 5 in./sec
  - Intermittent and/or fading time signal
  - Poor clarity of data traces
  - Combination of any of the above

Table III-3

CHARGE-DEPTH COMPUTATIONS

Event	BP_S (sec)	BP_B (sec)	Depth BP_S (ft)	Depth BP_B (ft)	$V \times t_1$ (ft)	Total Charge-Support Line (ft)	Stretch Factor BP (%)	Stretch Factor $V \times t_1$ (%)	Distance ($V \times t_2$) (ft)	Depth (SF) (R_1) + R_1 + 4 (ft)	Record Speed (cm/sec)	Timing Reliability*	Final Charge Depth** (ft)
E1	0.492	—	619	—	—	494	24	—	3185	607	64.35	E	619 ± 25(S)
E2	0.497	0.496	610	612	589	497	22	19	4043	610	63.90	G	602 ± 25(A)
E3	0.494	0.496	616	611	605	493	24	23	3195	605	63.6	E	613 ± 25(A)
E4	0.493	—	617	—	—	495	24	—	3322	608	64.0	F	617 ± 25(S)
E5	0.493	0.489	618	623	585	497	24	18	4165	610	63.9	E	604 ± 25(A)
E6	0.491	—	621	—	—	503	23	—	3940	618	63.77	E	[illegible] ± 25(S)
E7	—	—	—	—	—	502	—	—	—	616	64.0	G	616 ± 25(SF)
E8	—	0.497	—	611	579	502	21	15	3812	616	64.39	G	597 ± 35(A)
E9	0.481	0.478	636	641	605	499	27	21	5390	613	12.8	G	623 ± 25(A)
E10	0.501	—	608	—	—	499	21	—	4038	613	63.7	G	608 ± 25(S)
E11	0.502	—	603	—	—	498	20	—	3626	612	63.75	E	603 ± 25(S)
E12	—	0.473	—	650	630	514	26	23	—	631	63.35	E	642 ± 35(A)
E13	—	—	—	—	—	514	—	—	—	631	64.1	E	631 ± 25(SF)
E14	—	—	—	—	—	514	—	—	—	631	64.3	E	631 ± 25(SF)
E15	0.424	—	747	—	—	607	22	—	4822	745	12.75	G	747 ± 25(S)
E16	0.420	—	755	—	—	605	24	—	3851	742	12.55	G	755 ± 25(S)
E17	—	—	—	—	—	547	—	—	—	671	—	P	671 ± 27(SF)
E18	0.457	—	678	—	—	547	23	—	3244	671	12.7	G	678 ± 25(S)
E19	0.457	—	679	—	—	547	23	—	3136	671	12.7	G	679 ± 25(S)
E20	—	—	—	—	—	542	—	—	—	665	12.56	G	665 ± 27(SF)
E21	—	—	—	—	—	541	—	—	—	664	12.55	G	664 ± 27(SF)
E22	0.461	—	672	—	—	541	23	—	4782	664	12.65	F	672 ± 25(S)
E24	—	0.450	—	692	643	540	27	15	—	663	12.88	F	670 ± 35(A)
E25	—	0.466	—	662	647	540	22	20	—	663	12.65	G	657 ± 35(A)
E26	—	0.464	—	666	648	541	22	20	—	664	12.7	G	659 ± 35(A)
E27	0.486	—	629	—	—	499	25	—	3303	613	12.6	G	629 ± 25(S)
E29	0.494	—	615	—	—	498	23	—	4263	612	63.5	G	615 ± 25(S)
E30	0.501	0.498	604	610	595	499	20	19	3303	613	63.2	G	602 ± 25(A)
E31	0.491	—	620	—	—	496	24	—	3989	609	64.1	E	620 ± 25(S)
E32	0.493	—	616	—	—	496	23	—	4136	609	63.8	E	616 ± 25(S)
E33	0.496	0.492	612	618	592	497	22	19	413	610	64.18	F	604 ± 25(A)
E34	—	0.323	—	1047	1023	852	22	20	243	1043	63.55	G	1037 ± 35(A)
E35	0.924	0.917	273	284	252	262	2.7***	3.8***	4694	324	64.1[illegible]	E	324 ± 13(SF)
E36	1.205	—	190	—	—	127	46***	—	6223	159	64.6	E	1[illegible] ± 6(SF)
E37	—	—	—	—	—	54	—	—	—	71	63.73	G	[illegible] ± 3(SF)

* See text for explanation of code

** Codes for depth determination:

- S — Bubble-pulse calculations from ship
- B — Bubble-pulse calculations from buoy
- SF — Buoy-line length + 22% + 4'
- L — Charge-buoy traveltime x 4900 + 4'
- A — Average of L and S or B

*** Omitted from augmented stretch-factor calculations

Augmented stretch factor from bubble-pulse calculations = 23%
Augmented stretch factor from t_1 measurements = 22%
Total augmented stretch factor = 23%

- Fair (F): 1×10^{-1} sec timing capability
  - — Record-speed setting of 25 in. /sec or 5 in. /sec
  - — Weak or unreadable time signal
  - — Absence of a data trace
  - — Questionable interpretation of a data trace
  - — Combination of any of the above
- Poor (P): 5×10^{-1} sec timing capability
  - — No recording; detonation-time determination by stop watch
  - — No time signal
  - — No blaster-detonation pulse

Charge depths were determined primarily through application of the Willis formula, which expresses a functional relationship between the depth of detonation, weight of explosive charge, and period of oscillation of the gas bubble formed by the explosion products:[4]

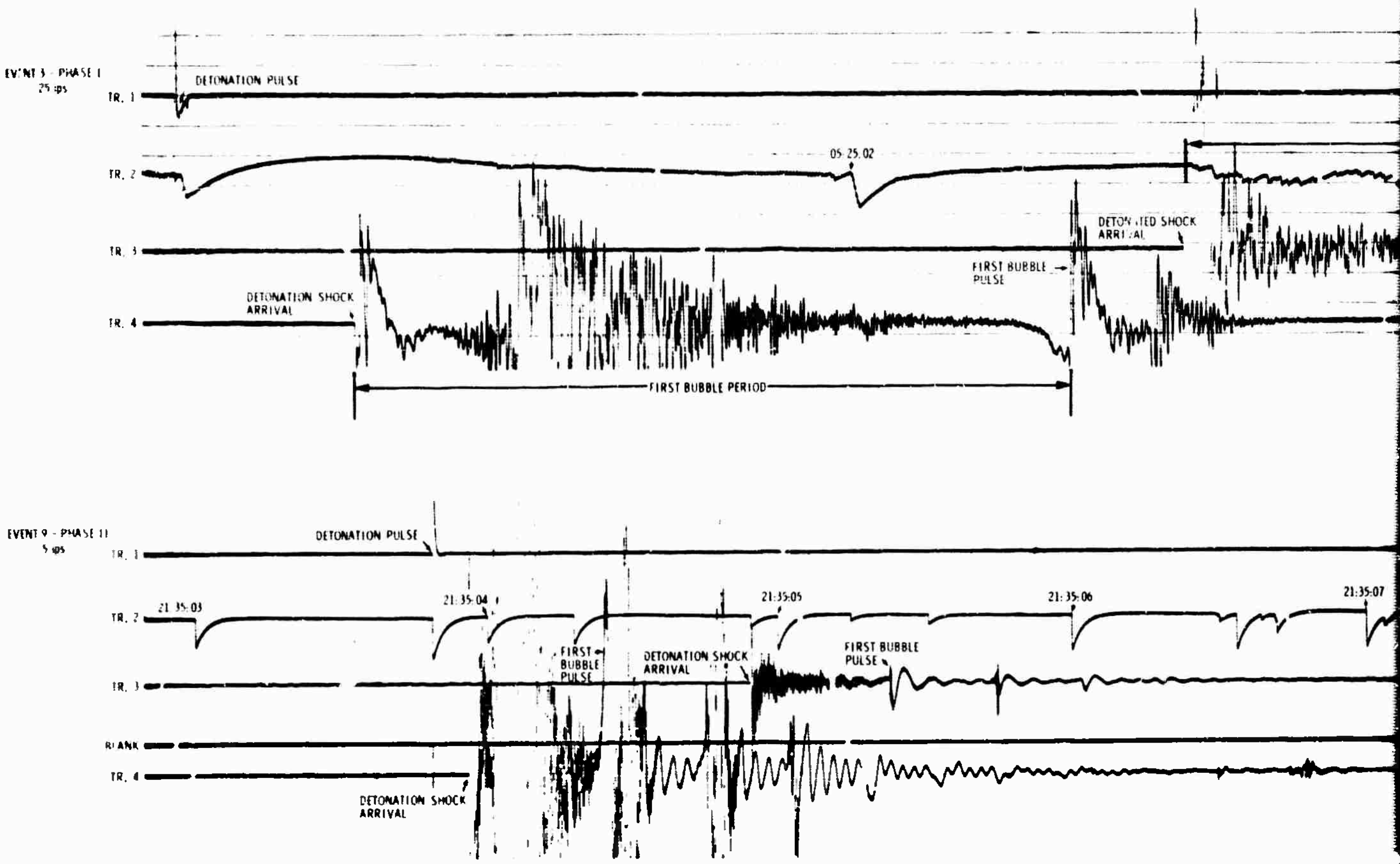
$$T = \frac{K(W)^{1/3}}{(d + 33)^{5/6}} \tag{3-1}$$

Solving for d,

$$d = \frac{K^{6/5} W^{2/5}}{T^{6/5}} - 33 \tag{3-1a}$$

Here, K is a thermodynamic constant characteristic of a specific explosive (K = 4.94 for Nitramon WW-EL[7]), W is the weight of the explosive charge in pounds, d is the charge depth in feet, and T is the bubble period in seconds. The bubble period is measured from the arrival of the detonation shock wave to the arrival of the pressure pulse which occurs when the gas bubble first reaches a minimum radius (Figure III-5). For depth computation, Equation 3-1a was used in the following form:

$$d = \text{antilog}\,(1.2 \log K + 0.4 \log W - 1.2 \log T) - 33 \tag{3-1b}$$


EVENT 3 - PHASE I
25 ips
TR. 1
DETONATION PULSE
TR. 2
05 25.02
TR. 3
TR. 4
DETONATION SHOCK ARRIVAL
FIRST BUBBLE PULSE
FIRST BUBBLE PERIOD
EVENT 9 - PHASE II
5 ips
TR. 1
DETONATION PULSE
TR. 2
21:35:03
21:35:04
21:35:05
21:35:06
21:35:07
TR. 3
FIRST BUBBLE PULSE
DETONATION SHOCK ARRIVAL
FIRST BUBBLE PULSE
BLANK
TR. 4
DETONATION SHOCK ARRIVAL

A

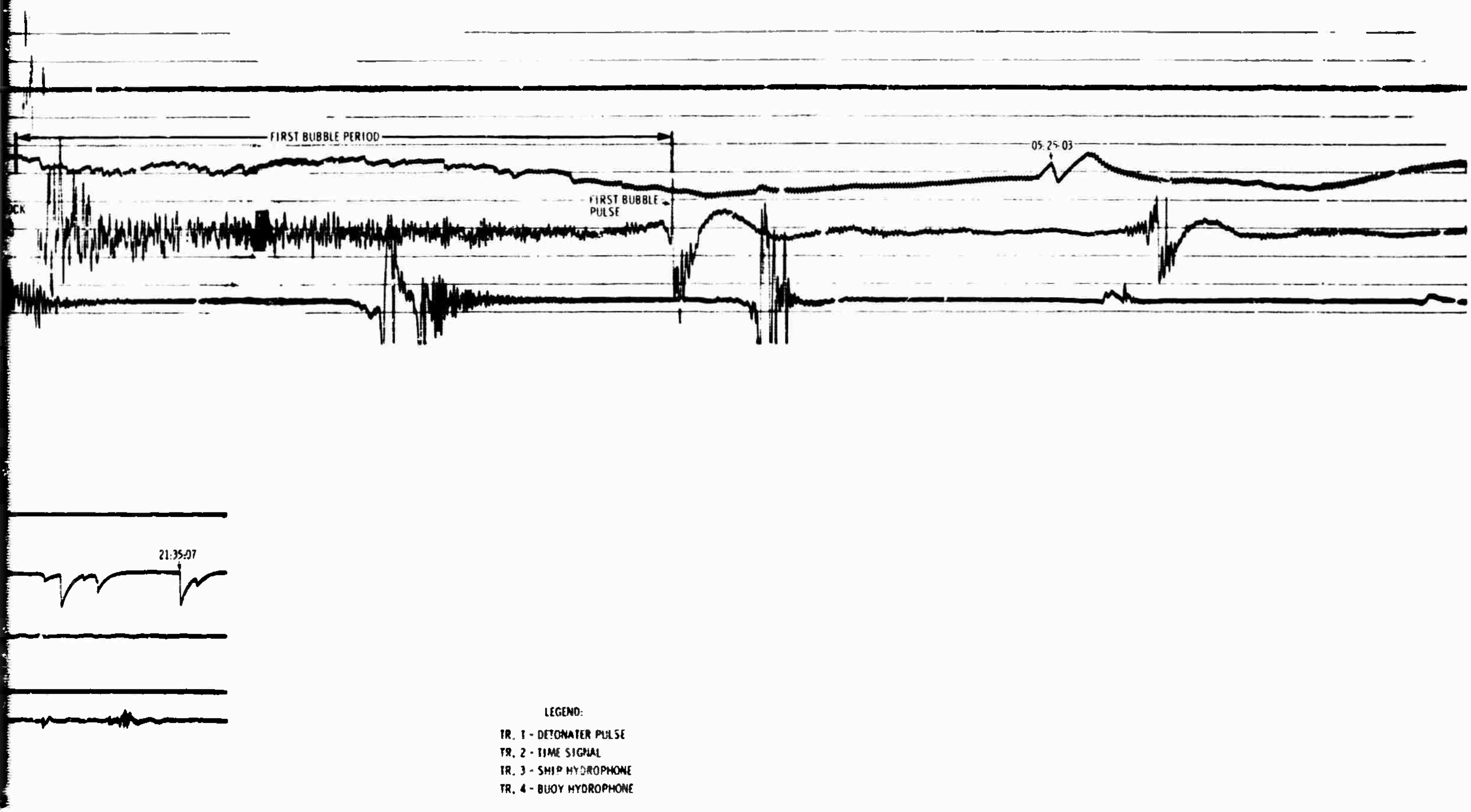


Figure III-5. Charge-Detonation Recording

Results of these computations are listed in Table III-3. Columns under BP_S and BP_B represent bubble periods measured from the ship- and buoy-hydrophone recordings, respectively.

Another means of determining the charge depths from the recorded data is the measurement of the traveltime (t_1) of the shock wave between the charge and the buoy and conversion to distance (Table III-3, where d is velocity times t_1) using an appropriate value for the shock-wave velocity. The velocity of shock-wave propagation is larger than the velocity of sound but approaches that value as the shock wave travels away from the point of detonation. The principle of similarity and data for TNT taken from Cole[4] can be used to get an idea of the order of magnitude of the difference in the distance traveled by a sound wave and the explosion shock wave in the same time. The factor k needed in application of the similarity principle is the cube root of the ratio of the charge weights and is equal to 3.29 for scaling from 300 lb to 10,700 lb. Cole shows that for a 300-lb charge, the shock wave travels 50 ft in the same time that a sound wave travels 47 ft. Therefore, for a 10,700-lb charge, the shock wave travels 165 ft in the same time that the sound wave travels 154 ft; this difference (11 ft) increases slightly for greater distances of travel. These calculations indicate, therefore, that the effective shock-wave velocity is at least 1.8 percent greater than the velocity of sound for a distance of 600 ft:

$$\frac{\text{shock velocity}}{\text{sound velocity}} \geq \frac{611/t}{600/t} = 1.018$$

Published values of sound velocity from measurements taken near the area of this experiment indicate that the average sound velocity for the first 600 ft of depth is approximately 4810 ft/sec.[2] Therefore, a value of 4900 ft/sec was used in the traveltime-to-distance conversions for the

5.35-ton charges. Table III-4 shows results from this method of depth determination compared with results from the bubble-period computations for all detonations in which a buoy-hydrophone recording was available.

It was assumed that the 5.35-ton charges always remain suspended directly below the buoy and that both the shock wave and the gas bubble originate at the center of the charge. A 4-ft correction factor was added to the traveltime distances to correct for the buoy-hydrophone depth of submersion. The average error between the two depth figures is 19 ft, with the bubble-pulse depth being greater in each case.

Table III-4

COMPARISON OF BUBBLE-PERIOD AND TRAVELTIME DEPTHS FOR 5.35-TON CHARGES

Event	Hydrophone Record Used	Bubble-Period Depth	Traveltime Depth*	Difference	Timing Reliability**
E2	Ship	610	593	17	G
E3	Ship	616	609	7	E
E5	Ship	618	589	29	E
E8	Buoy	611	583	28	G
E9	Ship	636	609	27	G
E12	Buoy	650	634	16	E
E24	Buoy	692	647	45	F
E25	Ship	662	651	11	G
E26	Ship	666	652	14	G
E30	Ship	604	599	5	G
E33	Ship	612	596	16	F
E34	Buoy	1047	1027	20	G
E35	Ship	273	256	17	E

* 4-ft correction factor added

** See text for explanation of code

In addition to the 5.35-ton charges, eleven 3.2-lb charges were detonated to test the validity of using traveltime information along with array geometry rather than charge-to-buoy traveltimes alone to determine more accurate charge depths. The array geometry used is shown in Figure III-6.

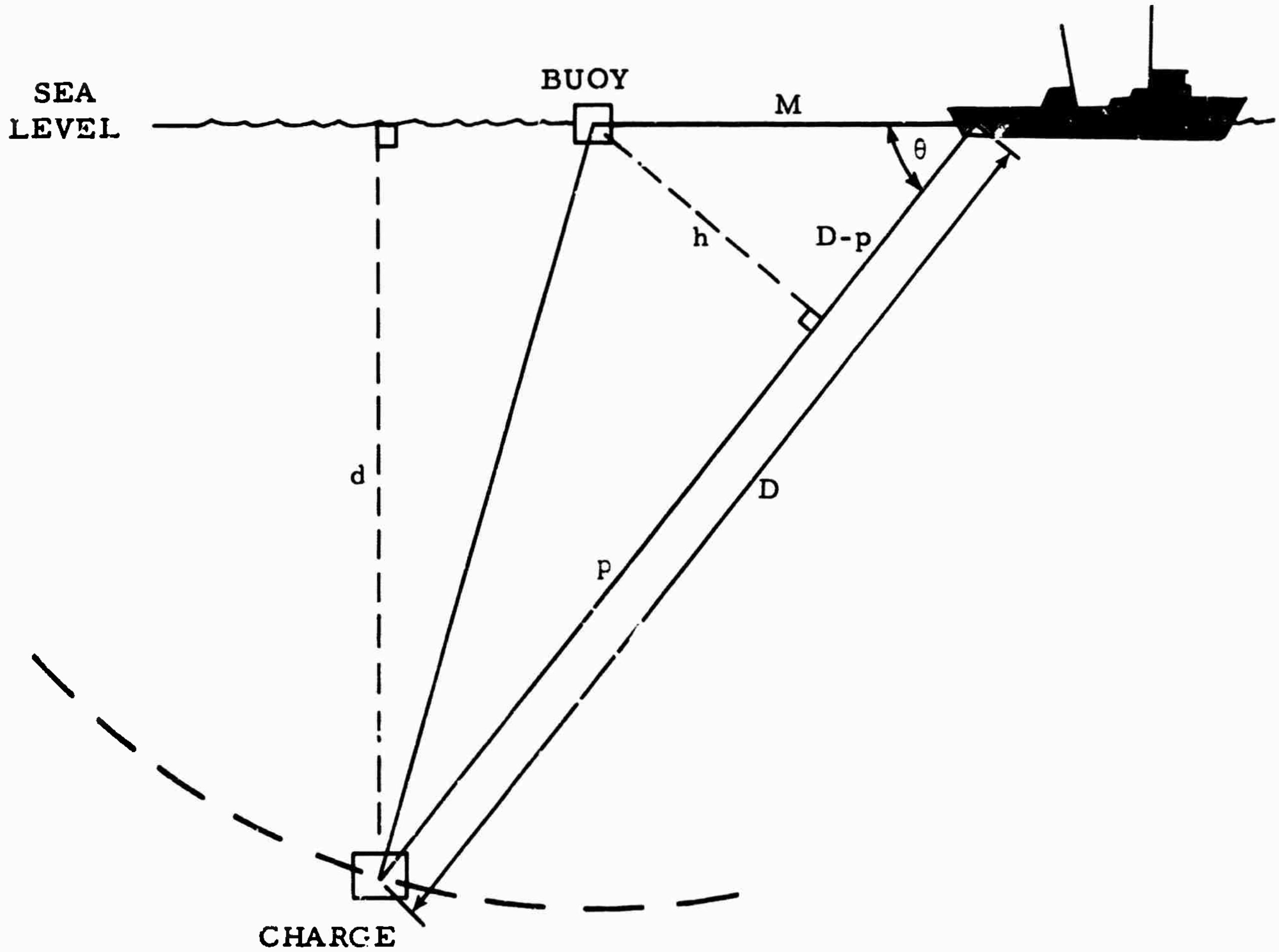


Figure III-6. 3.2-lb Charge Array Geometry

The charge depth was computed using the trigonometric formula derived below; the symbols are defined in Figure III-6.

$$h^2 = L^2 - p^2 \tag{3-2}$$

$$h^2 + (D - p)^2 = M^2$$

$$p = \frac{L^2 + D^2 - M^2}{2D}$$

$$\frac{d}{D} = \sin\theta = \frac{h}{M}$$

$$d = \left(\frac{D}{M}\right) h = \frac{D}{M}\left(L^2 - p^2\right)^{1/2}$$

$$d = \frac{D}{M}\left[L^2 - \left(\frac{L^2 + D^2 - M^2}{2D}\right)^2\right]^{1/2}$$

The distances D and L were obtained using sound-wave traveltimes from the charge to the ship hydrophone and to the buoy hydrophone, respectively. Since the charges were very small, the sound velocity of 4810 ft/sec was used in these computations. The distance M was determined by measuring the line length from the ship to the buoy.

As is apparent from Table III-5, agreement between the trigonometric calculations and the bubble-period calculations is rather poor. The following are some factors which may have contributed to the divergence between the two depth figures.

- Incompletely determined array geometry — The assumed array is limited to two dimensions (a vertical plane); for exact comparison with bubble-period calculations, a 3-dimensional array geometry and knowledge of its parameters are required.
- Insufficient accuracy in traveltime measurements — The nature of the trigonometric calculations requires a very precise determination of the distances L, D, and M and, therefore, a very precise determination of shock-wave traveltimes.

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- Inaccuracy in the assumed K factor — The detonator material (the K factor which is unknown) conceivably could alter the effective K factor of the explosive package, considering the small overall weight of the charges. The K factor for Nitramon WW-EL was used in the calculations.

Using the bubble-pulse and traveltime depths computed for the 5.35-ton detonations, a study of the charge-support-line stretch was made. Prior to each charge-launching sequence, the charge-support line was measured to an accuracy of ± 2 ft. A line-stretch factor was calculated for each available bubble-pulse depth and for each traveltime depth. Initial line lengths and calculated stretch factors are listed in Table III-3. Percent stretch factor (SF) was defined as

$$SF = \left(\frac{d - 4 - R}{R}\right) \times 100 \qquad (3\text{-}3)$$

where d is the charge depth and R is the unstretched line length. The charge depth is decreased 4 ft in the stretch-factor calculations because the charge-support line is attached to the buoy at a point approximately 4 ft below the surface.

The average stretch factor from all measurements was 22 percent. Effective weight of the charge in water is less than 2000 lb; for such a force, a line-stretch factor on the order of 5 percent is estimated by the manufacturer.[5] However, the 22-percent figures is considered valid since both traveltime and bubble-period measurements yielded substantially the same figure, with significant variations being encountered only at the shallowest depths. A constant stretch factor is not to be expected because a nylon line's degree of stretch is dependent not only upon the stretching force but also upon the frequency of use and time interval between stresses. The average stretch factor was used in computing the charge depth when no hydroacoustic data were available.

Table III-5

COMPARISON OF BUBBLE-PERIOD AND GEOMETRICALLY DETERMINED DEPTHS FOR 3.2-LB CHARGES

Event	Date (1967)	Detonation Time (GCT)	Location		BP_S (sec)	M (ft)	L (ft)	D (ft)	d from Eq. 3-1b (ft)	d from Eq. 3-2** (ft)
			N. Latitude	E. Longitude						
C1	10 July	01:42:04.7	51°41'30"	179°08'06"	0.062	150	600*	689	266	522
C2	10 July	05:21:04.4	51°51'18"	179°19'36"	0.048	150	600*	680	385	541
C3	10 July	22:37:00	52°02'30"	179°23'15"	0.065	150	300*	512	254	Invalid L+M < D
C4	5 Aug.	20:15:03.8	44°30'54"	170°27'30"	0.092	200	587	782	156	151
C5	6 Aug.	06:15:05.9	43°04'24"	169°03'20"	0.051	200	602	781	353	309
C6	7 Aug.	02:00:05.4	41°35'20"	167°42'00"	Partial Detonation					
C7	7 Aug.	02:25:03.1	41°35'24"	167°39'00"	0.035	[illegible]	600*	708	577	547
C8	11 Aug.	22:20:02.7	48°07'54"	174°28'42"	0.048	200	568	721	378	415
C9	12 Aug.	04:05:02.5	47°22'36"	173°32 48"	0.046	200	581	750	402	355
C10	12 Aug.	20:52:02.1	45°58'54"	172°03'00"	0.036	200	599	[illegible]	558	566
C11	1 Sept.	06:55:02.8	51°00'48"	178°10'30"	0.035	200	585	678	580	554

* Line measurement — no traveltime available

** Corrected 4 ft for depth of buoy hydrophone

Charge-to-ship distance (D in Figure III-3 and Table III-3) was computed from shock-wave traveltimes. Since this distance is large compared to the charge depth and since the direction of bubble migration is nearly at right angles to the path of sound travel, there should be no significant effect on the bubble-period measurement from the ship-hydrophone record due to vertical migration of the bubble. However, the bubble-period measurements at the buoy are affected by the bubble migration. The upward migration tends to make BP_B smaller than BP_S (Table III-3), as observed in six of the seven instances in which bubble-period comparisons were available. Therefore, bubble-period measurements made by means of the ship-hydrophone record should be considered more accurate than those made from the buoy-hydrophone record.

By taking the differential of Equation 3-1a and substituting typical values of K, W, and T, the effects of errors in these quantities may be examined. The differential of Equation 3-1a is

$$\Delta d \approx \frac{6}{5}\left(\frac{W^{2/5}}{T^{6/5}}\right)K^{1/5}\,\Delta K + \frac{2}{5}\left(\frac{K^{6/5}}{T^{6/5}}\right)W^{-3/5}\,\Delta W - \frac{6}{5}\left(K^{6/5}W^{2/5}\right)T^{-11/5}\,\Delta T \qquad (3\text{-}4)$$

Using K = 4.94, W = 10,700, and T = 0.492 (for which d = 620 ft) yields

$$\Delta d \approx 159\,\Delta K + (0.0245)\,\Delta W - 1600\,\Delta T \qquad (3\text{-}5)$$

Equation 3-5 shows that the accuracy of the K factor used is critical, since a 2-percent change in the K factor (e.g., from 4.94 to 4.84) results in a 16-ft change in d at 620 ft. Errors in the weight of explosive used are less critical, since a 2-percent error in the charge weight (ΔW = 214 lb) changes d only 5 ft at 620 ft. As mentioned earlier, timing is a critical factor. A timing error of 5 msec (typical of the average record timing accuracy) introduces a 16-ft depth error at 620 ft.

The preceding discussion does not include the inherent errors in the use of Equation 3-1 which result from certain approximations made in its derivation. One source of error is the lack of compensation for surface effects.[4] Such effects are probably the cause of the larger variations in depths computed by different methods for events E35 and E36.

Considering these factors, the charge depths calculated by bubble periods recorded at the ship's hydrophone are regarded as being accurate to ± 25 ft of the value stated except for events E35 and E36. The bubble-pulse depth accuracy for these two events is estimated to be ± 50 ft. As a result of the effect of bubble migration on the bubble-period measurements made from the buoy hydrophone, these depths are estimated to be accurate only to ± 35 ft.

The errors in depth associated with the traveltime data can be estimated in a similar manner. Here,

$$\Delta d \approx V \, \Delta t + t \, \Delta V$$

Using a typical timing error of 5 msec for Δt and 4900 ft/sec for V and neglecting the contribution of a velocity error to the total error, Δd is found to be 25 ft.

The degree of variation in the measured stretch factors indicates that those depths determined solely from initial line length and average percent of stretch are accurate to ± 4 percent of the value stated, or ± 25 ft at 620 ft.

In view of the previous statements, the following recommendations are made for future operations.

- Timing accuracy of the Visicorder-recorded data should be improved. This may be done by using an additional accurate timing source to generate sharper timing marks at more frequent intervals than those of the WWV time signal.

- The Ampex tape recorder should be replaced by a suitable field tape recorder; it should have a self-contained power supply so that a ship's power failure will not preclude the recording of data. Provision for onboard playback of the tape data should be included so that malfunctions of the recording system can be discovered and corrected in the field.

- If a good tape recorder is not available, the present light-sensitive Visicorder record paper should be replaced by a type that can be fixed in the field to prevent deterioration in the legibility of the Visicorder records.

- Hydrophone recordings at the buoy should be omitted except possibly for those shots where depths are measured by the independent means described later.

- The stretch factor of the charge-support line should be investigated under experimental conditions which simulate as closely as possible those of the field operations.

- The depths of several (5 to 10) charges should be determined by an accurate unrelated means for comparison with the depths calculated from the bubble period. The depths could be measured by means of a calibrated pressure-sensitive depth gauge attached to the charge and monitored from the ship. To permit its reuse, the depth gauge could be detached from the charge prior to detonation by a timing device or similar means.

The charge-depth data thus derived would permit an independent determination of the K factor; also, if a different depth were used for each such detonation, the depth at which surface phenomena cease to have an effect could be determined.

SECTION IV

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APPENDIX A

UNIT DROP AND RISE VELOCITIES

The purpose of this study was to determine the drop and rise velocities for the OBS units. Knowledge of the rise velocity is helpful to the operations crew because it allows determination of the expected surface time of a unit during recovery operations. The field logs, fathometer charts, and recorded data were utilized to determine the depth and time data required.

Drop time was computed as the difference between the time the unit hit bottom and its surface release. The bottom-arrival time was determined from the pressure trace by observing the time when the pressure trace amplitude stabilized (Figure A-1). The surface release was taken from field logs and verified by observing the recorded data; i.e., data recorded on the pressure channel showed a frequency change when the unit first entered the water (Figure A-1).

The rise time was computed as the difference between the surfacing time and the bottom-release time. Surfacing time was taken to be the time that the first signal was received from the OBS radio transmitter. Bottom release was determined from the recorded data. The sonar signal that released the OBS unit from its anchor also turned the tape recorder off, marking the time of release (Figure A-1).

The average drop velocity (for 24 samples) was 5.7 ± 0.3 ft/sec, and the average rise velocity (for 14 samples) was 4.1 ± 0.3 ft/sec. Unit drop and rise velocities are given in Table A-1. Fewer rise velocities could be obtained because surfacing time was difficult to determine accurately; true launch, bottom, and release times could be obtained fairly accurately from data recorded by the unit. The faster drop time is expected because the downward force on the unit during drop was 150 to 200 lb, whereas the upward (buoyant) force during rise was about 100 lb.

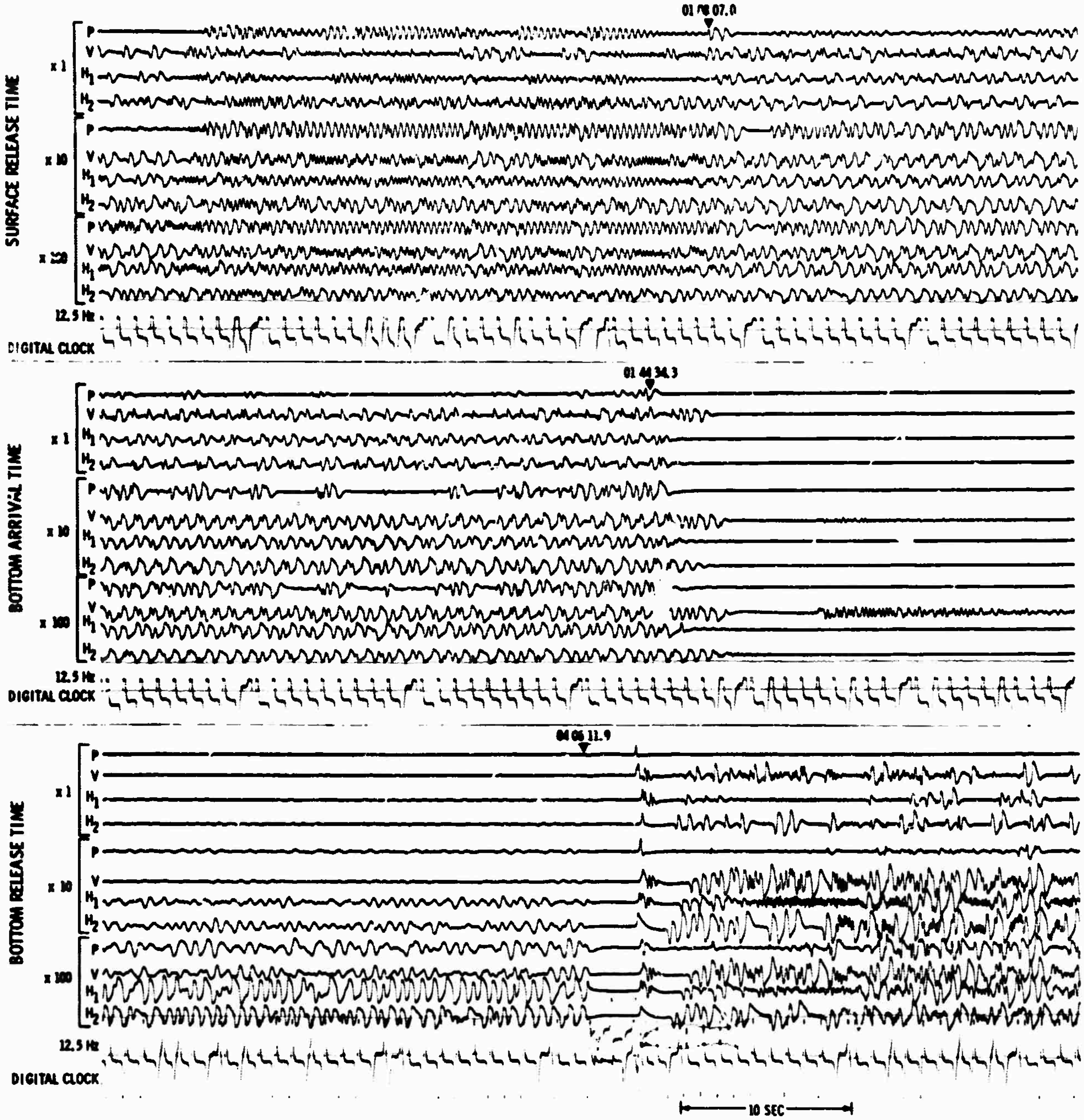

Figure A-1. Playback from Station S15 Showing Time Determinations
Used in Computing Drop and Rise Velocities

The variation in the velocity estimates appeared to be primarily measurement error, since there was as much variation for a given unit as there was between units. Estimates for the shallow units, of course, were more affected by timing errors, since the total drop and rise times were much smaller; but these timing errors were about the same as for the deep units.

Table A-1

UNIT DROP AND RISE VELOCITIES

Unit	Position	Depth (ft)	Drop Velocity (ft/sec)	Rise Velocity (ft/sec)	Remarks
1	S4	10,488	—	4.0	Recorder trouble
15	S7	23,082	5.9	4.0	
15	S16	12,000	5.4	4.0	
15	S25	606	5.9	—	Resurface time doubtful
16	S11	1,920	5.9	4.0	
18	S6	17,880	5.9	4.2	
18	S18	18,108	5.3	—	Resurface time doubtful
18	S26	204	5.0	—	Resurface time doubtful
19	S2	4,656	6.3	—	Resurface time doubtful
19	S19	4,320	5.9	—	Resurface time doubtful
19	S27	216	4.9	4.7	
20	S5	15,480	5.8	3.7	
20	S15	12,150	5.5	3.4	
20	S28	570	5.3	—	Resurface time doubtful
21	S1	1,122	6.2	4.7	
21	S12	216	6.0	—	Resurface time doubtful
21	S31	5,184	5.6	—	Resurface time doubtful
22	S8	18,900	5.9	4.0	
22	S14	12,180	5.6	3.8	
22	S30	360	5.6	—	Resurface time doubtful
24	S9	17,100	5.9	4.2	
24	S17	16,560	5.6	—	Sonar-release time doubtful
24	S23	2,772	6.0	—	Resurface time doubtful
25	S10	16,140	6.0	4.2	
25	S21	17,040	5.5	4.2	
Average			5.7	4.1	
Standard deviation			0.3	0.3	

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APPENDIX B

PRELIMINARY BULLETIN

This appendix presents the preliminary bulletin produced from the data recorded by the Ocean-Bottom Seismographs during the 1967 Aleutian Islands Experiment. The data include arrival times, phase types, phase periods, ground displacement, epicenter-to-station distances, and azimuth. Events were hand-associated for the explosions detonated during the experiment and for epicenters located by the USC&GS. The USC&GS events used were all events within 10° and all events with a magnitude equal to or greater than 5.0. The number of associations was 504.

Routine analysis was performed using the film seismograms made from the field tapes. The phase data were punched on cards and processed through a computer program to convert the arrival times (clock time) to Greenwich Civil Time (GCT) and to correct the times for tape recorder head misalignment and clock drift. All phase data are presented in chronological order, with the hypocenter data placed before the first associated arrival. Figure B-1 shows the bulletin analysis flow chart.

A. BULLETIN INTERPRETATION

Interpretation of the bulletin data is presented in two sections: epicenter data and phase data. The phase data are listed as either associated station events or unassociated station events.

1. Epicenter Data

a. USC&GS Epicenters

The first line of the epicenter data contains the following information:

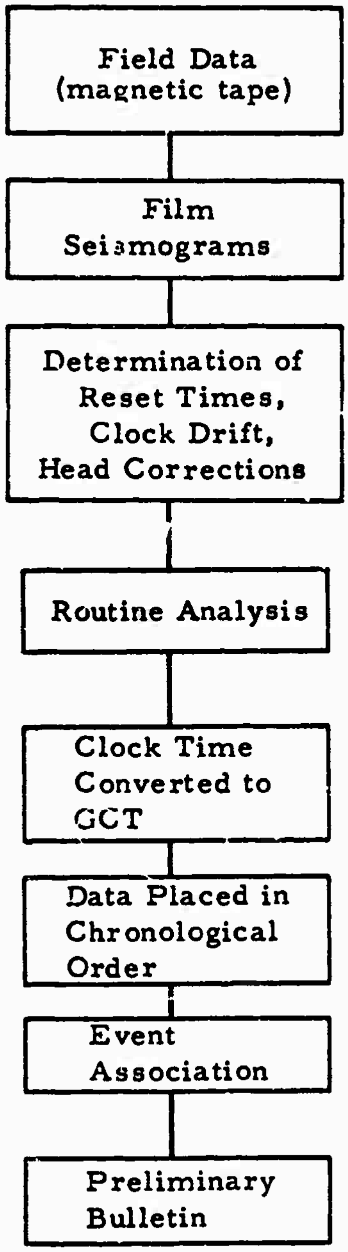

Figure B-1. Bulletin Analysis Flow Chart

- Date (GCT)
- Origin time (GCT)
- Latitude
- Longitude
- Geographic description of epicenter location

The second line of the epicenter data contains the following information:

- Depth (km)
- Magnitude (average m_b, Gutenberg and Richter, reported by the USC&GS)

b. Calibration Explosions

OBS calibration explosion data are presented in the same manner as the USC&GS epicenter data with the following exceptions:

- The geographic description at the explosion location is replaced by "Aleutian Explosion EXX" (explosion number)
- No magnitude is presented for the OBS calibration explosions
- Coordinates are rounded to the nearest tenth of a degree
- Explosion depth is given in feet

2. Phase Data

The column heading appearing at the top of each page of the bulletin applies to phase data. The headings are defined as follows:

- DAY — Day and month on which the arrival occurred (GCT). The day and month are listed only when the station designation changes.

- STA — Station designation. The station locations are presented in Table II-1. Land stations S35 through S40, respectively, are presented in the bulletin as
  - ADK (Adak Island)
  - BQ (Bethel, Alaska)
  - SP (St. Paul Island)
  - AA (Alka Island)
  - SQ (Shemya Island)
  - AC (Amchitka Island)
- PHASE — Type of phase recorded at the station. Prefixes are defined as follows:
  - I preceding the phase type indicates an impulsive and sharply defined phase beginning; direction of first motion is indicated by a + (up) or - (down)
  - E preceding the phase type indicates an emergent phase motion
  - I or E alone indicates an unidentified phase arrival
  - Parentheses enclosing phase type indicate a phase identification which is suspect
  - T designates hydroacoustic wave arrivals from the calibration explosions
- C — Component on which the phase arrival was observed and measured. Component designators are
  - Z (vertical seismometer)
  - X (first horizontal seismometer)
  - Y (second horizontal seismometer)
  - P (pressure transducer)

- TIME — Phase arrival time (GCT). Arrival times are measured to the nearest tenth of a second on all components.

- AMP — Phase amplitude (one-half peak to peak) in millimicrons or microns of ground displacement. The amplitudes have been corrected for instrument response and are presented to the nearest tenth of a unit. Amplitudes presented in microns are followed by a μ after the tenths column. Amplitudes are measured from the largest pulse in the first few cycles when possible. Amplitudes reported as 999.9 indicate that the trace was overdriven.

- PER — Period of the phase in seconds. Phase periods are measured from the largest pulse in the first few cycles. Phases with amplitudes reported as 999.9 do not contain period measurements.

- DIST -- Distance from epicenter location to recording station. All distances are computed using geocentric coordinates and are reported to the nearest tenth of a degree. The distance for unassociated events based on S-P time is as follows:

  — L (local, 0° to 1.4°)

  — N (near regional, 1.4° to 6.0°)

  — R (regional, 6.0° to 16.0°)

  — T (teleseismic, 16.0° to 180°)

- AZI — Epicenter-to-station azimuth. All azimuths are clockwise from north and are reported to the nearest degree.

B. COMPUTER PRINTOUTS

The following are computer printouts of data recorded by the Ocean-Bottom Seismographs during the 1967 Aleutian Islands Experiments.

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
10 JULY	ADK	EP		6 39 44.0			T	
10 JULY	S23	EP	Z	6 46 50.5	50.6	0.2	L	
		ES	P	52.4			L	
10 JULY	S23	EP	Z	6 58 9.6	7.5	0.2	L	
		E	Y	25.9			L	
10 JULY	S23	EP	P	7 4 .0			L	
		ES	Y	10.2			L	
10 JULY	S23	EP	P	7 50 43.7			L	
		ES	Y	53.9			L	
10 JULY	S23	EP	Z	8 19 33.7	7.4	0.1	L	
		ES	Y	53.4			L	
10 JULY	S23	EP	Z	8 59 14.3	12.6	0.2	L	
		ES	Y	24.8			L	
10 JULY	ADK	EP		10 28 55.3			T	
10 JULY	S23	EP	Z	10 35 32.0	3.7	0.1	L	
		ES	Y	58.8			L	
10 JULY	S23	EP	Z	10 40 41.4			L	
		ES	Y	57.6			L	

10 JULY 10 48 25.6 52.7N 168.2W FOX ISLANDS,ALEUTIAN
H = 26 KM MAG = 3.9

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
10 JULY	ADK	IP		10 49 43.9			5.3	264
		ES		50 42.1			5.3	264
10 JULY	S23	EP	Z	10 50 20.7			7.8	268
		ES	Y	27.5			7.8	268
10 JULY	S23	EP	Z	10 59 8.1	7.5	0.2	L	
		ES	Y	17.9			L	
10 JULY	S23	EP	Z	11 8 15.5	2.5	0.3	L	
		ES	Y	37.2			L	
10 JULY	S23	EP	Z	11 15 55.7	3.7	0.1	L	
		ES	Y	16 29.9			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
10 JULY	S23	EP	Z	11 34 17.7	3.7	0.1	L	
		ES	Y	28.5			L	
10 JULY	S23	EP	Z	11 37 31.1	11.0	0.1	L	
		ES	Y	39.5			L	
10 JULY	S23	EP	Z	11 44 37.9	7.4	0.1	L	
		ES	Y	49.1			L	
10 JULY	S23	EP	Z	11 47 41.9			L	
		ES	Y	54.1			L	
10 JULY	S23	EP	Z	12 0 15.1	7.4	0.1	N	
		ES	Y	1 07.2			N	
10 JULY	S23	EP	Z	12 3 37.8	14.7	0.1	L	
		ES	Y	48.2			L	
10 JULY	ADK	IP		12 17 55.3			T	
10 JULY	S23	EP	Z	12 27 41.4	17.6	0.2	L	
		ES	Y	52.8			L	
10 JULY	S23	EP	Z	14 48 19.2	3.7	0.1	L	
		ES	Y	37.4			L	
10 JULY	S23	EP	Z	16 44 20.6	15.1	0.2	L	
		ES	Y	33.1			L	
10 JULY	S23	EP	Z	17 7 1.9	18.4	0.1	L	
		ES	Y	14.3			L	
10 JULY	ADK	IP		18 41 11.2			N	
		IS		51.5			N	
10 JULY	S23	EP	P	20 7 36.5			L	
		ES	Y	49.1			L	
10 JULY	S23	EP	P	20 17 16.4			L	
		ES	Y	24.7			L	
11 JULY	S25	EP	Z	2 41 36.4	203.3	0.1	L	
		ES	Y	42.6			L	
11 JULY	S23	EP	Z	4 41 29.0	17.6	0.3	N	
		ES	Y	59.5			N	
11 JULY	ADK	IP		5 17 25.5			L	
		IS		37.2			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 JULY	S23	EP	Z	7 42 18.1	7.4	0.1	N	
		ES	Y	38.5			N	
11 JULY	ADK	IP		8 58 48.7			N	
		IS		59 14.9			N	
11 JULY	S23	EP	Z	8 59 17.2	10.1	0.2	N	
		ES	Y	9 0 6.4			N	
11 JULY	S23	EP	Z	10 0 9.0	10.1	0.2	N	
		ES	Y	30.1			N	
11 JULY	S25	EP	Z	10 0 13.3			L	
		ES	Y	39.9			L	
11 JULY	S27	EP	Z	16 9 58.6	0.7	0.1	N	
		ES	X	10 19.8			N	
11 JULY	S27	EP	Z	16 25 26.5	5.0	0.2	L	
		ES	X	41.5			L	
11 JULY	S27	EP	Z	16 37 38.2	11.0	0.1	L	
		ES	X	41.7			L	
11 JULY	S27	EP	Z	16 37 50.7	7.4	0.1	L	
		ES	X	57.4			L	
11 JULY	S27	EP	Z	16 40 12.1	7.4	0.1	L	
		ES	X	18.9			L	
11 JULY	S23	EP	Z	17 0 23.5	10.1	0.2	N	
		ES	Y	54.0			N	
11 JULY	S27	EP	Z	17 6 34.7	11.0	0.1	L	
		ES	X	48.2			L	
11 JULY	S27	EP	Z	18 1 29.0	7.4	0.1	L	
		ES	X	30.1			L	
11 JULY	S23	EP	Z	19 13 35.3	3.7	0.1	L	
		ES	Y	43.8			L	
11 JULY	S27	EP	Z	19 18 59.5	11.0	0.1	L	
		ES	X	19 7.7			L	
11 JULY	S27	EP	Z	19 19 16.8	14.7	0.1	L	
		E	X	19.1			L	
		ES	X	22.4			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 JULY	S25	EP	Z	19 22 20.9	50.6	0.2	N	
		ES	X	49.8			N	
11 JULY	S25	EP	Z	20 9 19.6	64.7	0.1	L	
		ES	X	30.7			L	
11 JULY	S27	EP	Z	21 17 3.4	1.0	0.2	L	
		ES	Y	10.5			L	
11 JULY	S23	EP	Z	21 17 5.3	18.4	0.1	L	
		ES	Y	13.5			L	
11 JULY	S23	EP	Z	22 14 55.8	7.5	0.2	L	
		ES	Y	15 9.4			L	
11 JULY	S23	EP	Z	22 53 45.7	18.4	0.1	L	
		ES	Y	54 .3			L	
11 JULY	S23	EP	Z	23 38 26.9	14.7	0.1	N	
		ES	Y	58.7			N	
		E	Y	39 18.3				
11 JULY	S25	EP	Z	23 39 6.7			N	
		ES	Y	27.2			N	

12 JULY 1 47 30.6 51.8N 175.0W ANDREANOF IS,ALEUTIAN
H = 17 KM MAG = 4.5

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 JULY	ADK	IP		1 47 45.7			1.0	274
12 JULY	S28	EP	Z	1 48 17.2	88.5	0.3	3.0	282
		ES	Y	37.5			3.0	282
12 JULY	S25	EP	Z	1 48 22.3	7.5	0.2	3.5	276
		ES	Y	49 1.8			3.5	276
12 JULY	S23	EP	Z	1 48 26.5	443.5	0.3	3.6	270
		ES	Y	49 11.3			3.6	270
12 JULY	ADK	IP		5 51 40.6			L	
		IS		48.4			L	
12 JULY	S31	EP	P	5 52 1.8			N	
		ES	Y	53 9.3			N	
		E	Z	54.3			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 JULY	S23	EP	P	7 41 33.7			L	
		ES	Y	41.5			L	
12 JULY	S23	EP	Z	9 38 17.1	12.6	0.2	L	
		ES	Y	29.5			L	
12 JULY	S25	EP	Z	9 38 20.3	18.4	0.1	N	
		ES	Y	35.1			N	

12 JULY 10 32 1.6 54.9N 161.1W ALASKA PENINSULA
H = 33 KM MAG = 5.0

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 JULY	ADK	EP		10 34 22.7			9.8	258
		I		25.0			9.8	258
12 JULY	S31	EP	P	10 34 40.1			10.9	266
12 JULY	S25	EP	Z	10 34 55.9	75.8	0.2	12.0	264
		ES	Y	35 2.8			12.0	264
12 JULY	S23	EP	Z	10 34 58.4	12.6	0.2	12.2	263
		ES	Y	35 8.3			12.2	263
12 JULY	S31	EP	Z	10 40 16.9			N	
		ES	Y	22.8			N	
12 JULY	S23	EP	Z	10 53 7.7	20.1	0.3	L	
		ES	Y	21.2			L	
12 JULY	S25	EP	Z	10 53 9.3	69.5	0.2	N	
		ES	Y	40.4			N	
12 JULY	S31	EP	Z	10 53 23.4	37.9	0.3	N	
		ES	Y	54 12.7			N	
12 JULY	ADK	EP		10 53 43.2				
12 JULY	S23	EP	Z	14 5 14.7	15.1	0.2	L	
		ES	Y	27.1			L	
12 JULY	S25	EP	Z	14 5 20.5	7.4	0.1	L	
		ES	Y	38.2			L	
12 JULY	ADK	EP		15 19 45.1				
12 JULY	ADK	EP		21 13 12.2				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 JULY	S23	EP	Z	22 50 39.2	15.1	0.2	L	
		ES	Y	47.4			L	
13 JULY	S23	EP	Z	3 28 54.8			L	
		ES	Y	29 5.4			L	
13 JULY	S23	EP	Z	8 19 4.1	14.7	0.1	L	
		ES	Y	11.6			L	
13 JULY	S31	EP	Z	8 19 16.5			L	
		ES	Y	30.6			L	
13 JULY	S31	EP	Z	9 11 32.7			L	
		ES	Y	48.4			L	
13 JULY	ACK	IP		10 15 44.9			T	
13 JULY	S23	EP	Z	22 9 56.9	12.6	0.2	N	
		ES	Y	10 17.5			N	
13 JULY	S25	EP	Z	22 10 2.9	55.4	0.1	N	
		ES	X	26.2			N	
13 JULY	S31	EP	Z	22 10 52.6			L	
		ES	Y	11 3.3			L	
13 JULY	S25	EP	Z	23 31 13.1			L	
		ES	Y	28.7			L	
14 JULY	S31	EP	Z	1 44 17.9			L	
		ES	P	58.2			L	
14 JULY	S25	EP	Z	2 50 7.7	24.0	0.1	L	
		ES	X	23.1			L	
14 JULY	S25	EP	Z	3 56 53.5	27.7	0.1	N	
		ES	X	57 12.5			N	
14 JULY	S25	EP	Z	4 14 29.9	44.2	0.2	L	
		ES	Y	36.3			L	
14 JULY	S23	EP	Z	5 39 50.5	11.0	0.1	L	
		ES	Y	56.8			L	
14 JULY	ACK	IP		7 45 27.2			N	
		IS		46 2.3			N	
14 JULY	S25	E	P	7 46 10.6				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
14 JULY	S25	EP	Z	11 51 35.7	138.6	0.1	L	
		ES	Y	46.4			L	
14 JULY	S23	EP	Z	11 59 41.8			L	
		ES	Y	51.7			L	
14 JULY	13 13 50.6	51.2N		178.4E	RAT ISLANDS,ALEUTIAN			
				H =	33 KM	MAG = 4.3		
14 JULY	S23	IP	Z	13 14 4.6	66.9	0.4	0.7	44
		ES	Y	31.4			0.7	44
14 JULY	S25	EP	Z	13 14 10.3	139.0	0.2	1.1	36
		ES	Y	45.6			1.1	36
14 JULY	S28	EP	Z	13 14 18.1	158.4	0.3	1.6	43
		ES	X	40.7			1.6	43
14 JULY	S31	EP	Z	13 14 25.3			2.2	42
		ES	Y	55.8			2.2	42
14 JULY	ADK	IP		13 14 39.3			3.2	76
		IS		15 14.9			3.2	76
14 JULY	ADK	EP		13 55 21.3			R	
		ES		56 46.1			R	
14 JULY	S31	E	Z	13 55 42.5				
14 JULY	S25	EP	Z	13 55 53.2			L	
		ES	Y	56 3.3			L	
14 JULY	S31	EP	Z	14 1 46.7			R	
		ES	Y	2 39.1			R	
14 JULY	S28	EP	Z	18 19 13.6	56.9	0.2	L	
		ES	Y	27.0			L	
14 JULY	S23	EP	Z	18 19 14.4	7.4	0.1	L	
		ES	Y	28.1			L	
14 JULY	S27	EP	Z	19 32 32.6	75.8	0.3	L	
		ES	X	49.6			L	
14 JULY	ADK	IP		19 32 34.0			L	
		IS		51.7			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
14 JULY	S28	EP	Z	19 32 34.6	190.1	0.2	L	
		ES	X	52.3			L	
14 JULY	S23	EP	Z	19 32 35.7	20.1	0.3	L	
		ES	Y	55.0			L	
14 JULY	S25	EP	Z	19 32 35.8	75.8	0.3	N	
		ES	X	55.4			N	
14 JULY	S31	EP	Z	19 32 35.8	110.9	0.1	N	
		ES	Y	56.4			N	
		E	P	33 42.7			N	
14 JULY	S26	EP	P	20 25 10.1				
14 JULY	ADK	IP		20 25 10.4			L	
		IS		20.2			L	
14 JULY	S31	EP	Z	20 25 21.4	46.2	0.1	R	
		ES	Y	26 43.6			R	
14 JULY	S27	EP	Z	20 25 22.8	20.1	0.2	L	
		ES	X	43.1			L	
14 JULY	S28	EP	Z	20 25 23.3	46.2	0.1	L	
		ES	Y	40.6			L	
14 JULY	S25	EP	Z	20 25 28.7	147.9	0.2	N	
		ES	Y	52.2			N	
14 JULY	S23	EP	Z	20 25 31.4	17.6	0.2	L	
		ES	Y	58.5			L	
14 JULY	S23	EP	Z	23 52 36.4	11.0	0.1	L	
		ES	Y	42.9			L	
15 JULY	S27	EP	Z	0 34 17.2	10.7	0.4	T	
15 JULY	S26	EP	Z	1 18 2.6	37.9	0.2	L	
		ES	X	16.2			L	
15 JULY	S23	EP	Z	1 18 12.5	12.6	0.2	L	
		ES	Y	21.2			L	
15 JULY	S25	EP	Z	1 18 17.8	101.6	0.1	L	
		ES	Y	30.2			L	
15 JULY	S27	EP	Z	1 18 20.5	22.1	0.1	L	
		ES	Y	35.1			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
15 JULY	S28	EP	Z	1 18 24.3	101.1	0.2	L	
		ES	X	41.6			L	
15 JULY	S31	EP	Z	1 18 33.5			N	
		ES	Y	56.7			N	
15 JULY	S26	EP	P	3 18 14.3			L	
		ES	X	33.3			L	
15 JULY	S23	EP	Z	3 18 22.1	18.4	0.1	L	
		ES	Y	33.9			L	
15 JULY	S25	EP	Z	3 18 27.2	105.3	0.1	L	
		E	Y	42.8			L	
15 JULY	S27	EP	Z	3 18 31.9	20.1	0.3	N	
		ES	Y	52.6			N	
15 JULY	S28	EP	Z	3 18 35.9	69.5	0.3	N	
		ES	X	58.8			N	
15 JULY	S31	EP	Z	3 18 46.2			N	
		ES	Y	19 13.8			N	
15 JULY	S26	EP	P	4 37 54.2				
15 JULY	S23	EP	Z	4 38 3.6	20.1	0.3	L	
		ES	Y	11.9			L	
15 JULY	S27	EP	Z	4 38 12.9	10.1	0.2	L	
		ES	Y	26.7			L	
15 JULY	S23	EP	Z	6 19 14.3	7.5	0.2	L	
		ES	Y	24.3			L	
15 JULY	S27	EP	Z	6 19 20.6			L	
		ES	Y	37.4			L	
15 JULY	S26	EP	Z	8 15 15.4	101.1	0.3		

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
15 JULY 8 14 59.3 51.5N 176.8E RAT ISLANDS,ALEUTIAN H = 32 KM MAG = 4.9								
15 JULY	S23	EP	Z	8 15 23.8	218.4	0.5	1.5	82
		ES	Y	47.5			1.5	82
15 JULY	S25	EP	Z	8 15 28.2	82.2	0.2	1.7	70
		ES	Y	16 11.7			1.7	70
15 JULY	S27	IP	Z	8 15 33.0	606.7	0.4	2.1	69
		ES	Y	59.3			2.1	69
15 JULY	S26	EP	Z	8 15 36.4	95.0	0.2	2.2	66
		ES	Y	16 4.5			2.2	66
15 JULY	S30	EP	P	8 15 40.7			2.6	62
15 JULY	S31	EP	Z	8 15 43.1			2.8	61
15 JULY	ACK	IP		8 16 1.2			4.1	82
		IS		50.4			4.1	82
15 JULY	S23	LP	Z	14 32 4.5	15.1	0.2	L	
		ES	Y	18.5			L	
15 JULY	S27	EP	Z	14 32 7.2	7.4	0.1	L	
		ES	Y	22.9			L	
15 JULY	S25	EP	Z	14 32 7.7			L	
		ES	Y	23.2			L	
15 JULY	S26	EP	P	17 3 42.3				
15 JULY	S23	EP	Z	17 3 52.2	158.4	0.2	L	
		ES	Y	4 1.9			L	
15 JULY	S25	EP	Z	17 3 56.8	212.5	0.1	N	
		ES	Y	4 26.3			N	
15 JULY	S27	EP	Z	17 3 58.6	25.3	0.2	L	
		E	Z	4 .0			L	
		ES	Y	11.4			L	
15 JULY	S28	EP	Z	17 4 2.3	50.6	0.2	N	
		ES	Y	22.7			N	
15 JULY	S31	EP	Z	17 4 11.4			N	
		ES	Y	39.0			N	
15 JULY	S23	EP	Z	17 46 14.8	17.6	0.2	L	
		ES	Y	27.1			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
15 JULY	S25	EP	Z	17 46 18.2	114.6	0.1	L	
		ES	Y	35.2			L	
15 JULY	S27	EP	Z	17 46 18.8	56.9	0.2	L	
		ES	Y	33.7			L	
15 JULY	S28	EP	Z	17 46 22.3	15.1	0.2	L	
		ES	X	39.3			L	
15 JULY	S28	EP	Z	18 14 38.3	6.3	0.2	N	
		ES	X	15 34.5			N	
15 JULY	S23	EP	Z	19 15 36.5	15.1	0.2	L	
		ES	Y	45.5			L	
15 JULY	S25	EP	Z	19 15 42.8	56.9	0.2	L	
		ES	Y	56.3			L	
15 JULY	S27	EP	Z	19 15 46.6	5.0	0.2	L	
		ES	X	16 4.6			L	
15 JULY	S28	EP	Z	19 15 51.1			N	
		ES	Y	16 11.3			N	
15 JULY	S28	EP	Z	19 43 5.7	10.1	0.2	N	
		ES	X	42.2			N	
15 JULY	S25	EP	Z	19 43 11.8			N	
		ES	Z	40.0			N	
15 JULY	ADK	IP		22 44 43.8			L	
		IS		53.4			L	
15 JULY	S26	EP	P	22 45 2.4				
15 JULY	S31	EP	Z	22 45 9.6	435.4	0.1	N	
		ES	Z	41.8			N	
		ET	P	46 45.8			N	
15 JULY	S28	EP	Z	22 45 12.6	63.2	0.2	N	
		ES	X	49.3			N	
15 JULY	S27	EP	Z	22 45 12.9	56.9	0.3	N	
		E	Y	32.0			N	
		ES	Y	48.9			N	
15 JULY	S25	EP	Z	22 45 19.0	94.8	0.3	N	
		ES	Y	46 2.7			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
15 JULY	S23	EP	Z	22 45 21.8	221.8	0.3	N	
		ES	Y	46 6.1			N	
16 JULY	ADK	EP		0 1 43.5				
16 JULY	S25	EP	Y	0 16 52.1			L	
		ES	X	17 5.3			L	
16 JULY	S23	EP	Z	2 16 38.9	14.7	0.1	L	
		ES	Y	50.2			L	
16 JULY	S27	EP	Z	2 16 45.6	5.0	0.2	L	
		ES	Y	17 2.7			L	

16 JULY 3 39 5.6 51.9N 175.0W ANDREANOF IS,ALEUTIAN
H = 33 KM MAG = 4.2

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 JULY	ADK	IP		3 39 22.3			1.0	269
		IS		32.1			1.0	269
16 JULY	S21	EP	Z	3 39 47.6	46.8	0.3	2.7	290
		ES	Z	40 27.9			2.7	290
		ET	P	41 27.2			2.7	290
16 JULY	S27	EP	Z	3 39 50.9	44.2	0.3	3.1	278
		E	Y	40 10.4			3.1	278
		ES	X	27.1			3.1	278
		E	Y	38.2			3.1	278
16 JULY	S26	EP	Z	3 39 51.0	31.6	0.2	3.0	280
		ES	X	40 27.5			3.0	280
16 JULY	S23	EP	Z	3 39 59.9	401.5	0.5	3.6	269
		ES	Y	40 44.3			3.6	269

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 JULY	S25	EP	Z	11 41 51.1			L	
		ES	X	42 6.2			L	
16 JULY	S25	EP	Z	12 19 5.7			N	
		ES	X	26.6			N	
16 JULY	S23	EP	Z	12 19 7.7	20.1	0.2	L	
		ES	Y	20.7			L	
16 JULY	S23	EP	Z	13 21 39.1	18.4	0.1	L	
		ES	Y	47.7			L	
16 JULY	ADK			13 45 25.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 JULY	S23	EP	Z	14 51 27.3	12.6	0.2	N	
		ES	Y	53.4			N	
16 JULY	S28	EP	Z	14 51 37.7	7.5	0.2	N	
		ES	Y	52 14.4			N	
16 JULY	S25	EP	Z	16 25 1.9			L	
		ES	Y	16.7			L	
16 JULY	S23	EP	Z	16 25 57.2	15.1	0.2	L	
		ES	Y	26 11.2			L	
16 JULY	S27	EP	Z	16 26 .1	7.4	0.1	L	
		ES	Y	16.5			L	

16 JULY 20 48 05.4 53.00N 178.77W ALEUTIAN EXPLOSION - E15
EXPLOSION DEPTH = 747 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 JULY	S31	IP	Z	20 48 16.6	151.7	0.2	0.35	229
		ES	Y	46.2			0.35	229
		ET	P	50 41.1			0.35	229
16 JULY	S30	EP	P	20 48 20.0			0.56	228
		E	P	29.5			0.56	228
		E	P	49 5.6			0.56	228
16 JULY	S26	EP	Z	20 48 23.2	370.7	0.4	1.29	225
16 JULY	S28	EP	Z	20 48 26.3	316.8	0.2	0.93	225
		E	X	50 57.7			0.93	225
		E	Y	52 7.9			0.93	225
16 JULY	S27	EP	Z	20 48 27.1	72.8	0.5	1.12	226
		E	Y	30.8			1.12	226
		E	Y	35.6			1.12	226
		E	Y	37.8			1.12	226
16 JULY	S25	EP	Z	20 48 34.5			1.47	230
		ES	Y	39.7			1.47	230
16 JULY	ADK	IP		20 48 35.9			1.73	131
16 JULY	S23	EP	Z	20 48 39.5	24.1	0.4	1.83	225
		ES	Y	49 3.9			1.83	225
		ET	P	50 45.2			1.83	225
16 JULY	AC-	EP		20 48 40.2			1.99	216
		E		46.0			1.99	216
		E		49 3.0			1.99	216
16 JULY	AA-	EP		20 48 53.2			2.89	104

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 JULY	S25	EP	Z	21 45 16.1			L	
		ES	X	24.6			L	
16 JULY	S23	EP	Z	21 46 16.6	12.6	0.2	L	
		ES	Y	25.8			L	
16 JULY	S31	EP	Z	21 46 29.1			N	
		ES	Y	41.6			N	
16 JULY	S25	EP	Z	21 52 25.8			L	
		ES	Y	37.5			L	
16 JULY	S23	EP	Z	21 52 26.2	11.0	0.1	L	
		ES	Y	38.1			L	
17 JULY	S26	E	P	0 21 47.9				

17 JULY 2 20 6.1 53.15N 178.62E ALEUTIAN EXPLOSION - E16
EXPLOSION DEPTH = 755 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
17 JULY	S31	-IP	Z	2 20 20.1			0.52	223
		ES	Z	55.1			0.52	223
		ET	P	22 53.4			0.52	223
17 JULY	S30	EP	P	2 20 23.9			0.72	224
		E	P	31.3			0.72	224
		E	P	21 16.3			0.72	224
17 JULY	S28	EP	Z	2 20 29.4	158.4	0.2	1.10	223
		ES	X	41.4			1.10	223
		ET	X	23 7.9			1.10	223
17 JULY	ALK	IP		2 20 37.0			1.76	136
17 JULY	S27	EP	P	2 20 41.1			1.29	224
		E	Y	57.6			1.29	224
		E	Y	23 50.1			1.29	224
17 JULY	S23	EP	Z	2 20 43.4	18.7	0.4	2.01	224
		ES	Y	21 6.4			2.01	224
		ET	P	22 .7			2.01	224
17 JULY	AC-	EP		2 20 46.7			2.17	216
		E		52.0			2.17	216
		E		21 12.0			2.17	216
17 JULY	SA-	EP		2 20 53.2			2.85	108
17 JULY	S23	EP	Z	3 5 25.9	22.6	0.3	L	
		ES	Y	39.6			L	

DAY	.A	PHASE	C	TIME	AMP	PER	DIST	AZI
17 JULY	S28	EP	Z	3 5 36.5	94.8	0.2	N	
		ES	X	57.4			N	
17 JULY	ADK	EP		3 30 35.3			N	
		ES		31 42.2			N	
17 JULY	S23	EP	Z	10 55 50.6	7.4	0.1	L	
		ES	Y	56 5.5			L	
17 JULY	ADK	EP		12 16 16.8			N	
		ES		49.3			N	
17 JULY	ADK	IP		13 53 59.4			N	
		ES		54 48.7			N	
17 JULY	S23	EP	Z	14 12 38.7	12.6	0.2	L	
		ES	Y	47.6			L	

17 JULY 22 3 4.8 53.25N 178.41W ALEUTIAN EXPLOSION - E17
EXPLOSION DEPTH = 671 FT

DAY	.A	PHASE	C	TIME	AMP	PER	DIST	AZI
17 JULY	S31	EP	Z	22 3 20.9	170..	0.3	0.67	226
		ES	Z	38.7			0.67	226
		ET	P	6 3.2			0.67	226
17 JULY	S30	EP	P	22 3 23.8			0.88	226
		E	P	33.9			0.88	226
		E	P	4 25.8			0.88	226
17 JULY	S28	EP	Z	22 3 30.2	190.1	0.2	1.25	225
		ES	Y	42.9			1.25	225
		E	Y	6 11.5			1.25	225
		E	Y	41.4			1.25	225
		E	Y	7 14.9			1.25	225
17 JULY	ADK	IP		22 3 35.9			1.75	142
17 JULY	S25	EP	Z	22 3 38.5			1.79	229
		ES	X	4 1.6			1.79	229
17 JULY	S23	EP	Z	22 3 43.6	21.4	0.4	2.16	224
		ES	Y	4 14.3			2.16	224
		ET	P	5 5.1			2.16	224
17 JULY	AA-	EP		22 3 51.3			2.76	111
17 JULY	SP-	EP		22 4 39.5			6.11	47

DAY	.A	PHASE	C	TIME	AMP	PER	DIST	AZI
17 JULY	S23	EP	Z	22 38 11.3	15.1	0.2	L	
		ES	Y	28.4			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
18 JULY	S23	EP	Z	0 28 .3	7.4	0.1	L	
		ES	Y	6.6			L	

18 JULY 1 6 5.4 53.41N 178.21W ALEUTIAN EXPLOSION - E18
EXPLOSION DEPTH = 678 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
18 JULY	S21	IP	Z	1 6 24.0	164.3	0.2	0.88	224
		ES	Z	7 11.0			0.88	224
		ET	P	9 16.0			0.88	224
18 JULY	S30	EP	P	1 6 27.3			1.08	224
		E	P	46.5			1.08	224
		E	P	7 40.5			1.08	224
18 JULY	S28	EP	Z	1 6 33.4	113.8	0.2	1.45	224
		ES	X	49.4			1.45	224
		E	Y	9 22.4			1.45	224
		E	Y	54.0			1.45	224
		E	Y	10 19.6			1.45	224
18 JULY	ALK	IP		1 6 36.9			1.82	148
18 JULY	S23	EP	Z	1 6 46.5	13.4	0.4	2.36	224
		ES	Y	7 25.3			2.36	224
18 JULY	AA-	EP		1 6 50.3			2.71	115
		E		7 27.0			2.71	115
18 JULY	AC-	EP		1 6 52.0			2.52	218
		E		7 13.0			2.52	218

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
18 JULY	S23	EP	Z	1 47 46.9	10.1	0.2	L	
		ES	Y	48 2.2			L	

18 JULY 3 30 5.5 53.52N 178.00W ALEUTIAN EXPLOSION - E19
EXPLOSION DEPTH = 679 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
18 JULY	S31	EP	Z	3 30 26.4	114.3	0.4	1.04	225
		ES	Z	31 21.3			1.04	225
		ET	P	33 25.8			1.04	225
18 JULY	S28	EP	Z	3 30 35.6	50.6	0.2	1.62	224
		ES	Y	58.0			1.62	224
		E	Y	33 34.0			1.62	224
		E	Y	34 1.6			1.62	224
18 JULY	AUK	IP		3 30 37.3			1.85	153
18 JULY	S30	EP	P	3 30 39.9			1.25	225
		E	P	31 12.0			1.25	225
		E	P	53.9			1.25	225
18 JULY	S23	EP	Z	3 30 49.1	8.0	0.4	2.53	224
		ES	Y	31 24.1			2.53	224
		ET	Y	33 38.3			2.53	224
18 JULY	AA-	EP		3 30 49.4			2.65	118
18 JULY	BQ-	EP		3 32 51.4			11.35	44
18 JULY	S23	EP	Z	4 40 52.6	316.8	0.2	N	
		ES	Y	41 26.6			N	
18 JULY	S28	EP	Z	4 41 4.9	69.5	0.2	L	
		ES	X	21.0			L	
18 JULY	S31	EP	Z	4 41 12.4			N	
		ES	Y	33.3			N	
18 JULY	S23	EP	Z	6 10 1.7	12.6	0.2	N	
		ES	Y	27.9			N	
18 JULY	S30	EP	P	6 20 57.4			N	
		E	P	21 41.2			N	
		E	P	22 9.0			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
18 JULY	6 21	5.4	53.65N	177.77W ALEUTIAN EXPLOSION - E20 EXPLOSION DEPTH = 665 FT				
18 JULY	S31	EP	Z	6 21 28.7	131.5	0.6	1.23	225
		ES	Z	22 36.3			1.23	225
		ET	P	24 36.9			1.23	225
18 JULY	S30	EP	P	6 21 32.6			1.44	226
18 JULY	ALK	IP		6 21 37.9			1.91	159
18 JULY	S28	EP	Z	6 21 37.9	37.9	0.2	1.81	225
		ES	Y	50.2			1.81	225
		E	Y	24 44.8			1.81	225
18 JULY	AA-	EP		6 21 49.7			2.60	123
18 JULY	S23	EP	Z	6 21 52.5	12.6	0.3	2.72	225
		ES	Y	22 25.0			2.72	225
		ET	Y	24 47.6			2.72	225
18 JULY	S25	EP	P	6 21 56.5			2.35	228
18 JULY	SP-	EP		6 22 32.5			5.55	48
18 JULY	BO-	EP		6 23 46.6			11.16	44
18 JULY	S25	EP	Z	6 40 47.7	101.6	0.1	N	
		ES	Y	41 11.6			N	
18 JULY	S23	EP	Z	6 40 51.9	20.1	0.3	L	
		ES	Y	41 6.1			L	
18 JULY	S23	EP	Z	10 50 48.0	10.1	0.3	L	
		ES	Y	51 1.2			L	
18 JULY	S25	EP	Z	11 50 40.0			N	
		ES	Y	51 5.8			N	
18 JULY	S28	EP	Z	13 25 26.3	56.9	0.2	L	
		ES	X	47.5			L	
18 JULY	S25	EP	Z	19 55 55.8			N	
		ES	Y	56 22.3			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI

18 JULY 23 25 5.5 53.76N 177.55W ALEUTIAN EXPLOSION - E21
EXPLOSION DEPTH = 664 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
18 JULY	S31	EP	Z	23 25 31.0			1.41	226
		ES	Z	26 49.5			1.41	226
		ET	P	28 47.0			1.41	226
18 JULY	S30	EP	P	23 25 34.5			1.61	226
		E	P	27 20.0			1.61	226
18 JULY	ACK	IP		23 25 38.7			1.93	164
18 JULY	S28	EP	Z	23 25 40.1	37.9	0.2	1.98	225
		ES	Y	52.4			1.98	225
		ET	Y	26 40.4			1.98	225
18 JULY	AA-	EP		23 25 48.3			2.55	126
		E		26 9.0			2.55	126
18 JULY	S23	EP	Z	23 25 54.9	15.1	0.2	2.89	225
		ES	Y	26 27.2			2.89	225
		ET	Y	29 2.8			2.89	225
18 JULY	SF	EP		23 26 30.5			5.38	48
19 JULY	S23	EP	Z	1 24 25.0	5.0	0.2	L	
		ES	Y	34.2			L	

19 JULY 2 37 5.2 53.90N 177.34W ALEUTIAN EXPLOSION - E22
EXPLOSION DEPTH = 672 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
19 JULY	S31	EP	Z	2 37 32.9	63.2	0.2	1.59	226
		ES	Y	39 3.1			1.59	226
		ET	P	40 56.9			1.59	226
19 JULY	ACK	IP		2 37 39.5			2.08	168
19 JULY	S28	EP	Z	2 37 42.3	25.3	0.2	2.16	225
		E	Y	57.5			2.16	225
		E	Y	39 15.0			2.16	225
19 JULY	AA-	EP		2 37 48.0			2.54	131
19 JULY	S30	EP	P	2 37 55.5			1.79	226
		E	P	39 9.1			1.79	226
		E	P	31.3			1.79	226
19 JULY	S23	EP	Z	2 37 56.9	12.6	0.2	3.07	225
		ES	Y	38 23.5			3.07	225
		ET	Z	41 13.7			3.07	225
19 JULY	S30	EP	Z	4 50 1.0				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
19 JULY	S23	EP	Z	4 58 26.6	12.6	0.2	L	
		ES	Y	40.4			L	
19 JULY	S30	I	P	5 13 24.3				
19 JULY	ADK	IP		6 19 16.3			L	
		IS		23.9			L	
19 JULY	S31	EP	Z	6 19 39.1			N	
		E	X	51.4			N	
		E	Y	20 7.4			N	
19 JULY	S31	EP	P	6 20 44.1			N	
		E	Y	52.9			N	
		ES	Y	21 4.9			N	
19 JULY	S23	EP	Z	6 42 40.0	17.6	0.2	L	
		ES	Y	47.5			L	
19 JULY	S25	EP	Z	6 42 45.2	46.2	0.1	L	
		ES	Y	55.6			L	
19 JULY	S31	EP	Z	6 42 59.0			N	
		ES	Y	43 20.5			N	
19 JULY	S31	EP	Z	8 27 30.8			N	
		ES	Y	28 10.7			N	
19 JULY	S31	EP	Z	8 29 .3			N	
		ES	Y	40.3			N	
19 JULY	S23	EP	Z	8 39 41.0	3.7	0.1	L	
		ES	Y	52.0			L	
19 JULY	ADK	EP		8 50 57.8			N	
		IS		51 42.0			N	
19 JULY	S23	EP	Z	8 53 23.4	12.6	0.2	L	
		ES	Y	36.3			L	
19 JULY	S25	EP	Z	8 53 31.7	46.2	0.1	L	
		ES	X	45.6			L	
19 JULY	S31	EP	Z	8 53 52.5			N	
		ES	Y	54 15.1			N	
19 JULY	S23	EP	Z	12 37 32.8	11.0	0.1	N	
		ES	Y	57.6			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
19 JULY	S23	EP	Z	12 50 01.3	11.0	0.1	N	
		ES	Y	37.C			N	
19 JULY	S31	EP	Z	12 37 51.8			N	
		ES	Y	38 26.7			N	
19 JULY	S31	EP	Z	12 49 54.9			N	
		ES	Y	50 19.9			N	
		E	Y	52 7.4			N	
19 JULY	S31	EP	P	12 50 54.5			L	
		ES	Y	51 12.5			L	
19 JULY	ACK	IP		12 51 59.C			T	
19 JULY	S23	EP	Z	13 54 15.9	12.6	0.2	N	
		ES	Y	37.1			N	
19 JULY	S31	EP	Z	16 25 17.8			N	
		ES	Y	38.6			N	
		E	Y	26 33.2			N	
19 JULY	S23	EP	Z	16 50 16.9	15.1	0.2	L	
		ES	Y	32.7			L	
19 JULY	S31	EP	Z	16 50 19.4			L	
		ES	Y	21.7			L	
19 JULY	S28	EP	Z	18 39 51.6	7.5	0.2	N	
		ES	X	40 22.7			N	
19 JULY	S31	EP	Z	18 39 57.5			N	
		E	X	40 .2			N	
		ES	Y	33.5			N	
19 JULY	S23	EP	P	19 5 55.3			L	
		ES	Y	6 5.9			L	
19 JULY	S31	EP	Z	19 14 56.C			N	
		ES	Y	15 50.6			N	
19 JULY	S31	EP	Z	19 17 49.7			N	
		ES	Y	18 36.8			N	
		E	Y	19 4.4			N	
		E	Y	48.4			N	
19 JULY	S31	EP	Z	19 20 .2	83.2	0.1	L	
		ES	Y	8.9			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
19 JULY	S31	EP	Z	19 25 2.0			N	
		ES	Y	31.8			N	
19 JULY	S31	EP	Z	19 35 7.1			N	
		ES	Y	28.4			N	
19 JULY	S31	EP	Z	20 40 42.4			L	
		ES	Y	50.2			L	
19 JULY	S31	EP	Z	20 41 39.2			N	
		ES	Y	42 31.5			N	
19 JULY	S31	EP	Z	20 42 53.4			N	
		ES	Y	43 26.5			N	
		E	Y	44 50.8			N	
19 JULY	S31	EP	Z	20 45 47.6			N	
		ES	Y	46 38.8			N	
19 JULY	S31	EP	Z	20 51 16.2			L	
		ES	Y	33.1			L	
19 JULY	S31	EP	Z	20 52 42.0			N	
		ES	Y	53 17.2			N	
19 JULY	ADK	EP		22 10 41.2			N	
		ES		11 41.5			N	
19 JULY	S31	EP	Z	22 10 59.6	16.1	0.4	R	
		ES	Y	12 4.1			R	
19 JULY	S31	EP	Z	22 16 9.9	7.5	0.3	R	
		E	Y	39.2			R	
		ES	Y	17 39.6			R	
		E	Y	20 11.4			R	
19 JULY	S23	EP	Z	22 48 21.6	10.1	0.2	N	
		ES	Y	43.6			N	

20 JULY 0 32 5.6 51.28N 178.59E ALEUTIAN EXPLOSION - E24
EXPLOSION DEPTH = 670 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
20 JULY	AC-	IP		32 16.6			0.49	76
		ES		23.0			0.49	76
20 JULY	S23	EP	Z	0 32 18.3	1.5U	0.5	0.54	41
		E	Y	24.0			0.54	41
20 JULY	S26	EP	Z	0 32 20.2	365.0	0.5	1.08	41
20 JULY	S27	EP	Z	0 32 29.3			1.26	41
20 JULY	S28	EP	Z	0 32 33.5	101.1	0.2	1.45	42
		ES	X	36.0			1.45	42
20 JULY	S30	EP	P	0 32 38.1			1.82	41
20 JULY	S31	EP	Z	0 32 40.0	26.1	0.5	2.03	41
20 JULY	ACK	IP		0 32 54.3			3.02	77
20 JULY	SQ-	EP		32 57.2			3.13	299
		E		33 36.0			3.13	299
20 JULY	AA-	EP		33 17.0			4.57	76
20 JULY	S23	EP	Z	1 0 25.4	728.7	0.3	L	
		ES	Y	33.9			L	
		E SUR	Z	38.7			L	
20 JULY	S26	EP	Z	1 0 26.7	316.8	0.3		
		E	X	43.0				
20 JULY	S28	EP	Z	1 0 38.9	12.6	0.3	N	
		ES	X	59.1			N	
		ET	X	1 48.6			N	
20 JULY	S31	EP	Z	1 0 45.4			N	
		E	X	51.9			N	
		ES	X	1 16.3			N	
20 JULY	S30	EP	P	1 0 53.1				
20 JULY	S31	EP	Z	3 13 57.0			T	
20 JULY	S31	EP	Z	3 40 48.6			L	
		ES	Y	41 1.1			L	
20 JULY	S23	EP	Z	4 47 1.2	7.4	0.1	L	
		ES	Y	16.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
20 JULY 5 5 5.4 51.17N 178.34E ALEUTIAN EXPLOSION - E25								
EXPLOSION DEPTH = 657 FT								
20 JULY	AC-	IP		5 5 20.8			0.66	71
		E		26.0			0.66	71
		E		31.0			0.66	71
		ES		34.0			0.66	71
20 JULY	S23	EP	Z	5 5 22.5	40.3	0.4	0.72	45
		LS	Y	31.1			0.72	45
		ET		7 44.6			0.72	45
20 JULY	S25	EP	P	5 5 29.0			1.09	37
20 JULY	S20	EP	P	5 5 33.5			2.00	42
		E	P	8 3.1			2.00	42
20 JULY	S28	EP	Z	5 5 37.7	208.6	0.3	1.63	43
		ES	Y	46.2			1.63	43
		E	Y	7 57.4			1.63	43
20 JULY	S31	EP	Z	5 5 43.8	23.2	0.5	2.21	42
20 JULY	SU-	EP		5 5 56.6			3.05	302
		E		6 4.0			3.05	302
		ES		36.0			3.05	302
20 JULY	ADK	IP		5 6 1.4			3.20	76
20 JULY	AA-	EP		5 6 20.5			4.75	75
20 JULY	BC-	EP		5 8 33.0				
20 JULY	S31	EP	Z	5 8 3.0			N	
		ES	Y	37.3			N	
20 JULY	S31	LP	Z	6 59 .0	15.1	0.3	T	
20 JULY 7 50 5.5 51.03N 178.18E ALEUTIAN EXPLOSION - E26								
EXPLOSION DEPTH = 659 FT								
20 JULY	AC-	EP		7 50 23.1			0.82	63
		ES		36.0			0.82	63
20 JULY	S23	EP	Z	7 50 25.3	34.8	0.5	0.90	43
		LS	Y	46.5			0.90	43
20 JULY	S25	EP	P	7 50 30.6			1.28	36
		LS	Y	53 56.9			1.28	36
20 JULY	S31	EP	Z	7 50 47.1	18.7	0.4	2.39	42
		LS	Y	51 16.5			2.39	42
20 JULY	SU-	EP		7 50 57.4			3.04	306
20 JULY	ADK	EP		7 51 1.4			3.34	73
20 JULY	AA-	EP		7 51 22.9			4.89	73

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
20 JULY	S31	EP	Z	7 53 46.1			N	
		ES	Y	54 16.5			N	
20 JULY	S31	EP	Z	8 22 50.0			L	
		ES	Y	23 7.3			L	
20 JULY	S23	EP	Z	9 38 45.0	12.6	0.2	L	
		ES	Y	58.5			L	
20 JULY	S31	EP	Z	9 38 48.3			L	
		ES	Y	39 5.3			L	
20 JULY	S23	EP	Z	11 50 5.4	7.4	0.1	L	
		ES	Y	15.7			L	

20 JULY 14 26 14.1 51.4N 178.3E RAT ISLANDS, ALEUTIAN
H = 33 KM MAG = 5.3

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
20 JULY	S23	IP	Z	14 26 28.1	196.6	0.5	0.6	62
		ES	Y	55.8			0.6	62
20 JULY	S26	EP	Z	14 26 31.1	999.9		1.1	52
20 JULY	S25	EP	Z	14 26 34.6	183.3	0.2	0.9	46
20 JULY	S27	EP	Z	14 26 38.5	999.9		1.3	50
20 JULY	S28	EP	Z	14 26 43.2			1.5	50
		ES	X	55.0			1.5	50
20 JULY	S31	EP	Z	14 26 48.6	31.9	0.5	2.1	47
20 JULY	ADK	IP		14 27 3.3			3.2	80
		IS		42.4			3.2	80

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
20 JULY	S31	EP	Z	15 46 20.0	80.7	0.8	T	
20 JULY	ADK	EP		15 46 23.6			N	
		I		45.2			N	
20 JULY	S23	EP	Z	18 4 47.5	14.7	0.1	L	
		ES	Y	5 .7			L	
20 JULY	S23	EP	Z	18 25 4.5	17.6	0.2	L	
		ES	Y	12.0			L	
20 JULY	S25	E	Y	18 25 30.7				
20 JULY	ADK	IP		19 17 23.7			L	
		IS		34.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
20 JULY	S31	EP	Z	19 17 57.6				
20 JULY	ADK	IP		23 23 54.1			T	
21 JULY	S31	EP	Z	2 42 49.3			L	
		ES	Y	43 22.5			L	
21 JULY	S28	EP	Z	5 24 33.3			L	
		ES	Y	49.5			L	
21 JULY	S31	EP	Z	5 24 41.7			L	
		ES	Y	25 1.2			L	
21 JULY	S31	EP	Z	7 46 57.0			L	
		ES	Y	47 12.0			L	
21 JULY	ADK	IP		10 13 18.4			L	
		IS		26.9			L	
21 JULY	S31	EP	Z	10 13 34.5			L	
		ES	Y	53.7			L	
21 JULY	S31	EP	P	10 14 36.0			L	
		ES	Y	46.5			L	
21 JULY	S31	EP	Z	10 55 44.6			N	
		ES	Y	56 6.0			N	
21 JULY	S31	EP	Z	11 35 7.2			N	
		ES	Y	36 4.5			N	
21 JULY	S27	EP	Z	17 8 22.1	168.1	0.4	L	
		ES	Y	37.5			L	
21 JULY	S28	EP	Z	17 8 25.9	158.4	0.2	L	
		ES	X	43.9			L	
21 JULY	S30	EP	P	17 8 26.0				
		E	P	27.8				
		E	P	31.1				
21 JULY	S31	EP	Z	17 8 28.0			N	
		ES	Y	50.4			N	
		E	P	9 29.1			N	
21 JULY	ADK	IP		17 8 34.3			N	
		IS		57.5			N	
22 JULY	S28	EP	Z	1 19 10.4			R	
		ES	Y	20 18.3			R	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
22 JULY	S31	EP	Z	1 19 26.7	7.5	0.2	N	
		ES	Y	20 7.1			N	
22 JULY	S31	EP	Z	1 21 20.2	12.6	0.2	L	
		ES	Y	34.3			L	
22 JULY	S31	EP	Z	1 22 10.0	15.1	0.2	L	
		ES	Y	21.3			L	
22 JULY	S31	EP	Z	2 18 25.2	5.0	0.2	L	
		ES	Y	37.2			L	
22 JULY	S31	EP	Z	3 49 21.4	5.0	0.2	N	
		ES	Y	56.5			N	
22 JULY	ADK	EP		4 10 31.2				
		E		21 5.0				
		E		37 55.0				
22 JULY	S31	EP	Z	4 31 35.9	7.5	0.2	N	
		ES	Y	32 32.7			N	
22 JULY	S31	EP	Z	5 39 11.5	21.4	0.4	T	
22 JULY	S31	EP	Z	9 37 26.0	10.1	0.2	N	
		E	Y	31.4			N	
		ES	Y	38 5.9			N	
22 JULY	S31	EP	Z	11 51 29.6	17.6	0.2	L	
		ES	Y	46.3			L	
		E	Y	52 30.3			L	
22 JULY	S31	EP	Z	16 5 23.9	10.1	0.3	T	
		E	Y	28.0			T	
22 JULY	ADK	EP		17 9 34.0				
		E		12 49.8				
		E		19 59.0				
22 JULY	S31	EP	Z	20 48 28.9			N	
		ES	Y	49 18.2			N	
22 JULY	ADK	EP		22 5 .0			[illegible]	
		ES		49.2			N	
22 JULY	S31	EP	Z	22 5 [illegible]4.4			R	
		ES	Y	6 32.0			R	
23 JULY	ADK	IP		4 9 4.6			N	
		ES		54.1			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
24 JULY	ALK	EP		7 51 20.0			T	
25 JULY	S11	EP	Z	1 9 19.3	12.7	0.2	L	
		ES	Y	35.2			L	
25 JULY	S11	EP	Z	9 46 21.4			L	
		ES	Y	26.8			L	
25 JULY	S11	EP	Z	10 50 13.0	5.[illegible]	0.2	L	
		ES	X	36.4			L	
25 JULY	S11	EP	Z	10 55 8.3			L	
		ES	Y	24.1			L	
25 JULY	S11	E	Y	12 40 14.7				
25 JULY	S11	EP	Z	15 32 46.0			N	
		ES	X	33 15.0			N	
25 JULY	S11	EP	Z	15 45 26.4	33.7	0.4	N	
		ES	Y	49.6			N	
25 JULY	S11	E	Y	16 33 27.4				
25 JULY	S11	EP	Z	17 5 36.5			L	
		ES	X	40.6			L	
25 JULY	S11	EP	Z	19 23 48.1	19.0	0.3	N	
		ES	Y	[illegible] 17.7			N	
25 JULY	S11	EP	Z	20 46 51.6	348.5	0.3	L	
		ES	Y	47 5.7			L	
25 JULY	S12	EP	P	20 46 55.0			L	
		ES	Y	47 13.5			L	
25 JULY	S11	E	X	21 15 28.0				
25 JULY	S11	E	X	21 28 56.[illegible]				
25 JULY	S11	EP	Z	21 42 10.4			N	
		ES	X	41.7				
25 JULY	S1[illegible]	EP	Z	22 48 46.7	18.5	0.1	L	
		ES	Y	49 2.6				
25 JULY	S11	[illegible]	X	23 16 29.7				
25 JULY	AFK	EP		23 27 30.2			N	
		IS		54.7			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
26 JULY	ADK	IP		3 39 11.5			L	
		IS		17.5			L	
26 JULY	S12	EP	P	3 39 33.6			N	
		ES	Y	59.1			N	
26 JULY	S14	-IP	Z	3 39 35.2	190.1	0.2	N	
		ES	X	59.3			N	
26 JULY	ADK	EP		5 24 18.8			N	
		ES		25 8.0			N	
26 JULY	ADK	EP		6 43 32.8				
26 JULY	S15	E	Z	7 9 25.8				
		E	Z	10 2.3				
26 JULY	S11	EP	Z	10 31 17.9			L	
		ES	Y	34.2				
26 JULY	S11	EP	Z	12 24 20.1			N	
		ES	Y	45.4				
26 JULY	S11	EP	Z	12 47 41.7			N	
		ES	Y	48 2.5				
26 JULY	S11	EP	Z	12 51 38.7			N	
		ES	Y	58.3				
26 JULY	S11	EP	Y	12 57 30.6			L	
		ES	Y	40.4				
26 JULY	S11	EP	Z	13 38 3.3			L	
		ES	Y	19.2				
26 JULY	S11	EP	Z	15 30 15.9			L	
		ES	Y	30.8				
26 JULY	S11	EP	Z	16 39 16.9			L	
		ES	X	25.7				
26 JULY	ADK	IP		16 56 57.2			N	
		I		59.5			N	
		IS		57 36.6			N	
26 JULY	S15	EP	Z	16 57 4.9	37.9	0.3		
		E	Y	17.8				
		E	P	59 33.8				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
26 JULY	S14	EP	Z	16 57 10.8	38.0	0.2	L	
		ES	X	22.9			L	
26 JULY	S11	EP	Z	16 57 33.4	3.7	0.1	N	
		ES	Y	52.5				
26 JULY	S11	EP	Z	17 6 15.4			N	
		ES	Y	46.7			N	
26 JULY	S11	EP	Z	17 13 9.6	34.8	0.3	N	
		ES	Y	39.5			N	
26 JULY	S11	EP	Z	19 20 3.6	3.7	0.1	L	
		ES	Y	17.3			L	
26 JULY	ADK	IP		19 20 18.1			N	
		IS		36.7			N	
26 JULY	S14	EP	Z	19 20 41.0	168.5	0.4	L	
		ES	X	54.7			L	
		E	X	21 24.1			L	
		E	P	22 35.4			L	
26 JULY	S15	EP	Z	19 20 42.4	145.6	0.5	N	
		ES	Y	21 17.6			N	
		E	P	22 55.2			N	
26 JULY	S12	EP	P	19 20 45.3			N	
		ES	X	21 26.0			N	
26 JULY	S11	EP	Z	19 20 53.6	18.5	0.1	N	
		ES	Y	21 12.1			N	
26 JULY	S16	E	Z	20 13 41.7				
26 JULY	S11	EP	Z	21 53 20.8			L	
		ES	Y	33.3			L	
26 JULY	S12	EP	P	22 12 38.0			L	
		ES	Y	49.6			L	
26 JULY	S11	EP	Z	22 12 41.4	60.2	0.1	L	
		ES	Y	53.4			L	
26 JULY	S11	EP	Z	22 51 5.6			L	
		ES	Y	[illegible]1.9			L	
26 JULY	S12	EP	P	23 11 13.0			L	
		ES	Y	26.5			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
26 JULY	S11	E	Y	23 11 20.4				
26 JULY	S14	EP	Z	23 35 7.1	22.2	0.3	N	
		ES	X	45.4			N	
26 JULY	ADK	IP		23 35 44.4			N	
		IS		36 2.6			N	
26 JULY	S15	EP	Z	23 36 8.9	10.1	0.3	N	
		ES	Y	46.2			N	
		E	P	38 23.8			N	
26 JULY	S16	EP	Z	23 36 14.2	12.7	0.2	N	
		ES	Y	56.6			N	
26 JULY	S12	EP	X	23 36 52.2			L	
		ES	Y	37 2.3			L	

27 JULY 1 40 5.3 55.40N 174.74W ALEUTIAN EXPLOSION - E14
EXPLOSION DEPTH = 631 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
27 JULY	S16	EP	Z	1 40 23.8			0.88	227
27 JULY	S15	EP	Z	1 40 43.3			1.79	227
		ET	P	42 19.5			1.79	227
27 JULY	S14	EP	Z	1 40 51.8	2.5	0.2	2.67	227
		E	P	43 26.8			2.67	227
27 JULY	ADK	E		1 40 54.0			3.73	199
		E		44 22.1			3.73	199
		I		39.8			3.73	199
27 JULY	SP-	EP		1 40 56.2			3.07	53
		E		41 5.0			3.07	53
		E		31.0			3.07	53
27 JULY	AA-	EP		1 40 56.2			3.22	174
27 JULY	S11	EP	Z	1 41 26.4			5.01	227

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
27 JULY	S12	E	P	1 44 38.0				
		E	P	45 29.8				
		E	P	46 30.2				
27 JULY	S11	EP	Z	1 45 9.1				
27 JULY	S11	EP	Z	1 56 35.0			N	
		ES	X	57 14.1			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
27 JULY	7 31 5.6	56.05N	173.50W	ALEUTIAN EXPLOSION - E13				
				EXPLOSION DEPTH = 631 FT				
27 JULY	S16	EP	Z	7 31 36.6			1.84	228
		ET	P	33 24.2			1.84	228
27 JULY	SP-	EP		7 31 44.5			2.12	57
		E		54.0			2.12	57
		E		32 7.0			2.12	57
27 JULY	S15	EP	Z	7 31 53.0	24.1	0.4	2.75	228
		ET	P	34 31.0			2.75	228
27 JULY	AA-	EP		7 32 4.6			3.88	167
27 JULY	S14	EP	Z	7 32 5.3	2.5	0.2	3.63	228
		ET	P	35 38.3			3.63	228
27 JULY	ALK	E		7 32 21.0			4.59	205
		E		36 10.5			4.59	205
		I		44.9			4.59	205
27 JULY	S11	EP	P	7 32 43.1			5.97	228
		ET	P	39 9.6			5.97	228
27 JULY	S12	E	P	7 33 6.3			5.45	228
27 JULY	BO-	EP		7 33 9.6			7.72	47
27 JULY	S11	EP	Z	7 37 12.6				
27 JULY	S16	EP	Z	7 52 6.0	9.3	0.1	R	
		ES	X	54 7.3			R	
27 JULY	S15	E	Z	9 57 42.6				
27 JULY	S11	EP	Z	14 16 34.3	53.9	0.3	N	
		ES	X	17 7.9			N	
27 JULY	S11	EP	Z	15 35 12.6			L	
		ES	Y	23.4			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI

27 JULY 16 35 31.3 52.0N 176.2W ANDREANOF IS,ALEUTIAN
H = 63 KM MAG = 4.4

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
27 JULY	ADK	IP		16 35 41.4			0.3	244
		IS		48.2			0.3	244
27 JULY	S14	-IP	Z	16 36 5.2	313.4	0.4	1.9	325
		E	X	38 1.7			1.9	325
27 JULY	S12	EP	P	16 36 6.9			2.4	277
		ES	Y	38.6			2.4	277
27 JULY	S15	-IP	Z	16 36 9.5	943.7	0.4	2.2	348
		ES	Y	23.6			2.2	348
		ET	P	38 20.8			2.2	348
27 JULY	S11	EP	Z	16 36 15.5	67.4	0.4	2.8	268
		ES	Z	30.1			2.8	268
27 JULY	S16	-IP	Z	16 36 17.6	316.8	0.3	2.8	4
		ES	Z	55.6			2.8	4
		ET	P	39 2.5			2.8	4

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
27 JULY	S14	EP	Z	16 46 46.9	9.5	0.3		
27 JULY	S14	EP	Z	17 0 19.9	9.5	0.3		
27 JULY	S11	EP	Z	17 13 38.4	18.5	0.1	L	
		ES	Y	45.7			L	
27 JULY	S11	EP	Z	18 8 38.8	23.2	0.1	L	
		ES	Y	50.7			L	

27 JULY 20 30 5.2 56.53N 172.26W ALEUTIAN EXPLOSION - E12
EXPLOSION DEPTH = 642 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
27 JULY	SP-	IP		20 30 30.0			1.29	60
		E		33.0			1.29	60
		E		46.0			1.29	60
27 JULY	S16	EP	Z	20 30 47.0			2.67	231
		ET	P	33 24.9			2.67	231
27 JULY	S15	EP	Z	20 31 3.4	5.0	0.2	3.58	231
		ET	P	34 32.7			3.58	231
27 JULY	AA-	EP		20 31 14.9			4.48	196
27 JULY	S14	EP	Z	20 31 14.9	9.5	0.3	4.46	230
		ET	P	35 40.1			4.46	230
27 JULY	S12	EP	P	20 31 39.4			6.28	230
27 JULY	ADK	EP		20 35 45.0			5.34	211
		IS		36 40.0			5.34	211

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
27 JULY	S11	EP	P	20 31 48.9				
		ET	P	38 11.3				
27 JULY	S12	EP	Y	20 36 49.2				
27 JULY	S11	EP	Z	20 37 25.7				
27 JULY	S16	EP	Z	22 10 .0	13.9	0.1	N	
		ES	Z	29.1			N	
27 JULY	ACK	IP		22 41 54.6			L	
		IS		42 7.4			L	
27 JULY	S14	EP	Z	22 42 18.0	8.8	0.2	N	
		ES	X	47.6			N	
27 JULY	S15	EP	Z	22 42 20.1	18.4	0.1	N	
		ES	Y	54.0			N	
		ET	P	44 32.3			N	
27 JULY	S16	EP	Z	22 42 26.9	9.5	0.2	N	
		ES	P	43 6.3			N	
28 JULY	S11	EP	Z	0 13 4.2	25.3	0.2	N	
		ES	X	42.0			N	
28 JULY	S11	EP	Z	2 17 11.0	19.0	0.2	L	
		ES	X	27.2			L	
28 JULY	S11	EP	Z	2 38 5.3	23.2	0.1	L	
		ES	Y	12.1			L	
28 JULY	S12	EP	P	3 [illegible] [illegible].2			L	
		ES	Y	2 14.5			L	
28 JULY	S14	EP	Z	3 2 55.4	5.0	0.2		
28 JULY	S12	EP	P	3 34 45.7			L	
		ES	Y	35 1.8			L	
28 JULY	S12	EP	P	3 56 50.0			L	
		ES	Y	57 6.2			L	
28 JULY	S14	EP	Z	3 57 13.6	5.0	0.2	N	
		ES	X	48.3			N	
		L	X	59 37.5			N	
28 JULY	S15	EP	Z	3 57 26.7			N	
		ES	X	58 6.2			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
28 JULY	S16	E	Z	3 58 18.3				
28 JULY	S12	EP	P	4 1 56.6			L	
		ES	Y	2 12.9			L	
28 JULY	S12	EP	P	4 2 40.1			L	
		ES	Y	56.4			L	
28 JULY	S12	EP	P	4 11 .1			L	
		ES	Y	16.3			L	
28 JULY	S12	EP	P	4 17 54.5			L	
		ES	Y	18 10.9			L	
28 JULY	S14	EP	Z	4 18 51.4	3.8	0.2		
28 JULY	S16	EP	Z	4 27 39.3	9.3	0.1	N	
		ES	X	28 27.5			N	
28 JULY	S15	EP	Z	4 27 47.2			N	
		ES	Y	28 23.3			N	
28 JULY	S14	EP	Z	4 28 28.4	6.3	0.2		
28 JULY	S12	EP	P	5 17 34.8			L	
		ES	Y	50.9			L	
28 JULY	S12	EP	P	5 36 31.6			L	
		ES	Y	48.7			L	
28 JULY	S11	EP	Z	7 27 31.3	106.5	0.1	L	
		ES	Y	48.2			L	
28 JULY	S16	EP	Z	13 56 12.1	9.5	0.2	N	
		ES	X	57 12.3			N	
28 JULY	ADK	EP		14 36 20.0				
28 JULY	S16	EP	Z	14 43 18.6	37.1	0.1	L	
		ES	Y	24.7			L	
28 JULY	S16	EP	Z	15 31 48.3	9.3	0.1	N	
		ES	Y	32 19.2			N	
28 JULY	S16	E	Z	15 53 25.3				
28 JULY	S11	EP	Z	16 54 42.2	28.5	0.3	N	
		ES	Y	55 3.4			N	
28 JULY	S16	E	Z	17 26 50.9				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
28 JULY	S11	EP	Z	17 36 2.3	9.5	0.2	N	
		ES	X	22.9			N	
28 JULY	S16	E	Z	18 6 55.9				
28 JULY	S11	E	Y	19 36 12.2				
28 JULY	ACK	IP		19 57 54.7			L	
		IS		58 3.1			L	
28 JULY	S11	EP	Z	19 58 9.2	4.6	0.1	N	
		ES	Y	59 8.7			N	
28 JULY	S12	EP	P	19 58 18.2			N	
		E	Y	37.0			N	
		ES	Y	55.2			N	
28 JULY	S14	EP	Z	19 58 20.9	101.1	0.4	N	
		ES	X	53.5			N	
28 JULY	S15	EP	Z	19 58 25.7	17.6	0.3	N	
		ES	Y	59 5.8			N	
28 JULY	S16	EP	Z	19 58 34.6	28.5	0.2	N	
		ES	Y	59 19.2			N	
28 JULY	ACK	IP		20 36 27.5			L	
		IS		35.8			L	
28 JULY	S11	EP	Z	20 36 40.3	46.3	0.1	N	
		ES	Y	37 36.1			N	
28 JULY	S12	EP	P	20 36 50.8			N	
		E	Y	37 9.3			N	
		ES	Y	27.8			N	
28 JULY	S14	EP	Z	20 36 53.4	70.8	0.4	N	
		ES	X	37 24.3			N	
28 JULY	S15	EP	Z	20 36 58.4	50.6	0.3	N	
		ES	Y	37 36.8			N	
28 JULY	S16	EP	Z	20 37 7.1	22.2	0.2	N	
		ES	Y	51.6			N	
29 JULY	S11	E	Y	2 53 44.9				
29 JULY	S14	EP	Z	6 43 17.0	1.8	0.1		

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
29 JULY	S11	EP	Z	9 38 35.7			L	
		ES	Y	51.4			L	
29 JULY	S16	E	Z	10 37 20.2			T	

29 JULY 10 24 24.6 6.8N 73.0W NORTHERN COLOMBIA
H = 161 KM MAG = 6.0

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
29 JULY	ACK	IP		10 37 21.7			93.0	323
29 JULY	ACK	E		10 47 36.0				
29 JULY	ADK	I		10 48 20.0				
29 JULY	S11	EP	Z	12 12 2.3	18.5	0.1	N	
		ES	Y	36.5			N	
29 JULY	S11	EP	Z	12 55 49.5	13.9	0.1	N	
		ES	Y	56 8.4			N	
29 JULY	S11	EP	Z	14 31 18.0	9.3	0.1	L	
		ES	Y	27.4			L	
29 JULY	S15	EP	Z	14 31 52.3			N	
		ES	X	32 26.2			N	
29 JULY	S14	EP	Z	14 31 29.8			N	
		ES	Z	32 6.2			N	
		E	X	33 50.0			N	
29 JULY	S16	E	Z	14 32 47.3				
29 JULY	S11	EP	Z	15 8 51.3			L	
		ES	Y	9 6.7			L	
29 JULY	S15	E	Z	19 22 42.6				
29 JULY	S11	EP	Z	20 49 14.9	18.5	0.1	L	
		ES	Y	28.4			L	
29 JULY	S16	E	Z	21 18 2.6				
29 JULY	S15	E	Z	21 18 8.5				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
29 JULY	S11	EP	Z	22 29 .8	18.5	0.1	L	
		ES	Y	18.0			L	
29 JULY	S12	EP	P	22 29 5.1			N	
		ES	Y	28.5			N	
30 JULY	S15	E	Z	5 35 34.3				
30 JULY	S11	EP	Z	7 1 8.3			L	
		ES	Y	26.2			L	
30 JULY	S11	EP	Z	11 33 16.6	9.3	0.1	L	
		ES	Y	25.9			L	
30 JULY	S15	E	Z	14 26 2.0				
30 JULY	S11	EP	Z	17 34 56.1	167.9	0.5	T	
30 JULY	S11	EP	Z	17 40 1.5	41.7	0.1	N	
		ES	Y	21.0			N	
30 JULY	S12	EP	P	17 40 6.7			N	
		ES	Y	29.0			N	
31 JULY	S15	EP	Z	1 20 33.4	5.0	0.2	N	
		ES	X	21 9.3			N	
31 JULY	S16	EP	Z	1 20 35.5			N	
		ES	Y	21 12.5			N	
31 JULY	S14	EP	Z	1 20 35.6	3.6	0.2		
		E	X	21 11.4				
31 JULY	S15	EP	Z	4 55 41.6	5.0	0.2	N	
		ES	X	56 32.6			N	
31 JULY	S15	EP	Z	6 2 24.3	44.2	0.2	L	
		ES	Y	38.8			L	
31 JULY	S16	EP	Z	6 7 45.3	34.8	0.2	N	
		ES	X	8 27.9			N	
31 JULY	S15	EP	Z	6 7 46.8			N	
		ES	Y	8 38.5			N	
31 JULY	S14	EP	Z	6 7 53.7	31.7	0.3	N	
		ES	X	8 46.3			N	
31 JULY	S11	EP	Z	12 52 22.1			N	
		ES	Y	44.7			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
31 JULY	S11	EP	Z	18 37 9.0	13.9	0.1	N	
		ES	Y	29.7			N	
31 JULY	S16	E	Z	18 39 51.0				
31 JULY	S11	EP	Z	19 50 27.0	50.9	0.1	L	
		ES	Y	41.0			L	
31 JULY	S16	EP	Z	22 50 28.2	55.6	0.1	L	
		ES	X	39.9			L	
1 G	S15	EP	Z	0 22 28.8			N	
		ES	X	23 14.9			N	
1 AUG	S16	EP	Z	0 22 38.3			L	
		E	Y	41.7			L	
1 AUG	S16	EP	Z	1 23 25.8	50.9	0.1	L	
		E	Y	27.0			L	
1 AUG	S12	EP	P	1 59 30.5			N	
		ES	Y	57.7			N	
1 AUG	S14	-IP	Z	1 59 30.6	123.6	0.2	N	
		ES	X	55.9			N	
1 AUG	S15	EP	Z	1 59 36.2	50.6	0.2	N	
		ES	Y	2 0 9.2			N	
1 AUG	S11	EP	Z	1 59 37.2	12.6	0.2	N	
		ES	Y	2 0 8.9			N	
1 AUG	S16	EP	Z	1 59 45.8	9.5	0.2	N	
		ES	Y	2 0 25.7			N	
1 AUG	S15	E	Z	4 57 45.0				
1 AUG	S15	E	Z	4 15 27.5				
1 AUG	S16	EP	Z	6 18 50.1	13.9	0.1	L	
		ES	Y	19 33.0			L	
1 AUG	S11	EP	Z	8 59 3.6	13.9	0.1	L	
		ES	Y	21.3			L	
1 AUG	S14	EP	Z	8 59 20.2	7.6	0.2	N	
		ES	X	43.0			N	
1 AUG	S15	EP	Z	8 59 29.6			N	
		ES	Y	9 0 8.5			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
1 AUG	S16	EP	Z	8 59 39.3			N	
		ES	X	9 0 28.6			N	
1 AUG	S11	EP	Z	10 34 49.2			L	
		ES	X	35 4.6			L	
1 AUG	S11	EP	Z	10 39 52.2	12.6	0.2	L	
		ES	Y	56.0			L	
1 AUG	S12	EP	P	11 32 18.8			L	
		ES	Y	24.7			L	
1 AUG	S16	EP	Z	12 2 16.4	66.5	0.2	N	
		ES	Y	3 13.5			N	
1 AUG	S15	EP	Z	12 2 16.1	75.8	0.3	T	
1 AUG	S14	EP	Z	12 2 23.7	15.1	0.3	L	
		ES	X	36.2			L	
1 AUG	S15	EP	Z	14 25 15.5			N	
		ES	X	26 12.3			N	
1 AUG	S12	EP	P	16 48 37.0			N	
		ES	Y	49 10.9			N	
1 AUG	S12	E	Y	18 6 5.6				
1 AUG	S16	EP	Z	21 30 54.8	28.5	0.2	L	
		ES	Y	31 10.1			L	
1 AUG	S14	EP	Z	21 34 .5	1.8	0.1	L	
		ES	X	17.0			L	
2 AUG	S12	E	Y	0 49 36.0				

2 AUG 0 44 41.6 44.6N 146.4E KURILE ISLANDS
H = 149 KM MAG = 5.0

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 AUG	ALK	IP		0 49 54.4			.5.4	60
2 AUG	S12	EP	P	1 41 19.5			N	
		ES	Y	48.9			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 AUG	S16	EP	Z	3 24 10.7	1[illegible] 5	0.1	L	
		ES	Y	16.5			L	
2 AUG	S11	EP	Z	3 29 49.9	37.1	0.1	L	
		ES	Y	59.8			L	
2 AUG	S11	EP	Z	8 34 48.3	285.1	0.2	L	
		ES	Y	35 2.6			L	
2 AUG	S14	EP	Z	8 35 10.6	1.8	0.1	N	
		ES	X	37.5			N	
2 AUG	S15	E	Z	8 35 54.8				
2 AUG	ADK	IP		9 47 57.0			T	
2 AUG	S11	EP	Z	12 20 59.8	13.6	0.2	L	
		ES	Y	21 9.6			L	
2 AUG	S11	EP	Z	13 58 19.1	361.2	0.3	L	
		ES	Y	29.9			L	
2 AUG	S12	EP	P	13 58 23.9			L	
		ES	Y	41.3			L	
2 AUG	S14	EP	Z	13 58 52.4	1.3	0.2	N	
		ES	X	59 29.0			N	
2 AUG	S15	EP	Z	13 59 3.7	0.5	0.2	N	
		ES	Y	47.4			N	
2 AUG	S11	EP	Z	14 11 44.3	15.1	0.2	L	
		ES	Y	55.1			L	
2 AUG	S12	EP	P	14 11 49.2			L	
		ES	Y	12 6.5			L	
2 AUG	S11	EP	Z	15 38 16.0			L	
		ES	Y	23.0			L	
2 AUG	S11	EP	Z	16 11 45.9	9.3	0.1	N	
		ES	X	12 8.9			N	
2 AUG	S16	E	P	17 14 .7				
2 AUG	S12	EP	P	17 15 55.2			L	
		ES	Y	16 12.1			L	
2 AUG	S16	E	P	17 16 32.7				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 AUG	S14	EP	Z	17 16 42.2	2.5	0.2	L	
		S	X	57.1			L	
2 AUG	ALK	IP		17 26 45.9			L	
		IS		57.5			L	
2 AUG	S14	IP	Z	17 27 8.5	53.9	0.2	N	
		ES	X	38.1			N	
2 AUG	S15	EP	Z	17 27 10.1	92.4	0.1	N	
		ES	X	42.8			N	
2 AUG	S12	EP	P	17 27 14.8			N	
		ES	Y	52.4			N	
2 AUG	S16	EP	Z	17 27 16.9	64.8	0.1	N	
		ES	Y	55.7			N	
2 AUG	S12	EP	P	17 29 7.8			L	
		ES	Y	24.8			L	
2 AUG	S15	E	Z	20 2 14.0				
3 AUG	S14	EP	Z	1 16 29.9	1.8	0.1	L	
		ES	X	49.2			L	
3 AUG	S15	E	Z	1 16 43.5				
3 AUG	S11	EP	Z	6 43 22.4	11.0	0.1	L	
		ES	X	37.9			L	
3 AUG	S14	EP	Z	6 43 39.3	1.8	0.1	N	
		ES	X	44 3.0			N	
3 AUG	S15	EP	Z	6 43 46.4			N	
		ES	Y	44 21.5			N	
3 AUG	S16	EP	Z	6 44 32.2	50.7	0.3	L	
		ES	X	42.8			L	
3 AUG	S11	EP	Z	7 49 23.0	5.6	0.2	L	
		ES	Y	39.4			L	
3 AUG	S15	E	Z	8 18 37.4				
3 AUG	S11	EP	Z	8 38 22.0	7.4	0.1	L	
		ES	Y	34.4			L	
3 AUG	S15	E	Z	13 35 58.7				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 AUG	S12	EP	P	15 23 59.7			L	
		ES	Y	24 17.4			L	
3 AUG	S11	EP	Z	15 24 5.2	27.8	0.1	N	
		ES	Y	26.0			N	
3 AUG	S14	EP	Z	16 8 29.8	75.8	0.2	L	
		ES	X	36.0			L	
3 AUG	S15	E	Z	16 37 1.2				
3 AUG	S12	EP	P	17 55 11.5			L	
		ES	Y	18.7			L	
3 AUG	S11	EP	Z	19 38 50.0	57.0	0.3	N	
		ES	Y	39 24.3			N	
3 AUG	S15	E	Z	20 47 10.4				
3 AUG	S15	E	Z	21 35 16.5				

3 AUG 21 37 26.7 53.0N 166.7W FOX ISLANDS,ALEUTIAN
H = 29 KM MAG = 4.6

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 AUG	S16	EP	Z	21 38 53.9	22.2	0.3	5.7	292
		ES	Y	39 29.8			5.7	292
3 AUG	ADK	EP		21 38 57.9			6.2	263
		ES		40 7.9			6.2	263
3 AUG	S15	EP	Z	21 38 59.4	47.1	0.4	6.2	285
		ES	Y	40 17.8			6.2	285
3 AUG	S14	EP	Z	21 39 13.1	7.6	0.3	6.8	279
		ES	X	31.2			6.8	279
3 AUG	S14	EP	Z	21 45 6.9	3.7	0.1	L	
		ES	X	24.7			L	
3 AUG	ADK	EP		22 2 16.5			N	
		ES		3 23.6			N	
3 AUG	S16	E	Z	22 2 19.3				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 AUG	23 17 8.4	53.8N		170.0W FOX ISLANDS,ALEUTIAN				
				H = 194 KM		MAG = 4.9		
3 AUG	S16	IP	Z	23 18 7.7	999.9		3.6	283
3 AUG	S15	EP	Z	23 18 13.3	775.2	0.4	4.1	278
3 AUG	ACK	IP		23 18 15.5			4.5	247
		IS		19 5.4			4.5	247
3 AUG	S14	IP	Z	23 18 20.8	1.50	0.6	4.8	270
		E	X	19 25.6			4.6	270
4 AUG	S14	IP	Z	0 1 51.7	7.6	0.2	N	
		ES	X	2 16.4			N	
4 AUG	S15	E	Z	0 2 33.0				
4 AUG	S15	E	Z	0 12 48.0				
4 AUG	S12	E	P	0 43 15.2				
4 AUG	S15	E	Z	1 34 3.2				
4 AUG	S11	EP	Z	2 0 57.8	999.9			
4 AUG	S12	IP	P	2 1 3.1			L	
		ES	Y	19.1			L	
4 AUG	ACK	IP		2 1 24.0			N	
		IS		54.8			N	
4 AUG	S14	EP	Z	2 1 27.1	14.7	0.1	N	
		ES	X	56.3			N	
4 AUG	S15	EP	Z	2 1 40.2	12.6	0.2	N	
		ES	Y	2 25.4			N	
4 AUG	S16	EP	Z	2 1 53.1	41.7	0.1	N	
		ES	Y	2 53.0			N	
4 AUG	S11	EP	Z	2 15 2.3	31.7	0.2	L	
		ES	X	13.2			L	
4 AUG	S12	EP	P	2 15 7.3			L	
		ES	X	23.0			L	
4 AUG	ACK	IP		3 2 16.2			L	
		IS		23.8			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 AUG	S14	EP	Z	3 2 41.4	94.8	0.3	N	
		ES	X	3 3.1			N	
4 AUG	S15	EP	Z	3 2 46.7	12.6	0.2	N	
		ES	Y	3 18.8			N	
4 AUG	S16	EP	Z	3 2 56.2			N	
		ES	X	3 42.4			N	
4 AUG	S15	E	Z	7 0 40.3				
4 AUG	S11	EP	Z	7 35 14.9	22.2	0.2	N	
		ES	X	34.4			N	
4 AUG	S11	EP	Z	7 55 .9	6.3	0.2	L	
		ES	Y	12.6			L	
4 AUG	S15	E	Z	8 13 19.6				
4 AUG	S11	EP	Z	12 31 58.1	9.3	0.1	N	
		ES	Y	32 18.4			N	
4 AUG	S14	EP	Z	13 5 1.7	9.2	0.1	N	
		ES	X	28.1			N	
4 AUG	S15	EP	Z	13 5 7.C			N	
		ES	Y	37.5			N	
4 AUG	S16	EP	Z	13 5 15.C			N	
		ES	Y	53.7			N	
4 AUG	S15	E	Z	14 30 5.9				
		E	Z	45.8				
4 AUG	S15	E	Z	14 37 59.5				
4 AUG	S11	EP	Z	16 7 23.8	15.8	0.2	L	
		ES	Y	42.6			L	
4 AUG	S12	EP	P	16 7 29.8			N	
		ES	Y	53.9			N	
4 AUG	ADK	EP		16 7 59.9			N	
		ES		8 43.3			N	
4 AUG	S14	EP	Z	16 8 9.8	1.8	0.1	N	
		ES	X	29.9			N	
4 AUG	S15	E	Z	16 9 1.9				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 AUG	S16	E	Z	16 9 19.6				
4 AUG	S15	E	Y	17 41 53.9				
4 AUG	ALK	IP		18 55 30.6			L	
		IS		38.0			L	
4 AUG	S12	EP	P	18 55 53.2			N	
		E	P	56 6.4			N	
		ES	Y	24.4			N	
4 AUG	S14	EP	Z	18 55 55.8	12.9	0.1	N	
		ES	X	56 20.6			N	
4 AUG	S15	EP	Z	18 56 .4	18.4	0.1	N	
		ES	Y	33.9			N	
4 AUG	S16	EP	Z	18 56 9.7			N	
		ES	Y	55.2			N	
5 AUG	S14	EP	Z	1 0 3.4	1.3	0.2	N	
		ES	X	30.8			N	
5 AUG	S14	EP	Z	6 1 10.4	12.9	0.1	L	
		ES	X	24.5			L	
5 AUG	S15	EP	Z	6 52 46.7			L	
		ES	Y	53 1.1			L	
5 AUG	S15	E	Y	7 47 52.1				
5 AUG	S11	EP	Z	7 50 58.2	13.9	0.1	L	
		ES	Y	51 16.1			L	
5 AUG	S11	EP	Z	8 37 2.2	13.9	0.1	L	
		ES	Y	15.9			L	
5 AUG	S11	EP	Z	12 55 29.0	9.3	0.1	N	
		ES	Y	49.4			N	
5 AUG	S16	L	X	15 45 21.1				
5 AUG	S16	E	Y	17 18 13.9				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 AUG	18 28 57.5	52.1N		178.4E	RAT ISLANDS,ALEUTIAN			
				H = 163 KM		MAG = 4.5		
5 AUG	S11	-IP	Z	18 29 22.9	999.9		0.7	114
		ES	Y	42.2			0.7	114
5 AUG	S12	EP	Z	18 29 24.2	573.0	0.4	0.9	83
		E	X	43.7			0.9	83
5 AUG	S14	-IP	Z	18 29 41.9	1.0U	0.6	2.6	55
		E	X	30 15.4			2.6	55
5 AUG	ADK	IP		18 29 46.8			3.1	92
		IS		30 24.5			3.1	92
5 AUG	S15	EP	Z	18 29 51.7	15.1	0.3	3.5	52
		ES	Y	30 33.9			3.5	52
5 AUG	S16	EP	Z	18 30 4.0	31.7	0.2	4.4	50
		ES	Y	53.3			4.4	50
5 AUG	S18	EP	Z	18 30 40.7	82.4	0.3	7.4	217
		ES	Z	32 2.5			7.4	217
5 AUG	S16	E	Z	20 46 5.5				
5 AUG	S11	E	Y	20 47 19.0				
5 AUG	S15	E	Z	20 47 51.7	12.6	0.3		
5 AUG	S18	E	Y	23 32 25.8				
5 AUG	S19	E	Z	23 52 41.3				
6 AUG	S19	E	Z	1 33 20.1				
6 AUG	S16	EP	Z	1 54 26.7	60.2	0.1	L	
		ES	Y	34.4			L	
6 AUG	S19	E	Z	7 2 8.8				
6 AUG	S18	E	Y	7 3 31.3				
6 AUG	S19	EP	Z	7 14 13.7			L	
		ES	Z	17.4			L	
6 AUG	S19	EP	Z	7 50 5.2			L	
		ES	Z	13.9			L	
6 AUG	S18	EP	Z	7 50 7.0	4.6	0.1	R	
		ES	X	31.1			R	
		E	Y	51 52.3			R	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 AUG	S19	P	Z	7 51 59.4				
6 AUG	S19	EP	Z	8 1 6.4	25.0	0.1		
		E	Z	19.6				
6 AUG	S18	EP	Z	8 1 7.0			N	
		E	Y	20.0			N	
		ES	Y	29.8			N	
6 AUG	S19	EP	Z	8 8 .5			R	
		ES	Z	9 19.4			R	
6 AUG	S19	EP	Z	8 19 5.2	4.6	0.1	L	
		ES	X	40.1			L	
6 AUG	S15	EP	Z	9 22 54.7	7.5	0.2	L	
		E	Y	57.1			L	
6 AUG	S18	EP	Z	13 46 19.2			N	
		ES	X	40.7			N	
6 AUG	S19	EP	Z	14 19 46.6	4.6	0.1	L	
		ES	Z	54.6			L	
6 AUG	S18	EP	Z	14 40 26.3			R	
		ES	Y	43 2.9			R	
6 AUG	S11	EP	Z	15 40 45.9	31.7	0.2	L	
		ES	Z	41 3.9			L	
6 AUG	S12	EP	P	15 40 50.2			N	
		ES	Y	41 11.3			N	
6 AUG	S14	EP	Z	15 41 17.1	1.8	0.1	N	
		ES	X	51.7			N	
6 AUG	ADK	EP		15 41 22.0			N	
		IS		42 .4			N	
6 AUG	S15	EP	Z	15 41 38.0			N	
		ES	Y	42 11.8			N	
6 AUG	S18	EP	Z	15 41 52.2	9.3	0.1	N	
		E	Y	42 14.3			N	
		ES	Y	43 .3			N	
6 AUG	S18	P	Z	15 48 34.8				
6 AUG	S19	EP	Z	15 50 45.4	4.6	0.1	N	
		ES	X	51 14.1			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 AUG	S11	EP	Z	15 59 48.4	55.1	0.2	L	
		ES	Y	55.7			L	
6 AUG	S12	EP	P	15 59 48.6			L	
		E	Y	53.0			L	
		ES	Y	56.7			L	
6 AUG	S14	EP	Z	16 0 17.7	1.8	0.1	N	
		ES	X	41.1			N	
6 AUG	S15	E	Z	16 1 .8				
6 AUG	S18	E	X	16 32 39.1				
6 AUG	S18	E	X	18 55 23.0				
6 AUG	S19	EP	Z	18 55 50.7	4.6	0.1	L	
		ES	X	56 8.3			L	
6 AUG	S15	E	Z	20 7 3.9				
6 AUG	S15	EP	Z	20 12 47.1	12.6	0.2	L	
		E	Y	51.0			L	
6 AUG	S12	EP	P	21 21 20.9			L	
		ES	X	39.3			L	
6 AUG	S14	EP	Z	21 21 43.7	1.8	0.1	N	
		ES	X	22 27.1			N	
6 AUG	ACK	IP		22 19 36.0			L	
		IS		45.5			L	
6 AUG	S14	-IP	Z	22 19 58.6	385.5	0.3	N	
		ES	X	20 25.0			N	
6 AUG	S15	EP	Z	22 20 .2	145.4	0.2	N	
		ES	Y	31.9			N	
6 AUG	S12	EP	P	22 20 5.3			N	
		ES	Y	42.4			N	
6 AUG	S16	EP	Z	22 20 7.2	63.4	0.2	N	
		ES	X	43.5			N	
6 AUG	S11	EP	Z	22 20 12.2	60.2	0.2	N	
		ES	Y	53.5			N	
6 AUG	S18	EP	Z	22 21 34.3	9.3	0.1	N	
		ES	Y	23 19.2			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 AUG	S18	P	Z	22 31 15.0				

6 AUG 22 46 8.1 52.7N 168.4W FOX ISLANDS,ALEUTIAN
H = 44 KM MAG = 4.3

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 AUG	S16	EP	Z	22 47 22.7	6.3	0.2	4.9	298
		ES	Y	48 41.2			4.9	298
6 AUG	ADK	IP		22 47 24.0			5.1	264
		IS		48 21.2			5.1	264
6 AUG	S15	EP	Z	22 47 27.1	12.6	0.2	5.3	289
		ES	Y	48 36.6			5.3	289
6 AUG	S14	EP	Z	22 47 34.9	5.0	0.2	5.8	282
		ES	X	56.1			5.8	282
6 AUG	S12	EP	P	22 47 53.1			7.2	271
		ES	Y	48 14.7			7.2	271
6 AUG	S11	EP	Z	22 47 59.4	31.7	0.2	7.6	268
		ES	Y	48 4.9			7.6	268
		E	X	49 26.2			7.6	268
6 AUG	S17	E	Z	22 49 2.0			12.7	253
6 AUG	S16	EP	Z	22 49 20.9	23.2	0.1	14.4	250
		ES	Y	51 50.4			14.4	250

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 AUG	S18	IP	Z	23 3 49.2	3.2	0.3	N	
		ES	Y	4 23.7			N	
6 AUG	S18	E	Y	23 8 43.1			N	
7 AUG	S14	EP	Z	0 33 11.8	3.8	0.2	N	
		ES	X	42.8			N	
7 AUG	S15	EP	Z	0 33 15.1	12.6	0.2	N	
		ES	Y	48.4			N	
7 AUG	S16	EP	Z	0 33 23.3	9.3	0.1	N	
		ES	X	34 1.5			N	
7 AUG	S18	E	Y	2 14 55.8				
7 AUG	S18	EP	Z	2 52 6.1	3.2	0.2	R	
		ES	X	5[illegible] [illegible]7.0			R	
7 AUG	S16	EP	Z	4 43 22.9	6.3	0.2	R	
		ES	Y	45 20.8			R	
		E	X	49 59.6				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 AUG	S18	FP	Z	4 55 8.6				
7 AUG	S14	EP	Z	5 53 47.7	1.3	0.2	N	
		ES	X	54 24.3			N	
7 AUG	S15	E	Z	5 54 25.C				
7 AUG	S18	E	Y	6 27 45.6				
7 AUG	S18	EP	Z	7 48 38.9	3.2	0.2		
7 AUG	ADK	E		8 24 49.1				
7 AUG	S19	EP	Z	8 59 35.2	4.6	0.1	L	
		ES	Z	47.4			L	
7 AUG	S11	EP	Z	10 32 45.3	6.3	0.2	L	
		ES	Y	33 .C			L	
7 AUG	ADK	EP		11 18 3.3			T	
		ES		21 59.C			T	
7 AUG	S18	FP	Z	11 26 4.5	9.3	0.1	N	
		ES	Y	49.7			N	
7 AUG	S15	E	Z	11 34 35.1				
7 AUG	S11	EP	Z	12 41 15.9	47.5	0.2	L	
		FS	Y	33.5			L	
7 AUG	S18	E	Y	12 54 30.8				
7 AUG	S19	EP	Z	18 30 36.2			N	
		ES	X	31 45.7			N	
7 AUG	S15	EP	Z	18 58 33.6			N	
		ES	Y	59 25.C			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 AUG	19 23 23.7	51.8N		173.9W	ANDREANOF IS,ALEUTIAN			
				H =	33 KM	MAG = 4.1		
7 AUG	ACK	IP		19 23 51.8			1.7	273
		IS		24 26.6			1.7	273
7 AUG	S15	EP	Z	19 24 11.7	203.9	0.5	3.0	323
		ES	Y	56.7			3.0	323
7 AUG	S14	EP	Z	19 24 13.1	320.4	0.5	3.0	306
		ES	X	25 15.1			3.0	306
7 AUG	S16	EP	Z	19 24 16.1	107.7	0.3	3.2	340
		ES	Y	54.4			3.2	340
7 AUG	S12	EP	P	19 24 21.7			3.8	279
		E	Y	25 8.0			3.8	279
		E	Y	16.0			3.8	279
7 AUG	S11	EP	Z	19 24 28.1	23.6	0.4	4.2	273
		E	Y	39.0			4.2	273
7 AUG	S18	EP	Z	19 25 49.5	4.6	0.1	10.9	243
		ES	Y	27 42.1			10.9	243
7 AUG	S14	EP	Z	20 21 33.5	6.3	0.2	N	
		ES	X	22 4.1			N	
7 AUG	S15	EP	Z	20 21 34.6	64.7	0.1	N	
		ES	Y	22 6.1			N	
7 AUG	S16	EP	Z	20 21 41.0	55.6	0.1	N	
		ES	Y	22 18.0			N	
7 AUG	S11	E	Y	21 11 37.5				
7 AUG	21 35 2.8	40.08N		166.39E	ALEUTIAN EXPLOSION - E9			
				EXPLOSION DEPTH =	623 FT			
7 AUG	S21	EP	Z	21 35 31.4	63.4	0.2	1.80	33
		ET	P	37 15.7			1.80	33
7 AUG	S19	EP	P	21 36 20.7			5.35	33
		ET	P	38 35.3			5.35	33
7 AUG	S18	EP	Z	21 36 41.1	15.8	0.2	7.21	33
		ES	Z	48.9			7.21	33
		ET	P	43 56.0			7.21	33
7 AUG	S19	EP	Z	21 41 28.3			5.35	33
		ES	Y	40.8			5.35	33

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 AUG	S18	EP	Z	21 43 56.0	6.3	0.2	L	
		ES	Z	44 9.7			L	
7 AUG	S11	EP	Z	22 11 20.8	9.3	0.1	L	
		ES	Y	39.5			L	
8 AUG	S19	E	Z	2 6 1.1				
8 AUG	S14	EP	Z	2 23 7.6	6.3	0.2		

8 AUG 4 40 3.7 40.86N 167.04E ALEUTIAN EXPLOSION - E27
EXPLOSION DEPTH = 629 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 AUG	S21	EP	Z	4 40 19.5	85.5	0.2	0.87	35
		ET	P	41 8.2			0.87	35
8 AUG	S19	EP	Z	4 41 8.3	32.4	0.1	4.43	33
		ES	Y	55.1			4.43	33
		ET	P	45 33.1			4.43	33
8 AUG	S18	EP	Z	4 41 29.4	138.7	0.5	6.29	34
		ES	Y	42 32.6			6.29	34
		ET	P	48 48.6			6.29	34
8 AUG	S19	EP	Z	4 45 12.9	9.3	0.1	L	
		ES	X	32.9			L	
8 AUG	S18	EP	Z	4 47 49.6	4.6	0.1	L	
		ES	X	48 5.6			L	
8 AUG	S17	EP	Z	4 49 4.0				
8 AUG	S12	EP	P	5 2 27.6			L	
		ES	X	34.9			L	
8 AUG	S19	E	Z	5 9 40.9				
8 AUG	S14	EP	Z	9 8 21.9	3.7	0.1	N	
		ES	X	9 10.8			N	
8 AUG	S16	EP	Z	9 22 7.3			L	
		ES	Y	17.3			L	
8 AUG	S16	EP	Z	9 51 21.3	9.3	0.1	R	
		ES	X	52 29.2			R	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 AUG	S14	EP	Z	9 51 31.0	1.3	0.2	N	
		ES	X	52 7.9			N	
8 AUG	S15	EP	Z	9 51 32.3			N	
		ES	X	52 7.7			N	
8 AUG	S2[illegible]	E	Z	11 47 44.0				
8 AU	S16	EP	Z	15 43 21.2	9.3	0.1	N	
		ES	X	44 12.0			N	
8 AUG	S15	EP	Z	15 43 27.7			N	
		ES	Y	44 6.1			N	
8 AUG	S14	EP	Z	15 43 29.4	3.7	0.1	N	
		ES	X	44 13.1			N	
		E	Z	48 7.4			N	
8 AUG	S11	EP	Z	15 47 8.9	53.9	0.2	L	
		ES	Y	20.0			L	
8 AUG	S11	E	Y	16 11 59.9				
8 AUG	S19	E	Z	16 34 20.1				
8 AUG	S11	EP	Z	17 31 13.5	9.3	0.1	N	
		ES	Y	35.1			N	
8 AUG	S14	EP	Z	17 31 16.6	1.8	0.1	N	
		ES	X	39.3			N	
8 AUG	S11	EP	Z	17 38 31.7	23.2	0.1	L	
		ES	Y	41.0			L	
8 AUG	S15	E	Z	18 17 28.4				
8 AUG	S16	EP	Z	18 32 36.1	19.0	0.2	N	
		ES	X	33 20.4			N	
8 AUG	S15	EP	Z	18 32 37.5	5.0	0.3	N	
		ES	Y	33 26.3			N	
8 AUG	S14	EP	Z	18 32 44.2	7.6	0.2		
8 AUG	S11	EP	Z	19 43 42.1	13.9	0.1	L	
		ES	Y	57.7			L	
8 AUG	S14	EP	Z	19 44 24.1	2.5	0.2		
8 AUG	S15	E	Y	19 44 57.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 AUG	S11	EP	Z	20 30 11.3	6.3	0.2	N	
		ES	Y	34.3			N	
8 AUG	S14	EP	Z	20 30 46.0	2.5	0.2		
8 AUG	S11	EP	Z	21 51 1.2	15.8	0.2	L	
		ES	X	11.8			L	
8 AUG	S12	EP	P	21 51 7.4			L	
		ES	Y	22.7			L	
8 AUG	S14	EP	Z	21 52 2.2	1.8	0.1		
8 AUG	S16	EP	Z	22 18 6.8	9.5	0.2	R	
		ES	Y	19 18.3			R	
8 AUG	S15	E	Z	22 18 15.6				
8 AUG	S11	EP	Z	22 45 33.5			L	
		ES	Y	48.7			L	
9 AUG	S11	EP	Z	0 21 39.9			L	
		ES	Y	48.6			L	
9 AUG	S12	E	P	0 21 55.1				
9 AUG	S11	EP	Z	1 7 34.1			L	
		ES	Y	51.4			L	
9 AUG	S14	EP	Z	1 17 41.4	1.8	0.1		
		E	Z	18 28.0				

9 AUG 3 55 2.2 42.30N 168.32E ALEUTIAN EXPLOSION - E10
EXPLOSION DEPTH = 608 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 AUG	S21	EP	Z	3 55 18.3	83.9	0.5	0.85	213
		ET	P	56 5.4			0.85	213
9 AUG	S19	EP	Z	3 55 44.5	23.2	0.1	2.70	34
		ET	P	58 23.1			2.70	34
9 AUG	S18	EP	Z	3 56 6.0	25.3	0.2	4.56	35
		ES	X	57.0			4.56	35
		ET	P	4 0 39.2			4.56	35
9 AUG	S17	EP	P	3 56 40.5			6.35	34

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 AUG	S18	E	P	4 0 39.1				
9 AUG	S14	E	Z	4 13 25.9				
9 AUG	S14	EP	Z	7 59 29.8	10.1	0.2		
9 AUG	S15	EP ES	Z Y	7 59 37.6 8 0 11.3	22.1	0.1	N N	
9 AUG	S16	EP ES	Z X	7 59 49.1 8 0 31.0			N N	
9 AUG	S14	EP	Z	8 1 13.9	7.6	0.2		

9 AUG 8 20 3.7 6.4S 130.4E BANDA SEA
H = 89 KM MAG = 5.7

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 AUG	ACK	EP		8 31 28.2			73.5	31
9 AUG	S15	EP ES	Z X	9 20 29.7 21 21.9			N N	
9 AU	S18	EP ES	Z X	9 31 8.7 32 59.5	9.5	0.2	R R	
9 AUG	S19	EP ES	Z Z	9 31 20.5 33 19.2	44.4	0.2	R R	
9 AUG	S14	EP	Z	9 31 38.1	5.0	0.2		
9 AUG	S21	EP ES	Z X	9 31 42.2 34 .5	12.7	0.2	R R	
9 AUG	S15	E	Z	9 31 43.3				
9 AUG	S16	E	Z	9 31 52.1				
9 AUG	S19	EP ES	Z Z	9 42 38.1 43 20.8	12.7	0.3		
9 AUG	S21	E	Z	9 45 26.0				
9 AUG	S11	EP ES	Z X	10 32 55.8 33 22.8	9.5	0.	N N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 AUG	S11	EP	Z	12 21 24.8			L	
		ES	Y	37.2			L	
9 AUG	S11	EP	Z	12 30 4.0			L	
		ES	Y	15.6			L	
9 AUG	S11	EP	Z	12 51 9.4			L	
		ES	Y	21.3			L	
9 AUG	S11	EP	Z	12 53 34.6			L	
		ES	Y	47.2			L	
9 AUG	S11	EP	Z	13 8 47.0	28.5	0.2	L	
		ES	Y	53.3			L	
9 AUG	S11	EP	Z	14 22 30.2	25.3	0.2	L	
		ES	X	48.3			L	
9 AUG	S11	EP	Z	15 0 39.1			L	
		ES	Y	52.8			L	
9 AUG	S15	EP	Z	15 26 18.4			N	
		ES	X	27 7.5			N	
9 AUG	S11	E	Y	15 41 32.4			L	
9 AUG	S11	E	Y	16 12 15.1			L	
9 AUG	S21	EP	Z	17 18 42.8			L	
		E	Y	47.6			L	
9 AUG	S11	EP	Z	17 20 31.7			L	
		ES	Y	40.2			L	
9 AUG	S12	EP	P	17 20 31.9			L	
		ES	X	39.8			L	
9 AUG	S14	EP	Z	17 26 14.2			N	
		ES	X	37.3			N	
9 AUG	S11	E	Y	17 26 59.2			N	
9 AUG	S11	EP	Z	17 53 31.6	12.7	0.2	N	
		ES	Y	54 11.4			N	
9 AUG	S11	EP	Z	18 16 7.9	38.0	0.2	L	
		ES	Y	24.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 AUG	S11	EP	Z	18 41 5.4	19.0	0.2	N	
		E	X	19.9			N	
		ES	Y	28.5			N	
9 AUG	S14	EP	Z	18 41 14.9			N	
		ES	X	44.0			N	
9 AUG	S12	EP	P	18 42 3.4			L	
		ES	Y	22.8			L	
9 AUG	S15	EP	Z	18 42 22.6			N	
		ES	Y	59.3			N	
9 AUG	S16	EP	Z	18 42 39.5			N	
		ES	Y	43 22.7			N	
9 AUG	S12	E	Y	18 42 48.7				
9 AUG	S12	EP	P	18 44 29.5			L	
		ES	X	49.3			L	
9 AUG	S11	EP	Z	18 44 31.5			N	
		ES	Y	53.6			N	
9 AUG	S14	EP	Z	22 40 39.3	25.3	0.3	N	
		ES	X	41 16.4			N	
9 AUG	S15	EP	Z	22 40 41.1	11.0	0.1	N	
		ES	Y	41 12.1			N	
9 AUG	S16	EP	Z	22 40 50.2	6.3	0.2	N	
		ES	X	41 25.3			N	
10 AUG	S11	E	Y	0 51 38.1				
10 AUG	S14	EP	Z	1 15 19.4	5.0	0.2		
10 AUG	S18	E	Y	1 37 .5				
10 AUG	S14	EP	Z	5 3 25.8	12.6	0.2		
10 AUG	S16	EP	Z	5 11 50.0				
		E	P	13 46.3				
10 AUG	S19	E	Z	5 14 40.1				
10 AUG	ACK	EP		5 53 51.6			N	
		ES		54 28.2			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
10 AUG	S11	EP	Z	7 57 15.9			L	
		E	Y	28.1			L	
		ES	X	32.9			L	
10 AUG	S11	EP	Z	9 9 52.8	126.7	0.2	L	
		ES	Y	10 5.8			L	
10 AUG	S12	EP	P	9 9 57.6			L	
		ES	Y	10 13.0			L	
10 AUG	S14	EP	Z	9 10 19.9	1.3	0.2	N	
		ES	X	11 8.2			N	
10 AUG	ADK	EP		9 10 23.1			N	
		ES		11 1.2			N	
10 AUG	S18	EP	Z	9 11 9.0	9.5	0.2	R	
		ES	Z	12 22.8			R	
10 AUG	S15	E	X	9 11 13.5				
10 AUG	S11	EP	Z	9 17 18.7	12.7	0.2	L	
		ES	Y	25.1			L	
10 AUG	S11	EP	Z	10 17 31.1			L	
		ES	Y	44.6			L	
10 AUG	S11	EP	Z	10 18 19.0	53.9	0.2	L	
		ES	Y	32.2			L	
10 AUG	S14	EP	Z	10 18 31.3	1.8	0.1	N	
		ES	X	59.4			N	
10 AUG	S15	EP	Z	10 18 44.1	5.0	0.2	N	
		E	Y	19 17.8			N	
10 AUG	S16	E	Z	10 19 2.3				
10 AUG	S15	EP	Z	10 39 7.4			N	
		ES	Y	37.8			N	
10 AUG	S16	EP	Z	10 39 18.9			N	
		ES	X	51.8			N	
10 AUG	S11	EP	Z	10 39 54.9			L	
		ES	Y	40 13.0			L	
10 AUG	S11	EP	Z	10 46 11.5	50.7	0.2	N	
		ES	X	34.8			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
10 AUG	11 21 22.3	45.4N		150.3E	KURILE ISLANDS			
				H = 37 KM		MAG = 5.7		
10 AUG	S21	EP	Z	11 24 23.2	6.3	0.2	13.2	101
		ES	Y	26 39.1			13.2	101
10 AUG	S19	E	Z	11 24 39.0	9.3	0.1	14.3	86
		E	Z	27 3.7			14.3	86
10 AUG	S18	EP	Z	11 24 49.2	117.2	0.3	15.2	80
		ES	X	27 23.8			15.2	80
10 AUG	S11	EP	Z	11 25 57.1	39.4	0.6	20.2	61
		E	X	29 32.0			20.2	61
10 AUG	S14	EP	Z	11 26 17.0	48.9	0.9	22.0	57
10 AUG	ADK	EP		11 26 20.5			22.6	61
		I		28.0			22.6	61
		I		39.2			22.6	61
		ES		35 26.7			22.6	61
		E		37 28.2			22.6	61
		E		50.7			22.6	61
10 AUG	S15	EP	Z	11 26 23.8	97.6	0.9	22.7	55
10 AUG	S21	E	Z	11 37 .6				
		E	Y	47.2				
10 AUG	S18	EP	Z	11 37 19.7			N	
		ES	Y	38 17.5			N	
10 AUG	S19	EP	Z	11 37 31.8	40.4	0.4		
		E	Z	38 22.3				
10 AUG	ADK	EP		12 11 3.8				
10 AUG	S15	EP	Z	12 28 9.8	10.1	0.2	N	
		ES	Y	38.6			N	
10 AUG	S11	EP	Z	13 4 .8			L	
		ES	Y	16.5			L	
10 AUG	S11	EP	Z	13 45 51.6	12.7	0.3	L	
		ES	Y	46 23.1			L	
10 AUG	S12	EP	Z	14 4 42.4	6.3	0.2	L	
		ES	Y	5 7.6			L	
10 AUG	S11	EP	Z	14 4 47.7			N	
		ES	Y	5 14.1			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
10 AUG	S14	EP	Z	14 4 48.5	9.2	0.1	N	
		ES	X	5 24.0			N	
10 AUG	S15	EP	Z	14 4 55.7	2.5	0.2	N	
		ES	Y	5 35.4			N	
10 AUG	S16	E	Y	14 5 49.7			N	
		E	P	8 3.3			N	
10 AUG	S11	EP	Z	17 45 15.4	28.5	0.2	L	
		ES	Y	30.5			L	
10 AUG	S12	EP	P	17 45 13.1			L	
		ES	X	26.1			L	
10 AUG	S14	EP	Z	17 45 23.1	14.7	0.1	N	
		ES	X	53.1			N	
10 AUG	S15	EP	Z	17 45 38.1	5.0	0.2	N	
		ES	Y	46 12.6			N	
10 AUG	S15	EP	Z	17 49 53.5	5.0	0.2	R	
		ES	Y	51 9.5			R	
10 AUG	S14	EP	Z	17 50 38.6	5.0	0.2	N	
		ES	X	51 15.6			N	
10 AUG	S16	EP	Z	17 50 45.6			N	
		ES	X	51 13.8			N	
10 AUG	S11	EP	Z	18 0 12.1			N	
		ES	Y	46.1			N	
10 AUG	S18	EP	Z	18 0 51.3	37.1	0.1	N	
		ES	Y	1 55.8			N	
10 AUG	S18	E	Z	18 8 37.8				
10 AUG	S15	E	Z	18 11 50.3				
10 AUG	S11	EP	Z	20 20 14.0	12.7	0.2	N	
		ES	Y	38.6			N	
10 AUG	S11	EP	Z	22 52 59.9			L	
		ES	X	53 10.3			L	
11 AUG	S12	EP	P	0 0 13.5			N	
		ES	X	41.[illegible]			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	S11	EP	Z	0 0 14.4	15.8	0.3	N	
		ES	Y	42.7			N	
11 AUG	S15	E	Y	0 1 16.3				
11 AUG	ACK	IP		0 21 13.6			L	
		IS		21.5			L	
11 AUG	S12	EP	P	0 21 37.5			N	
		ES	Y	22 11.6			N	
11 AUG	S14	EP	Z	0 21 39.7	76.0	0.2	N	
		ES	X	22 10.6			N	
11 AUG	S11	EP	Z	0 21 41.3	31.7	0.3	N	
		ES	Y	22 22.5			N	
11 AUG	S15	EP	Z	0 21 44.6	87.4	0.4	N	
		ES	Y	22 23.6			N	
11 AUG	S16	EP	Z	0 21 54.1	12.7	0.2	N	
		ES	Y	22 41.3			N	
		E	P	24 41.8			N	
		E	Y	25 16.7			N	

11 AUG 0 25 1.8 45.73N 171.68E ALEUTIAN EXPLOSION - E11
EXPLOSION DEPTH = 603 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	S18	EP	Z	0 25 9.2	999.9		0.36	46
11 AUG	S19	EP	Z	0 25 29.4	12.7	0.2	1.50	216
		ET	P	26 53.4			1.50	216
11 AUG	S17	EP	P	0 25 37.9			2.14	38
		ET	P	27 44.8			2.14	38
11 AUG	S21	EP	Z	0 26 4.8	63.4	0.2	5.06	216
		ET	P	31 8.1			5.06	216
11 AUG	S11	EP	Z	0 26 59.6			7.93	37

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	S17	EP	Z	0 27 44.6	151.7	0.4		
11 AUG	S11	EP	Z	0 34 20.1			L	
		ES	Y	34.1			L	
11 AUG	S18	E	Z	4 18 35.6				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	S15	EP	Z	6 9 35.5	7.5	0.2	L	
		ES	Y	46.0			L	
11 AUG	S12	E	Z	7 13 28.5				
11 AUG	S15	E	Z	10 6 36.9				
11 AUG	S11	EP	Z	10 23 52.7			L	
		ES	Y	24 10.9			L	

11 AUG 10 43 30.4 52.3N 171.4W FOX ISLANDS,ALEUTIAN
H = 38 KM MAG = 4.3

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	ADK	IP		10 44 19.5			3.3	264
		I		21.1			3.3	264
		IS		59.4			3.3	264
11 AUG	S16	EP	Z	10 44 28.8	114.1	0.3	3.6	315
		ES	Y	45 15.1			3.6	315
		E	P	47 34.4			3.6	315
11 AUG	S15	EP	Z	10 44 29.5	53.8	0.4	3.8	301
		ES	Y	45 18.6			3.8	301
11 AUG	S14	EP	Z	10 44 35.4	50.7	0.3	4.2	290
		E	X	48.6			4.2	290
		E	Z	51 40.0			4.2	290
11 AUG	S12	EP	P	10 44 51.1			5.3	272
		ES	Y	45 54.4			5.3	272
11 AUG	S11	EP	Z	10 44 56.9	34.8	0.3	5.7	269
		E	X	46 7.6			5.7	269
11 AUG	S18	EP	Z	10 46 18.1	4.6	0.1	12.5	246
		ES	Z	48 27.7			12.5	246
11 AUG	S21	EP	Z	10 47 32.6	23.6	0.4	17.6	241
11 AUG	S11	EP	Z	10 50 25.1	107.7	0.3	T	
11 AUG	S12	E	P	10 50 31.6				
11 AUG	S18	E	Z	10 58 32.6				
11 AUG	S19	EP	Z	10 59 52.3	4.6	0.1	R	
		ES	X	11 1 8.1			R	
11 AUG	S21	E	X	11 5 19.2				
11 AUG	S18	E	Z	11 18 28.8				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	S18	E	Z	12 2 9.6				
11 AUG	S21	E	Z	12 2 16.0				
11 AUG	S11	EP	Z	12 3 18.1			L	
		ES	Y	33.9			L	
11 AUG	S11	EP	Z	13 16 19.4	633.6	0.3	L	
		ES	Y	36.3			L	
11 AUG	S12	EP	P	13 16 22.2				
11 AUG	S14	E	Z	13 16 40.8				
11 AUG	S18	E	Z	13 18 53.8				
11 AUG	S11	EP	Z	13 41 29.3			N	
		ES	Y	42 .3			N	
11 AUG	S18	EP	Z	13 32 16.8	83.4	0.1	R	
		ES	Y	33 29.7			R	
11 AUG	S21	E	X	13 35 37.5				
11 AUG	S11	EP	Z	13 49 55.7	25.3	0.3	N	
11 AUG	S11	EP	Z	16 32 9.6			N	
		ES	Y	13 50 26.1			N	
11 AUG	S15	E	Z	14 37 4.9				
11 AUG	S11	EP	Z	16 32 9.6			N	
		ES	X	35.8			N	
11 AUG	ADK	IP		16 51 35.4			N	
		IS		59.3			N	
11 AUG	S15	EP	Z	16 51 41.1	94.1	0.4	N	
		ES	Y	52 12.1			N	
11 AUG	S16	EP	Z	16 51 43.7	34.8	0.2	N	
		ES	X	52 16.5			N	
11 AUG	S14	EP	Z	16 51 44.2	114.1	0.3	T	
11 AUG	S12	EP	P	16 51 57.6			N	
		ES	Y	52 39.6			N	
11 AUG	S11	EP	Z	16 52 3.8	19.0	0.2	N	
		ES	Y	54.2			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	S11	EP	Z	17 32 20.0			L	
		ES	Y	29.3			L	
11 AUG	S21	EP	Z	19 0 52.6	6.3	0.2		
		E	X	5 54.3				
11 AUG	S18	E	Z	19 7 48.5				
11 AUG	S19	E	X	19 29 26.7				
		E	X	33 47.7				
11 AUG	S18	EP	Z	19 35 52.7	9.3	0.1	T	
		ES	X	39 17.6			T	
11 AUG	S11	EP	Z	20 3 3.7			L	
		ES	Y	18.6			L	
11 AUG	S12	EP	P	20 4 10.6			N	
		ES	X	33.0			N	

11 AUG 20 36 2.2 48.09N 174.46E ALEUTIAN EXPLOSION - E29
EXPLOSION DEPTH = 615 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
11 AUG	S17	EP	Z	20 36 20.0	7.4	0.1	0.89	220
		ET	P	37 8.6			0.89	220
11 AUG	S18	EP	Z	20 36 42.7	13.9	0.1	2.68	219
		ET	P	39 21.1			2.68	219
11 AUG	S19	EP	Z	20 37 10.5	4.6	0.1	4.54	219
		ET	P	41 41.8			4.54	219
11 AUG	S11	EP	Z	20 37 17.4	27.0	0.4	4.90	38
		ES	X	38 14.9			4.90	38
11 AUG	S21	EP	Z	20 37 57.2	9.3	0.1	8.09	219
		ET	P	46 7.0			8.09	219
		ES	X	39 20.2			8.09	219
11 AUG	AA-	EP		20 38 4.3			8.36	56
11 AUG	S11	EP	Z	20 41 22.9			N	
		ES	X	49.1			N	
11 AUG	S12	EP	P	20 41 37.4			N	
		ES	Y	42 6.7			N	
12 AUG	S12	EP	P	1 13 32.0			L	
		ES	X	50.1			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 AUG	S11	EP	Z	1 13 37.4			L	
		ES	Y	56.3			L	
12 AUG	S14	EP	Z	1 13 40.3	6.3	0.2	N	
		ES	X	14 4.9			N	
12 AUG	S15	EP	Z	1 13 49.0			N	
		ES	Y	14 22.2			N	
12 AUG	S17	E	Y	4 5 12.6				

12 AUG 4 30 38.5 38.5N 141.9E EAST COAST HONSHU, JAPAN
H = 53 KM MAG = 5.4

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 AUG	S21	EP	Z	4 35 18.5	12.7	.2	20.0	73
12 AUG	S19	E	Z	4 35 49.9			22.1	65
12 AUG	S18	EP	Z	4 36 8.0	6.3	0.2	23.4	62
		ES	Y	39 57.4			23.4	62
12 AUG	ADK	E		4 36 58.0			31.7	5.
12 AUG	S21	E	X	4 38 32.8				
12 AUG	S19	E	Z	4 39 27.0				
12 AUG	S21	EP	Z	4 54 28.1	6.3	0.2	R	
		ES	Y	55 39.4			R	
12 AUG	S19	EP	Z	4 56 53.6	34.4	0.6	R	
		ES	X	58 13.4			R	
12 AUG	S18	EP	Z	4 58 40.0	9.3	0.1	R	
		ES	Y	59 53.5			R	
12 AUG	S18	E	X	5 8 32.6				
12 AUG	S11	EP	Z	6 53 25.5	25.3	0.2	N	
		ES	X	58.2			N	
12 AUG	S12	EP	P	6 53 29.5			N	
		ES	Y	54 4.6			N	
12 AUG	S14	EP	Z	6 53 49.3	3.8	0.2		
		E	X	54 23.4				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 AUG	S18	EP	Z	6 54 7.0	55.6	0.1	R	
		ES	Y	55 27.9			R	
12 AUG	S12	EP	P	7 24 28.8			L	
		ES	Y	37.8			L	
12 AUG	S11	EP	Z	7 24 33.5	12.7	0.2	N	
		ES	Y	54.0			N	
12 AUG	S14	EP	Z	7 24 41.7	2.5	0.2	N	
		ES	X	25 15.2			N	
12 AUG	S15	E	Z	7 25 22.1				
12 AUG	S18	E	Z	7 30 38.0				
12 AUG	S11	EP	Z	8 6 58.3			L	
		ES	Y	7 5.0			L	
12 AUG	S11	EP	Z	8 54 23.2	37.1	0.1	L	
		ES	Y	36.8			L	
12 AUG	S14	EP	Z	8 54 37.7	7.6	0.2	N	
		ES	X	55 3.1			N	
12 AUG	S11	EP	Z	9 47 44.0			L	
		ES	Y	48 1.8			L	

12 AUG 9 39 44.3 24.7S 177.5W SOUTH OF FIJI ISLANDS
H = 134 KM MAG = 5.8

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 AUG	S21	EP	Z	9 50 25.8	121.0	0.6	67.4	348
12 AUG	S19	E	Z	9 50 41.7	62.0	0.5	69.7	351
12 AUG	S18	E	Z	9 50 45.3	57.3	0.4	71.0	352
12 AUG	ACK	EP		9 51 18.8			76.2	1
		ES		10 0 50.3			76.2	1
12 AUG	S11	EP	Z	9 51 20.3	779.3	0.8	76.2	358
12 AUG	S12	EP	Z	9 51 22.7	306.9	0.7	76.6	358
12 AUG	S14	EP	Z	9 51 28.4	813.2	0.8	77.9	0
12 AUG	S15	EP	Z	9 51 31.4	78.5	0.6	78.5	0
12 AUG	S16	E	Z	9 51 35.9			79.2	1

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 AUG	10 40 43.9	53.7N	160.4E	EAST COAST OF KAMCHATKA				
				H = 25 KM	MAG = 5.0			
12 AUG	S19	EP	Z	10 43 20.0	12.7	0.2	11.3	140
		ES	X	45 11.7			11.3	140
12 AUG	S18	EP	Z	10 43 9.0	53.9	0.3	10.8	131
		ES	Y	44 56.3			10.8	131
12 AUG	S11	EP	Z	10 43 32.2	6.3	0.2	11.6	92
		ES	X	45 34.6			11.6	92
12 AUG	S21	EP	Z	10 43 42.1	34.8	0.3	13.1	155
		ES	X	45 52.1			13.1	155
12 AUG	S14	EP	Z	10 43 46.5	3.8	0.2	12.8	82
12 AUG	S15	E	Z	10 43 58.8			13.3	79
12 AUG	S16	E	Z	10 44 2.7			13.9	76
12 AUG	S18	EP	Z	10 53 50.0	4.6	0.1	N	
		ES	Y	54 13.6			N	
12 AUG	S19	EP	Z	10 54 24.1	12.7	0.2	N	
		ES	X	55 3.6			N	
12 AUG	S21	EP	Z	10 56 32.3	9.5	0.2	N	
		ES	Y	57 16.2			N	
12 AUG	S16	E	Z	11 18 3.6				
12 AUG	S11	EP	Z	12 7 48.5	38.0	0.2	N	
		ES	Y	8 12.7			N	
12 AUG	ALK	EP		12 41 55.4				
12 AUG	S11	EP	Z	15 6 40.5			N	
		ES	Y	7 2.2			N	
12 AUG	S14	E	Z	15 7 19.2				
12 AUG	S15	E	Z	15 7 35.3				
12 AUG	S11	EP	Z	16 49 40.5			L	
		ES	Y	53.4			L	
12 AUG	S14	E	Z	17 11 .7				
12 AUG	S11	EP	Z	17 57 35.0	47.5	0.3	L	
		ES	Y	46.5			L	
12 AUG	S14	E	Z	17 58 27.2				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 AUG	S15	E	Z	17 58 51.2				
12 AUG	S11	EP	Z	18 0 50.7	57.0	0.2	L	
		ES	Y	57.C			L	
12 AUG	S12	EP	Z	18 0 52.2	46.2	0.1	L	
		ES	Y	59.2			L	
12 AUG	S14	EP	Z	18 1 20.8	3.7	0.1	N	
		ES	X	43.6			N	
12 AUG	ADK	IP		18 41 30.5			L	
		IS		36.6			L	
12 AUG	S14	-IP	Z	18 41 54.8	148.9	0.2	N	
		ES	X	42 21.1			N	
12 AUG	S12	EP	P	18 41 55.C			N	
		ES	Y	42 21.1			N	
12 AUG	S11	EP	Z	18 41 59.5	126.7	0.3	N	
		ES	Y	42 31.C			N	
12 AUG	S15	EP	Z	18 42 .C	100.9	0.4	N	
		ES	Y	32.9			N	
12 AUG	S16	EP	Z	18 42 10.2	25.3	0.2	N	
		ES	Y	50.0			N	
		E	P	44 59.3			N	
12 AUG	S18	EP	Z	18 43 21.5	1.8	0.1	R	
		ES	X	44 57.3			R	
12 AUG	S19	E	Z	18 45 46.3				
12 AUG	S11	EP	Z	18 49 48.9	63.4	0.3	N	
		ES	Y	50 22.2			N	
12 AUG	S18	EP	Z	18 50 21.C	22.2	0.2	N	
		ES	Y	51 21.3			N	
		E	Z	52 55.4			N	
		E	X	55 45.3			N	
12 AUG	S12	E	Y	18 50 32.5				
12 AUG	S19	E	X	18 55 .C				
12 AUG	S18	EP	Z	19 51 43.6	6.3	0.2	R	
		ES	Y	53 32.6			R	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
12 AUG	S21	EP	Z	19 53 53.1	6.3	0.2		
12 AUG	S19	E	Z	20 1 48.5				
12 AUG	S11	EP	Z	20 13 46.6	12.7	0.2	L	
		ES	Y	14 1.3			L	
12 AUG	S11	EP	Z	20 18 37.6	2.5	0.2	L	
		ES	Y	51.2			L	
12 AUG	S18	EP	Z	20 52 5.4	9.3	0.1	L	
		E	Y	8.1			L	
12 AUG	S11	EP	Z	21 34 21.6	7.4	0.1	N	
		ES	Y	46.0			N	
12 AUG	S14	EP	Z	21 34 50.2	5.5	0.1	N	
		ES	X	35 35.2			N	
12 AUG	S15	E	Z	21 35 55.2				
12 AUG	S11	EP	Z	21 37 33.1	7.4	0.1	N	
		ES	Y	54.2			N	
12 AUG	S14	EP	Z	21 37 41.7	5.5	0.1	N	
		ES	X	38 9.7			N	
12 AUG	S15	E	Z	21 38 25.9				
12 AUG	S15	E	Z	22 28 20.1				
13 AUG	S11	EP	Z	0 23 33.4	23.2	0.1	L	
		ES	Y	47.9			-	
13 AUG	S11	EP	Z	3 15 2.7	107.7	0.3	L	
		ES	Y	14.3			L	
13 AUG	S15	EP	Z	7 54 56.8	25.3	0.3	N	
		ES	Y	55 28.3			N	
		E	P	57 16.7			N	
13 AUG	S14	EP	Z	7 54 57.5	12.9	0.1	N	
		ES	X	55 29.3			N	
13 AUG	S16	EP	Z	7 55 2.0	28.5	0.2	N	
		ES	Y	36.8			N	
		E	P	57 52.3				
13 AUG	S16	EP	Z	9 58 44.2			N	
		ES	Z	59 37.3			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
13 AUG	S16	EP	Z	10 37 57.3			L	
		ES	Z	38 .4			L	
13 AUG	S11	EP	Z	11 1 28.8	3.7	0.1	L	
		ES	Y	41.2			L	
13 AUG	S11	EP	Z	11 7 59.5	3.7	0.1	L	
		ES	X	8 5.1			L	
13 AUG	S12	EP	P	12 34 10.2			L	
		ES	Y	24.9			L	
13 AUG	S11	EP	Z	12 34 15.9	31.7	0.2	L	
		ES	Y	35.2			L	
13 AUG	S14	EP	Z	12 34 16.6	64.8	0.1	L	
		ES	X	36.3			L	
13 AUG	S15	EP	Z	12 34 26.0	25.3	0.2	N	
		ES	Y	55.6			N	
		E	P	36 31.2			N	
13 AUG	S16	EP	Z	12 34 38.1	6.3	0.2	N	
		ES	X	35 15.7			N	
13 AUG	S16	E	Z	12 47 51.6				
13 AUG	S11	IP	Z	13 20 57.2	999.9		L	
13 AUG	S12	EP	Z	13 21 3.5	1.3U	0.3	N	
		ES	Y	25.3			N	
13 AUG	S14	EP	Z	13 21 25.0	136.2	0.3	N	
		ES	X	22 4.1			N	
13 AUG	ACK	IP		13 21 30.2			N	
		IS		22 12.9			N	
13 AUG	S15	EP	Z	13 21 35.8	19.0	0.3	N	
		ES	Y	22 23.4			N	
13 AUG	S16	EP	Z	13 21 40.4	25.3	0.2	N	
		ES	X	22 44.2			N	
		E	P	24 20.3			N	
13 AUG	S19	EP	Z	13 22 32.5	9.3	0.1	R	
		ES	X	23 58.1			R	
13 AUG	S21	EP	Z	13 23 19.4	9.5	0.2	R	
		ES	X	25 23.1			R	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
13 AUG	S19	EP	Z	13 30 50.2	12.7	0.2	L	
		ES	X	31 22.9			L	
13 AUG	S11	EP	Z	13 34 22.1	31.7	0.2	L	
		ES	X	39.4			L	
13 AUG	S11	EP	Z	14 31 14.2	19.0	0.2	L	
		ES	X	31.7			L	
13 AUG	S16	EP	Z	15 7 .8	9.3	0.1	L	
		E	Z	4.6			L	
13 AUG	S11	EP	Z	15 29 29.0	3.7	0.1	L	
		ES	Y	37.2			L	
13 AUG	S11	EP	X	16 3 33.5			R	
		ES	X	5 8.5			R	
13 AUG	S11	L	X	16 32 19.7				
13 AUG	S15	EP	Z	16 44 16.7			L	
		ES	Y	28.0			L	
13 AUG	S19	EP	Z	17 38 53.6	9.3	0.1	L	
		ES	X	39 9.4			L	
13 AUG	S21	E	P	17 42 53.1				
13 AUG	S11	EP	Z	18 19 5.6	22.2	0.3	N	
		ES	Y	34.3			N	
13 AUG	S16	EP	Z	18 28 36.4			L	
		ES	Y	49.3			L	
13 AUG	S11	EP	Z	19 32 9.9	46.3	0.1	L	
		ES	Y	16.2			L	
13 AUG	S12	EP	P	19 32 11.7			L	
		ES	Y	18.8			L	
13 AUG	S14	EP	Z	19 32 35.0	3.7	0.1	M	
		ES	X	33 3.2			M	
13 AUG	S15	E	Z	19 33 22.0				
		E	P	35 27.2				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
13 AUG	20	6 50.6	35.3N	135.3E	SOUTHERN HONSHU,JAPAN			
				H = 357 KM		MAG = 6.0		
13 AUG	S21	EP	Z	20 11 53.6	203.3	0.8	26.0	66
13 AUG	S19	EP	Z	20 12 14.4	1.1U	1.1	28.[illegible]	60
13 AUG	S11	EP	Z	20 13 15.3	620.5	0.5	35.3	48
		E	X	39.6			35.3	48
		E	X	18 [illegible]2.8			35.3	48
13 AUG	S14	EP	Z	20 13 30.4	307.7	0.7	37.2	46
13 AUG	ADK	IP		20 13 34.1			37.8	49
		IS		18 54.4			37.8	49
13 AUG	S15	EP	Z	20 13 36.2	1.1U	0.6	37.9	45
13 AUG	S16	EP	Z	20 13 42.9	16.9	0.4	38.7	44
13 AUG	S21	EP	Z	20 12 54.2	3.2	0.2	N	
		ES	X	14 3.2			N	
13 AUG	S21	E	Z	20 17 6.2				
13 AUG	S19	E	Z	20 18 5.1				
13 AUG	S21	E	X	20 32 37.6				
13 AUG	S19	EP	Z	20 33 29.1	12.7	0.3	T	
		E	Z	35 28.0			T	
		E	X	36 51.3			T	
13 AUG	ADK	EP		22 25 28.2				
14 AUG	S21	E	Z	0 54 58.6				
14 AUG	S11	EP	Z	1 21 33.0	7.4	0.1	L	
		ES	Y	48.6			L	
14 AUG	S11	EP	Z	1 23 24.4	3.7	0.1	N	
		ES	Y	45.1			N	
14 AUG	S11	EP	Z	1 40 9.9	3.7	0.1	L	
		ES	Y	17.2			L	
14 AUG	S15	EP	Z	2 46 27.9			L	
		E	X	29.9			L	
14 AUG	S21	E	Z	2 51 15.3				
14 AUG	S11	EP	Z	3 21 49.3	9.5	0.2	N	
		ES	Y	22 16.7			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
14 AUG	S11	EP	Z	3 33 49.4	9.5	0.2	N	
		ES	Y	34 20.0			N	
14 AUG	S15	EP	Z	5 32 13.1	27.7	0.1	L	
		E	Y	16.0			L	
14 AUG	S11	EP	Z	5 38 25.3	3.7	0.1	L	
		ES	Y	35.4			L	

14 AUG 5 47 22.4 52.3N 172.7W ANDREANOF IS,ALEUTIAN
H = 33 KM MAG = 4.2

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
14 AUG	ADK	IP		5 48 1.0			2.5	261
		IS		35.9			2.5	261
14 AUG	S15	EP	Z	5 48 6.0	208.6	0.2	3.2	308
		ES	Y	35.4			3.2	308
		E	P	50 36.0			3.2	308
14 AUG	S14	EP	Z	5 48 7.3	69.7	0.3	3.4	293
		E	X	37.4			3.4	293
14 AUG	S16	EP	Z	5 48 10.7	337.0	0.4	3.1	324
		ES	Y	42.1			3.1	324
		ET	P	51 14.6			3.1	324
14 AUG	S12	EP	P	5 48 18.6			4.5	272
		ES	Y	35.4			4.5	272
14 AUG	S11	EP	Z	5 48 23.8	57.0	0.2	4.9	268
		ES	X	36.5			4.9	268

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
14 AUG	S11	EP	Z	5 58 21.2	15.8	0.3	N	
		ES	X	59 12.2			N	
14 AUG	S14	EP	Z	5 58 42.4	1.8	0.1	L	
		ES	X	59 .9			L	
14 AUG	S15	EP	Z	5 58 56.7			L	
		ES	Y	59 5.0			L	
14 AUG	S16	EP	Z	5 59 1.7	69.7	0.2	R	
		ES	Y	6 0 23.5			R	
14 AUG	S15	EP	Z	6 8 13.3			N	
		ES	Y	32.2			N	
14 AUG	S11	EP	Z	6 10 1.3	44.4	0.2	L	
		ES	Y	14.3			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
14 AUG	S12	EP	P	6 10 29.1			L	
		ES	X	34.1			L	
14 AUG	S15	EP	Z	7 8 30.4	126.4	0.2	L	
		ES	X	36.8			L	
14 AUG	S11	EP	Z	8 37 20.7	3.7	0.1	L	
		ES	Y	39.7			L	
14 AUG	ACK	EP		9 5 22.0			N	
		ES		6 4.0			N	
14 AUG	S16	EP	Z	9 5 26.9	66.5	0.3	N	
		ES	Y	6 18.5			N	
14 AUG	S15	EP	Z	9 5 28.9	44.2	0.2	N	
		ES	Y	6 21.5			N	
		E	P	8 .6			N	
14 AUG	S14	EP	Z	9 5 34.8				
14 AUG	S11	EP	Z	10 0 21.4	15.8	0.2	L	
		ES	Y	28.2			L	
14 AUG	S11	EP	Z	11 4 6.2	4.6	0.1	L	
		E	Y	11.4			L	
14 AUG	S11	EP	Z	12 21 1.0	7.4	0.1	N	
		ES	Y	35.7			N	
14 AUG	S12	EP	P	12 21 27.7			L	
		ES	Y	36.2			L	
14 AUG	S16	EP	Z	17 12 19.6	9.3	0.1	L	
		ES	Y	29.4			L	
14 AUG	S16	E	P	17 19 29.9				
14 AUG	S16	EP	Z	21 42 42.5			N	
		ES	Y	43 31.7			N	
14 AUG	S11	EP	Z	22 23 57.1	12.7	0.2	L	
		ES	Y	24 2.2			L	
15 AUG	S11	EP	Z	2 23 48.0	28.5	0.2	L	
		ES	Y	24 2.5			L	
15 AUG	S11	EP	Z	2 50 31.6	144.9	0.4	N	
		ES	X	51 12.3			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
15 AUG	S16	E	Z	3 27 29.3				
15 AUG	S11	EP	Z	5 22 25.8	19.0	0.2	L	
		ES	Y	36.5			L	
15 AUG	S11	EP	Z	6 15 58.1	20.2	0.4	N	
		ES	Y	16 24.2			N	
15 AUG	S16	EP	Z	7 6 31.5	9.3	0.1	N	
		ES	Y	9 15.2			N	
15 AUG	S15	E	X	7 9 3.9				
15 AUG	S14	EP	Z	7 9 4.8	5.0	0.2		
15 AUG	S11	EP	Z	8 12 25.1	2.5	0.2	N	
		ES	Y	55.0			N	
15 AUG	S11	EP	Z	8 19 3.8	19.0	0.2	L	
		ES	Y	13.7			L	
15 AUG	S11	EP	Z	11 2 44.9	6.3	0.2	L	
		ES	Y	3 2.7			L	
15 AUG	ALK	IP		18 44 7.7			L	
		IS		17.5			L	
15 AUG	S11	EP	Z	18 44 25.1	2.5	0.2	N	
		ES	Y	48.6			N	
15 AUG	S14	EP	Z	18 44 25.6	3.7	0.1	N	
		ES	X	49.9			N	
15 AUG	S15	EP	Z	18 44 59.7	18.5	0.1	L	
		E	Y	45 5.7			L	
15 AUG	S11	EP	Z	18 49 18.6	2.5	0.2	N	
		ES	Y	34.2			N	
15 AUG	S11	EP	Z	22 26 43.7	15.8	0.2	L	
		ES	Y	27 1.0			L	
15 AUG	S16	EP	Z	22 28 35.3			N	
		ES	Y	59.6			N	
15 AUG	S15	EP	Z	22 29 32.9			L	
		ES	Y	52.1			L	
15 AUG	S14	EP	Z	22 48 10.5	3.8	0.2		

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
15 AUG	S15	EP	Z	23 43 16.4	63.2	0.2	L	
		ES	Y	28.4			L	
16 AUG	S15	E	Z	1 4 4.7				
16 AUG	S11	E	Y	2 46 51.9				
16 AUG	S14	EP	Z	2 47 40.5	6.3	0.2		
		E	Z	48 12.7				
16 AUG	S15	EP	Z	2 47 44.4			N	
		ES	Y	48 19.0			N	
		E	P	49 57.1			N	
16 AUG	S15	EP	Z	2 47 53.7			N	
		ES	Y	48 33.9			N	

16 AUG 3 10 1.2 50.4N 178.0E RAT ISLANDS,ALEUTIAN
H = 33 KM MAG = 4.2

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 AUG	S11	EP	Z	3 10 31.5	104.5	0.3	1.7	30
		E	Y	41.3			1.7	30
		ES	Y	55.5			1.7	30
16 AUG	ADK	EP		3 10 57.8			3.7	64
		IS		11 10.0			3.7	64
16 AUG	S14	EP	Z	3 11 3.9	2.5	0.2	4.0	37
		ES	X	49.8			4.0	37
16 AUG	S15	EP	Z	3 11 15.0	25.3	0.2	4.9	37
		ES	Y	12 14.0			4.9	37
16 AUG	S16	EP	Z	3 11 32.5			5.8	38
		ES	X	12 33.4			5.8	38

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 AUG	ADK	IP		3 11 42.0			T	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 AUG	3 12	2.6	50.5N	177.9E	RAT ISLANDS,ALEUTIAN			
				H =	33 KM	MAG = 4.4		
16 AUG	S11	IP	Z	3 12 32.2	380.2	0.3	1.6	34
		E	Y	41.4			1.6	34
		ES	Y	56.2			1.6	34
16 AUG	S12	EP	P	3 12 40.4			2.1	36
		ES	Y	13 10.0			2.1	36
16 AUG	ADK	IP		3 12 59.0			3.7	66
		IS		13 41.4			3.7	66
16 AUG	S15	EP	Z	3 13 15.8	19.0	0.2	4.8	39
		ES	Y	14 11.5			4.8	39
		E	P	15 39.7			4.8	39
16 AUG	S16	EP	Z	7 8 41.3				
16 AUG	S11	EP	Z	7 18 37.3	2.5	0.2	N	
		ES	Y	19 6.7			N	
16 AUG	S12	E	P	7 38 19.0				
16 AUG	S11	EP	Z	7 57 28.0	3.2	0.2	N	
		ES	Y	52.0			N	
16 AUG	S11	EP	Z	8 38 32.5	4.6	0.1	L	
		ES	Y	42.2			L	
16 AUG	S11	EP	Z	9 44 29.3	4.6	0.1	L	
		ES	Y	36.7			L	
16 AUG	S11	EP	Z	11 6 18.0	25.3	0.2	N	
		ES	X	43.2			N	
16 AUG	S11	EP	Z	11 33 31.9	4.6	0.1	L	
		ES	Y	42.9			L	
16 AUG	S11	-IP	Z	12 9 59.3	1.00	0.3		
		E	X	10 9.7				
		E	X	28.0				
16 AUG	S12	EP	P	12 10 2.7			L	
		E	P	7.2			L	
		ES	X	20.2			L	
16 AUG	ADK	EP		12 10 26.6			N	
		I		29.0			N	
		IS		11 8.0			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 AUG	S14	EP	Z	12 10 31.2	1.8	0.1	N	
		ES	X	59.4			N	
16 AUG	S15	EP	Z	12 10 36.8	12.6	0.2	N	
		ES	Y	11 26.1			N	
		E	P	13 16.1			N	
16 AUG	S16	EP	Z	12 10 58.0			N	
		ES	X	11 39.7			N	
		ET	P	14 37.3			N	
16 AUG	S11	EP	Z	12 12 54.1	13.9	0.1	L	
		ES	Y	13 4.4			L	
16 AUG	S11	EP	Z	12 18 18.2	13.9	0.1	L	
		ES	Y	29.2			L	
16 AUG	S11	EP	Z	12 36 11.0	4.6	0.1	L	
		ES	X	21.5			L	
16 AUG	ACK	IP		12 53 31.0			L	
		IS		44.3			L	
16 AUG	S12	EP	P	12 53 37.7			L	
		ES	Y	55.8			L	
16 AUG	S11	EP	Z	12 53 40.4	38.0	0.3	N	
		ES	Y	54 1.7			N	
16 AUG	S14	EP	Z	12 53 44.8	11.3	0.2	N	
		ES	X	54 9.4			N	
16 AUG	S15	EP	Z	12 54 19.5	37.9	0.2	L	
		ES	Y	25.7			L	
		E	P	56 16.2			L	
16 AUG	S16	EP	Z	12 54 23.3			N	
		ES	Y	45.4			N	
		ET	P	56 10.1			N	
16 AUG	S11	EP	Z	13 9 52.0	4.6	0.1	L	
		ES	Y	59.2			L	
16 AUG	S11	EP	Z	13 25 39.0	63.4	0.2	L	
		ES	X	49.9			L	
16 AUG	S12	EP	P	13 25 46.6			L	
		ES	Y	26 1.2			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
16 AUG	S14	EP	Z	13 26 30.8	2.5	0.2		
		E	X	47.6				
16 AUG	S16	E	P	13 52 35.8				
16 AUG	S12	EP	P	17 3 26.1			N	
		ES	X	52.5			N	
16 AUG	S14	EP	Z	21 15 12.4	1.8	0.1	N	
		ES	X	45.4			N	
16 AUG	S16	EP	Z	21 40 37.1				
		ES	Y	54.3				
16 AUG	S16	EP	Z	23 56 22.6			L	
		ES	Z	30.1			L	
17 AUG	S16	E	Z	0 2 52.6	9.5	0.2		
17 AUG	S14	EP	Z	1 33 48.1	53.9	0.3	T	
17 AUG	S15	E	Z	1 33 56.2				
17 AUG	S12	EP	P	4 17 52.9			L	
		ES	X	18 13.5			L	
17 AUG	S14	EP	Z	4 44 44.8	1.8	0.1	N	
		ES	X	45 11.0			N	
17 AUG	S15	EP	Z	4 44 56.1	12.6	0.2	N	
		ES	Y	45 28.4			N	
		E	P	47 4.0			N	
17 AUG	S16	EP	Z	4 45 .0			N	
		ES	Z	45.9			N	
17 AUG	S11	E	Y	4 45 28.0				
17 AUG	S11	EP	Z	6 26 58.9	31.7	0.3	L	
		ES	X	27 9.9			L	
17 AUG	S11	EP	Z	6 47 37.6	3.2	0.2	L	
		ES	Y	47.8			L	
17 AUG	S16	EP	Z	6 49 36.9			N	
		ES	Y	55.4			N	
17 AUG	S11	E	Y	11 17 42.4				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
17 AUG	S15	EP	Z	11 35 9.3	6.3	0.2	N	
		ES	Y	36 .4			N	
		E	P	37 41.9			N	
17 AUG	S14	EP	Z	11 35 17.1	3.7	0.1	N	
		ES	X	57.4			N	
17 AUG	S11	EP	Z	12 9 8.0	6.3	0.2	L	
		ES	Y	27.1			L	
17 AUG	S12	E	X	14 27 16.0				
17 AUG	S11	EP	Z	16 20 57.3	1.3	0.2	N	
		ES	Y	21 24.4			N	
17 AUG	S12	EP	P	16 21 21.8			L	
		ES	Y	34.5			L	
17 AUG	S11	EP	Z	16 28 28.3	19.0	0.3	N	
		ES	Y	29 5.1			N	
17 AUG	S12	EP	P	16 31 50.9			L	
		ES	X	32 9.7			L	
17 AUG	S11	EP	Z	16 31 51.0	50.7	0.2	L	
		ES	Y	32 10.9			L	
17 AUG	S14	EP	Z	16 32 2.4	1.8	0.1	N	
		ES	X	33.5			N	
17 AUG	S15	EP	Z	16 32 11.9			N	
		ES	Y	51.2			N	
		E	P	34 34.2			N	
17 AUG	S16	EP	Z	16 33 8.2				
		E	P	35 28.8				
17 AUG	S16	E	Z	17 27 40.9				
17 AUG	S15	E	Z	17 35 48.4				
17 AUG	S11	EP	Z	18 49 35.5	22.2	0.2	L	
		ES	Y	48.4			L	
17 AUG	S16	EP	Z	18 59 14.3	32.4	0.1	R	
		ES	Y	19 0 48.5			R	
17 AUG	S11	EP	Z	19 17 49.2	12.7	0.2	L	
		ES	Y	58.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
17 AUG	S14	EP	Z	22 45 50.4	23.2	0.5		

17 AUG 22 42 9.3 59.4N 151.4W KENAI PENINSULA,ALASKA
H = 55 KM MAG = 5.0

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
17 AUG	ADK	EP		22 45 51.9			16.1	253
18 AUG	S12	EP	P	1 36 31.3			L	
		ES	X	46.8			L	
18 AUG	S14	E	Z	3 1 58.3				
18 AUG	S15	EP	Z	3 59 44.8	25.3	0.2	N	
		ES	Y	4 0 33.0			N	
		E	P	2 9.7			N	
18 AUG	S14	EP	Z	3 59 57.6	5.5	0.1	N	
		ES	X	4 0 33.1			N	
18 AUG	S16	EP	Z	4 0 3.7	6.3	0.2	N	
		ES	Y	42.2			N	
		E	P	2 43.3			N	
18 AUG	S15	E	Z	4 32 32.1				
18 AUG	S15	E	Z	5 12 7.9				
18 AUG	ADK	EP		5 54 35.8				
18 AUG	S14	EP	Z	6 23 4.6	5.5	0.1	N	
		E	Z	29.7			N	
		ES	X	38.2			N	
18 AUG	S15	EP	Z	6 23 10.1			N	
		ES	Y	41.2			N	
18 AUG	S16	EP	Z	7 7 43.9			N	
		ES	Y	8 10.4			N	
18 AUG	S14	EP	Z	8 23 44.6	1.8	0.1	N	
		E	Z	24 6.8			N	
		ES	X	21.3			N	
18 AUG	S15	E	Z	8 24 26.7				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
18 AUG	S16	EP	Z	8 24 46.2			!	
		ES	Y	50.7			L	
18 AUG	S14	EP	Z	16 8 21.6	12.9	0.1	N	
		ES	X	49.6			N	
18 AUG	S15	EP	Z	16 8 25.2			N	
		ES	Y	9 1.4			N	
		E	P	10 38.2			N	
18 AUG	S16	EP	Z	16 8 32.8			N	
		ES	Y	9 14.7			N	
		E	P	11 21.2			N	
18 AUG	S15	EP	Z	17 4 44.9			L	
		E	Y	46.7			L	
18 AUG	S15	EP	Z	17 8 3.7			L	
		E	Y	8.2			L	
19 AUG	S15	EP	Z	2 11 10.9	25.3	0.2		
19 AUG	S14	EP	Z	3 15 34.1	5.5	0.1	N	
		ES	X	57.4			N	
19 AUG	S14	E	Z	5 47 17.6				
19 AUG	S15	E	Z	5 47 34.3				
19 AUG	S16	EP	Z	5 47 47.4				
		ES	X	55.4				
19 AUG	S14	EP	Z	6 20 29.6	11.1	0.1	N	
		E	Z	55.1			N	
		ES	X	21 4.7			N	
19 AUG	S15	EP	Z	6 20 37.2	37.0	0.1	N	
		ES	Y	21 8.0			N	
		E	P	22 57.3			N	
19 AUG	S16	EP	Z	6 20 51.6			N	
		ES	X	21 30.5			N	
		E	P	23 43.1			N	
19 AUG	S14	E	Z	10 2 25.0				
19 AUG	S15	E	Z	11 15 16.4				
19 AUG	S16	E	Z	11 38 43.0				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
19 AUG	S14	EP	Z	16 50 22.8	3.7	0.1	N	
		ES	X	44.4			N	
19 AUG	S15	EP	Z	16 50 50.6			L	
		ES	Y	59.3			L	
		E	P	52 44.2			L	
19 AUG	S14	EP	Z	19 24 55.9	2.5	0.2		
		E	Z	25 26.3				
19 AUG	S15	E	Z	19 25 38.9				
19 AUG	S14	EP	Z	20 48 35.9	3.7	0.1	N	
		ES	X	49 12.3			N	
19 AUG	S16	EP	Z	21 6 32.0			L	
		LS	Y	45.4			L	
19 AUG	ACK	IP		23 0 4.5				
		IS		15.0				
19 AUG	S14	EP	Z	23 0 19.6	38.0	0.2	N	
		ES	X	41.0			N	
19 AUG	S15	EP	Z	23 0 26.5	34.1	0.2	N	
		ES	X	56.1			N	
		E	P	2 45.7			N	
19 AUG	S16	EP	Z	23 3 37.8			N	
		ES	Y	4 18.0			N	
19 AUG	S14	E	Z	23 42 24.8				
19 AUG	S15	E	Z	23 42 40.3				
20 AUG	ACK	IP		0 6 6.5			L	
		IS		21.6			L	
20 AUG	S14	EP	Z	0 6 22.2	7.6	0.2	N	
		E	Z	51.8			N	
		ES	X	7 2.8			N	
20 AUG	S15	EP	Z	0 6 30.9	25.3	0.2	N	
		ES	X	7 7.0			N	
		E	P	8 53.3			N	
20 AUG	S16	EP	Z	0 6 43.2			N	
		ES	Y	7 28.4			N	
		E	P	9 44.7			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
20 AUG	S15	EP	Z	0 10 39.8	25.3	0.3	L	
		ES	Y	53.1			L	
		E	P	13 28.1			L	
20 AUG	ACK	EP		0 10 47.8				
20 AUG	S14	E	Z	1 3 19.9				
20 AUG	S15	E	Z	1 3 32.4				
		E	P	5 20.1				
20 AUG	ACK	IP		1 12 58.0			L	
		IS		13 14.0			L	
20 AUG	S14	EP	Z	1 13 14.0	14.7	0.1	N	
		ES	X	44.1			N	
20 AUG	S15	EP	Z	1 13 22.6	18.5	0.1	N	
		ES	Y	59.2			N	
		E	P	15 32.8			N	
20 AUG	S16	EP	Z	1 13 34.5			N	
		ES	Y	14 19.3			N	
		E	P	16 27.1			N	
20 AUG	S15	E	Z	7 2 24.0				
20 AUG	S15	E	Z	7 28 2.8				
20 AUG	S16	EP	Z	7 28 10.2			N	
		ES	Y	39.5			N	
20 AUG	S16	EP	Z	7 38 4.6			R	
		ES	Y	40 35.8			R	
20 AUG	S15	E	P	7 39 39.5				
20 AUG	S15	E	Z	9 16 41.6				
20 AUG	S16	EP	Z	13 43 23.3			N	
		ES	Y	44 5.4			N	
		E	P	46 34.0			N	
20 AUG	S16	E	Z	19 10 58.2				
21 AUG	ACK	EP		7 45 36.8				
		ES		56 9.0				
31 AUG	ACK	EP		13 44 23.2			N	
		ES		45 16.8			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
1 SEPT	S1	EP	X	2 20 31.5			L	
		ES	X	45.1			L	
1 SEPT	S2	E	P	3 9 26.9				
1 SEPT	3 31 10.5	5.5S		147.2E EAST NEW GUINEA REGION H = 182 KM MAG = 5.6				
1 SEPT	ALK	EP		3 41 33.5			64.9	24
1 SEPT	S2	EP	Z	6 34 11.5	601.9	0.2	L	
		ES	Y	18.5			L	
1 SEPT	S1	EP	P	6 34 12.1				
1 SEPT	S2	EP	Z	12 46 55.1	37.0	0.1	L	
		E	X	58.0			L	
1 SEPT	S2	EP	Z	12 52 9.0	56.9	0.2	N	
		ES	X	53 3.2			N	
		E	P	56 50.8			N	
1 SEPT	S1	EP	P	12 52 9.4			N	
		ES	X	53 4.4			N	
1 SEPT	ALK	EP		12 58 59.3			N	
		ES		59 49.8			N	
1 SEPT	S2	EP	Z	13 43 20.1	19.0	0.2	L	
		ES	X	38.3			L	
1 SEPT	S2	EP	Z	14 52 58.4	113.8	0.2	L	
		ES	X	53 4.8			L	
1 SEPT	S1	EP	Y	14 53 1.0			L	
		ES	Y	10.0			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
1 SEPT	17 31	2.9	52.5N	172.3E	NEAR ISLANDS,ALEUTIAN			
				H = 33 KM	MAG = 4.4			
1 SEPT	S1	EP	Y	17 32 5.5			4.1	103
		ES	X	43.1			4.1	103
1 SEPT	S2	EP	Z	17 32 7.8	44.2	0.3	4.1	105
		ES	X	33 5.4			4.1	105
1 SEPT	S2	EP	Z	17 51 8.6	19.0	0.2	L	
		ES	X	18.3			L	
1 SEPT	S2	EP	Z	18 43 8.5			N	
		ES	X	35.6			N	
1 SEPT	S2	EP	Z	19 2 41.9			L	
		E	X	48.2			L	
1 SEPT	S2	E	P	20 21 39.5				
1 SEPT	22 42	1.8	44.9N	147.0E	KURILE IS,N JAPAN REGION			
				H = 134 KM	MAG = 5.4			
1 SEPT	S5	EP	Z	22 46 44.1	80.1	0.5	21.5	63
		E	Y	50 37.8			21.5	63
1 SEPT	S2	EP	Z	22 46 47.9	157.0	0.6	21.9	62
1 SEPT	S2	E	P	23 1 41.5				
1 SEPT	S2	E	P	23 9 47.6				
2 SEPT	S5	EP	Z	0 37 6.0	25.3	0.2	L	
		ES	X	12.7			L	
2 SEPT	S1	EP	P	0 38 43.5			L	
		E	X	44.5			L	
2 SEPT	S2	EP	Z	0 38 45.8	27.7	0.1	L	
		ES	X	39 2.9			L	
2 SEPT	S5	EP	Z	0 38 51.6			N	
		ES	Y	39 10.7			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 SEPT	S5	EP	Z	1 13 17.5			N	
		ES	Y	41.4			N	
2 SEPT	S5	EP	Z	1 27 33.7			L	
		ES	Y	49.2			L	
2 SEPT	S5	EP	Z	1 49 49.7	277.9	0.1	L	
		ES	Y	54.4			L	
2 SEPT	S2	EP	Z	1 49 53.6	44.2	0.2	L	
		ES	X	50 1.2			L	
2 SEPT	S5	EP	Z	2 47 48.6	44.2	0.2	L	
		ES	Y	59.3			L	
2 SEPT	S2	EP	Z	2 47 56.0			L	
		ES	X	48 11.3			L	
2 SEPT	S5	EP	Z	2 55 54.5			L	
		ES	Y	56 5.2			L	
2 SEPT	S5	EP	Z	3 8 11.3			L	
		ES	Y	22.2			L	
2 SEPT	S6	EP	Z	3 9 6.4			L	
		ES	Z	14.6			L	
2 SEPT	S2	EP	Z	3 9 14.9			L	
		ES	X	20.2			L	
2 SEPT	S5	EP	Z	5 27 41.6			L	
		ES	X	59.9			L	
2 SEPT	S5	EP	X	6 16 6.0			L	
		ES	Y	20.8			L	
2 SEPT	S5	L	Z	7 11 19.3				
2 SEPT	S4	E	X	7 11 32.1				
2 SEPT	S4	E	X	7 15 35.9				
		E	X	17 1.4				
2 SEPT	S5	E	Y	7 15 42.6				
2 SEPT	S6	EP	Z	7 16 47.3			L	
		ES	X	54.9			L	
2 SEPT	S5	EP	Z	7 16 52.2			L	
		ES	Y	17 1.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 SEPT	S4	EP	Z	7 23 52.1	9.5	0.2	L	
		ES	Y	24 4.4			L	
2 SEPT	S5	EP	Z	7 23 56.7			L	
		ES	Y	24 13.9			L	
2 SEPT	S4	E	X	7 37 51.4				
2 SEPT	S7	EP	Z	7 43 46.7				
2 SEPT	S4	EP	Z	9 16 45.0	50.7	0.2	L	
		ES	Y	49.4			L	
2 SEPT	S5	EP	Z	9 16 50.5	221.8	0.2	L	
		ES	Z	56.7			L	
2 SEPT	S2	EP	Z	9 16 50.6	92.4	0.1	L	
		ES	X	57.0			L	
2 SEPT	S6	EP	Z	9 16 51.1			L	
		ES	X	59.8			L	
2 SEPT	S1	EP	P	9 16 53.0			L	
		ES	Y	59.4			L	
2 SEPT	S7	EP	Z	9 16 53.6	12.7	0.2	L	
		ES	X	17 3.0			L	
2 SEPT	S4	EP	Z	9 18 30.8	9.5	0.2	L	
		ES	Y	35.6			L	
2 SEPT	S5	EP	Z	9 18 36.2	31.6	0.2	L	
		ES	Y	42.6			L	
2 SEPT	S5	EP	Z	9 20 7.9	63.2	0.2	L	
		ES	Y	14.2			L	
2 SEPT	S4	EP	Z	9 21 2.4	19.0	0.2	L	
		ES	Y	7.1			L	
2 SEPT	S7	EP	Z	9 27 44.9			L	
		ES	Y	56.3			L	
2 SEPT	S6	EP	Z	9 27 45.7			L	
		ES	X	57.3			L	
2 SEPT	S5	EP	Z	9 27 49.3			L	
		ES	Y	28 2.9			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 SEPT	S7	EP	Z	9 44 22.7	9.5	0.2	L	
		ES	Y	26.0			L	
2 SEPT	S6	EP	Z	9 44 23.8			L	
		ES	X	29.7			L	
2 SEPT	S7	EP	Z	10 12 1.6			N	
		ES	Y	24.5			N	
		E	P	14 8.1			N	
2 SEPT	S6	EP	Z	10 12 1.9			N	
		ES	X	25.6			N	
2 SEPT	S5	EP	X	10 12 6.4			N	
		ES	Y	30.2			N	
2 SEPT	S6	EP	Z	10 48 14.9			L	
		ES	X	21.7			L	
2 SEPT	S7	E	Y	10 48 17.5				
2 SEPT	S5	EP	Z	11 8 48.3			L	
		ES	Y	56.2			L	
2 SEPT	S4	E	X	11 8 49.3				
2 SEPT	S4	IP	Z	11 20 3.0	999.9		L	
		E	Z	7.1			L	
2 SEPT	S2	EP	Z	11 20 7.4	50.6	0.2	L	
		ES	X	12.1			L	
2 SEPT	S5	IP	Z	11 20 8.7	82.2	0.2	L	
		ES	X	10.4			L	
2 SEPT	S1	EP	P	11 20 9.9			L	
		ES	Y	15.0			L	
2 SEPT	S7	EP	Z	11 20 13.8	12.7	0.2	L	
		ES	Y	22.5			L	
		E	P	45.2			L	
2 SEPT	S6	EP	Z	13 16 35.4			L	
		ES	X	49.4			L	
2 SEPT	S7	EP	Z	13 16 43.9			L	
		ES	Y	46.9			L	
2 SEPT	S4	I	X	13 16 56.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 SEPT	S5	E	Y	13 28 49.6				
2 SEPT	S4	E	X	14 36 12.6				
2 SEPT	S7	EP	Z	16 14 35.6			L	
		ES	Y	38.1			L	
2 SEPT	S6	E	X	17 24 28.0				
2 SEPT	S6	EP	Z	17 58 53.4			L	
		ES	X	59 4.2			L	
2 SEPT	S6	EP	Z	18 41 12.1			N	
		ES	X	34.9			N	
2 SEPT	S7	EP	Z	18 41 12.5			N	
		E	Y	22.5			N	
		ES	Y	34.1			N	
		E	P	42 56.3			N	
2 SEPT	S5	EP	Z	18 41 16.3	19.0	0.2	N	
		ES	Y	39.5			N	
2 SEPT	S2	EP	Z	18 41 19.7			N	
		ES	X	45.9			N	
2 SEPT	S4	E	Y	18 41 37.4				
2 SEPT	S7	EP	P	18 58 53.4			L	
		ES	X	59 7.0			L	
2 SEPT	S5	EP	X	18 59 8.7			L	
		ES	L	17.4			L	
2 SEPT	S5	E	Z	19 26 51.3				
2 SEPT	S5	EP	Z	21 15 31.3			L	
		ES	Y	44.3			L	
2 SEPT	S7	EP	Z	22 2 10.8			L	
		ES	Y	14.7			L	
2 SEPT	S6	E	X	22 2 17.4				
2 SEPT	S7	EP	Z	22 25 22.9	2.5	0.3	L	
		ES	X	27.6			L	
2 SEPT	S5	E	Y	22 25 39.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
2 SEPT	S5	EP	Z	23 27 48.7	44.2	0.2	L	
		ES	Y	28 6.1			L	
2 SEPT	S5	EP	Z	23 47 41.9				
2 SEPT	S6	EP	Z	23 47 42.6	28.5	0.3	L	
		E	Z	43.8			L	
		ES	X	54.8			L	
2 SEPT	S7	EP	Z	23 47 44.1	3.2	0.2	L	
		ES	X	57.8			L	
		E	P	48 50.1			L	
2 SEPT	S4	EP	Z	23 47 47.0			L	
		ES	X	48 5.2			L	
		E	P	49 15.7			L	
2 SEPT	S2	EP	Z	23 47 54.3	19.0	0.2	N	
		ES	X	48 15.5			N	
		E	P	49 40.8			N	
2 SEPT	S1	E	X	23 48 18.7				
3 SEPT	S2	EP	Z	0 31 23.2	12.6	0.2	L	
		ES	X	30.9			L	
3 SEPT	S4	E	X	0 31 30.9				
3 SEPT	S2	EP	Z	1 8 33.2			L	
		ES	X	49.9			L	
3 SEPT	S5	EP	X	1 8 36.1			L	
		ES	X	55.2			L	
3 SEPT	S4	E	Y	1 8 49.0				
3 SEPT	S7	EP	Z	1 8 56.0			L	
		ES	Y	59.3			L	
3 SEPT	S6	E	X	1 8 56.9				
3 SEPT	ALK	IP		1 17 26.9			L	
		IS		36.1			L	
3 SEPT	S4	EP	Z	1 18 4.1	9.5	0.2		
		E	Y	16.5				
		E	X	52.5				
3 SEPT	S5	EP	Z	1 18 8.6				
		E	X	55.5				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S6	EP	Z	1 18 9.1			N	
		ES	X	55.4			N	
3 SEPT	S7	EP	Z	1 18 11.2	6.3	0.2	L	
		ES	X	20.8			L	
3 SEPT	S8	EP	Z	1 18 13.8	19.0	0.3		

3 SEPT 1 23 19.6 7.8S 147.1E EAST NEW GUINEA REGION
H = 139 KM MAG = 5.4

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	ADK	EP		1 33 59.8			67.1	23

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S8	EP	Z	[illegible] 13 13.8	6.3	0.2	L	
		ES	X	[illegible].3			L	
3 SEPT	S10	EP	Z	2 13 15.4	10.1	0.2	L	
		ES	Y	21.4			L	
3 SEPT	S7	EP	Z	2 13 15.5	38.0	0.3	L	
		E	Z	17.6			L	
		ES	Y	21.7			L	
[illegible] SEPT	S6	EP	Z	2 13 17.3	73.9	0.1	L	
		ES	X	25.4			L	
3 SEPT	S4	EP	Z	2 13 20.5	31.7	0.3	L	
		E	X	32.8			L	
		E	Y	14 12.7			L	
3 SEPT	S5	EP	Z	2 13 22.0	120.1	0.2	L	
		ES	Y	32.9			L	
3 SEPT	S2	EP	Z	2 13 29.0	44.2	0.2	L	
		ES	X	44.2			L	
		E	P	14 40.2			L	
3 SEPT	S1	EP	P	2 26 51.9			I	
		E	Y	27 2.6			L	
3 SEPT	S2	EP	Z	2 26 54.5	69.5	0.2	L	
		ES	X	27 8.2			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S4	EP	Z	2 26 56.2	18.5	0.1		
		E	Y	27 16.8				
3 SEPT	S5	EP	Z	2 27 1.9				
3 SEPT	S7	EP	Z	2 27 6.4			N	
		ES	Y	29.5			N	
3 SEPT	S8	EP	Z	2 27 10.1			N	
		ES	X	33.9			N	
3 SEPT	ACK	IP		2 30 6.0			N	
		IS		26.1			N	
3 SEPT	S4	I	X	2 30 52.0				
		E	Y	31 53.1				
3 SEPT	S5	EP	Z	2 30 54.1				
		E	Y	31 52.2				
		E	Y	32 9.4				
3 SEPT	S2	E	X	2 31 49.0				
3 SEPT	S10	E	Y	2 32 10.1				
3 SEPT	S4	EP	Z	2 51 52.5	13.9	0.1	L	
		E	Y	58.3			L	
		E	Y	52 10.3			L	
3 SEPT	S1	EP	P	2 51 53.8			L	
		ES	Y	52 9.2			L	
3 SEPT	S2	EP	Z	2 51 54.4	120.1	0.2	L	
		ES	X	52 10.8			L	
3 SEPT	S6	EP	Z	2 51 57.1				
		E	Z	52 4.4				
		E	X	15.4				
3 SEPT	S5	EP	Z	2 51 57.3	19.0	0.2	L	
		ES	Y	52 15.9			L	
3 SEPT	S7	EP	Z	2 51 59.2	9.5	0.2	N	
		ES	Y	52 19.7			N	
3 SEPT	S8	E	X	2 52 3.6				
		E	X	22.4				
3 SEPT	S10	EP	Z	2 52 4.7			N	
		ES	Y	29.3			N	

CAY	STA	PFASE	C	TIME	AMP	PER	CIST	AZI
3 SEPT	S8	EP	Z	3 8 58.1	6.3	0.2	L	
		ES	X	9 .7			L	
3 SEPT	S10	EP	Z	3 8 59.4			L	
		ES	Y	9 4.3			L	
3 SEPT	S7	EP	Z	3 9 .7	12.7	0.3	L	
		ES	X	6.7			L	
3 SEPT	S6	EP	Z	3 9 2.3			L	
		ES	X	10.4			L	
3 SEPT	S5	EP	Z	3 9 7.5			L	
		ES	Y	17.6			L	
3 SEPT	S4	E	Y	3 9 17.7				
3 SEPT	S10	EP	Z	3 27 42.1			L	
		ES	Y	45.3			L	
3 SEPT	S1	EP	P	3 40 12.8			L	
		ES	X	26.0			L	
3 SEPT	S2	EP	Z	3 40 14.9	73.9	0.1	L	
		ES	X	30.9			L	
3 SEPT	S4	EP	Z	3 40 15.8	22.2	0.3	L	
		E	Y	21.9			L	
		E	Y	34.1			L	
3 SEPT	S5	EP	Z	3 40 20.5			L	
		ES	Y	26.4			L	
3 SEPT	S6	EP	Z	3 40 21.3				
		E	P	29.0				
		E	X	45.4				
3 SEPT	S7	EP	Z	3 40 23.8	53.9	0.2		
		E	Z	25.9				
		E	X	45.5				
3 SEPT	S8	EP	Z	3 40 26.8	19.0	0.3	N	
		ES	X	49.5			N	
3 SEPT	S10	EP	Z	3 40 30.2	7.5	0.2	N	
		ES	Y	57.1			N	
3 SEPT	S6	EP	Z	4 1 33.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S7	EP	Z	4 1 33.1			L	
		ES	X	44.8			L	
3 SEPT	S8	EP	Z	4 1 34.1	9.5	0.3	L	
		ES	Y	43.9			L	
3 SEPT	S5	EP	Z	4 1 36.0	12.6	0.2	L	
		ES	Y	49.1			L	
3 SEPT	S10	EP	Z	4 1 36.2			L	
		ES	Y	48.3			L	
3 SEPT	S4	E	Y	4 1 46.7				
		E	Y	2 40.2				
3 SEPT	S10	EP	Z	4 34 39.6			L	
		ES	Y	43.4			L	

3 SEPT 4 37 2.3 49.92N 176.66E ALEUTIAN EXPLOSION - E2
EXPLOSION DEPTH = 602 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S10	EP	Z	4 37 11.3	999.9		0.37	41
		ET	P	30.4			0.37	41
3 SEPT	S5	-IP	Z	4 37 26.3	999.9		1.29	41
3 SEPT	S8	EP	Z	4 37 16.2	999.9		0.69	41
		ET	P	52.8			0.69	41
3 SEPT	S7	EP	Z	4 37 19.6	182.5	0.5	0.92	41
		ET	P	38 11.3			0.92	41
3 SEPT	S6	EP	Z	4 37 21.6	88.5	0.2	1.09	40
		ET	P	38 21.4			1.09	40
3 SEPT	S4	EP	Z	4 37 24.9	53.9	0.4	1.44	40
		ET	P	38 46.6			1.44	40
		ET	P	39.7			1.44	40
3 SEPT	S2	EP	Z	4 37 33.4	37.9	0.2	1.81	41
		ET	P	39 17.4			1.81	41
3 SEPT	AC-	EP		4 37 39.2			2.25	48
		E		44.0			2.25	48
		E		51.0			2.25	48
3 SEPT	SC-	EP		4 37 52.9			3.24	331
		ES		38 30.0			3.24	331
3 SEPT	ADK	EP		4 38 13.4			4.66	63
3 SEPT	AA-	EP		4 38 32.4			6.19	65

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S1	EP	P	4 39 22.4				

DAY	STA	FASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S10	EP	Z	4 55 4.7			L	
		ES	Y	7.6			L	
3 SEPT	S4	E	X	5 14 41.3				
3 SEPT	S5	E	Y	5 14 46.7				
3 SEPT	S10	EP	Z	6 16 52.0	110.9	0.1	L	
		ES	Y	55.1			L	
3 SEPT	S8	E	Z	6 16 56.7				
3 SEPT	S5	E	Y	6 49 49.5				
3 SEPT	S5	EP	Y	6 55 58.3			L	
		ES	Y	56 15.9			L	
3 SEPT	S2	E	X	6 56 10.1				
3 SEPT	S4	E	X	6 56 10.5				
3 SEPT	S7	EP	Z	6 56 16.5			L	
		ES	X	20.8			L	
3 SEPT	S6	E	X	6 56 18.4				
3 SEPT	S8	E	Y	6 56 22.9				
3 SEPT	S10	E	Y	6 56 29.5				
3 SEPT	S10	EP	Z	7 55 32.0			L	
		ES	X	35.2			L	
3 SEPT	S4	EP	Z	8 0 52.7	28.5	0.2		
		E	Y	1 26.5				
		E	Y	49.8				
3 SEPT	S5	EP	Z	8 0 57.5	50.6	0.2	N	
		ES	Y	1 53.9			N	
3 SEPT	S6	EP	Z	8 0 58.3			L	
		ES	X	1 1.9			L	
3 SEPT	S7	IP	Z	8 1 .4	53.9	0.2		
		E	Y	2.2				
		E	X	57.6				
3 SEPT	S8	EP	Z	8 1 3.2	19.0	0.2	L	
		ES	Y	11.7			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S10	EP	Z	8 1 6.7				
		E	Y	34.3				
		E	Y	2 9.3				
3 SEPT	S10	E	Y	8 4 49.3				
3 SEPT	S5	EP	X	8 23 54.9			L	
		ES	Y	24 7.9			L	
3 SEPT	S4	E	X	8 24 4.9				
3 SEPT	S5	EP	Z	8 29 57.6			L	
		ES	X	30 8.1			L	
3 SEPT	S6	E	X	8 30 3.8				
3 SEPT	S5	EP	Z	8 50 8.4			L	
		ES	Y	19.3			L	
3 SEPT	S10	E	Y	8 50 10.2				
3 SEPT	S4	E	X	8 50 19.0				
3 SEPT	S4	EP	Z	9 16 33.7	9.5	0.2		
		E	Y	17 21.7				
		E	Y	50.3				
3 SEPT	S5	E	Y	9 16 39.4				
3 SEPT	S10	EP	Z	9 17 .1			N	
		ES	Y	29.3			N	
3 SEPT	S7	EP	Z	9 17 3.0			N	
		E	Z	12.2			N	
		ES	Y	31.0			N	
3 SEPT	S6	E	X	9 17 5.5				
		E	X	30.9				
3 SEPT	S5	E	X	9 17 6.6				
		E	Z	1.7				
3 SEPT	S6	EP	Z	9 25 .5			L	
		ES	X	13.9			L	
3 SEPT	S10	E	Y	9 25 2.9				
3 SEPT	S5	EP	Z	9 25 4.9			L	
		ES	Y	20.4			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S7	E	Y	9 25 10.8				
3 SEPT	S4	E	X	9 25 20.2				
3 SEPT	S10	EP	Z	10 56 36.9			N	
		ES	Y	55.9			N	
3 SEPT	S5	EP	Z	11 31 40.6			L	
		ES	Y	53.2			L	
3 SEPT	S8	EP	Z	11 31 42.1			L	
		ES	X	54.1			L	
3 SEPT	S10	EP	Z	11 31 44.7			L	
		ES	Y	32 .0			L	
3 SEPT	S4	E	X	11 31 45.7				
3 SEPT	S6	E	X	11 31 53.2				
3 SEPT	ACK	EP		11 34 37.2				
3 SEPT	S2	EP	Z	11 35 6.7	44.2	0.3		
3 SEPT	S4	EP	Z	11 35 7.8	47.5	0.3		
		E	Y	18.3				
3 SEPT	S7	EP	Z	11 35 13.4	18.2	0.5	N	
		E	Z	15.3			N	
		ES	Y	33.3			N	
		E	X	38 4.7			N	
3 SEPT	S5	EP	Z	11 35 13.4	246.0	0.6		
3 SEPT	S8	EP	Z	11 35 17.1				
		E	X	36 7.7				
3 SEPT	S10	EP	Z	11 35 19.9			L	
		ES	Y	22.7			L	
3 SEPT	S4	E	X	12 19 47.8				
3 SEPT	S5	E	X	12 19 55.5				
3 SEPT	S6	E	X	12 19 56.9				
3 SEPT	S10	E	Y	12 20 8.8				
3 SEPT	S10	E	Y	12 58 49.5				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S4	-IP	Z	14 42 9.0	999.9			
		E	Y	24.5				
3 SEPT	S1	EP	P	14 42 11.4			L	
		ES	X	24.9			L	
3 SEPT	S2	EP	Z	14 42 11.7	25.3	0.2	L	
		ES	X	25.5			L	
3 SEPT	S6	EP	Z	14 42 13.3	69.5	0.2		
		E	P	20.6				
		E	X	29.2				
3 SEPT	S5	EP	Z	14 42 13.4			L	
		E	Y	15.5			L	
3 SEPT	S7	-IP	Z	14 42 15.4	999.9		L	
		ES	Y	31.3			L	
3 SEPT	S8	EP	Z	14 42 17.6	32.4	0.1	N	
		ES	X	35.3			N	
3 SEPT	S10	EP	Z	14 42 21.0	73.9	0.1	N	
		ES	Y	41.9			N	
3 SEPT	S10	EP	Z	14 59 30.5			L	
		ES	Y	33.3			L	
3 SEPT	S4	E	X	14 59 45.5				
3 SEPT	S10	E	Y	15 0 54.3				
3 SEPT	S1	EP	P	15 2 22.3			L	
		ES	Y	28.8			L	
3 SEPT	S2	EP	Z	15 2 22.9	555.8	0.1	L	
		ES	X	29.4			L	
3 SEPT	S4	EP	Z	15 2 22.9	37.1	0.1	L	
		E	Y	31.6			L	
3 SEPT	S5	EP	Z	15 2 28.9			L	
		ES	Y	30.9			L	
3 SEPT	S7	EP	Z	15 2 31.4	19.0	0.2	L	
		E	Z	33.2			L	
		ES	Y	43.9			L	
3 SEPT	S8	EP	Z	15 2 34.6			L	
		ES	X	48.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S10	EP	Z	15 2 38.5			L	
		ES	Y	45.1			L	
3 SEPT	S6	E	X	15 2 41.0				
3 SEPT	S6	E	X	15 18 15.2				
3 SEPT	S10	EP	Z	15 26 46.0			L	
		ES	X	48.4			L	
3 SEPT	S5	EP	Z	15 30 1.8			N	
		ES	X	20.5			N	
3 SEPT	S7	EP	Z	15 30 1.9			N	
		ES	Y	24.7			N	
3 SEPT	S4	E	Y	15 30 15.2				
3 SEPT	S6	E	X	15 30 22.2				
3 SEPT	S10	EP	Z	15 30 30.9			L	
		ES	Y	34.2			L	
3 SEPT	S10	EP	P	15 34 41.7			L	
		ES	Y	50.0			L	
3 SEPT	S5	EP	X	15 44 18.5			L	
		ES	X	29.9			L	
3 SEPT	S8	EP	Z	16 4 10.3	19.0	0.3	L	
		ES	Y	12.2			L	
3 SEPT	S7	EP	Z	16 4 13.0			L	
		ES	X	18.0			L	
3 SEPT	S10	EP	Z	16 4 13.0			L	
		ES	Y	18.0			L	
3 SEPT	S6	E	X	16 4 22.4				
3 SEPT	S7	EP	Z	16 34 8.4			L	
		ES	Z	18.6			L	
3 SEPT	S6	EP	Z	16 34 9.1	25.3	0.2	L	
		ES	X	20.0			L	
3 SEPT	S5	EP	Z	16 34 12.7	37.9	0.2	L	
		ES	Y	25.0			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S4	L	X	16 34 23.9				
		E	X	35 9.5				
3 SEPT	S6	EP	Z	16 46 12.4			L	
		LS	X	23.1			L	
3 SEPT	S7	EP	Z	16 46 15.1			L	
		ES	Y	22.3			L	
3 SEPT	S5	EP	Z	16 46 15.5			L	
		ES	Y	27.6			L	
3 SEPT	S4	L	Y	16 46 26.1				
		E	Y	47 19.4				
3 SEPT	S10	EP	Z	16 48 54.7	94.1	0.4	N	
		ES	Y	49 17.7			N	
3 SEPT	S8	EP	Z	16 48 55.7	66.5	0.2	N	
		ES	X	49 16.7			N	
3 SEPT	S6	LP	Z	16 48 56.2				
3 SEPT	S7	EP	Z	16 48 56.7			N	
		LS	Y	49 19.5			N	
3 SEPT	S4	EP	Z	16 48 57.4			N	
		ES	Y	49 22.8			N	
		E	P	50 51.9			N	
3 SEPT	S5	EP	Z	16 48 59.7			N	
		ES	Y	49 23.6			N	
3 SEPT	S2	EP	Z	16 49 4.2			L	
		LS	X	31.6			L	
		E	P	51 4.4			L	
3 SEPT	ADK	E		16 49 46.8				
		E		50 42.0				
3 SEPT	S5	EP	Z	18 10 48.0			L	
		ES	Y	52.7			L	
3 SEPT	S4	E	X	18 10 52.3				
3 SEPT	S6	E	X	18 10 53.9				
3 SEPT	S4	E	X	18 23 22.3				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	S7	EP	Z	18 53 52.3	23.2	0.1	L	
		ES	Y	55.5			L	
3 SEPT	S5	EP	Z	18 56 54.1			L	
		ES	Y	59.2			L	
3 SEPT	S4	E	X	19 4 57.0				
3 SEPT	S10	EP	Z	19 52 46.3	19.0	0.2	L	
		ES	Y	50.2			L	
3 SEPT	S8	EP	Z	19 52 47.2	22.2	0.3	L	
		ES	X	58.4			L	
3 SEPT	S7	EP	Z	19 52 47.4			N	
		ES	Y	53 7.7			N	
3 SEPT	S6	EP	Z	20 30 52.8	19.0	0.2	L	
		ES	X	57.3			L	

3 SEPT 21 7 30.8 10.6S 79.8W OFF COAST OF PERU
H = 38 KM MAG = 6.5

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	ACK	EP		21 21 25.2			102.5	321
		EPP		25 47.0			102.5	321
		ES		33 8.0			102.5	321
3 SEPT	S10	EP	P	21 34 44.5			L	
		ES	Y	49.5			L	
3 SEPT	S2	E	X	21 41 56.6				
3 SEPT	S8	E	X	22 22 18.0				
3 SEPT	S2	E	X	22 22 44.5				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
3 SEPT	22 30	2.1	51.82N	179.34E	ALEUTIAN EXPLOSION - E8 EXPLOSION DEPTH = 597 FT			
3 SEPT	S1	EP	Y	22 30 14.9			0.55	223
3 SEPT	S2	EP	Z	22 30 18.0	145.4	0.2	0.75	223
3 SEPT	S4	EP	Z	22 30 20.0	69.3	0.5	1.12	224
3 SEPT	S5	LP	Z	22 30 26.4	999.9		1.26	223
3 SEPT	S6	EP	Z	22 30 28.6			1.46	223
3 SEPT	S7	EP	Z	22 30 30.9	63.4	0.2	1.63	222
3 SEPT	S8	EP	Z	22 30 34.2	44.4	0.3	1.86	222
3 SEPT	S10	LP	Z	22 30 38.4	40.3	0.4	2.19	223
3 SEPT	ACK	IP		22 30 43.5			2.48	88
3 SEPT	S10	EP	Z	22 57 14.6			L	
		ES	Y	17.4			L	
3 SEPT	S8	EP	Z	22 57 19.2	12.7	0.2	L	
		ES	X	23.4			L	
3 SEPT	S6	E	X	23 26 9.9				
4 SEPT	ACK	IP		0 33 21.7			N	
		IS		44.3			N	
4 SEPT	S10	LP	Z	0 34 47.2			L	
		ES	Y	50.9			L	
4 SEPT	S4	EP	Z	1 [illegible]	18.5	0.1	L	
		ES	Y	[illegible]			L	
4 SEPT	S2	LP	Z	1 13 21.3	37.0	0.1	L	
		ES	X	25.6			L	
4 SEPT	S5	EP	Z	1 13 25.7	25.3	0.2	L	
		ES	Y	33.9			L	
4 SEPT	S10	E	Y	1 24 17.0				
4 SEPT	S4	E	X	1 27 12.4				
		E	X	29 16.7				
4 SEPT	S4	E	Y	1 44 57.3				
4 SEPT	S4	EP	Z	2 23 52.7	6.3	0.2	L	
		ES	Y	24 .8			L	
4 SEPT	S4	E	Y	2 51 55.3				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 SEPT	S4	E	X	3 35 6.6				
4 SEPT	ACK	IP		3 38 14.7			L	
		IS		22.5			L	
4 SEPT	S2	EP	Z	3 38 47.6	9.2	0.1	N	
		ES	X	39 25.8			N	
4 SEPT	S2	EP	Z	3 38 47.6	9.2	0.1	N	
		ES	X	39 25.9			N	
4 SEPT	S5	EP	Z	3 38 52.9			N	
		ES	Y	39 25.9			N	
4 SEPT	S4	E	X	3 38 53.1				
		E	Y	39 35.5				
4 SEPT	S6	E	Z	3 38 53.3				
4 SEPT	S7	EP	Z	3 38 54.6			N	
		ES	Y	39 33.3			N	
4 SEPT	S10	EP	Z	3 38 59.1				
		E	Y	39 44.6				
4 SEPT	S7	EP	Z	3 56 56.3	31.7	0.2	L	
		ES	Y	57 8.3			L	
4 SEPT	ACK	EP		4 3 56.3				
		I		4 54.4				
		I		13 55.0				
4 SEPT	S7	EP	Z	4 4 29.8	12.7	0.2	N	
		ES	X	5 2.5			N	
4 SEPT	S4	E	Y	4 4 52.1				
4 SEPT	S10	E	Y	4 5 14.0				
4 SEPT	S2	EP	Z	4 15 34.0	139.0	0.2	L	
		ES	X	48.2			L	
4 SEPT	S4	EP	Z	4 15 35.0	15.8	0.3		
		E	Y	57.6				
4 SEPT	S5	EP	Z	4 15 40.2			L	
		ES	Y	57.7			L	
4 SEPT	S7	EP	Z	4 15 43.5			N	
		ES	Y	16 4.1			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 SEPT	S10	EP	Z	4 15 50.2	19.0	0.2	N	
		ES	Y	16 15.2			N	
4 SEPT	S10	EP	Z	4 19 31.2			N	
		ES	Y	20 13.0			N	
4 SEPT	S4	E	Y	4 19 51.4				
4 SEPT	S1	E	P	4 23 45.1				
4 SEPT	S2	EP	Z	4 23 46.3	285.1	0.2	L	
		ES	X	52.7			L	
4 SEPT	S4	EP	Z	4 23 46.8	44.4	0.3	L	
		ES	X	56.1			L	
4 SEPT	S5	EP	Z	4 23 50.2			L	
		ES	X	24 3.8			L	
4 SEPT	S10	E	Z	4 24 1.2				
		E	Y	21.8				
4 SEPT	S6	E	X	4 24 6.7				
4 SEPT	S2	E	P	4 50 2.5				
4 SEPT	S10	E	Y	5 37 57.8				
4 SEPT	S8	EP	Z	5 47 .7			L	
		ES	X	2.7			L	
4 SEPT	S4	E	X	6 1 1.2				
4 SEPT	S4	E	X	6 17 27.1				
4 SEPT	S4	EP	Z	7 16 26.3	12.7	0.2	L	
		ES	X	30.3			L	
4 SEPT	S2	EP	Z	7 16 30.3	37.0	0.1	L	
		ES	X	35.2			L	
4 SEPT	S5	EP	Z	7 16 32.0	31.6	0.2	L	
		ES	X	39.1			L	
4 SEPT	S4	E	X	7 18 57.7				
4 SEPT	S4	EP	Z	7 36 19.1	25.3	0.2		
4 SEPT	S5	E	X	7 36 26.3				

DAY	STA	PHASE	C	TIME			AMP	PER	DIST	AZI
4 SEPT	S2	EP	Z	8	2	.9	46.2	0.1	L	
		ES	X			12.4			L	
4 SEPT	S4	EP	Z	8	2	3.3	38.0	0.3	L	
		ES	X			7.2			L	
4 SEPT	S5	EP	Z	8	2	9.0	151.7	0.2	L	
		ES	Z			13.4			L	
4 SEPT	S1	EP	P	8	2	9.9			L	
		ES	Y			15.9			L	
4 SEPT	S6	EP	Z	8	2	10.7			L	
		ES	X			22.5			L	
4 SEPT	S7	EP	Z	8	2	13.3	19.0	0.2	L	
		ES	Y			22.5			L	
4 SEPT	S8	EP	Z	8	2	17.7			L	
		ES	X			26.7			L	
4 SEPT	S10	EP	P	8	2	20.3			L	
		ES	Y			34.8			L	
4 SEPT	S4	L	X	9	59	51.1				
4 SEPT	S5	EP	Z	9	59	52.5			L	
		ES	Y			58.4			L	
4 SEPT	S1	EP	P	11	17	34.4			L	
		ES	Y			47.6			L	
4 SEPT	S4	E	X	11	17	54.5				
4 SEPT	S4	EP	Z	11	27	15.2	15.8	0.2	L	
		ES	X			18.6			L	
4 SEPT	S1	EP	P	11	41	10.8			L	
		ES	Y			23.7			L	
4 SEPT	S4	EP	Z	11	57	38.3	9.5	0.2	L	
		ES	X			41.7			L	
4 SEPT	S5	EP	Z	11	57	41.7	63.2	0.2	L	
		ES	Y			47.7			L	
4 SEPT	S10	E	X	12	1	23.8				
4 SEPT	S10	EP	Z	12	12	51.8				
		E	Y		13	39.7				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 SEPT	S7	EP	Z	12 12 54.5			L	
		ES	Y	13 2.9			L	
4 SEPT	S7	EP	Z	12 13 39.5			L	
		ES	Y	49.3			L	
4 SEPT	S6	E	X	12 13 52.6				
4 SEPT	S10	E	X	12 22 20.4				
		E	Y	23 20.3				
4 SEPT	S7	EP	Z	12 22 31.2			N	
		ES	Y	23 8.9			N	
4 SEPT	S5	EP	Z	12 22 42.1			L	
		ES	Y	55.6			L	
4 SEPT	S1	EP	P	12 22 45.3			L	
		ES	Y	52.0			L	
4 SEPT	S2	EP	Z	12 22 46.0	37.9	0.2	L	
		ES	X	58.1			L	
4 SEPT	S4	EP	Z	12 22 46.8	9.5	0.2	L	
		ES	X	58.1			L	
4 SEPT	S10	EP	Z	12 35 25.4			L	
		ES	Y	27.9			L	
4 SEPT	S6	EP	P	12 48 12.3			N	
		ES	X	34.5			N	
4 SEPT	S10	EP	Z	12 48 19.4			L	
		ES	Y	37.4			L	
		E	X	50 .8			L	
4 SEPT	S5	E	Z	12 48 24.9				
4 SEPT	S4	E	X	12 48 34.8				
4 SEPT	S10	EP	Z	13 19 50.6			L	
		ES	Y	55.7			L	
4 SEPT	S6	E	Z	13 34 57.9				
4 SEPT	S4	E	X	13 52 33.3				
4 SEPT	S10	EP	P	14 50 59.5			L	
		ES	X	51 3.3			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 SEPT	S9	EP	Z	15 1 19.2	28.5	0.2	L	
		ES	X	23.0			L	
4 SEPT	S7	EP	Z	15 1 20.1	88.7	0.2	L	
		E	Y	21.8			L	
4 SEPT	S10	EP	Z	15 1 21.0	44.2	0.2	L	
		ES	Y	24.9			L	
4 SEPT	S4	EP	Z	15 1 25.9	15.8	0.2	L	
		ES	X	36.3			L	
4 SEPT	S5	EP	Z	15 1 27.0	63.2	0.2	L	
		ES	Y	36.2			L	
4 SEPT	S6	E	X	15 1 38.[illegible]				
4 SEPT	S8	EP	Z	15 23 36.3	41.2	0.3		
		E	Y	38.3				
4 SEPT	S9	EP	Z	15 23 37.8	999.9			
		E	X	42.0				
4 SEPT	S7	EP	Z	15 23 38.5	999.9		L	
		ES	Y	16 11 30.6			L	
4 SEPT	S10	IP	Z	15 23 39.9	999.9			
4 SEPT	S2	EP	Z	15 23 42.6	18.5	0.1	N	
		ES	X	24 6.3			N	
4 SEPT	S4	EP	Z	15 23 44.3	999.9		L	
		ES	Y	54.3			L	
4 SEPT	S5	EP	Z	15 23 45.7	348.5	0.2	L	
		ES	Z	53.7			L	
4 SEPT	S1	EP	P	15 23 55.8			L	
		ES	Y	24 10.0			L	
4 SEPT	S1	EP	P	15 51 4.6			L	
		ES	Y	16.0			L	
4 SEPT	S4	E	Y	15 51 26.5				
4 SEPT	S5	E	Z	16 10 53.9				
4 SEPT	S10	EP	Z	16 10 58.0			N	
		ES	Y	11 15.8			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 SEPT	S4	EP	Z	16 10 58.8			N	
		ES	Y	11 21.4			N	
4 SEPT	S9	EP	Z	16 11 8.7				
		E	Y	12 39.1				
4 SEPT	S7	EP	Z	16 11 12.7	22.2	0.2	L	
4 SEPT	S6	E	Z	16 11 15.8				
4 SEPT	S6	EP	Z	16 46 2.4	31.6	0.3	L	
		E	X	4.6			L	
4 SEPT	S7	EP	Z	16 47 25.6	12.7	0.2	L	
		ES	X	37.3			L	
4 SEPT	S7	EP	Z	17 32 59.7	12.7	0.2	L	
		ES	Y	33 14.3			L	
4 SEPT	S2	E	P	18 27 23.0				
4 SEPT	S10	EP	Z	19 32 56.0				
		E	Y	33 21.7				
		E	Y	34 57.5				
4 SEPT	S9	EP	Z	19 32 58.6				
		E	Y	33 5.0				
		E	Y	35 8.6				
4 SEPT	S6	EP	Z	19 33 .2				
4 SEPT	S5	E	Z	19 33 3.0				
4 SEPT	S4	E	X	19 33 4.2				
4 SEPT	S10	E	X	19 41 38.3				
		E	P	43 6.3				
4 SEPT	S4	E	X	20 11 34.3				
4 SEPT	S6	E	X	20 14 28.9				
4 SEPT	S5	EP	Z	20 14 29.9			L	
		ES	Y	34.2			L	
4 SEPT	S5	EP	Z	20 53 15.7			N	
		ES	X	40.9			N	
4 SEPT	S4	E	X	20 53 34.9				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
4 SEPT	S4	EP	Z	21 48 19.4	22.2	0.2	L	
		ES	X	24.0			L	
4 SEPT	S5	EP	Z	21 48 22.8	[illegible].8	0.2	L	
		ES	Y	28.0			L	
4 SEPT	S6	EP	Z	23 8 58.5	25.3	0.2	L	
		ES	X	9 10.1			L	
4 SEPT	S5	EP	Z	23 9 2.1			L	
		ES	Y	15.6			L	
4 SEPT	S4	E	Z	23 9 14.2				
		E	X	10 15.3				
5 SEPT	S6	EP	Z	0 55 38.7			L	
		ES	X	41.9			L	
5 SEPT	S10	E	Y	0 55 40.2				

5 SEPT 1 35 2.8 51.64N 179.09E ALEUTIAN EXPLOSION - E7
EXPLOSION DEPTH = 616 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	S9	E	Z	0 55 42.6			1.75	223
5 SEPT	AC-	EP		1 35 9.4			0.30	147
		ES		13.0			0.30	147
5 SEPT	S1	-IP	P	1 35 9.9			0.30	224
5 SEPT	S2	IP	Z	1 35 13.9	10.7U	0.4	0.50	224
5 SEPT	S4	EP	Z	1 35 15.7	999.9		0.87	225
5 SEPT	S5	EP	Z	1 35 21.8	999.9		1.02	223
5 SEPT	S6	EP	Z	1 35 24.4	109.2	0.5	1.22	224
5 SEPT	S7	EP	Z	1 35 26.6	69.7	0.2	1.39	222
5 SEPT	S8	EP	Z	1 35 29.9	18.2	0.5	1.62	223
5 SEPT	S9	EP	Z	1 35 31.2			1.75	223
5 SEPT	S10	EP	Z	1 35 34.0	72.8	0.5	1.94	223
5 SEPT	ADK	IP		1 35 46.5			2.66	63
5 SEPT	SO-	IP		1 35 55.2			3.25	292
		ES		36 37.4			3.25	292
5 SEPT	AA-	EP		1 36 8.8				
5 SEPT	S6	E	X	1 41 8.3				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	S2	EP	Z	2 9 58.6	12.6	0.[illegible]	L	
		ES	X	10 14.1			L	
5 SEPT	S5	L	Z	2 10 6.8				
5 SEPT	S4	E	Y	2 10 10.0				
5 SEPT	S10	EP	Z	2 10 13.7			N	
		ES	Y	40.4			N	
5 SEPT	S9	E	Z	2 10 37.3				
5 SEPT	S4	E	X	2 28 40.9				
5 SEPT	S2	EP	Z	2 37 36.5			L	
		ES	X	50.5			L	
5 SEPT	S4	E	Y	2 37 56.4				
5 SEPT	S4	E	X	2 57 59.5				
5 SEPT	S10	EP	Z	3 4 29.3			L	
		ES	Y	36.7			L	
5 SEPT	S8	EP	Z	3 4 32.2				
		E	X	40.1				
		E	X	5 12.8				
5 SEPT	S6	EP	Z	3 4 35.6			L	
		ES	X	48.4			L	
5 SEPT	S9	EP	Z	3 4 39.1				
5 SEPT	S5	EP	Z	3 4 40.0			L	
		ES	Y	55.2			L	
5 SEPT	S4	E	Z	3 4 55.1				
5 SEPT	S8	EP	Z	3 46 10.9			L	
		ES	X	23.0			L	
5 SEPT	S8	E	Z	4 2 44.4				
		L	X	3 5.5				
5 SEPT	S8	E	Z	4 12 57.2				
		E	X	13 1.6				
5 SEPT	S10	E	Y	4 13 4.6				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	S1	EP	P	4 54 58.7			L	
		ES	X	55 4.1			L	
5 SEPT	S2	EP	Z	4 55 .2			L	
		ES	X	6.6			L	
5 SEPT	S3	EP	Z	4 55 8.8			L	
		ES	Y	18.6			L	
5 SEPT	S4	C	X	4 55 9.7				
5 SEPT	S10	EP	Z	5 15 20.9	19.0	0.2	L	
		ES	X	24.9			L	
5 SEPT	S9	E	Z	5 15 23.5				
5 SEPT	S8	EP	Z	5 15 25.6				
		E	Z	31.7				
		E	Z	57.1				
5 SEPT	S10	EP	Z	6 40 42.0			L	
		ES	Y	46.0			L	
5 SEPT	S8	EP	Z	6 40 42.1			L	
		ES	X	44.8			L	
5 SEPT	S9	E	Z	6 40 44.2				
5 SEPT	S8	EP	Z	8 10 41.6				
		E	X	46.2				
		E	X	11 8.5				
5 SEPT	S10	EP	Z	8 10 43.3			L	
		ES	Y	50.3			L	
5 SEPT	S9	F	Z	8 10 48.5				
5 SEPT	S3	E	Z	8 10 50.5				
5 SEPT	S4	E	X	8 26 15.9				
5 SEPT	S1	EP	P	8 26 16.8			L	
		ES	X	28.8			L	
5 SEPT	S2	EP	Z	8 26 18.0			L	
		ES	X	33.3			L	
5 SEPT	S3	EP	Z	8 26 21.7	37.9	0.2		

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	S7	EP	Z	8 26 27.4	28.5	0.2	N	
		ES	X	47.1			N	
5 SEPT	S5	EP	Z	8 45 17.6			N	
		ES	Y	47.9			N	
5 SEPT	S10	E	X	8 45 34.2				
5 SEPT	S9	E	Z	8 45 38.0				
5 SEPT	S6	E	X	8 45 43.2				
5 SEPT	S4	E	X	8 45 46.9				
5 SEPT	S1	EP	P	9 40 1.3			L	
		ES	Y	4.4			L	
5 SEPT	S5	EP	Z	11 28 33.0			L	
		ES	X	36.7			L	
5 SEPT	S10	E	Y	11 37 13.4				
5 SEPT	S6	EP	Z	11 49 42.0			L	
		ES	X	52.6			L	
5 SEPT	S1	EP	P	12 26 29.2			L	
		ES	Y	37.3			L	
5 SEPT	S4	E	Z	12 26 43.3				
5 SEPT	S1	EP	P	12 38 37.5			L	
		ES	X	50.4			L	
5 SEPT	S5	EP	Z	12 38 46.3			L	
		ES	Y	39 3.3			L	
5 SEPT	S7	EP	Z	12 38 47.8	38.0	0.2	N	
		ES	X	39 9.0			N	
5 SEPT	S8	EP	Z	12 38 50.7	15.8	0.2	N	
		ES	X	39 13.5			N	
5 SEPT	S9	EP	Z	12 38 52.5				
		E	Y	39 17.4				
5 SEPT	S10	EP	P	12 38 54.1			N	
		ES	Y	39 21.0			N	
5 SEPT	S4	E	X	12 38 57.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	S6	E	X	12 39 7.7				
5 SEPT	S10	EP	Z	13 35 46.4			L	
		ES	Y	51.3			L	
5 SEPT	S9	E	Y	13 35 55.0				
5 SEPT	S4	E	X	14 16 24.9				
5 SEPT	S10	E	Y	15 5 36.7				
5 SEPT	S4	E	X	16 16 8.0				
5 SEPT	S9	E	Y	16 17 24.3				
5 SEPT	S10	E	Y	16 17 28.0				
5 SEPT	S1	EP	P	16 24 2.8			L	
		ES	Y	18.1			L	
5 SEPT	S4	E	X	16 24 30.9				
5 SEPT	S9	EP	Z	17 17 24.9				
		E	Y	37.4				
5 SEPT	S10	EP	Z	18 2 12.0	25.3	0.2	L	
		ES	Y	15.3			L	
5 SEPT	S9	EP	Z	18 2 14.0				
		E	Y	18.6				
		E	Y	28.3				
5 SEPT	S8	EP	Z	18 2 15.8	12.7	0.2	L	
		ES	X	20.7			L	
5 SEPT	S7	EP	Z	18 2 19.6			L	
		ES	Y	27.5			L	
5 SEPT	S6	EP	Z	18 2 21.3			L	
		ES	X	31.6			L	
5 SEPT	S4	E	Z	18 7 49.0				
5 SEPT	S1	EP	P	19 51 48.0			N	
		ES	Y	52 11.2			N	
5 SEPT	S2	EP	Z	19 51 52.6			N	
		ES	X	52 21.8			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	ACK	IP		20 11 .9			L	
		IS		8.4			L	
5 SEPT	S1	EP	P	20 11 40.2			N	
		ES	Y	12 19.0			N	
5 SEPT	S2	EP	Z	20 11 41.7			N	
		ES	X	12 27.9			N	
5 SEPT	S4	EP	Z	20 11 41.9			N	
		ES	Y	12 38.8			N	
5 SEPT	S5	EP	Z	20 11 47.4	19.0	0.2		
		E	Y	56.8				
		E	Z	12 31.7				
		E	Y	47.9				
5 SEPT	S6	EP	Z	20 11 47.7				
5 SEPT	S7	EP	Z	20 11 49.1			N	
		ES	Y	12 18.0			N	
5 SEPT	S8	LP	Z	20 11 50.2				
		E	Z	12 33.0				
5 SEPT	S9	EP	Z	20 11 52.2				
		E	Y	12 39.5				
5 SEPT	S10	LP	Z	20 11 54.0	12.6	0.2		
		E	Y	12 42.6				
5 SEPT	S6	EP	Z	21 7 59.1			L	
		ES	X	8 3.2			L	
5 SEPT	S4	LP	Z	21 7 59.7			L	
		ES	Y	8 10.5			L	
5 SEPT	S7	EP	Z	21 7 59.8			L	
		ES	X	8 8.5			L	
5 SEPT	S8	EP	Z	21 8 1.3	34.8	0.2	L	
		ES	Z	9.3			L	
		E	Z	46.2			L	
5 SEPT	S5	EP	Z	21 8 1.8			L	
		ES	Y	12.1			L	
5 SEPT	S9	EP	Z	21 8 2.6	18.5	0.1		
		E	Y	13.0				
		E	Y	50.3				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	S10	EP	Z	21 8 4.1	25.3	0.2	L	
		ES	Y	14.9			L	
5 SEPT	S8	EP	Z	21 36 45.5				
		E	Z	55.3				
5 SEPT	S5	EP	Z	22 36 57.3			N	
		ES	X	37 26.7			N	
5 SEPT	S4	E	X	22 37 21.9				
5 SEPT	S2	EP	Z	23 15 21.9			L	
		ES	X	26.3			L	
5 SEPT	S2	EP	Z	23 34 11.5			N	
		ES	X	34.4			N	
5 SEPT	S1	EP	P	23 35 10.0			N	
		ES	Y	32.2			N	
5 SEPT	S4	EP	Z	23 35 16.1			N	
		ES	X	52.1			N	
5 SEPT	S5	E	Z	23 35 17.1				
5 SEPT	S7	EP	Z	23 35 21.3			N	
		ES	Y	54.2			N	
5 SEPT	S8	EP	Z	23 35 22.8			N	
		ES	Z	52.7			N	
5 SEPT	S9	E	Y	23 35 54.5				
5 SEPT	S8	EP	Z	23 44 7.9	28.5	0.2	L	
		ES	Z	12.8			L	
5 SEPT	S9	EP	Z	23 44 8.3			L	
		ES	Y	14.3			L	
5 SEPT	S7	EP	Z	23 44 8.4			L	
		E	Z	11.9			L	
		ES	Y	16.0			L	
5 SEPT	S10	EP	Z	23 44 9.6			L	
		ES	Y	15.8			L	
5 SEPT	S5	EP	Z	23 44 14.7			L	
		ES	Y	25.2			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
5 SEPT	S1	EP	P	23 49 7.1			L	
		ES	Y	14.4			L	
5 SEPT	S4	EP	Z	23 49 9.5			L	
		ES	X	23.1			L	
5 SEPT	S2	EP	Z	23 49 10.0			L	
		ES	X	22.5			L	
5 SEPT	S8	EP	Z	23 49 19.8			L	
		ES	Z	37.2			L	
5 SEPT	S7	EP	Z	23 49 19.9			L	
		ES	Y	32.5			L	
5 SEPT	S9	EP	Z	23 49 21.7			N	
		ES	Y	40.9			N	
5 SEPT	S10	EP	P	23 49 23.9			N	
		ES	Y	44.3			N	
6 SEPT	S9	EP	Z	0 2 55.7				
		E	Y	57.9				
6 SEPT	S8	EP	Z	0 2 56.9			L	
		ES	Z	59.5			L	
6 SEPT	S10	EP	Z	0 2 57.2			L	
		ES	Y	3 2.0			L	
6 SEPT	S4	EP	Z	1 10 11.1			N	
		ES	X	30.3			N	
6 SEPT	S10	E	Y	1 14 2.2				
6 SEPT	S5	EP	Z	1 54 38.0			N	
		ES	X	58.2			N	
6 SEPT	S1	EP	P	2 5 4.6			L	
		ES	Y	20.0			L	
6 SEPT	S4	EP	Z	2 5 12.8	15.8	0.2	L	
		ES	X	20.0			L	
6 SEPT	S2	EP	Z	2 5 13.9	31.6	0.2	L	
		ES	X	19.2			L	
6 SEPT	S5	EP	Z	2 5 19.6	19.0	0.2	L	
		ES	Y	26.9			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S7	EP	Z	2 5 21.9	6.3	0.2	L	
		ES	Y	33.6			L	
6 SEPT	S5	EP	Z	3 13 50.8			L	
		ES	Y	14 2.7			L	
6 SEPT	S4	EP	Z	3 13 54.1			L	
		ES	X	14 1.3			L	
6 SEPT	S9	E	Y	3 13 57.2				
6 SEPT	S10	E	Y	3 14 58.7				
6 SEPT	S10	E	Y	3 17 23.3				
6 SEPT	S10	E	Y	3 22 52.8				
6 SEPT	S7	E	Z	3 22 56.1				
6 SEPT	S10	E	Y	3 25 26.7				
6 SEPT	S2	E	P	3 28 20.9				
6 SEPT	S2	E	P	3 38 26.8				
6 SEPT	S8	EP	Z	4 18 43.5	9.5	0.2		
		E	Z	49.2				
		E	Z	19 2.3				
6 SEPT	S6	EP	Z	4 18 43.5			L	
		ES	X	54.5			L	
6 SEPT	S9	EP	Z	4 18 44.4			L	
		ES	Y	54.0			L	
6 SEPT	S7	EP	Z	4 18 44.5			L	
		ES	X	51.4			L	
6 SEPT	S10	EP	Z	4 18 45.9			L	
		ES	Y	53.7			L	
6 SEPT	S5	EP	Z	4 18 49.6			L	
		ES	X	59.5			L	
6 SEPT	S4	E	Y	4 18 59.7				
6 SEPT	S10	EP	Z	5 12 7.4			L	
		ES	Y	10.5			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI

6 SEPT 5 25 1.5 49.79N 176.52E ALEUTIAN EXPLOSION - E3
EXPLOSION DEPTH = 613 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S10	EP	Z	5 25 14.4	999.9		0.52	40
		ET	P	43.1			0.52	40
6 SEPT	S9	EP	Z	5 25 16.9	999.9		0.72	39
		ET	P	55.5			0.72	39
6 SEPT	S8	EP	Z	5 25 19.0	76.0	0.3	0.85	40
		ET	P	26 7.1			0.85	40
6 SEPT	S7	EP	Z	5 25 22.6	53.9	0.2	1.08	40
		ET	P	26 24.1			1.08	40
6 SEPT	S6	EP	Z	5 25 24.4	56.9	0.2	1.25	39
		ET	P	26 34.2			1.25	39
6 SEPT	S4	EP	Z	5 25 27.8			1.60	39
		ET	P	26 59.7			1.60	39
6 SEPT	S5	EP	Z	5 25 29.2	63.2	0.3	1.45	40
		ET	P	26 52.3			1.45	40
6 SEPT	S2	EP	Z	5 25 36.5	999.9		1.96	40
		ET	P	27 30.4			1.96	40
6 SEPT	S1	EP	P	5 25 38.8			2.16	40
		ET	P	26 45.9			2.16	40
6 SEPT	AC-	EP		5 25 41.6			2.41	47
6 SEPT	ADK	EP		5 26 15.8			4.80	62

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S1	EP	P	5 38 45.3			L	
		ES	Y	51.7			L	
6 SEPT	S1	E	Y	5 44 31.6				
6 SEPT	S10	EP	Z	6 1 55.5			N	
		ES	Y	2 23.0			N	
6 SEPT	S8	EP	Z	6 1 58.2				
		E	Z	2 25.6				
		E	Z	4 46.7				
6 SEPT	S7	EP	Z	6 1 58.9			N	
		ES	Y	2 23.8			N	
6 SEPT	S6	EP	Z	6 1 59.6			N	
		ES	X	2 30.1			N	
6 SEPT	S5	E	Z	6 2 2.9				
6 SEPT	S4	E	X	6 33.7				
6 SEPT	S10	E	Y	6 42 42.0				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S4	E	X	7 4 14.3				
6 SEPT	S5	EP	Z	7 41 51.1	68.2	0.7	T	
6 SEPT	S10	EP	Z	7 51 16.0			L	
		ES	Y	20.2			L	
6 SEPT	S4	E	P	8 36 6.0				
		E	P	27.2				
6 SEPT	S2	E	P	8 36 37.1				
6 SEPT	S1	E	Y	8 37 13.6				
6 SEPT	S10	E	X	8 43 7.0				
6 SEPT	S10	EP	Z	8 52 16.0	37.0	0.1	L	
		ES	Y	18.5			L	
6 SEPT	S9	EP	Z	8 52 18.1			L	
		ES	Y	22.6			L	
6 SEPT	S8	EP	Z	8 52 20.8	9.5	0.3	L	
		ES	Z	25.4			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	9 25 34.2	52.4N		168.6W	FOX ISLANDS,ALEUTIAN			
				H =	42 KM	MAG = 4.2		
6 SEPT	ADK	IP		9 26 47.8			5.0	267
		IS		27 45.1			5.0	267
6 SEPT	S1	E	P	9 27 27.1			7.9	268
6 SEPT	S2	EP	Z	9 27 29.4	82.2	0.2	8.1	267
		ES	X	36.4			8.1	267
6 SEPT	S4	EP	Z	9 27 29.4	999.9		8.4	266
		E	Y	29 2.2			8.4	266
6 SEPT	S5	EP	Z	9 27 34.3	999.9		8.5	265
		E	Y	47.6			8.5	265
		E	Y	29 6.6			8.5	265
6 SEPT	S6	EP	Z	9 27 35.0	31.6	0.2	8.7	264
6 SEPT	S7	EP	Z	9 27 37.1	19.0	0.2	8.8	264
		E	Z	39.8			8.8	264
		ES	Y	50.2			8.8	264
6 SEPT	S8	EP	Z	9 27 39.5	44.4	0.3	9.0	263
		E	Z	41.0			9.0	263
		E	Z	29 14.9			9.0	263
6 SEPT	S9	EP	Z	9 27 41.0	6.3	0.2	9.1	263
		E	Y	28 6.9			9.1	263
		E	Y	29 18.9			9.1	263
6 SEPT	S10	EP	Z	9 27 42.7	12.6	0.3	9.3	262
		E	Y	28 4.8			9.3	262
		E	Y	29 23.5			9.3	262
6 SEPT	S10	E	Y	9 37 26.3				
6 SEPT	S9	E	Y	9 37 40.4				
6 SEPT	S4	E	X	10 30 38.3				
6 SEPT	S8	E	Z	10 30 45.1				
6 SEPT	S9	EP	Z	10 30 46.4				
6 SEPT	ADK	EP		11 20 2.7			N	
		ES		25.4			N	
6 SEPT	S10	EP	Z	11 38 15.6			L	
		ES	Y	19.4			L	
6 SEPT	S9	EP	Z	11 38 17.5			L	
		ES	Y	21.8			L	
6 SEPT	S4	E	Z	12 17 49.0				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S7	EP	Z	12 17 56.5			N	
		E	Y	18 27.7			N	
6 SEPT	S8	EP	Z	14 4 52.2			L	
		ES	Z	58.2			L	
6 SEPT	S9	EP	Z	14 4 52.9	12.6	0.3	L	
		ES	Y	59.3			L	
6 SEPT	S7	EP	Z	14 4 52.9	6.3	0.2	L	
		ES	Y	58.9			L	
6 SEPT	S10	EP	P	14 4 54.2			L	
		ES	Y	5 2.4			L	
6 SEPT	S6	EP	Z	14 4 54.6			L	
		ES	X	5 3.3			L	
6 SEPT	S4	EP	Z	14 4 56.2			L	
		ES	Y	5 8.1			L	
6 SEPT	S5	EP	Z	14 4 58.0			L	
		ES	X	5 8.4			L	
6 SEPT	S10	EP	Z	14 12 12.4			L	
		ES	Y	14.9			L	
6 SEPT	S8	E	Z	15 12 21.6				
		E	Z	27.5				
6 SEPT	S9	EP	P	15 12 21.7			L	
		ES	Y	29.0			L	
6 SEPT	S7	EP	Z	15 12 21.0			L	
		ES	Y	28.6			L	
6 SEPT	S10	EP	Z	15 12 23.5				
		E	Y	31.2				
		E	Y	56.1				
6 SEPT	S6	EP	Z	15 12 24.4			L	
		ES	X	31.3			L	
6 SEPT	S4	EP	Z	15 12 26.2			L	
		ES	Y	36.8			L	
6 SEPT	S5	EP	Z	15 12 26.8			L	
		ES	X	37.0			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S10	EP	Z	15 50 28.3			L	
		ES	Y	31.0			L	
6 SEPT	S10	EP	Z	15 55 45.4	126.4	0.2	L	
		ES	Y	46.9			L	
6 SEPT	S9	EP	Z	15 55 47.6	19.0	0.3	L	
		ES	Y	51.5			L	
6 SEPT	S6	EP	Z	15 55 55.6			L	
		ES	X	56 5.5			L	
6 SEPT	S5	E	Y	16 33 11.9				
6 SEPT	S10	EP	Z	16 55 13.3			L	
		ES	Y	15.0			L	
6 SEPT	ADK	EP		16 57 50.2			N	
		ES		58 46.8			N	
6 SEPT	S4	EP	Z	16 58 31.2	19.0	0.2	L	
6 SEPT	S5	E	Z	16 58 36.0				
6 SEPT	S7	EP	Z	16 58 39.1			L	
		ES	Y	47.3			L	
6 SEPT	S8	L	Z	16 58 41.1				
6 SEPT	S9	E	Z	16 58 42.9				
6 SEPT	ADK	EP		17 14 16.9			N	
		IS		15 13.5			N	
6 SEPT	S1	E	P	17 14 56.3				
6 SEPT	S2	E	P	17 14 57.8				
6 SEPT	S4	EP	Z	17 14 58.2	25.3	0.2		
		E	Y	16 30.3				
6 SEPT	S5	E	Z	17 15 3.4				
6 SEPT	S6	EP	Z	17 15 6.6				
		E	X	12.9				
6 SEPT	S7	EP	Z	17 15 6.9				
		L	Y	21.4				
6 SEPT	S8	L	Z	17 15 8.2				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S9	E	Z	17 15 9.6				
		E	Y	16 50.C				
6 SEPT	S10	EP	Z	17 15 11.4				
		E	X	32.C				

6 SEPT 17 24 4C.1 52.6N 168.5W FCX ISLANDS,ALEUTIAN
H = 33 KM MAG = 4.8

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	ADK	IP		17 25 54.C			5.1	265
		IS		26 51.2			5.1	265
6 SEPT	S1	E	P	17 26 33.2			8.0	267
		E	P	27 59.2			8.0	267
6 SEPT	S4	EP	Z	17 26 35.2	999.9		8.4	265
6 SEPT	S2	EP	Z	17 26 35.5	316.8	0.3	8.1	266
		ES	X	28 3.9			8.1	266
6 SEPT	S5	EP	Z	17 26 40.3	188.3	0.4	8.6	264
		ES	Z	54.3			8.6	264
6 SEPT	S7	EP	Z	17 26 43.C	999.9		8.9	263
		E	Y	28 20.6			8.9	263
6 SEPT	S8	EP	Z	17 26 45.1	999.9		9.1	262
		E	Z	28 23.3			9.1	262
6 SEPT	S9	EP	Z	17 26 46.9	63.4	0.3	9.2	261
		ES	Y	57.2			9.2	261
		E	Y	28 24.9			9.2	261
6 SEPT	S10	EP	Z	17 26 49.C	174.8	0.5	9.4	261
		E	Y	28 27.6			9.4	261

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S9	E	P	17 35 50.2				
		E	Y	36 37.2				
6 SEPT	S6	E	P	17 36 .2				
6 SEPT	S7	E	P	17 36 15.4				
6 SEPT	S10	E	P	17 36 18.8				
6 SEPT	S10	E	X	17 53 55.3				
6 SEPT	S6	EP	Z	17 57 27.1			L	
		ES	X	38.5			L	
6 SEPT	S5	EP	Z	17 57 30.C			L	
		ES	Y	42.8			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S7	EP	Z	17 57 34.9			L	
		ES	Y	37.0			L	
6 SEPT	S4	E	X	17 57 41.3				
6 SEPT	S4	EP	Z	18 5 12.6			L	
		ES	X	30.5			L	
6 SEPT	S5	EP	X	18 5 16.5			N	
		ES	Y	39.9			N	
6 SEPT	S10	E	Y	18 50 45.2				
6 SEPT	S8	EP	Z	18 57 9.8	27.8	0.1	L	
		ES	Z	13.0			L	
6 SEPT	S9	EP	P	18 57 10.0			L	
		ES	Y	15.1			L	
6 SEPT	S7	EP	Z	18 57 11.7			L	
		ES	X	17.6			L	
6 SEPT	S6	EP	Z	18 57 13.2			L	
		ES	X	21.3			L	
6 SEPT	S10	E	Y	18 57 17.5				
6 SEPT	S5	EP	Y	18 57 19.3			L	
		ES	X	27.9			L	
6 SEPT	S1	EP	P	19 40 26.4			L	
		ES	Y	35.7			L	

6 SEPT 19 51 12.9 49.66N 176.35E ALEUTIAN EXPLOSION - E4
EXPLOSION DEPTH = 617 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S10	EP	Z	19 51 27.2	247.6	0.5	0.69	40
		ET	P	52 4.5			0.69	40
6 SEPT	S9	EP	Z	19 51 29.6	109.5	0.5	0.88	39
		ET	P	52 18.1			0.88	39
6 SEPT	S8	EP	Z	19 51 31.8	175.3	0.4	1.02	40
		ET	Z	52 28.6			1.02	40
6 SEPT	S7	EP	Z	19 51 35.4	209.1	0.3	1.25	40
		ET	P	52 47.2			1.25	40
6 SEPT	S6	EP	Z	19 51 37.2	999.9		1.42	39
		ET	P	52 57.1			1.42	39
6 SEPT	S4	EP	Z	19 51 40.5	999.9		1.76	39
		ET	P	53 22.0			1.76	39
6 SEPT	S5	-IP	Z	19 51 41.9	328.5	0.5	1.62	40
		ET	P	53 13.5			1.62	40
6 SEPT	S2	EP	Z	19 51 48.9	247.6	0.5	[illegible].13	40
		ET	P	53 52.8			2.13	40
6 SEPT	S1	EP	P	19 51 51.4			2.33	40
		ET	P	54 7.9			2.33	40
6 SEPT	AC-	EP		19 51 54.3			2.57	47
		E		52 23.0			2.57	[illegible]
6 SEPT	ADK	EP		19 52 27.8			4.95	[illegible]
		ES		53 23.6			4.95	61
6 SEPT	AA-	EP		19 52 49.6			6.48	63
6 SEPT	S4	EP	Z	20 21 43.2			L	
		ES	X	55.2			L	
6 SEPT	S10	E	X	21 3 14.6				
6 SEPT	S10	E	X	21 21 7.3				
6 SEPT	S9	EP	Z	22 4 46.2			L	
		ES	Y	51.5			L	
6 SEPT	S8	E.	Z	22 4 46.5			L	
		ES	Z	51.1			L	
6 SEPT	S10	EP	Z	22 4 47.6			L	
		ES	Y	53.7			L	
6 SEPT	S7	EP	[illegible]	22 4 48.0	12.7	0.2	L	
		ES	[illegible]	54.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S6	EP	Z	22 4 50.0	25.3	0.2	L	
		ES	X	58.3			L	
6 SEPT	S5	EP	Z	22 4 53.9	19.0	0.2	L	
		ES	Y	5 4.2			L	
6 SEPT	S10	EP	Z	22 34 .7			N	
		ES	Y	25.0			N	
		E	Y	35 53.0			N	
6 SEPT	S5	EP	Z	22 34 12.2			L	
		ES	Y	28.6			L	
6 SEPT	S9	EP	Z	22 34 17.4			L	
		ES	X	25.3			L	
6 SEPT	S6	E	X	22 34 25.2				
6 SEPT	S7	E	Y	22 34 25.6				
6 SEPT	S8	EP	Z	22 37 22.0	9.5	0.2	L	
		E	Z	23.0			L	
6 SEPT	S9	EP	Z	22 37 23.6			L	
		ES	Y	27.6			L	
6 SEPT	S7	EP	Z	22 37 24.6	6.3	0.2	L	
		[illegible]	Y	35.4			L	
6 SEPT	S10	E	Y	22 37 31.3				
6 SEPT	S7	EP	Z	22 47 50.7			L	
		ES	Y	48 .6			L	
6 SEPT	AEK	EP		22 57 1.8			N	
		ES		58.3			N	
6 SEPT	S2	E	P	22 57 43.2				
6 SEPT	S4	EP	Z	22 57 43.3	15.8	0.2	R	
		ES	Y	59 14.2			R	
6 SEPT	S5	EP	Z	22 57 48.1	53.8	0.4	L	
		ES	Z	58 4.7			L	
6 SEPT	S6	E	Z	22 57 49.3				
6 SEPT	S8	E	Z	22 57 53.4				
6 SEPT	S9	E	Y	22 57 58.0				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S10	E	Y	22 57 58.7				
		E	Y	59 35.9				

6 SEPT 23 10 2.4 49.51N 176.21E ALEUTIAN EXPLOSION - E5
EXPLOSION DEPTH = 604 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S10	EP	Z	23 10 19.3	114.3	0.4	0.87	38
		ET	P	11 5.4			0.87	38
6 SEPT	S9	EP	Z	23 10 21.7	999.9		1.06	38
		ET	P	11 19.1			1.06	38
6 SEPT	S8	EP	Z	23 10 23.9	219.0	0.5	1.19	39
		ET	P	11 29.4			1.19	39
6 SEPT	S7	EP	Z	23 10 27.4	253.4	0.3	1.42	39
		ET	P	11 48.2			1.42	39
6 SEPT	S6	EP	Z	23 10 29.5	999.9		1.59	38
		ET	P	11 58.4			1.59	38
6 SEPT	S4	EP	Z	23 10 32.4			1.94	38
		ET	P	12 23.4			1.94	38
6 SEPT	S5	-IP	Z	23 10 33.9	999.9		1.79	39
		ET	P	12 16.3			1.79	39
6 SEPT	S2	EP	Z	23 10 40.9	189.3	0.5	2.31	39
		ET	P	12 54.1			2.31	39
6 SEPT	S1	EP	P	23 10 43.4			2.51	39
		ET	P	13 9.3			2.51	39
6 SEPT	AC-	EP		23 10 46.3			2.75	46
		E		11 16.0			2.75	46
6 SEPT	ADK	EP		23 11 20.6			5.11	60
		ES		12 15.3			5.11	60
6 SEPT	AA-	EP		23 11 41.4			6.64	62

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
6 SEPT	S1	EP	P	23 35 34.9			L	
		ES	X	39.9			L	
7 SEPT	S4	EP	Z	0 11 12.6			L	
		ES	X	19.8			L	
7 SEPT	S5	EP	Z	0 21 16.9			L	
		ES	Y	24.8			L	
7 SEPT	S2	EP	Z	0 29 .9			L	
		ES	X	14.0			L	
7 SEPT	S1	EP	P	0 29 6.8			L	
		ES	Y	11.9			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S4	EP	Z	0 29 9.7			L	
		ES	X	17.3			L	
7 SEPT	S5	EP	Z	0 29 15.6			L	
		ES	Y	24.9			L	
7 SEPT	S7	EP	Z	0 41 16.7	6.3	0.2	L	
7 SEPT	S8	EP	Z	0 41 18.5	12.7	0.2	L	
		ES	Z	27.7			L	
7 SEPT	S2	E	X	0 45 37.5				
7 SEPT	S4	EP	Z	0 49 18.6			L	
		ES	X	23.4			L	
7 SEPT	S5	EP	Z	0 49 23.7	25.3	0.2	L	
		ES	X	31.3			L	
7 SEPT	S6	E	X	0 49 36.5				
7 SEPT	S1	EP	P	2 21 7.5			L	
		ES	X	12.7			L	
7 SEPT	S4	EP	Z	2 21 8.7			L	
		ES	X	18.6			L	
7 SEPT	S2	EP	Z	2 21 9.0	73.9	0.1	L	
		ES	X	15.3			L	
7 SEPT	S5	EP	Z	2 21 15.0			L	
		E	Y	26.4			L	
7 SEPT	S10	EP	Z	2 34 15.7			L	
		ES	Y	19.8			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	2 36	1.2	49.39N	176.03E ALEUTIAN EXPLOSION - E6 EXPLOSION DEPTH = 621 FT				
7 SEPT	S10	EP	Z	2 36 20.4	182.0	0.5	1.04	39
		ET	P	37 13.4			1.04	39
7 SEPT	S9	EP	Z	2 36 22.6	65.7	0.5	1.23	38
		ET	P	37 30.6			1.23	38
7 SEPT	S8	EP	Z	2 36 24.8	62.0	0.5	1.36	39
		ET	P	37 42.6			1.36	39
7 SEPT	S7	EP	Z	2 36 28.3			1.59	39
		ET	P	37 59.6			1.59	39
7 SEPT	S6	EP	Z	2 36 30.0			1.76	39
		ET	P	37 9.8			1.76	39
7 SEPT	S4	EP	Z	2 36 33.2	999.9		2.11	39
		ET	P	38 35.0			2.11	39
7 SEPT	S5	EP	Z	2 36 34.3	196.6	0.5	1.96	39
		ET	P	38 27.8			1.96	39
7 SEPT	S2	EP	Z	2 36 41.5	40.3	0.4	2.47	39
		ET	P	39 5.6			2.47	39
7 SEPT	S1	EP	P	2 36 44.5			2.67	40
		ET	P	39 21.7			2.67	40
7 SEPT	AC-	EP		2 36 47.3			2.91	45
		E		37 19.0			2.91	45
7 SEPT	ADK	EP		2 37 21.1			5.27	59
		ES		38 17.4			5.27	59
7 SEPT	S8	EP	Z	3 28 24.6			L	
		ES	Z	26.8			L	
7 SEPT	S9	EP	Z	3 28 26.9			L	
		ES	Y	30.7			L	
7 SEPT	S4	EP	Z	3 45 12.7			L	
		ES	X	24.6			L	
7 SEPT	S9	EP	Z	3 46 2.5	63.4	0.2		
		E	Y	5.1				
7 SEPT	S8	EP	Z	3 46 3.6	999.9		L	
7 SEPT	S10	EP	Z	3 46 4.4	75.8	0.2	L	
		ES	Y	8.1			L	
7 SEPT	S7	EP	Z	3 46 7.1	19.0	0.2	L	
		ES	Y	13.2			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S5	EP	Z	3 46 14.0	25.3	0.2	L	
		ES	X	24.0				
7 SEPT	S6	E	X	3 46 20.7				
7 SEPT	S10	E	Y	5 16 48.7				

7 SEPT 6 19 2.7 49.21N 175.85E ALEUTIAN EXPLOSION - E30
EXPLOSION DEPTH = 602 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S10	EP	Z	6 19 24.8	999.9		1.25	38
		ET	P	20 33.8			1.25	38
7 SEPT	S9	EP	Z	6 19 27.0	999.9		1.44	38
		ET	P	20 47.6			1.44	38
7 SEPT	S8	EP	Z	6 19 29.3	146.0	0.5	1.58	38
		ET	P	20 57.9			1.58	38
7 SEPT	S7	EP	Z	6 19 32.5	999.9		1.80	39
		ET	P	21 16.6			1.80	39
7 SEPT	S6	EP	Z	6 19 34.6	101.1	0.2	1.98	38
		ET	P	21 26.8			1.98	38
7 SEPT	S4	EP	Z	6 19 38.6	38.0	0.3	2.32	38
		ET	P	21 51.7			2.32	38
7 SEPT	S5	EP	Z	6 19 39.0	999.9		2.17	39
		ET	P	21 43.1			2.17	39
7 SEPT	S2	EP	Z	6 19 46.1	47.1	0.4	2.69	39
		ET	P	22 22.4			2.69	39
7 SEPT	S1	EP	P	6 19 48.4			2.89	39
		ET	P	22 37.1			2.89	39
7 SEPT	AC-	EP		6 1 54.2			3.13	44
		E		20 27.0			3.13	44
7 SEPT	ADK	EP		6 20 25.0			5.47	58
		ES		21 23.6			5.47	58

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S7	EP	Z	6 48 28.8	15.8	0.2	L	
		ES	Y	37.6			L	
7 SEPT	S9	EP	Z	6 48 30.2			L	
		ES	Y	40.5			L	
7 SEPT	S10	EP	Z	6 48 31.6	55.4	0.1	L	
		ES	Y	42.9			L	
7 SEPT	S5	EP	Z	6 48 31.6	37.9	0.2	L	
		ES	Y	42.5			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S2	EP	Z	6 48 36.3	19.0	0.2	L	
		ES	X	51.4			L	
7 SEPT	S1	EP	P	6 48 37.9			L	
		ES	Y	54.1			L	
7 SEPT	S4	E	Y	6 48 41.5				
		E	P	49 25.3				
7 SEPT	S9	E	Y	6 56 58.1				
7 SEPT	S10	E	Y	6 57 1.8				
7 SEPT	S1	EP	P	7 22 16.8			L	
		ES	X	35.9			L	
7 SEPT	S4	EP	Z	7 22 18.0	53.9	0.2		
		E	X	40.8				
7 SEPT	S2	EP	Z	7 22 18.4	69.5	0.2	N	
		ES	X	39.2			N	
7 SEPT	S5	EP	Z	7 22 23.0	56.[illegible]	0.2	N	
		ES	Y	46.7			N	
7 SEPT	S6	EP	Z	7 22 23.8	25.3	0.2	L	
		E	P	31.2			L	
		ES	X	38.6			L	
7 SEPT	S7	EP	Z	7 22 25.6	25.3	0.2	N	
		E	Z	35.1			N	
		ES	Y	52.3			N	
7 SEPT	S8	EP	Z	7 22 28.1	15.8	0.2	N	
		ES	Z	55.9			N	
7 SEPT	S9	EP	Z	7 22 29.6			N	
		ES	Y	59.8			N	
7 SEPT	S10	EP	Z	7 22 31.8				
		E	Z	49.0				
		E	Y	23 3.9				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI

7 SEPT 7 12 36.6 2.7N 124.3E CELEBES SEA
H = 274 KM MAG = 5.8

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	ADK	EP		7 23 15.2			69.2	35
		E		24 16.5			69.2	35
		E		31 58.6			69.2	35
7 SEPT	S5	L	Z	8 8 23.0				
7 SEPT	S9	EP	Z	8 12 6.3	9.5	0.2		
		ES	Y	9.5				
7 SEPT	S8	EP	Z	8 12 7.2	9.5	0.3	L	
		ES	Z	9.9			L	
7 SEPT	S6	EP	Z	8 12 12.3			L	
		ES	X	20.1			L	
7 SEPT	ADK	IP		8 30 31.5			L	
		IS		43.1			L	
7 SEPT	S2	EP	Z	8 31 17.5	19.0	0.2	N	
		ES	X	32 11.3			N	
7 SEPT	S4	E	X	8 31 18.1				
		E	Y	32 19.0				
7 SEPT	S5	EP	Z	8 31 21.5				
		E	Y	32 9.2				
		E	Y	27.2				
7 SEPT	S7	EP	Z	8 31 22.3			N	
		ES	Y	32 10.0			N	
7 SEPT	S9	EP	Z	8 31 24.5				
		ES	Y	32 17.0				
7 SEPT	S10	EP	Z	8 31 26.6				
		E	X	32 24.1				
7 SEPT	S4	E	X	9 29 41.0				
7 SEPT	S8	E	Z	10 5 21.2				
		E	Z	27.2				
7 SEPT	S7	EP	Z	10 5 26.8			L	
		ES	Y	39.6			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S10	EP	Z	10 59 55.4	999.9		L	
		E	Y	57.0			L	
7 SEPT	S9	EP	Z	10 59 56.2	999.9		L	
		E	X	11 0 .5			L	
7 SEPT	S8	EP	Z	10 59 58.5	999.9		L	
7 SEPT	S7	EP	Z	11 0 2.4	22.2	0.2	L	
		ES	Y	9.6			L	
7 SEPT	S6	EP	Z	11 0 4.4	31.6	0.2	L	
		ES	X	13.8			L	
7 SEPT	S5	EP	Z	11 0 8.6			L	
		ES	Y	19.3			L	
7 SEPT	S4	E	Y	11 0 20.9				
		E	Y	1 2.6				
7 SEPT	S2	E	X	11 0 32.7				
7 SEPT	S4	E	Y	11 13 32.6				

7 SEPT 7 12 36.6 2.7N 124.3E CELEBES SEA
H = 274 KM MAG = 5.8

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S10	EP	Z	11 19 43.1	51.0	0.5	64.9	34
7 SEPT	S8	EP	Z	11 19 43.7	29.2	0.5	65.2	34
7 SEPT	S7	EP	Z	11 19 44.1	25.5	0.5	65.4	34
7 SEPT	ADK	EP		11 19 50.2			69.2	35
7 SEPT	S4	E	X	11 36 34.3				
7 SEPT	S10	EP	Z	11 43 57.4			L	
		ES	X	44 2.2			L	
7 SEPT	S9	E	Y	11 44 5.1				
7 SEPT	S4	E	X	11 48 44.4				
7 SEPT	S2	EP	Z	12 36 19.5			L	
		ES	X	31.8			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S4	E	Y	12 36 35.2				
7 SEPT	S2	EP	Z	12 38 16.5			L	
		ES	X	32.4			L	
7 SEPT	S5	EP	Z	12 38 23.5			L	
		ES	Y	37.9			L	
7 SEPT	S9	EP	Z	12 38 25.8			N	
		ES	Y	49.4			N	
7 SEPT	S4	E	X	12 38 29.3				
7 SEPT	S6	E	X	12 38 40.2				
7 SEPT	S10	E	Y	12 38 52.9				
7 SEPT	S10	E	Y	13 51 45.1				
		E	X	54 12.4				
7 SEPT	S2	E	P	14 56 50.9				
7 SEPT	S10	EP	Z	14 57 52.4			L	
		ES	Y	55.4			L	
7 SEPT	S5	EP	X	15 8 9.6			L	
		ES	Y	11.2			L	

7 SEPT 15 54 37.1 53.0N 166.9W FOX ISLANDS,ALEUTIAN
H = 43 KM MAG = 4.1

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	ADK	EP		15 56 5.6			6.1	263
7 SEPT	S6	EP	Z	15 56 42.6	94.8	0.2	9.7	263
7 SEPT	S1	E	P	15 56 44.8			9.0	266
7 SEPT	S2	EP	Z	15 56 46.9	63.2	0.3	9.1	265
		ES	X	50.0			9.1	265
7 SEPT	S4	EP	Z	15 56 47.1	158.4	0.3	9.5	264
7 SEPT	S5	EP	Z	15 56 51.7	50.6	0.2	9.6	263
7 SEPT	S10	EP	Z	15 57 1.0	69.5	0.3	10.4	261
		E	Y	2.9			10.4	261

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S8	EP	Z	15 56 57.2	148.3	0.4		
		E	P	57 5.3				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S9	EP ES	Z Y	15 56 59.C 57 .8	44.4	0.3	L L	
7 SEPT	S7	EP E	Z Y	15 57 54.6 58 2.8	999.9			
7 SEPT	S10	EP ES	Z Y	16 30 53.9 31 5.8			L L	
7 SEPT	S9	EP ES	Z Y	16 30 59.3 31 4.C			L L	
7 SEPT	S8	E	Z	16 55 11.3				
7 SEPT	S9	EP ES	P Y	17 23 35.4 42.1			L L	
7 SEPT	S6	EP ES	X X	17 23 38.8 45.7			L L	
7 SEPT	S10	E	Y	17 23 45.2				
7 SEPT	S4	E E	Y Y	17 23 50.9 44 33.7				
7 SEPT	S6	EP ES	Z X	17 52 37.8 53 2.3			N N	
7 SEPT	S10	EP ES	Z Y	17 55 30.2 57.1			N N	
7 SEPT	S7	EP ES	Z Y	17 55 31.8 59.1			N N	
7 SEPT	S5	E	Z	17 55 33.6				
7 SEPT	S1	E E	P Y	17 55 38.8 56 20.6				
7 SEPT	S2	E	P	17 55 39.1				
7 SEPT	S4	E	Y	17 55 41.5				
7 SEPT	S9	E	Y	17 56 3.7				
7 SEPT	S9	E	Y	17 57 15.5				
7 SEPT	ACK	IP IS		18 34 17.1 24.C			L L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S10	E	Y	18 57 20.4				
7 SEPT	S6	E	Z	18 57 28.5				
7 SEPT	S10	EP	Z	19 3 45.7			L	
		ES	Y	48.7			L	
7 SEPT	S9	EP	P	19 11 28.7			L	
		ES	Y	36.8			L	
7 SEPT	S8	EP	Z	19 11 30.1			L	
		ES	Z	36.1			L	
7 SEPT	S6	EP	Z	19 11 30.3			L	
		ES	X	46.8			L	
7 SEPT	S7	EP	Z	19 11 31.4	12.7	0.3	L	
		LS	Y	39.4			L	
7 SEPT	S4	EP	Z	19 11 32.2	9.5	0.2	L	
		ES	Y	46.2			L	
		E	P	12 30.0			L	
7 SEPT	S5	EP	Z	19 11 34.1	82.2	0.2	L	
		ES	Y	46.8			L	
7 SEPT	S10	E	Y	19 11 38.0				
7 SEPT	S2	EP	Z	19 11 40.0	19.0	0.2	L	
		ES	X	56.2			L	
7 SEPT	S9	E	Y	19 35 39.9				
7 SEPT	S10	E	Y	19 35 43.0				
7 SEPT	S10	EP	Z	19 59 54.7			L	
		LS	Y	20 0 2.1			L	
7 SEPT	S6	EP	Z	19 59 54.9			L	
		ES	X	20 0 4.4			L	
7 SEPT	S4	EP	Z	19 59 57.2				
		L	Y	20 0 8.9				
7 SEPT	S5	EP	Z	19 59 55.8	19.0	0.2	L	
		ES	Y	20 0 9.6			L	
7 SEPT	S7	E	X	20 0 1.5				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	ADK	IP		20 44 38.6			N	
		IS		57.4			N	
7 SEPT	S8	E	Z	20 45 28.1				
		E	Z	46 21.7				
7 SEPT	S9	EP	Z	20 45 29.5				
		E	Y	46 26.1				
7 SEPT	S10	E	Y	20 45 35.4				
		E	Y	46 29.6				

7 SEPT 20 57 1.3 48.82N 175.31E ALEUTIAN EXPLOSION - E33
EXPLOSION DEPTH = 604 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S10	EP	Z	20 57 29.3	19.0	0.2	1.77	39
		ET	P	59 12.9			1.77	39
7 SEPT	S9	EP	Z	20 57 31.5			1.97	39
		ET	P	59 26.4			1.97	39
7 SEPT	S8	EP	Z	20 57 33.6	15.8	0.2	2.10	39
		ET	P	59 36.9			2.10	39
7 SEPT	S6	EP	Z	20 57 39.0			2.50	39
		ET	P	21 0 6.0			2.50	39
7 SEPT	S7	EP	Z	20 57 36.8	25.5	0.5	2.33	39
		ET	P	59 55.7			2.33	39
7 SEPT	S4	EP	Z	20 57 41.9			2.85	39
		ET	P	21 0 30.9			2.85	39
7 SEPT	S5	EP	Z	20 57 43.4			2.70	39
		ET	P	21 0 22.1			2.70	39
7 SEPT	S2	EP	Z	20 57 53.2			3.21	39
		ET	P	21 1 1.4			3.21	39
7 SEPT	S1	EP	P	20 57 57.2			3.41	39
		ET	P	21 1 16.7			3.41	39
7 SEPT	SQ-	EP		20 58 2.5			3.98	349
7 SEPT	ADK	E		20 58 22.6			5.98	56

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S8	E	Z	21 44 49.6				
		E	Z	52.2				
7 SEPT	S7	EP	Z	21 44 52.4			L	
		ES	Y	57.8			L	
7 SEPT	S9	E	Y	21 44 53.9				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
7 SEPT	S4	EP	Z	22 1 4.3	19.0	0.2	L	
		ES	X	8.3			L	
7 SEPT	S5	EP	Z	22 1 7.7			L	
		ES	Y	12.3			L	
7 SEPT	S6	E	X	22 1 20.4				
7 SEPT	S4	E	X	22 29 25.5				
7 SEPT	S7	EP	Z	23 46 26.7			L	
		ES	Y	44.0			L	
		E	P	47 52.3			L	
7 SEPT	S8	EP	Z	23 46 27.2	12.7	0.2	L	
		ES	Z	43.2			L	
7 SEPT	S9	EP	Z	23 46 27.3			L	
		ES	X	45.8			L	
		E	Y	48 9.7			L	
7 SEPT	S10	EP	Z	23 46 28.3	19.0	0.3	N	
		ES	Y	46.5			N	
		E	P	48 6.0			N	
7 SEPT	S5	EP	Z	23 46 31.3			L	
		ES	Y	40.9			L	
7 SEPT	S4	E	X	23 46 31.5				
		E	X	49.0				
7 SEPT	S2	EP	X	23 46 32.4			N	
		ES	X	57.2			N	
7 SEPT	S6	E	X	23 46 43.9				
8 SEPT	S6	EP	Z	0 17 31.3			L	
		ES	X	41.9			L	
8 SEPT	S5	EP	Z	0 17 34.4			L	
		ES	Y	46.3			L	
8 SEPT	S4	E	X	0 17 44.8				
		E	X	18 41.0				
8 SEPT	S8	EP	Z	0 41 11.1	31.7	0.3	L	
		ES	Z	16.9			L	
8 SEPT	S9	EP	Z	0 41 11.7	28.5	0.3	L	
		ES	Y	18.8			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S7	EP	Z	0 41 11.8	12.7	0.2	L	
		E	Z	14.5			L	
		ES	Y	18.4			L	
8 SEPT	S6	EP	Z	0 41 13.3			L	
		ES	X	19.8			L	
8 SEPT	S10	EP	Z	0 41 13.7			L	
		ES	Y	21.3			L	
8 SEPT	S4	EP	Z	0 41 15.4	9.5	0.3	L	
		ES	X	23.2			L	
		E	P	57.4			L	
8 SEPT	S2	EP	Z	0 41 23.7			L	
		ES	X	38.3			L	
8 SEPT	S1	EP	X	0 41 26.7			L	
		ES	X	41.3			L	
8 SEPT	S5	EP	Z	0 41 26.8	37.9	0.2	L	
		ES	Z	37.3			L	
8 SEPT	S10	EP	Z	0 44 44.5			L	
		ES	Y	47.5			L	
8 SEPT	S1	E	X	0 56 51.9				
8 SEPT	S8	EP	Z	1 58 59.2			L	
		ES	Z	59 5.7			L	
8 SEPT	S9	EP	Z	1 58 59.8			L	
		ES	Y	59 7.0			L	
8 SEPT	S7	EP	Z	1 58 59.9			L	
		ES	Y	59 6.7			L	
8 SEPT	S10	EP	Z	1 59 1.9			L	
		ES	Y	9.3			L	
		E	Y	33.6			L	
8 SEPT	S4	EP	Z	1 59 4.7				
		E	Y	14.9				
		E	X	52.8				
8 SEPT	S5	EP	Z	1 59 5.1			L	
		ES	Y	15.2			L	
8 SEPT	S6	E	Z	1 59 11.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S7	EP	Z	2 29 21.7			L	
		ES	X	31.8			L	
8 SEPT	S6	EP	Z	2 29 22.3	19.0	0.2	L	
		ES	X	33.8			L	
8 SEPT	S5	EP	Z	2 29 25.2			L	
		ES	Y	38.3			L	
8 SEPT	S10	E	X	2 29 33.3				
8 SEPT	S4	E	X	2 29 36.8				
		E	X	30 28.5				

8 SEPT 2 35 1.9 48.97N 175.40E ALEUTIAN EXPLOSION - E32
EXPLOSION DEPTH = 616 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S10	EP	Z	2 35 28.8	138.4	0.5	1.62	40
		ET	P	37 3.1			1.62	40
8 SEPT	S9	EP	Z	2 35 30.9	37.1	0.4	1.82	40
		LT	P	37 15.3			1.82	40
8 SEPT	S8	EP	Z	2 35 32.9	63.4	0.3	1.95	40
		ET	P	37 27.4			1.95	40
8 SEPT	S7	EP	Z	2 35 36.6	40.4	0.4	2.18	40
		LT	P	37 44.5			2.18	40
8 SEPT	S6	EP	Z	2 35 38.2			2.35	40
		ET	P	37 56.3			2.35	40
8 SEPT	S2	EP	P	2 35 39.7			3.06	40
		ET	P	38 51.6			3.06	40
8 SEPT	S4	EP	Z	2 35 41.2			2.70	39
		LT	P	38 20.0			2.70	39
8 SEPT	S5	EP	Z	2 35 42.8	121.0	0.4	2.55	40
		ET	P	38 12.2			2.55	40
8 SEPT	S1	EP	P	2 35 42.3			3.26	40
		ET	P	39 6.4			3.26	40
8 SEPT	SO-	EP		2 36 .7			3.66	348
8 SEPT	BO-	EP		2 39 4.5			17.51	39
		E		26.0			17.51	39

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S9	EP	Z	2 39 57.1	999.9		L	
		ES	Y	40 9.6			L	
8 SEPT	ADK	IP		2 40 34.9			N	
		IS		41 13.4			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S10	EP	Z	2 58 25.1			L	
		ES	Y	27.9			L	
8 SEPT	S10	IP	Z	3 29 27.2	126.4	0.2	L	
		E	Y	29.6			L	
8 SEPT	S9	EP	Z	3 29 29.1	25.3	0.2	L	
		ES	Y	33.2			L	
8 SEPT	S5	EP	X	3 29 31.4			N	
		ES	X	54.5			N	
8 SEPT	S8	EP	Z	3 29 31.7	133.1	0.2	L	
		E	Z	36.4			L	
		E	Z	48.7			L	
8 SEPT	S7	EP	Z	3 29 37.8			L	
		ES	Y	43.7			L	
8 SEPT	S10	EP	Z	5 1 51.4				
		E	Y	2 2.4				
		E	X	31.0				
		E	Y	3 40.7				
8 SEPT	S8	EP	Z	5 1 52.1			N	
		ES	Z	2 28.2			N	
		E	Z	4 51.4			N	
8 SEPT	S6	EP	Z	5 1 53.7			N	
		ES	X	2 30.5			N	
8 SEPT	S9	EP	Z	5 1 54.2			N	
		ES	Y	2 28.0			N	
8 SEPT	S7	EP	Z	5 1 56.7	9.5	0.3	N	
		E	Y	2 11.5			N	
		ES	X	33.2			N	
8 SEPT	S5	E	Z	5 1 57.1				
8 SEPT	S4	E	X	5 1 58.3				
		E	Y	2 12.7				
		E	Y	58.0				
8 SEPT	S2	EP	Z	5 1 59.7			L	
		ES	[illegible]	2 13.2			L	
8 SEPT	S1	E	P	5 2 1.1				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S7	EP	Z	5 11 54.9			L	
		ES	Y	12 4.7			L	
8 SEPT	S5	EP	Z	5 11 55.7			L	
		ES	Y	12 7.3			L	
8 SEPT	S4	E	X	5 11 58.8				
8 SEPT	S10	EP	Z	5 11 59.9			L	
		ES	Y	12 13.2			L	
8 SEPT	S1	EP	P	5 51 6.9			L	
		ES	Y	17.4			L	
8 SEPT	S2	EP	Z	5 51 10.9			L	
		ES	X	21.2			L	

8 SEPT 6 5 2.0 49.17N 179.64E ALEUTIAN EXPLOSION - E31
EXPLOSION DEPTH = 620 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S10	EP	Z	6 5 26.1	999.9		1.37	41
		ET	P	6 45.7			1.37	41
8 SEPT	S9	EP	Z	6 5 28.2	999.9		1.56	40
		ET	P	6 57.6			1.56	40
8 SEPT	S8	EP	Z	6 5 30.5	175.2	0.5	1.70	41
		ET	P	7 8.1			1.70	41
8 SEPT	S7	EP	Z	6 5 33.9	47.5	0.3	1.92	41
		ET	P	7 26.7			1.92	41
8 SEPT	S6	EP	Z	6 5 34.1			2.09	40
		ET	P	7 37.0			2.09	40
8 SEPT	S4	EP	Z	6 5 38.8			2.44	40
		ET	P	8 1.9			2.44	40
8 SEPT	S5	EP	Z	6 5 40.3	999.9		2.29	40
		ET	P	7 55.2			2.29	40
8 SEPT	S2	EP	Z	6 5 47.2			2.81	40
		ET	P	8 32.7			2.81	40
8 SEPT	S1	EP	P	6 5 50.5			3.01	40
		ET	P	8 48.4			3.01	40
8 SEPT	AC-	EP		6 5 54.8			3.25	45
		E		6 28.0			3.25	45

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S8	E	Z	6 32 12.5				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S8	EP	Z	6 33 33.5			L	
		ES	Z	35.5			L	
8 SEPT	S2	E	X	7 16 3.2				
8 SEPT	S4	E	X	7 16 8.7				
8 SEPT	S4	EP	Z	7 54 18.7	19.0	0.2	L	
8 SEPT	S9	EP	Z	8 1 48.5			L	
		ES	Y	2 1.6			L	
8 SEPT	S8	EP	Z	8 1 48.6			L	
		ES	Z	54.5			L	
8 SEPT	S7	EP	Z	8 1 49.3			L	
		ES	Y	55.4			L	
8 SEPT	S6	E	X	8 1 50.3				
8 SEPT	S10	EP	Z	8 1 51.7			L	
		ES	Y	58.2			L	
8 SEPT	S5	EP	X	8 1 55.3			L	
		ES	Y	2 3.9			L	
8 SEPT	S2	EP	Z	9 8 56.2	12.6	0.2	L	
		ES	X	9 2.6			L	
8 SEPT	S1	E	X	10 31 39.5				
		E	Y	56.2				
8 SEPT	S2	EP	Z	10 31 42.0	126.4	0.2	N	
		ES	X	32 1.2			N	
8 SEPT	S4	EP	Z	10 31 42.2	69.7	0.2	N	
		ES	Y	32 2.9			N	
8 SEPT	S5	EP	Z	10 31 47.3	56.9	0.2	N	
		ES	Z	32 9.9			N	
8 SEPT	S6	EP	Z	10 31 48.6	63.2	0.2	N	
		ES	X	32 14.5			N	
8 SEPT	S7	EP	Z	10 31 50.7	999.9			
		E	Y	52.4				
		E	X	32 16.3				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S8	EP	Z	10 31 53.3	999.9			
		E	Z	32 1.7				
		E	Z	19.8				
8 SEPT	S9	EP	Z	10 31 54.9	12.7	0.2	N	
		ES	Y	32 23.8			N	
8 SEPT	S10	EP	Z	10 31 57.0	19.0	0.2		
		E	Y	32 27.2				
8 SEPT	S8	EP	Z	10 47 30.8			L	
		E	Z	36.6			L	
		E	Z	48.7			L	
8 SEPT	S9	EP	Z	10 47 31.2	5.0	0.2	L	
		ES	Y	37.7			L	
8 SEPT	S7	EP	Z	10 47 31.9			L	
		ES	Y	38.3			L	
8 SEPT	S10	EP	P	10 47 33.0				
		E	Y	41.0				
		E	X	48 5.4				
8 SEPT	S5	EP	Z	10 47 36.5			L	
		ES	Y	46.3			L	
8 SEPT	S4	E	X	10 47 46.2				
8 SEPT	S2	E	Z	11 42 55.6				
8 SEPT	S2	EP	Z	13 2 5.4			N	
		ES	X	32.8			N	
8 SEPT	S10	EP	Z	13 7 48.9			L	
		ES	Y	8 4.2			L	
8 SEPT	S8	EP	Z	13 7 51.1				
		E	Z	8 6.7				
		E	Z	9 15.9				
8 SEPT	S7	EP	Z	13 7 53.1			L	
		ES	Y	8 10.2			L	
8 SEPT	S6	EP	Z	13 7 53.8	25.3	0.2	L	
		ES	X	8 2.7			L	
8 SEPT	S5	EP	Z	13 7 57.6	31.6	0.2	N	
		ES	Y	8 18.3			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S10	EP	Z	14 11 29.2	19.0	0.2	L	
		E	Z	31.1			L	
		ES	Y	32.3			L	
8 SEPT	S9	EP	Z	14 11 31.2			L	
		ES	Y	35.9			L	
8 SEPT	S10	EP	Z	14 22 54.3			L	
		E	Z	56.2			L	
		ES	Y	57.4			L	
8 SEPT	S9	EP	Z	14 22 56.1			L	
		ES	Y	23 1.2			L	
8 SEPT	S4	E	Y	14 25 46.8				
8 SEPT	S2	EP	Z	14 50 21.3			L	
		ES	X	27.0			L	
8 SEPT	S5	EP	Y	14 50 28.4			L	
		ES	Y	38.0			L	
8 SEPT	S4	E	X	14 50 30.0				
8 SEPT	S10	E	Y	15 20 43.5				
8 SEPT	S6	EP	Z	15 27 15.3			L	
		ES	X	25.3			L	
8 SEPT	S10	E	Y	15 27 24.9				
		E	X	28 41.2				
8 SEPT	S8	EP	Z	16 1 33.4	12.7	0.3	L	
		ES	Z	35.4			L	
8 SEPT	S4	EP	Z	16 20 7.7			L	
		ES	X	17.3			L	
8 SEPT	S5	EP	Z	16 20 13.8			L	
		ES	Y	25.4			L	
8 SEPT	S10	E	Y	16 54 59.0				
8 SEPT	S5	E	Y	17 1 56.1				
8 SEPT	S10	E	Y	17 4 36.1				
		E	X	6 8.0				
8 SEPT	S5	EP	Z	17 40 30.6			L	
		ES	Y	42.0			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S7	E	X	17 40 37.6				
8 SEPT	S9	E	Y	17 40 38.5				
8 SEPT	S10	E	Y	17 40 41.0				
8 SEPT	S4	EP	Z	17 46 2.8			N	
		ES	Y	25.6			N	
8 SEPT	S2	EP	Z	17 46 5.5	19.0	0.2	N	
		ES	X	25.5			N	
8 SEPT	S5	EP	Z	17 46 8.2			N	
		ES	Y	31.0			N	
8 SEPT	S6	E	X	17 46 34.8				
8 SEPT	S10	E	Y	17 46 44.6				
8 SEPT	S10	EP	Z	17 54 48.8	10.1	0.2	L	
		ES	Y	51.5			L	
8 SEPT	S10	-IP	Z	18 13 16.2	63.2	0.2	L	
		ES	Y	19.6			L	
8 SEPT	S9	EP	Z	19 5 51.3			L	
		ES	Y	53.3			L	
8 SEPT	S10	EP	Z	19 14 11.2			L	
		ES	Y	13.6			L	
8 SEPT	S9	EP	Z	19 45 52.7			L	
		ES	Y	56.0			L	
8 SEPT	S10	EP	Z	19 45 54.0	12.6	0.2	L	
		ES	Y	59.4			L	
8 SEPT	S8	E	Z	19 45 56.4				
8 SEPT	S7	EP	Z	19 45 56.8			L	
		ES	Y	46 1.5			L	
8 SEPT	S6	EP	Z	19 45 56.9			L	
8 SEPT	S5	EP	P	19 46 1.2			L	
		ES	Y	11.2			L	
8 SEPT	S7	EP	Z	19 50 55.6	15.8	0.2	L	
		ES	Y	51 4.4			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S6	EP	Z	19 50 55.7	83.2	0.1	L	
		ES	X	51 6.6			L	
8 SEPT	S4	EP	Z	19 50 55.9			L	
		ES	Y	51 7.8			L	
8 SEPT	S8	EP	Z	19 50 56.0	9.5	0.3		
		E	Z	51 4.8				
		E	Z	44.7				
8 SEPT	S9	EP	Z	19 50 56.5	19.0	0.3	L	
		ES	Y	51 6.9			L	
8 SEPT	S10	EP	Z	19 50 58.3	31.6	0.2	L	
		ES	Y	51 9.4			L	
8 SEPT	S5	EP	Z	19 50 58.4	31.6	0.2	L	
		ES	Y	51 7.3			L	
8 SEPT	S2	EP	Z	19 51 2.9	25.3	0.2	L	
		ES	X	17.9			L	
		E	P	52 9.9			L	
8 SEPT	S9	EP	Z	20 14 9.4			L	
		ES	Y	13.2			L	
8 SEPT	S10	EP	P	20 14 11.3			L	
		ES	Y	16.3			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	20 45	2.7	50.07N	176.87E ALEUTIAN EXPLOSION - E1 EXPLOSION DEPTH = 619 FT				
8 SEPT	S10	EP	Z	20 45 9.3	999.9		0.16	42
		ET	P	15.0			0.16	42
8 SEPT	S9	EP	Z	20 45 11.9	999.9		0.35	40
		ET	P	26.9			0.35	40
8 SEPT	S8	EP	Z	20 45 14.5	999.9		0.49	42
		ET	P	39.2			0.49	42
8 SEPT	S7	EP	Z	20 45 18.3	255.5	0.5	0.72	42
9		ET	P	56.3			0.72	42
8 SEPT	S6	EP	Z	20 45 20.2	999.9		0.89	40
		ET	P	46 8.4			0.89	40
8 SEPT	S4	EP	Z	20 45 23.5			1.23	40
8 SEPT	S1	EP	P	20 45 16.5			1.80	41
		ET	P	47 17.7			1.80	41
8 SEPT	S5	EP	Z	20 45 24.7	999.9		1.09	41
		ET	P	46 24.2			1.09	41
8 SEPT	S2	EP	Z	20 45 31.9	47.1	0.4	1.60	41
		ET	P	47 3.1			1.60	41
8 SEPT	AC-	EP		20 45 36.3			2.05	49
		E		46 1.0			2.05	49
8 SEPT	ADK	EP		20 46 11.1			4.47	64
		E		47 1.9			4.47	64
8 SEPT	S10	EP	Z	21 4 4.0	27.7	0.1	L	
		ES	Y	6.4			L	
8 SEPT	S9	EP	Z	21 25 12.8			L	
		ES	Y	18.0			L	
8 SEPT	S8	EP	Z	21 25 12.9			L	
		ES	Z	16.8			L	
8 SEPT	S7	EP	Z	21 25 16.4			L	
		E	Z	19.3			L	
		ES	X	20.9			L	
8 SEPT	S5	EP	Z	21 25 20.3			L	
		ES	Y	30.5			L	
8 SEPT	S10	E	Y	21 25 20.5				
8 SEPT	S6	E	X	21 25 24.4				
8 SEPT	S4	E	X	21 25 30.2				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S2	EP	Z	21 44 31.3	189.6	0.2	N	
		ES	Y	45 1.8			N	
8 SEPT	S4	EP	Z	21 52 47.0			L	
		ES	Y	51.0			L	

8 SEPT 21 53 46.8 52.3N 179.6W ANDREANOF IS,ALEUTIAN
H = 251 KM MAG = 4.3

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	ADK	IP		21 54 28.8			1.9	102
		IS		58.3			1.9	102
8 SEPT	S1	EP	X	21 54 29.8			1.4	230
8 SEPT	S4	EP	Z	21 54 30.9	999.9		1.9	229
8 SEPT	S5	EP	Z	21 54 35.8	999.9		2.1	228
8 SEPT	S7	EP	Z	21 54 38.3	999.9		2.4	227
8 SEPT	S6	E	Z	21 54 39.3			2.3	228
8 SEPT	S9	EP	Z	21 54 42.0	999.9		2.8	227
		E	Y	43.5			2.8	227
		E	P	55 22.1			2.8	227
8 SEPT	S10	IP	Z	21 54 44.2	999.9		3.0	226

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S7	EP	Z	22 7 34.1			L	
		ES	Y	50.8			L	
		E	P	8 58.7			L	
8 SEPT	S8	EP	Z	22 7 34.6	19.0	0.2	L	
		ES	Z	51.6			L	
		E	P	9 12.5			L	
8 SEPT	S9	EP	Z	22 7 35.0	9.5	0.3	L	
		E	Z	42.0			L	
		ES	Y	52.3			L	
		E	P	9 13.3			L	
8 SEPT	S4	EP	Z	22 7 35.5			N	
		ES	X	8 1.3			N	
8 SEPT	S10	EP	Z	22 7 35.8	25.3	0.3	L	
		E	X	53.8			L	
		E	X	9 6.9			L	
8 SEPT	S6	EP	Z	22 7 36.9			L	
		ES	X	50.9			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S5	EP	Z	22 7 37.4				
8 SEPT	S2	E	Z	22 7 38.9				

8 SEPT 22 30 7.8 50.08N 176.87E ALEUTIAN EXPLOSION - E34
EXPLOSION DEPTH = 1037 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S10	IP	Z	22 30 9.2	214.9	0.3	0.16	43
		ET	P	15.1			0.16	43
8 SEPT	S9	EP	Z	22 30 11.9	999.9		0.35	40
		ET	P	25.8			0.35	40
8 SEPT	S8	EP	Z	22 30 14.5	999.9		0.49	42
		ET	P	39.3			0.49	42
8 SEPT	S7	EP	Z	22 30 18.2	95.0	0.3	0.71	42
9		ET	P	56.2			0.71	42
8 SEPT	S6	EP	Z	22 30 20.2	999.9		0.89	40
		ET	P	31 8.3			0.89	40
8 SEPT	S4	EP	Z	22 30 23.2	50.7	0.2	1.23	40
		ET	P	31 31.7			1.23	40
8 SEPT	S5	EP	Z	22 30 24.8	94.8	0.3	1.08	41
		ET	P	31 24.2			1.08	41
8 SEPT	S1	EP	P	22 30 34.6			1.80	41
		ET	P	32 13.3			1.80	41
8 SEPT	S2	EP	Z	22 30 32.0	37.9	0.3	1.60	41
		ET	P	32 2.7			1.60	41
8 SEPT	AC-	EP		22 30 37.5			2.05	49
8 SEPT	SW-	EP		22 30 56.3			3.17	328

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	S5	EP	Z	22 41 21.7			L	
		ES	X	32.4			L	
8 SEPT	S1	EP	P	22 41 24.3			L	
		ES	Y	39.0			L	
8 SEPT	S4	E	X	22 41 24.4				
		E	X	38.8				
8 SEPT	S9	EP	Z	22 41 24.5			L	
		ES	X	41.2			L	
8 SEPT	S8	EP	Z	22 46 22.4	273.1	1.0	T	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI

8 SEPT 22 37 39.5 12.2N 140.8E WEST CAROLINE ISLANDS
H = 27 KM MAG = 5.3

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
8 SEPT	ACK	EP		22 46 50.7			52.3	32
		E		54 10.6			52.3	32
8 SEPT	S2	E	P	23 39 35.1				
9 SEPT	S10	EP	Z	0 13 20.6			L	
		ES	X	26.5			L	
9 SEPT	S4	EP	Z	0 55 53.9	31.7	0.2	L	
		ES	X	58.7			L	
9 SEPT	S5	EP	Z	0 55 58.2			L	
		ES	Y	56 3.3			L	
9 SEPT	S2	EP	Z	0 56 1.0	12.6	0.2	L	
		ES	X	8.0			L	

9 SEPT 1 0 1.4 50.08N 176.85E ALEUTIAN EXPLOSION - E35
EXPLOSION DEPTH = 324 FT

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S10	IP	Z	1 0 8.1	999.9		0.16	45
		ET	P	14.9			0.16	45
9 SEPT	S9	EP	Z	1 0 10.9	999.9		0.35	41
		ET	P	28.5			0.35	41
9 SEPT	S7	EP	Z	1 0 17.2	79.2	0.3	0.72	43
10		ET	P	58.1			0.72	43
9 SEPT	S6	EP	Z	1 0 19.2	101.1	0.3	0.89	41
		ET	P	1 8.0			0.89	41
9 SEPT	S4	EP	Z	1 0 22.1	31.7	0.3	1.23	40
		ET	P	1 32.3			1.23	40
9 SEPT	S5	EP	Z	1 0 23.7	999.9		1.09	42
		ET	P	1 23.9			1.09	42
9 SEPT	S1	EP	P	1 0 33.7			1.80	41
		ET	P	2 18.2			1.80	41
9 SEPT	S2	EP	Z	1 0 40.9	44.2	0.3	1.60	41
		ET	P	2 2.8			1.60	41
9 SEPT	ADK	EP		1 1 11.1			4.47	64

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S5	LP	Z	1 22 42.4			L	
		ES	Y	50.3			L	
9 SEPT	S4	EP	Z	1 53 13.9	25.3	0.2		
		L	X	36.8				
9 SEPT	S9	EP	Z	1 53 14.9	19.0	0.2	N	
		E	Z	22.3			N	
		ES	Y	39.3			N	
		E	P	54 53.2			N	
9 SEPT	S8	EP	Z	1 53 15.0	15.8	0.2	N	
		ES	Z	38.3			N	
9 SEPT	S7	EP	Z	1 53 15.1	9.5	0.3	N	
		E	Z	16.6			N	
		E	Z	18.6			N	
		ES	Y	39.1			N	
9 SEPT	S6	EP	Z	1 53 15.4			L	
		ES	X	25.8			L	
9 SEPT	S10	EP	Z	1 53 15.4	132.7	0.2		
		E	Y	36.8				
		E	X	54 57.6				
9 SEPT	S5	EP	Z	1 53 16.6				
9 SEPT	S2	EP	Z	1 53 19.7				
		E	X	49.8				
9 SEPT	S1	L	P	1 53 21.9				
9 SEPT	ADK	E		1 53 59.5				
		I		55 8.8				
9 SEPT	S9	EP	Z	1 59 47.5			L	
		ES	X	50.7			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	3 15	12.7	53.4N	167.5W	FOX ISLANDS,ALEUTIAN			
				H =	33 KM	MAG = 4.1		
9 SEPT	ADK	IP		3 16 38.4			5.8	258
		ES		17 46.2			5.8	258
9 SEPT	S4	EP	Z	3 17 19.1			9.2	261
		ES	Y	35.1			9.2	261
9 SEPT	S2	EP	Z	3 17 20.1	19.0	0.2	8.8	262
		ES	X	34.2			8.8	262
9 SEPT	S6	EP	Z	3 17 23.4			9.5	260
		ES	X	34.1			9.5	260
9 SEPT	S5	EP	Z	3 17 23.8			9.3	260
9 SEPT	S7	EP	Z	3 17 28.7			9.6	259
		ES	Y	47.0			9.6	259
9 SEPT	S9	EP	Z	3 17 31.4			9.9	258
		E	X	34.2			9.9	258
		E	Y	19 18.3			9.9	258
9 SEPT	S10	E	Y	3 17 35.5			10.1	258
		E	X	19 24.5			10.1	258
9 SEPT	S10	E	Y	3 24 21.9				
9 SEPT	S4	EP	Z	3 47 12.0			N	
		ES	Y	37.7			N	
9 SEPT	S7	EP	Z	3 47 14.0	9.5	0.2	L	
		ES	Y	29.9			L	
		E	P	48 32.7			L	
9 SEPT	S8	EP	Z	3 47 14.6	19.0	0.3	L	
		ES	Z	30.9			L	
9 SEPT	S9	EP	Z	3 47 15.0				
		E	X	30.3				
		E	Y	48 51.8				
9 SEPT	S6	EP	Z	3 47 16.2			L	
		ES	X	30.5			L	
9 SEPT	S10	EP	Z	3 47 16.4	37.9	0.3	L	
		ES	X	34.1			L	
		E	P	48 53.0			L	
9 SEPT	S5	EP	Z	3 47 16.8				
9 SEPT	S2	EP	Z	3 47 17.8	37.9	0.2	N	
		ES	X	43.5			N	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S1	EP	P	3 47 20.0			N	
		LS	Y	42.1			N	
9 SEPT	S8	EP	Z	3 57 29.3	145.7	0.3		
		E	Z	34.9				
9 SEPT	S9	EP	Z	3 57 29.8	88.7	0.3	L	
		E	X	31.4			L	
9 SEPT	S7	EP	Z	3 57 30.3	50.7	0.3	L	
		ES	Y	37.1			L	
9 SEPT	S6	EP	Z	3 57 31.8	126.4	0.3		
9 SEPT	S10	EP	Z	3 57 31.8	88.5	0.3	L	
		E	Y	36.4			L	
9 SEPT	S4	EP	Z	3 57 33.9	53.9	0.2	L	
		ES	X	40.8			L	
9 SEPT	S5	EP	Z	3 57 35.5	189.6	0.3	L	
		ES	Z	45.9			L	
9 SEPT	S2	EP	Z	3 57 42.2	63.2	0.2	L	
		ES	X	56.9			L	
9 SEPT	S1	EP	P	3 57 44.3			L	
		ES	X	59.9			L	
9 SEPT	S7	E	X	4 37 35.2				
9 SEPT	S10	E	Z	4 37 36.0				
9 SEPT	S9	EP	Z	4 42 23.8			L	
		ES	Y	30.6			L	
9 SEPT	S7	EP	Z	4 42 24.5			L	
		ES	X	31.4			L	
		E	P	43.7			L	
9 SEPT	S6	EP	Z	4 42 25.9				
9 SEPT	S10	EP	Z	4 42 26.4			L	
		ES	Y	33.6			L	
9 SEPT	S4	EP	Z	4 42 28.1			L	
		ES	Y	39.6			L	
9 SEPT	S5	EP	Z	4 42 30.0			L	
		ES	X	40.2			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	4 45	1.5	50.06N	176.91E	ALEUTIAN EXPLOSION - E36			
					EXPLOSION DEPTH = 159 FT			
9 SEPT	S10	IP	Z	4 45 8.0	999.9		0.16	30
		ET	P	13.3			0.16	30
9 SEPT	S9	EP	Z	4 45 10.6	999.9		0.35	34
		ET	P	26.9			0.35	34
9 SEPT	S8	EP	Z	4 45 13.2	104.5	0.3	0.48	38
		ET	P	37.3			0.48	38
9 SEPT	S7	EP	Z	4 45 16.9	117.2	0.3	0.71	39
		ET	P	56.5			0.71	39
9 SEPT	S6	EP	Z	4 45 19.1	120.1	0.2	0.88	38
		ET	P	46 6.6			0.88	38
9 SEPT	S4	EP	Z	4 45 22.1	47.5	0.3	1.23	38
		ET	P	46 31.1			1.23	38
9 SEPT	S5	EP	Z	4 45 23.4	126.4	0.3	1.08	39
		ET	P	24.5			1.08	39
9 SEPT	S2	EP	Z	4 45 30.8	31.6	0.2	1.60	40
		ET	P	47 1.3			1.60	40
9 SEPT	S1	EP	P	4 45 33.5			1.80	40
		ET	P	3 47 17.0			1.80	40
9 SEPT	AC-	EP		4 45 36.3			2.04	48
9 SEPT	ADK	EP		4 46 11.0			4.45	64
9 SEPT	S4	E	X	5 8 42.8				
		E	Y	53.0				
9 SEPT	S1	EP	P	5 30 58.2			L	
		ES	X	32 11.1			L	
9 SEPT	S5	EP	X	5 31 10.8			N	
		ES	Y	29.6			N	
9 SEPT	S4	E	X	5 31 20.8				
9 SEPT	S7	E	Y	5 31 36.9				
9 SEPT	S5	E	Y	5 39 48.9				
9 SEPT	S10	E	Y	5 50 5.8				
9 SEPT	ADK	EP		6 24 13.0				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	6 45 .6	50.06N	176.88E	ALEUTIAN EXPLOSION - F37				
				EXPLOSION DEPTH = 71 FT				
9 SEPT	S10	IP	Z	6 45 7.8	999.9		0.17	37
		ET	P	14.3			0.17	37
9 SEPT	S9	EP	Z	6 45 10.2	999.9		0.36	37
		ET	P	28.0			0.36	37
9 SEPT	S8	EP	Z	6 45 12.7	85.5	0.3	0.49	40
		ET	P	38.4			0.49	40
9 SEPT	S7	EP	Z	6 45 16.5	25.3	0.3	0.72	41
10		ET	P	57.6			0.72	41
9 SEPT	S6	EP	Z	6 45 18.7	75.8	0.2	0.89	39
		ET	P	46 7.7			0.89	39
9 SEPT	S4	EP	Z	6 45 21.5	12.7	0.3	1.24	39
		ET	P	46 32.3			1.24	39
9 SEPT	S5	EP	Z	6 45 23.0	63.2	0.2	1.09	40
		ET	P	46 23.5			1.09	40
9 SEPT	S2	EP	Z	6 45 30.4	19.0	0.2	1.61	40
		ET	P	47 2.5			1.61	40
9 SEPT	S1	EP	P	6 45 32.9			1.81	40
		ET	P	47 18.3			1.81	40
9 SEPT	ADK	EP		6 46 6.6				
9 SEPT	S4	E	X	7 0 23.3				
9 SEPT	S10	EP	Z	7 6 14.9			L	
		ES	X	19.2			L	
9 SEPT	S9	EP	Z	7 6 16.6			L	
		ES	X	21.9			L	
9 SEPT	S8	EP	Z	7 6 18.4	15.8	0.3	L	
		ES	Z	23.7			L	
9 SEPT	S7	EP	Z	7 6 21.8			L	
		ES	Y	30.7			L	
9 SEPT	S4	EP	Z	7 8 52.5			L	
		ES	X	59.0			L	
9 SEPT	S10	EP	Z	7 53 34.2			L	
		ES	Y	39.7			L	
9 SEPT	S9	EP	Z	7 53 35.6	5.0	0.2	L	
		ES	Y	41.8			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S8	EP	Z	7 53 37.7	6.3	0.3	L	
		ES	Z	44.0			L	
9 SEPT	S7	EP	Z	7 53 40.7			L	
		ES	Y	50.5			L	
9 SEPT	S6	EP	Z	7 53 42.4			L	
		ES	X	54.6			L	
9 SEPT	S5	EP	X	7 53 48.5			L	
		ES	X	54 1.1			L	
9 SEPT	S4	E	X	7 54 .3				
9 SEPT	ADK	IP		8 4 14.5			L	
		IS		22.8			L	
9 SEPT	S5	EP	X	8 4 39.6			N	
		ES	Y	5 5.0			N	
9 SEPT	S1	EP	P	8 4 48.6			N	
		ES	Y	5 23.3			N	
9 SEPT	S2	EP	Z	8 4 51.4	31.6	0.2	N	
		ES	X	5 32.7			N	
9 SEPT	S6	EP	Z	8 4 55.9			N	
		ES	X	5 38.9			N	
9 SEPT	S8	EP	Z	8 4 59.2				
		E	Z	5 43.7				
9 SEPT	S7	EP	Z	8 4 59.2				
		E	Y	5 15.9				
		E	Y	53.7				
9 SEPT	S4	E	Y	8 5 .6				
		E	Y	27.5				
9 SEPT	S9	EP	Z	8 5 2.2	9.5	0.2		
		E	Y	45.4				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI

9 SEPT 8 37 50.4 18.0N 145.5E MARIANA ISLANDS
H = 241 KM MAG = 5.2

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S8	EP	Z	8 45 13.0	54.1	0.6	41.2	31
9 SEPT	S7	EP	Z	8 45 15.0	49.2	0.6	41.4	31
		E	Z	24.9			41.4	31
9 SEPT	S4	EP	Z	8 45 16.8	32.8	0.5	41.9	31
9 SEPT	S5	EP	Z	8 45 19.1	80.1	0.5	41.7	31
9 SEPT	S2	E	Z	8 45 23.1			42.3	31
9 SEPT	ADK	IP		8 45 44.2			45.0	33
		IS		46 37.0			45.0	33

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S6	EP	Z	9 54 47.8	371.8	0.8	T	

9 SEPT 10 6 44.1 27.7S 63.1W SANTIAGO DEL ESTERO SA
H = 578 KM MAG = 5.8

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	ADK	IP		10 24 40.5			125.6	316
		I		26 51.5			125.6	316
		S		30 50.5			125.6	316
		E		32 34.5			125.6	316
9 SEPT	S4	EPKP	Z	10 24 44.7	157.4	0.6	128.9	315
		E	Z	27 10.7			128.9	315
9 SEPT	S7	EPKP	Z	10 24 48.3	62.7	0.7	129.3	314
		E	Z	57.8			129.3	314
		E	Z	26 10.1			129.3	314
		E	Z	27 15.2			129.3	314
9 SEPT	S6	EPKP	Z	10 24 48.4	96.9	0.7	129.4	314
		E	Z	27 16.0			129.4	314
9 SEPT	S5	EPKP	Z	10 24 48.5	250.1	0.7	129.0	314

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S8	EP	Z	10 43 31.0	9.5	0.2		
		E	Z	34.4				
		E	Z	50.0				
9 SEPT	S7	EP	Z	10 43 32.0	6.3	0.2	L	
		E	Z	37.5			L	
		ES	Y	39.4			L	

TEXT NOT REPRODUCIBLE

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S4	EP	Z	10 43 37.1	6.3	0.2	L	
		ES	X	43.1			L	
		[illegible]	X	44 34.[illegible]			L	
9 SEPT	S[illegible]	EP	Z	10 43 38.6	31.6	0.2	L	
		ES	Y	48.7			L	
9 SEPT	S2	EP	Z	10 43 45.7	19.0	0.2	L	
		ES	X	44 .5			L	
9 SEPT	S6	EP	Z	10 46 34.4	12.6	0.2	L	
		ES	X	43.0			L	
9 SEPT	S4		X	11 24 33.2				
9 SEPT	S4	[illegible]	X	11 36 24.2				
9 SEPT	S7	EP	Z	11 36 25.9			L	
		ES	Y	35.5			L	
9 SEPT	S5	[illegible]	X	11 36 30.6				
9 SEPT	S6		X	11 36 33.4				
9 SEPT	S5	[illegible]	X	13 6 57.1				
9 SEPT	S4		X	14 48 46.6				
9 SEPT	S5	EP	Z	14 52 43.9	36.4	0.5		

TEXT NOT REPRODUCIBLE

9 SEPT 14 43 27.7 12.3N 140.7E WEST CAROLINE ISLANDS
H = 33 KM MAG = 5.4

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	ALK	IP		14 53 7.5			52.3	32
9 SEPT	S6	[illegible]	X	14 54 57.3				
9 SEPT	S1	EP	P	15 22 5.0			L	
		ES	Y	15.7			L	
9 SEPT	S2	EP	Z	15 22 7.1	44.2	0.2	L	
		ES	X	21.5			L	

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	S5	EP	X	15 22 11.0			L	
		ES	X	28.3			L	
9 SEPT	S4	E	X	15 22 23.2				
9 SEPT	S6	L	X	15 22 33.1				
9 SEPT	S4	EP	Z	15 37 33.3	15.8	0.3	N	
		ES	Y	55.4			N	
9 SEPT	S5	E	Z	15 37 36.3			N	
		E	Y	56.8			N	
9 SEPT	S2	E	P	15 45 30.9				
9 SEPT	S5	EP	P	17 32 17.6			L	
		ES	Y	33.2			L	
9 SEPT	S2	EP	Z	17 32 31.0			L	
		ES	X	44.3			L	
9 SEPT	S4	E	X	17 32 32.8				
9 SEPT	S4	E	X	18 5 34.1				
		E	X	7 33.4				
9 SEPT	S5	EP	Z	18 7 18.7			N	
		ES	X	39.8			N	
9 SEPT	S4	EP	Z	18 29 57.0	50.7	0.2	L	
		ES	Y	30 2.7			L	
9 SEPT	S2	EP	Z	18 29 59.0	411.9	0.2	L	
		ES	X	30 2.6			L	
9 SEPT	S1	E	P	18 30 .2				
9 SEPT	S5	EP	Z	18 30 2.8	31.6	0.2	L	
		ES	Y	10.1			L	
9 SEPT	S5	EP	X	19 4 .2			L	
		ES	Y	14.4			L	
9 SEPT	S4	E	X	19 4 12.8				
		E	X	5 32.0				
9 SEPT	S4	E	Y	21 9 39.1				
9 SEPT	S1	L	X	23 31 12.2				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
9 SEPT	ADK	E		23 45 11.7				
10 SEPT	S1	EP	X	0 31 39.1			L	
		ES	X	56.2			L	
10 SEPT	S2	E	Z	0 31 54.2				
		E	P	32 50.6				
10 SEPT	ADK	EP		0 32 8.5				
10 SEPT	S2	EP	Z	2 4 27.1			L	
		ES	X	35.2			L	
10 SEPT	S1	E	P	5 0 37.7				
		E	Y	46.3				
10 SEPT	S2	EP	Z	5 0 38.5	110.9	0.1	L	
		ES	X	50.3			L	
10 SEPT	S2	EP	Z	5 42 51.0	37.9	0.2	L	
		ES	X	43 11.3			L	
10 SEPT	S1	EP	P	5 42 53.3			N	
		ES	Y	43 13.2			N	
10 SEPT	S1	EP	P	11 5 6.2			N	
		ES	X	26.8			N	
10 SEPT	S2	EP	Z	11 21 11.2			L	
		ES	X	17.5			L	
10 SEPT	ADK	E		11 36 21.8				
		E		37 30.8				
10 SEPT	S2	EP	Z	11 37 3.1	25.3	0.2	L	
		ES	X	6.3			L	
10 SEPT	S1	E	Y	11 37 3.2				
10 SEPT	S2	EP	Z	12 47 22.5	19.0	0.2	L	
		ES	X	27.9			L	
10 SEPT	S1	EP	P	12 47 24.6			L	
		ES	X	30.9			L	
10 SEPT	S1	EP	P	12 59 7.2			L	
		ES	Y	25.0			L	
10 SEPT	S2	E	P	12 59 9.7				

DAY	STA	PHASE	C	TIME	AMP	PER	DIST	AZI
10 SEPT	S2	EP	Z	13 36 7.9	194.0	0.1	L	
		ES	Z	14.9			L	
10 SEPT	S1	EP	P	13 36 10.2			L	
		ES	X	15.9			L	
10 SEPT	S1	EP	P	14 1 34.8			L	
		ES	X	43.2			L	
11 SEPT	ACK	EP		7 48 24.1			R	
		ES		49 43.2			R	

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13. ABSTRACT

A preliminary model of the crustal structure across the Aleutian Ridge in the vicinity of Amchitka is presented. Data from two inline-reversed refraction profiles utilizing shot and Ocean-Bottom Seismograph (OBS) arrays along a northeast-southwest line through Amchitka were used to determine the structure. The analysis was limited to first-arrival data, most of which was Moho-refracted; however, some upper-crust refractors were identified immediately beneath Amchitka. Observed traveltimes were corrected to a reference plane 4.5 km below sea level to minimize lateral velocity variations associated with the large changes in water depth and the changes in subwater crustal velocities along the profiles. Calculations assuming plane constant-velocity dipping layers give a Moho depth of 15 km at the north end of the Petrel Bank (northeast of Amchitka). The depth increases to over 40 km at Amchitka then decreases to 12 km in the Pacific (southwest of Amchitka). Moho velocity of 8.0 to 8.1 km/sec was obtained for the area. Also, 4.9- and 6.2-km/sec refractors at depths of about 1 and 10 km were identified beneath Amchitka. Shot depths were determined from hydroacoustic data by using the bubble-pulse method and converting traveltime data to depths (using an average velocity of 4900 ft/sec). A detailed discussion of these methods, including an error analysis, is presented. Routine analysis of all OBS recordings was performed and a preliminary bulletin prepared. A total of 2734 station events was observed, 306 of which were associated with the 35 explosions and 198 associated with earthquakes having known epicenters.

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