**DEPARTMENT OF
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FINAL REPORT: VOLUME 77-4

Refraction Shooting Near Roosevelt
Hot Springs: Data

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Micro Geophysics

REFRACTION SHOOTING NEAR ROOSEVELT

HOT SPRINGS: DATA

INTRODUCTION

Under a contract dated April 6, 1977, with the University of Utah, MicroGeophysics Corporation has completed a large-scale refraction program over the geothermal anomaly at Roosevelt Hot Springs in north-central Utah. This report contains the data as required by that contract and is submitted to fulfill the obligations of that contract.

CONTRACT DELIVERABLES

The contract calls for the following deliverable items:

- A) Shotpoint and recording sites located on 7 1/2 minute quadrangle maps.
 - 1) Shotpoint and geophone locations in X-Y coordinates.
 - 2) Elevation cross-section along refraction line.
- B) Time-distance records at fixed gain. (Static corrected to 4900 feet sea level datum).
 - 1) Elevations, velocities, and formulas used to calculate static corrections.
 - 2) Static corrections applied to each trace.
- C) Automatic gain control record section.

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D) Magnetic tapes.

- 1) Digital field tapes (21 track)
- 2) Reformatted 9-track tapes (Univac 1108 compatible)

E) Analogue field records.

Table 1 contains the geophone and shotpoint coordinates. The first column contains the designations for each location. The first number is the spread; the second number denotes the geophone. Shotpoints are noted via the letters SP. The X and Y coordinates are in meters on the Universal Transverse Mercator projection, zone 12. Increasing X-coordinate values are to the east, the Y-coordinate increases to the north. Elevations (Z) are in feet above mean sea level as surveyed.

Plate 1 is a reproduction of the 7 1/2 minute quadrangle maps on which each shotpoint and geophone is located.

Plate 2 is an elevation cross section along the line. Note that the cross section is schematic, stations are plotted at equal intervals and changes in the azimuth of the line are not represented.

Table 2 is a list of the shot information. The holes at each shotpoint are listed. For multiple hole shots, the spread numbers and the lengths of detonating cord are the same. Total charge weights can be obtained by adding the weight of powder in the holes which were shot into a specific spread. For example; H1, H2, H3a, H7 and H8 at SPI were shot into spread 5. The total charge expended was 3300#. The first number of the tape record number is the field reel number. The last four

TABLE 1
Geophone and Shotpoint
Coordinates

Station	X	Y	Z
1-1	³ 21,207	⁴² 57,933	5094
SP 1	21,207	57,933	5094
1-2	21,498	57,987	5085
1-3	21,697	58,101	5076
1-4	22,060	58,178	5065
1-5	22,332	58,201	5052
1-6	22,619	58,393	5039
1-7	22,901	58,499	5026
1-8	23,166	58,598	5016
1-9	23,445	58,693	5007
1-10	23,740	58,808	4998
1-11	24,013	58,899	4994
1-	24,315	58,881	4951
1-14	24,493	58,612	4995
1-15	24,701	58,385	4942
1-16	24,923	58,488	4940
1-17	25,220	58,591	4965
1-18	25,561	58,605	4970
1-19	25,811	58,679	4973
1-20	26,101	58,748	4975
1-21	26,459	58,827	4967
1-22	26,673	58,866	4969
1-23	26,991	58,890	4978
1-24 2-1	27,293	58,901	4988
2-2	27,608	58,910	5003
2-3	27,894	58,915	5017
2-4	28,197	58,908	5030
2-5	28,510	58,917	5048
SP 3	28,657	58,848	

TABLE 1, (continued)

Station	X	Y	Z
2-6	³ 28,789	⁴² 58,953	5078
2-7	29,091	59,042	5093
2-8	29,350	59,147	5091
2-9	29,655	59,211	5103
2-10	29,923	59,256	5120
2-11	30,256	59,298	5136
2-	30,568	59,333	5150
2-14	30,831	59,391	5169
2-15	31,138	59,418	5186
2-16	31,417	59,451	5218
2-17	31,729	59,502	5240
2-18	32,041	59,547	5260
SP 4	32,041	59,547	
2-19	32,318	59,594	5288
2-20	32,616	59,623	5312
2-21	32,917	59,660	5342
2-22	33,199	59,690	5362
2-23	33,503	59,800	5378
3-1	33,874	59,877	5415
3-2	34,119	59,896	5453
3-3	34,435	59,866	5480
3-4	34,760	59,835	5508
3-5	35,077	59,811	5552
3-6	35,352	59,820	5596
3-7	35,665	59,817	5634
SP 5	35,683	59,875	
3-8	35,904	59,889	5663
3-9	36,101	60,048	5682
3-10	36,341	60,221	5674
3-11	36,470	60,403	5736
3-	36,712	60,610	5789
3-14	36,953	60,758	5821

TABLE 1, (continued)

Station	X	Y	Z
3-15	³ 37,115	⁴² 60,942	5857
3-16	37,361	61,113	5917
3-17	37,649	61,200	5914
3-18	37,913	61,225	5966
3-19	38,251	61,306	6019
3-20	38,510	61,325	6061
3-21	38,753	61,498	6111
3-22	39,082	61,527	6161
SP 6	39,225	61,702	
3-23	39,374	61,558	6208
3-24 4-1	39,697	61,514	6269
4-2	39,986	61,637	6311
4-3	40,207	61,783	6342
4-4	40,503	61,809	6324
4-5	40,703	61,910	6340
4-6	41,051	61,919	6380
4-7	41,362	61,875	6491
4-8	41,690	61,846	6441
4-9	41,889	61,919	6480
4-10	42,163	61,997	6554
4-11	42,420	62,115	6441
4-	42,678	62,133	6748
4-14	42,897	62,079	6846
4-15	43,190	62,033	6974
4-16	43,502	61,995	7104
4-17	43,777	61,940	7145
4-18	44,062	61,967	7180
SP 7	44,165	62,120	
4-19	44,358	62,004	7213
4-20	44,625	61,907	7150
4-21	44,953	61,962	7122
4-22	45,237	61,778	7062

TABLE 1, (continued)

Station	X	Y	Z
4-23	³ 45,405	⁴² 61,610	7007
4-24 5-1	45,653	61,506	6924
5-2	45,883	61,571	6840
5-3	46,150	61,655	6882
5-4	46,447	61,730	6958
5-5	46,721	61,647	6880
5-6	46,972	61,615	6764
5-7	46,993	61,397	6839
5-8	47,001	61,118	6908
5-9	47,025	60,847	6998
SP 8	46,896	60,783	
5-10	47,235	60,738	7131
5-11	47,325	60,442	7132
5-	47,807	60,843	7297
5-14	47,889	60,602	7254
5-15	47,825	60,259	7222
5-16	48,009	60,447	7211
5-17	48,366	60,424	7194
5-18	48,671	60,551	7180
5-19	48,850	60,713	7166
5-20	49,060	60,862	7101
5-21	49,333	60,803	7093
5-22	49,589	60,712	7065
5-23	49,703	60,464	7080
5-24	49,907	60,395	7039
SP 9	50,250	60,420	

Shooting Information

Shot Point	Shot Hole	Tape Record Number	Weight of Powder in Hole	Spread Number	Length of Detonating Cord (ft)	Depth of Holes (ft)
1	H1	5-004020	180	5	97	130
	H2	5-004020	240	5	97	130
	H3	3-04400	300	2	54	120
	H3a	5-004020	1140	5	97	133
	H4	4-000540	1020	4	90	115
	H5a	3-066640	30	1	35	55
	H5b	3-046660	60	1	35	55
	H5	2-000460	1020	3	40	100
	H6	4-000540	1020	4	90	125
3	H7	5-004020	720	5	97	122
	H8	5-004020	1020	5	97	126
	H1	3-000460	30	2	58	60
	H2	1-000620	90	3	67	51
	H3	4-000520	300	4	65	70
	H4	2-000040	300	3	67	130
5	H5	4-000520	720	4	65	80
	H1	3-000420	300	2	100	130
	H2	[NOT SHOT]				
	H3	1-000520	30	3	58	60
	H4	4-000500	90	4	75	75
	H5	4-000500	300	4	58	78
6	H1	4-000460	30	4	56	50
	H2	1-000460	30	3	56	60
7	H1	3-046400	1020	2	59	130
	H2	2-000400	420	3	69	96
	H3	[NOT SHOT]				
	H4	5-002060	90	5	97	80
	H5	4-006440	30	4	52	55
	H6	5-002060	150	5	97	90

Shot Point	Shot Hole	Tape Record Number	Weight of Powder in Hole	Spread Number	Length of Detonating Cord (ft)	Depth of Holes (ft)
8	H1	5-002040	30	5	80	60
	H4a	5-002040	90	5	80	
	H1	[NOT SHOT]				
	H2	5-002020	30	5	58	60
	H3	3-066600	390	2	78	115
9	H3a	3-066600	600	2	78	85
	H4	4-000420	300	4	70	95
	H5	3-066600	300	2	78	95
	H5a		420	2	78	75
	H6	3-066600	300	2	78	98
	H7	2-000440	300	3	81	130
	H7a	2-000440	240	3	81	86
	H8	2-004440	210	3	81	100
	H8a	2-004440	300	3	81	68

digits of the tape record number are the first word in the trace header on each trace (see PHOENIX trace headers, below). The trace header numbers are not unique so a listing of the records and their position on the tapes is given in Table 3.

The static corrections for each trace were calculated by assuming that each spread is underlain by a single layer with velocity V_1 and a half space of velocity V_2 . The velocities V_1 and V_2 were chosen for each spread by inspection of data from shots which fell within the spread. A straight line fit to arrival times near the shot gave a "best" estimate of V_1 , the slope of the line thru more distant phones gave a velocity assigned to the half space. Inspection of the intercepts indicates that the elevation of the top of the assumed first layer can be safely assumed to be below the datum. If we refer to Figure 1, we see that the ΔE 's are known for the shot and geophone, and therefore, the geophone and shot corrections can be derived using the formulas given. The playouts given have had this simple type of static applied.

The statics that have been applied are listed in Table 5 for each shot and geophone. The columns listed are:

- 1 ΔL_G - slant distance, geophone to datum (ft.)
- 2 ΔR_G - radial distance, geophone along datum (ft.)
- 3 Geophone correction - milliseconds
- 4 ΔL_S - slant distance shot to datum (ft.)
- 5 ΔR_S - radial distance shot along datum (ft.)
- 6 Shot correction - milliseconds

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TABLE 3

Tape Contents Information

Tape Record Number	Tape Number	Contents Cal or Test
410	MI 543	
20		
40		
50		
460		
400		
420		
440		
460		Shot 6 Spread 3
500		
520		Shot 5 Spread 3
540		Shot 4 Spread 3
560		
600		
620		Shot 3 Spread 3
20		
40		
460		Shot 3 Spread 3
100	MI 544	
520		
400		Shot 7 Spread 3
2400		
420		
440		Shot 9 Spread 3
460		Shot 1 Spread 3
500		
400		
420		Shot 5 Spread 2
440		Shot 4 Spread 2
460		Shot 3 Spread 2
2400		
4400		Shot 1 Spread 2
6400		
26400		
6400		Shot 7 Spread 2
26400		
26600		Shot 9 Spread 2
26620		
26640	MI 405	Shot 1 Spread 1
26660		
6660		Shot 1 Spread 1
400		
420		Shot 9 Spread 4
440		Shot 7 Spread 4
450		
460		Shot 6 Spread 4
500		Shot 5 Spread 4
520		Shot 3 Spread 4
540		Shot 1 Spread 4

TABLE 3, (continued)

Tape Record Number	Tape Number	Contents Cal or Test
400	MI 405	
600		
2000		
2020		Shot 9 Spread 5
2040		Shot 8 Spread 5
2060		Shot 7 Spread 5
4000		
4020		Shot 1 Spread 5
0		
10		
20		
30		
40		
50		
10000		
200		
400		
600		
2400		

TABLE 4
Shotpoint Coordinates

Shotpoint	Location		Elevation
	X (m)	Y (m)	(ft)
SP1	321,207	4,257,993	5094
SP2	(Not Used)		
SP3	328,657	4,258,848	5056
SP4	(Not Used)		
SP5	335,683	4,259,875	5660
SP6	339,225	4,261,702	6161
SP7	344,165	4,262,120	7188
SP8	346,896	4,260,783	6998
SP9	350,250	4,260,420	7030

TABLE 5 - STATIC DATA

See pg 9

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1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
355	199	34	288	161	28	1	63	10355	18500	1	1	1
344	193	33	288	161	28	1	62					2
333	186	32	288	161	28	1	61					3
320	179	31	288	161	28	1	58					4
304	170	30	288	161	28	1	58					5
288	161	28	288	161	28	1	56					6
273	153	26	288	161	28	1	55					7
261	146	25	288	161	28	1	54					8
250	140	24	288	161	28	1	53					9
239	134	23	288	161	28	1	51					10
234	131	23	288	161	28	1	51					11
182	102	18	288	161	28	1	46					13
187	105	18	288	161	28	1	46					14
171	96	17	288	161	28	1	45					15
169	95	16	288	161	28	1	45					16
199	111	19	288	161	28	1	48					17
205	115	20	288	161	28	1	48					18
209	117	20	288	161	28	1	49					19
211	118	20	288	161	28	1	49					20
202	113	20	288	161	28	1	48					21
204	114	20	288	161	28	1	48					22
215	120	21	288	161	28	1	49					23
227	127	22	288	161	28	1	50	10355	18500	1	1	24
228	129	30	211	120	28	3	61	7500	13250	2	1	1
228	129	30	298	169	40	5	75	7500	13250		3	
228	129	30	485	275	65	2	97				4	
228	129	30	878	497	117	5	152				5	
228	129	30	2772	1569	370	3	403				7	
228	129	30	2534	1434	338	3	372				9	
246	139	33	211	120	28	3	64	7500	13250	2	1	2
246	139	33	298	169	40	5	78				3	
246	139	33	485	275	65	2	99				4	
246	139	33	878	497	117	5	155				5	
246	139	33	2772	1569	370	3	405				7	
246	139	33	2534	1434	338	3	374	7500	13250	2	9	2

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
263	149	35	211	120	28	3	66	7500	13250	2	1	3
263	149	35	298	169	40	5	80				3	
263	149	35	485	275	65	2	102				4	
263	149	35	878	497	117	5	157				5	
263	149	35	2772	1569	370	3	408				7	
263	149	35	2534	1434	338	3	376	7500	13250	2	9	3
279	158	37	211	120	28	3	68	7500	13250	2	1	4
279	158	37	298	169	40	5	82				3	
279	158	37	485	275	65	2	104				4	
279	158	37	878	497	117	5	159				5	
279	158	37	2772	1569	370	3	410				7	
279	158	37	2534	1434	338	3	378	7500	13250	2	9	4
301	170	40	211	120	28	3	71	7500	13250	2	1	5
301	170	40	298	169	40	5	85				3	
301	170	40	485	275	65	2	107				4	
301	170	40	878	497	117	5	162				5	
301	170	40	2772	1569	370	3	413				7	
301	170	40	2534	1434	338	3	381	7500	13250	2	9	5
337	191	45	211	120	28	3	76	7500	13250	2	1	6
337	191	45	298	169	40	5	90				3	
337	191	45	485	275	65	2	112				4	
337	191	45	878	497	117	5	167				5	
337	191	45	2772	1569	370	3	417				7	
337	191	45	2534	1434	338	3	386	7500	13250	2	9	6
355	201	47	211	120	28	3	78	7500	13250	2	1	7
355	201	47	298	169	40	5	92				3	
355	201	47	485	275	65	2	114				4	
355	201	47	878	497	117	5	169				5	
355	201	47	2772	1569	370	3	420				7	
355	201	47	2534	1434	338	3	389	7500	13250	2	9	7
353	200	47	211	120	28	3	78	7500	13250	2	1	8
353	200	47	298	169	40	5	92				3	
353	200	47	485	275	65	2	114				4	
353	200	47	878	497	117	5	169				5	
353	200	47	2772	1569	370	3	419				7	
353	200	47	2534	1434	338	3	388	7500	13250	2	9	8

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
368	208	49	211	120	28	3	80	7500	13250	2	1	9
368	208	49	298	169	40	5	94				3	
368	208	49	485	275	65	2	116				4	
368	208	49	878	497	117	5	171				5	
368	208	49	2772	1569	370	3	421				7	
368	208	49	2534	1434	338	3	390	7500	13250	2	9	9
388	220	52	211	120	28	3	83	7500	13250	2	1	10
388	220	52	298	169	40	5	97	7500	13250		3	
388	220	52	485	275	65	2	118	7500	13250		4	
388	220	52	878	497	117	5	174	7500	13250		5	
388	220	52	2772	1569	370	3	424	7500	13250		7	
388	220	52	2534	1434	338	3	393	7500	13250	2	9	10
408	231	54	211	120	28	3	85	7500	13250	2	1	11
408	231	54	298	169	40	5	99	7500	13250		3	
408	231	54	485	275	65	2	121	7500	13250		4	
408	231	54	878	497	117	5	176	7500	13250		5	
408	231	54	2772	1569	370	3	427	7500	13250		7	
408	231	54	2534	1434	338	3	396	7500	13250	2	9	11
425	240	57	211	120	28	3	87	7500	13250	2	1	13
425	240	57	298	169	40	5	102	7500	13250		3	
425	240	57	485	275	65	2	123	7500	13250		4	
425	240	57	878	497	117	5	179	7500	13250		5	
425	240	57	2772	1569	370	3	429	7500	13250		7	
425	240	57	2534	1434	338	3	398	7500	13250	2	9	13
448	253	60	211	120	28	3	90	7500	13250	2	1	14
448	253	60	298	169	40	5	105	7500	13250		3	
448	253	60	485	275	65	2	126	7500	13250		4	
448	253	60	878	497	117	5	182	7500	13250		5	
448	253	60	2772	1569	370	3	432	7500	13250		7	
448	253	60	2534	1434	338	3	401	7500	13250	2	9	14
468	265	62	211	120	28	3	93	7500	13250	2	1	15
468	265	62	298	169	40	5	108	7500	13250		3	
468	265	62	485	275	65	2	129	7500	13250		4	
468	265	62	878	497	117	5	184	7500	13250		5	
468	265	62	2772	1569	370	3	435	7500	13250		7	
468	265	62	2534	1434	338	3	404	7500	13250	2	9	15

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
507	287	68	211	120	28	3	98	7500	13250	2	1	16
507	287	68	298	169	40	5	113				3	
507	287	68	485	275	65	2	134				4	
507	287	68	878	497	117	5	190				5	
507	287	68	2772	1569	370	3	440				7	
507	287	68	2534	1434	338	3	409	7500	13250	2	9	16
510	288	68	211	120	28	3	99	7500	13250	2	1	17
510	288	68	298	169	40	5	113				3	
510	288	68	485	275	65	2	135				4	
510	288	68	878	497	117	5	190				5	
510	288	68	2772	1569	370	3	440				7	
510	288	68	2534	1434	338	3	409	7500	13250	2	9	17
558	316	74	211	120	28	3	105	7500	13250	2	1	18
558	316	74	298	169	40	5	119				3	
558	316	74	485	275	65	2	141				4	
558	316	74	878	497	117	5	196				5	
558	316	74	2772	1569	370	3	447				7	
558	316	74	2534	1434	338	3	416	7500	13250	2	9	18
592	335	79	211	120	28	3	110	7500	13250	2	1	19
592	335	79	298	169	40	5	124				3	
592	335	79	485	275	65	2	146				4	
592	335	79	878	497	117	5	201				5	
592	335	79	2772	1569	370	3	451				7	
592	335	79	2534	1434	338	3	420	7500	13250	2	9	19
621	352	83	211	120	28	3	114	7500	13250	2	1	20
621	352	83	298	169	40	5	128				3	
621	352	83	485	275	65	2	149				4	
621	352	83	878	497	117	5	205				5	
621	352	83	2772	1569	370	3	455				7	
621	352	83	2534	1434	338	3	424	7500	13250	2	9	20
658	372	88	211	120	28	3	118	7500	13250	2	1	21
658	372	88	298	169	40	5	133				3	
658	372	88	485	275	65	2	154				4	
658	372	88	878	497	117	5	210				5	
658	372	88	2772	1569	370	3	460				7	
658	372	88	2534	1434	338	3	429	7500	13250	2	9	21
682	386	91	211	120	28	3	122	7500	13250	2	1	22
682	386	91	298	169	40	5	136				3	
682	386	91	485	275	65	2	158				4	
682	386	91	878	497	117	5	213				5	
682	386	91	2772	1569	370	3	463				7	
682	386	91	2534	1434	338	3	432	7500	13250	2	9	22

1	2	3	4	5	6	7	8	9	10	Spread	Shot	Point	Geophone
701	397	94	211	120	28	3	124	7500	13250	2		1	23
701	397	94	298	169	40	5	139					3	
701	397	94	485	275	65	2	160					4	
701	397	94	878	497	117	5	215					5	
701	397	94	2772	1569	370	3	466					7	
701	397	94	2534	1434	338	3	435	7500	13250	2		9	23
746	422	100	211	120	28	3	130	7500	13250	2		1	24
746	422	100	298	169	40	5	145					3	
746	422	100	485	275	65	2	166					4	
746	422	100	878	497	117	5	221					5	
746	422	100	2772	1569	370	3	472					7	
746	422	100	2534	1434	338	3	441	7500	13250	2		9	24
1225	1060	77	387	334	24	2	103	16000	18500	3		1	1
1225	1060	77	351	303	22	4	102					3	
1225	1060	77	657	569	41	2	120					4	
1225	1060	77	1582	1368	99	3	178					5	
1225	1060	77	2639	2283	165	2	244					6	
1225	1060	77	4620	3995	289	2	368					7	
1225	1060	77	4131	3573	258	4	338	16000	18500	3		9	1
1301	1125	81	387	334	24	2	107	16000	18500	3		1	2
1301	1125	81	351	303	22	4	107					3	
1301	1125	81	657	569	41	2	124					4	
1301	1125	81	1582	1368	99	3	183					5	
1301	1125	81	2639	2283	165	2	249					6	
1301	1125	81	4620	3395	289	2	372					7	
1301	1125	81	4131	3573	258	4	343	16000	18500	3		9	2
1355	1172	85	387	334	24	2	111	16000	18500	3		1	3
1355	1172	85	351	303	22	4	110					3	
1355	1172	85	657	569	41	2	128					4	
1355	1172	85	1582	1368	99	3	186					5	
1355	1172	85	2639	2283	165	2	252					6	
1355	1172	85	4620	3395	289	2	376					7	
1355	1172	85	4131	3573	258	4	346	16000	18500	3		9	3
1410	1220	88	387	334	24	2	114	16000	18500	3		1	4
1410	1220	88	351	303	22	4	114					3	
1410	1220	88	657	569	41	2	131					4	
1410	1220	88	1582	1368	99	3	190					5	
1410	1220	88	2639	2283	165	2	256					6	
1410	1220	88	4620	3395	289	2	379					7	
1410	1220	88	4131	3573	258	4	350	16000	18500	3		9	4

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
1498	1296	94	387	334	24	2	120	16000	18500	3	1	5
1498	1296	94	351	303	22	4	119				3	
1498	1296	94	657	569	41	2	137				4	
1498	1296	94	1582	1368	99	3	195				5	
1498	1296	94	2639	2283	165	2	261				6	
1498	1296	94	4620	3995	289	2	385				7	
1498	1296	94	4131	3573	258	4	355	16000	18500	3	9	5
1088	941	68	387	334	24	2	94	16000	18500	3	1	6
1088	941	68	351	303	22	4	94				3	
1088	941	68	657	569	41	2	111				4	
1088	941	68	1582	1368	99	3	170				5	
1088	941	68	2639	2283	165	2	235				6	
1088	941	68	4620	3995	289	2	359				7	
1088	941	68	4131	3573	258	4	330	16000	18500	3	9	6
1661	1437	104	387	334	24	2	130	16000	18500	3	1	7
1661	1437	104	351	303	22	4	129				3	
1661	1437	104	657	569	41	2	147				4	
1661	1437	104	1582	1368	99	3	205				5	
1661	1437	104	2639	2283	165	2	271				6	
1661	1437	104	4620	3995	289	2	395				7	
1661	1437	104	4131	3573	258	4	366	16000	18500	3	9	7
1719	1487	107	387	334	24	2	134	16000	18500	3	1	8
1719	1487	107	351	303	22	4	133				3	
1719	1487	107	657	569	41	2	150				4	
1719	1487	107	1582	1368	99	3	209				5	
1719	1487	107	2639	2283	165	2	275				6	
1719	1487	107	4620	3995	289	2	399				7	
1719	1487	107	4131	3573	258	4	369	16000	18500	3	9	8
1757	1520	110	387	334	24	2	136	16000	18500	3	1	9
1757	1520	110	351	303	22	4	135				3	
1757	1520	110	657	569	41	2	153				4	
1757	1520	110	1582	1368	99	3	211				5	
1757	1520	110	2639	2283	165	2	277				6	
1757	1520	110	4620	3995	289	2	401				7	
1757	1520	110	4131	3573	258	4	372	16000	18500	3	9	9
1741	1506	109	387	334	24	2	135	16000	18500	3	1	10
1741	1506	109	351	303	22	4	134				3	
1741	1506	109	657	569	41	2	152				4	
1741	1506	109	1582	1368	99	3	210				5	
1741	1506	109	2639	2283	165	2	276				6	
1741	1506	109	4620	3995	289	2	400				7	
1741	1506	109	4131	3573	258	4	371			3	9	10

										Spread	Shot Point	Geophone
1865	1613	117	387	334	24	2	143	16000	18500	3	1	11
1865	1613	117	351	303	22	4	142				3	
1865	1613	117	657	569	41	2	160				4	
1865	1613	117	1582	1368	99	3	218				5	
1865	1613	117	2639	2283	165	2	284				6	
1865	1613	117	4620	3995	289	2	408				7	
1865	1613	117	4131	3573	258	4	378	16000	18500	3	9	11
1970	1704	123	387	334	24	2	149	16000	18500	3	1	13
1970	1704	123	351	303	22	4	149				3	
1970	1704	123	657	569	41	2	166				4	
1970	1704	123	1582	1368	99	3	225				5	
1970	1704	123	2639	2283	165	2	291				6	
1970	1704	123	4620	3995	289	2	414				7	
1970	1704	123	4131	3573	258	4	385	16000	18500	3	9	13
2034	1759	127	387	334	24	2	153	16000	18500	3	1	14
2034	1759	127	351	303	22	4	153				3	
2034	1759	127	657	569	41	2	170				4	
2034	1759	127	1582	1368	99	3	229				5	
2034	1759	127	2639	2283	165	2	295				6	
2034	1759	127	4620	3995	289	2	418				7	
2034	1759	127	4131	3573	258	4	389	16000	18500	3	9	14
2106	1821	132	387	334	24	2	158	16000	18500	3	1	15
2106	1821	132	351	303	22	4	157				3	
2106	1821	132	657	569	41	2	175				4	
2106	1821	132	1582	1368	99	3	233				5	
2106	1821	132	2639	2283	165	2	299				6	
2106	1821	132	4620	3995	289	2	423				7	
2106	1821	132	4131	3573	258	4	393	16000	18500	3	9	15
2225	1924	139	387	334	24	2	165	16000	18500	3	1	16
2225	1924	139	351	303	22	4	165				3	
2225	1924	139	657	569	41	2	182				4	
2225	1924	139	1582	1368	99	3	241				5	
2225	1924	139	2639	2283	165	2	306				6	
2225	1924	139	4620	3995	289	2	430				7	
2225	1924	139	4131	3573	258	4	401	16000	18500	3	9	16
2219	1919	139	387	334	24	2	165	16000	18500	3	1	17
2219	1919	139	351	303	22	4	164				3	
2219	1919	139	657	569	41	2	182				4	
2219	1919	139	1582	1368	99	3	240				5	
2219	1919	139	2639	2283	165	2	306				6	
2219	1919	139	4620	3995	289	2	430				7	
2219	1919	139	4131	3573	258	4	401	16000	18500	3	9	17

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
2323	2009	145	387	334	24	2	171	16000	18500	3	1	18
2323	2009	145	351	303	22	4	171				3	
2323	2009	145	657	569	41	2	188				4	
2323	2009	145	1582	1368	99	3	247				5	
2323	2009	145	2639	2283	165	2	313				6	
2323	2009	145	4620	3995	289	2	436				7	
2323	2009	145	4131	3573	258	4	407	16000	18500	3	9	18
2428	2100	152	387	334	24	2	178	16000	18500	3	1	19
2428	2100	152	351	303	22	4	177				3	
2428	2100	152	657	569	41	2	195				4	
2428	2100	152	1582	1368	99	3	253				5	
2428	2100	152	2639	2283	165	2	319				6	
2428	2100	152	4620	3995	289	2	443				7	
2428	2100	152	4131	3573	258	4	414	16000	18500	3	9	19
2512	2173	157	387	334	24	2	183	16000	18500	3	1	20
2512	2173	157	351	303	22	4	183				3	
2512	2173	157	657	569	41	2	200				4	
2512	2173	157	1582	1368	99	3	259				5	
2512	2173	157	2639	2283	165	2	324				6	
2512	2173	157	4620	3995	289	2	448				7	
2512	2173	157	4131	3573	258	4	419	16000	18500	3	9	20
2612	2259	163	387	334	24	2	189	16000	18500	3	1	21
2612	2259	163	351	303	22	4	189				3	
2612	2259	163	657	569	41	2	206				4	
2612	2259	163	1582	1368	99	3	265				5	
2612	2259	163	2639	2283	165	2	331				6	
2612	2259	163	4620	3995	289	2	454				7	
2612	2259	163	4131	3573	258	4	425	16000	18500	3	9	21
2711	2345	169	387	334	24	2	196	16000	18500	3	1	22
2711	2345	169	351	303	22	4	195				3	
2711	2345	169	657	569	41	2	212				4	
2711	2345	169	1582	1368	99	3	271				5	
2711	2345	169	2639	2283	165	2	337				6	
2711	2345	169	4620	3995	289	2	461				7	
2711	2345	169	4131	3573	258	4	431	16000	18500	3	9	22
2805	2426	175	387	334	24	2	201	16000	18500	3	1	23
2805	2426	175	351	303	22	4	201				3	
2805	2426	175	657	569	41	2	218				4	
2805	2426	175	1582	1368	99	3	277				5	
2805	2426	175	2639	2283	165	2	343				6	
2805	2426	175	4620	3995	289	2	466				7	
2805	2426	175	4131	3573	258	4	437	16000	18500	3	9	23

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
2926	2531	183	387	334	24	2	209	16000	18500	3	1	24
2926	2531	183	351	303	22	4	208				3	
2926	2531	183	657	569	41	2	226				4	
2926	2531	183	1582	1368	99	3	285				5	
2926	2531	183	2639	2283	165	2	350				6	
2926	2531	183	4620	3995	289	2	474				7	
2926	2531	183	4131	3573	258	4	445	16000	18500	3	9	24
1827	1086	166	210	125	19	2	187	11000	18500	4	1	1
1827	1086	166	281	167	26	2	194				3	
1827	1086	166	965	574	88	3	256				5	
1827	1086	166	1685	1002	153	2	321				6	
1827	1086	166	2935	1745	267	3	435				7	
1827	1086	166	2592	1541	236	3	405	11000	18500	4	9	1
1879	1117	171	210	125	19	2	192	11000	18500	4	1	2
1879	1117	171	281	167	26	2	198				3	
1879	1117	171	965	574	88	3	261				5	
1879	1117	171	1685	1002	153	2	326				6	
1879	1117	171	2935	1745	267	3	440				7	
1879	1117	171	2592	1541	236	3	410	11000	18500	4	9	2
1918	1140	174	210	125	19	2	195	11000	18500	4	1	3
1918	1140	174	281	167	26	2	202				3	
1918	1140	174	965	574	88	3	265				5	
1918	1140	174	1685	1002	153	2	330				6	
1918	1140	174	2935	1745	267	3	444				7	
1918	1140	174	2592	1541	236	3	413	11000	18500	4	9	3
1896	1127	172	210	125	19	2	193	11000	18500	4	1	4
1896	1127	172	281	167	26	2	200				3	
1896	1127	172	965	574	88	3	263				5	
1896	1127	172	1685	1002	153	2	327				6	
1896	1127	172	2935	1745	267	3	442				7	
1896	1127	172	2592	1541	236	3	411	11000	18500	4	9	4
1915	1139	174	210	125	19	2	195	11000	18500	4	1	5
1915	1139	174	281	167	26	2	202				3	
1915	1139	174	965	574	88	3	264				5	
1915	1139	174	1685	1002	153	2	329				6	
1915	1139	174	2935	1745	267	3	443				7	
1915	1139	174	2592	1541	236	3	413	11000	18500	4	9	5
1965	1168	179	210	125	19	2	200	11000	18500	4	1	6
1965	1168	179	281	167	26	2	206				3	
1965	1168	179	965	574	88	3	269				5	
1965	1168	179	1685	1002	153	2	334				6	
1965	1168	179	2935	1745	267	3	448				7	
1965	1168	179	2592	1541	236	3	418	11000	18500	4	9	6

	1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
	2103	1251	191	210	125	19	2	212	11000	18500	4	1	7
	2103	1251	191	281	167	26	2	219				3	
	2103	1251	191	965	574	88	3	281				5	
	2103	1251	191	1685	1002	153	2	346				6	
	2103	1251	191	2935	1745	267	3	461				7	
	2103	1251	191	2592	1541	236	3	430	11000	18500	4	9	7
	2041	1214	186	210	125	19	2	207	11000	18500	4	1	8
	2041	1214	186	281	167	26	2	213				3	
	2041	1214	186	965	574	88	3	276				5	
	2041	1214	186	1685	1002	153	2	341				6	
	2041	1214	186	2935	1745	267	3	455				7	
	2041	1214	186	2592	1541	236	3	425	11000	18500	4	9	8
	2090	1242	190	210	125	19	2	211	11000	18500	4	1	9
	2090	1242	190	281	167	26	2	217				3	
	2090	1242	190	965	574	88	3	280				5	
	2090	1242	190	1685	1002	153	2	345				6	
	2090	1242	190	2935	1745	267	3	459				7	
	2090	1242	190	2592	1541	236	3	429	11000	18500	4	9	9
22	2182	1297	198	210	125	19	2	219	11000	18500	4	1	10
	2182	1297	198	281	167	26	2	226				3	
	2182	1297	198	965	574	88	3	289				5	
	2182	1297	198	1685	1002	153	2	353				6	
	2182	1297	198	2935	1745	267	3	468				7	
	2182	1297	198	2592	1541	236	3	437	11000	18500	4	9	10
	2041	1214	186	210	125	19	2	207	11000	18500	4	1	11
	2041	1214	186	281	167	26	2	213				3	
	2041	1214	186	965	574	88	3	276				5	
	2041	1214	186	1685	1002	153	2	341				6	
	2041	1214	186	2935	1745	267	3	455				7	
	2041	1214	186	2592	1541	236	3	425	11000	18500	4	9	11
	2423	1441	220	210	125	19	2	241	11000	18500	4	1	13
	2423	1441	220	281	167	26	2	248				3	
	2423	1441	220	965	574	88	3	311				5	
	2423	1441	220	1685	1002	153	2	375				6	
	2423	1441	220	2935	1745	267	3	490				7	
	2423	1441	220	2592	1541	236	3	459	11000	18500	4	9	13
	2545	1513	231	210	125	19	2	252	11000	18500	4	1	14
	2545	1513	231	281	167	26	2	259				3	
	2545	1513	231	965	574	88	3	322				5	
	2545	1513	231	1685	1002	153	2	386				6	
	2545	1513	231	2935	1745	267	3	501				7	
	2545	1513	231	2592	1541	236	3	470	11000	18500	4	9	14

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
2704	1608	246	210	125	19	2	267	11000	18500	4	1	15
2704	1608	246	281	167	26	2	273				3	
2704	1608	246	965	574	88	3	336				5	
2704	1608	246	1685	1002	153	2	401				6	
2704	1608	246	2935	1745	267	3	515				7	
2704	1608	246	2592	1541	236	3	485	11000	18500	4	9	15
2866	1704	261	210	125	19	2	282	11000	18500	4	1	16
2866	1704	261	281	167	26	2	288				3	
2866	1704	261	965	574	88	3	351				5	
2866	1704	261	1685	1002	153	2	416				6	
2866	1704	261	2935	1745	267	3	530				7	
2866	1704	261	2592	1541	236	3	500	11000	18500	4	9	16
2917	1734	265	210	125	19	2	286	11000	18500	4	1	17
2917	1734	265	281	167	26	2	293				3	
2917	1734	265	965	574	88	3	355				5	
2917	1734	265	1685	1002	153	2	420				6	
2917	1734	265	2935	1745	267	3	535				7	
2917	1734	265	2592	1541	236	3	504	11000	18500	4	9	17
2960	1760	269	210	125	19	2	290	11000	18500	4	1	18
2960	1760	269	281	167	26	2	297				3	
2960	1760	269	965	574	88	3	359				5	
2960	1760	269	1685	1002	153	2	424				6	
2960	1760	269	2935	1745	267	3	538				7	
2960	1760	269	2592	1541	236	3	508	11000	18500	4	9	18
3001	1785	273	210	125	19	2	293	11000	18500	4	1	19
3001	1785	273	281	167	26	2	300				3	
3001	1785	273	965	574	88	3	363				5	
3001	1785	273	1685	1002	153	2	428				6	
3001	1785	273	2935	1745	267	3	542				7	
3001	1785	273	2592	1541	236	3	512	11000	18500	4	9	19
2923	1738	266	210	125	19	2	287	11000	18500	4	1	20
2923	1738	266	281	167	26	2	293				3	
2923	1738	266	965	574	88	3	356				5	
2923	1738	266	1685	1002	153	2	421				6	
2923	1738	266	2935	1745	267	3	535				7	
2923	1738	266	2592	1541	236	3	505	11000	18500	4	9	20

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
2888	1717	263	210	125	19	2	284	11000	18500	4	1	21
2888	1717	263	281	167	26	2	290				3	
2888	1717	263	965	574	88	3	353				5	
2888	1717	263	1685	1002	153	2	418				6	
2888	1717	263	2935	1745	267	3	532				7	
2888	1717	263	2592	1541	236	3	502	11000	18500	4	9	21
2813	1673	256	210	125	19	2	277	11000	18500	4	1	22
2813	1673	256	281	167	26	2	283				3	
2813	1673	256	965	574	88	3	346				5	
2813	1673	256	1685	1002	153	2	411				6	
2813	1673	256	2935	1745	267	3	525				7	
2813	1673	256	2592	1541	236	3	495	11000	18500	4	9	22
2820	1677	256	210	125	19	2	277	11000	18500	4	1	23
2820	1677	256	281	167	26	2	284				3	
2820	1677	256	965	574	88	3	347				5	
2820	1677	256	1685	1002	153	2	411				6	
2820	1677	256	2935	1745	267	3	526				7	
2820	1677	256	2592	1541	236	3	495	11000	18500	4	9	23
2642	1571	240	210	125	19	2	261	11000	18500	4	1	24
2642	1571	240	281	167	26	2	268				3	
2642	1571	240	965	574	88	3	330				5	
2642	1571	240	1685	1002	153	2	395				6	
2642	1571	240	2935	1745	267	3	510				7	
2642	1571	240	2592	1541	236	3	479	11000	18500	4	9	24
2642	1571	240	207	123	19	4	263	11000	18500	5	1	1
2642	1571	240	2892	1719	263	4	507				7	
2642	1571	240	2653	1577	241	3	484				8	
2642	1571	240	2648	1574	241	3	484	11000	18500	5	9	1
2537	1509	231	207	123	19	4	253	11000	18500	5	1	2
2537	1509	231	2892	1719	263	4	497				7	
2537	1509	231	2653	1577	241	3	475				8	
2537	1509	231	2648	1574	241	3	474	11000	18500	5	9	2
2590	1540	235	207	123	19	4	258	11000	18500	5	1	3
2590	1540	235	2892	1719	263	4	502				7	
2590	1540	235	2653	1577	241	3	479				8	
2590	1540	235	2648	1574	241	3	479	11000	18500	5	9	3
2684	1596	244	207	123	19	4	266	11000	18500	5	1	4
2684	1596	244	2892	1719	263	4	511				7	
2684	1596	244	2653	1577	241	3	488				8	
2684	1596	244	2648	1574	241	3	488	11000	18500	5	9	4

1	2	3	4	5	6	7	8	9	10	Spread	Shot Point	Geophone
2587	1538	235	207	123	19	4	258	11000	18500	5	1	5
2587	1538	235	2892	1719	263	4	502				7	
2587	1538	235	2653	1577	241	3	479				8	
2587	1538	235	2648	1574	241	3	479	11000	18500	5	9	5
2443	1452	222	207	123	19	4	244	11000	18500	5	1	6
2443	1452	222	2892	1719	263	4	489				7	
2443	1452	222	2653	1577	241	3	466				8	
2443	1452	222	2648	1574	241	3	466	11000	18500	5	9	6
2536	1508	231	207	123	19	4	253	11000	18500	5	1	7
2536	1508	231	2892	1719	263	4	497				7	
2536	1508	231	2653	1577	241	3	475				8	
2536	1508	231	2648	1574	241	3	474	11000	18500	5	9	7
2622	1559	238	207	123	19	4	261	11000	18500	5	1	8
2622	1559	238	2892	1719	263	4	505				7	
2622	1559	238	2653	1577	241	3	482				8	
2622	1559	238	2648	1574	241	3	482	11000	18500	5	9	8
2734	1626	249	207	123	19	4	271	11000	18500	5	1	9
2734	1626	249	2892	1719	263	4	515				7	
2734	1626	249	2653	1577	241	3	493				8	
2734	1626	249	2648	1574	241	3	492	11000	18500	5	9	9
2899	1724	264	207	123	19	4	286	11000	18500	5	1	10
2899	1724	264	2892	1719	263	4	530				7	
2899	1724	264	2653	1577	241	3	508				8	
2899	1724	264	2648	1574	241	3	507	11000	18500	5	9	10
2900	1725	264	207	123	19	4	286	11000	18500	5	1	11
2900	1725	264	2892	1719	263	4	530				7	
2900	1725	264	2653	1577	241	3	508				8	
2900	1725	264	2648	1574	241	3	507	11000	18500	5	9	11
3106	1847	282	207	123	19	4	305	11000	18500	5	1	13
3106	1847	282	2892	1719	263	4	549				7	
3106	1847	282	2653	1577	241	3	526				8	
3106	1847	282	2648	1574	241	3	526	11000	18500	5	9	13
3052	1815	278	207	123	19	4	300	11000	18500	5	1	14
3052	1815	278	2892	1719	263	4	544				7	
3052	1815	278	2653	1577	241	3	521				8	
3052	1815	278	2648	1574	241	3	521	11000	18500	5	9	14

3012	1791	274	207	123	19	4	296	11000	18500	5	1	15
3012	1791	274	2892	1719	263	4	540				7	
3012	1791	274	2653	1577	241	3	518				8	
3012	1791	274	2648	1574	241	3	517	11000	18500	5	9	15
2999	1783	273	207	123	19	4	295	11000	18500	5	1	16
2999	1783	273	2892	1719	263	4	539				7	
2999	1783	273	2653	1577	241	3	517				8	
2999	1783	273	2648	1574	241	3	516	11000	18500	5	9	16
2978	1770	271	207	123	19	4	293	11000	18500	5	1	17
2978	1770	271	2892	1719	263	4	537				7	
2978	1770	271	2653	1577	241	3	515				8	
2978	1770	271	2648	1574	241	3	514	11000	18500	5	9	17
2960	1760	269	207	123	19	4	291	11000	18500	5	1	18
2960	1760	269	2892	1719	263	4	536				7	
2960	1760	269	2653	1577	241	3	513				8	
2960	1760	269	2648	1574	241	3	513	11000	18500	5	9	18
2943	1750	268	207	123	19	4	290	11000	18500	5	1	19
2943	1750	268	2892	1719	263	4	534				7	
2943	1750	268	2653	1577	241	3	512				8	
2943	1750	268	2648	1574	241	3	511	11000	18500	5	9	19
2862	1702	260	207	123	19	4	283	11000	18500	5	1	20
2862	1702	260	2892	1719	263	4	527				7	
2862	1702	260	2653	1577	241	3	504				8	
2862	1702	260	2648	1574	241	3	504	11000	18500	5	9	20
2852	1696	259	207	123	19	4	282	11000	18500	5	1	21
2852	1696	259	2892	1719	263	4	526				7	
2852	1696	259	2653	1577	241	3	503				8	
2852	1696	259	2648	1574	241	3	503	11000	18500	5	9	21
2817	1675	256	207	123	19	4	278	11000	18500	5	1	22
2817	1675	256	2892	1719	263	4	523				7	
2817	1675	256	2653	1577	241	3	500				8	
2817	1675	256	2648	1574	241	3	500	11000	18500	5	9	22
2836	1686	258	207	123	19	4	280	11000	18500	5	1	23
2836	1686	258	2892	1719	263	4	524				7	
2836	1686	258	2653	1577	241	3	502				8	
2836	1686	258	2648	1574	241	3	501	11000	18500	5	9	23
2785	1656	253	207	123	19	4	276	11000	18500	5	1	24
2785	1656	253	2892	1719	263	4	520				7	
2785	1656	253	2653	1577	241	3	497				8	
2785	1656	253	2648	1574	241	3	497	11000	18500	5	9	24

$$\alpha_1 = \sin^{-1} v_1/v_2$$

$$\Delta L_S = \Delta E_S / \cos \alpha_1$$

$$\Delta R_S = ((\Delta L_S)^2 - (\Delta E_S)^2)^{1/2}$$

$$\Delta R_G = ((\Delta L_G)^2 - (\Delta E_G)^2)^{1/2}$$

Geophone correction

$$= L_G/v_1$$

Shot Correction

$$= L_S/v_1$$

$$\Delta L_G = \Delta E_G / \cos \alpha_1$$

TITLE: CORRECTIONS		
SCALE:	APPROVED BY:	DRAWN BY <i>FB</i>
DATE:		REVISED
<i>Micro Geophysics</i>		DRAWING NUMBER Figure 1

- 7 Primacord correction - time between shot initiation and charge detonation with primacord @ 24'/ms (ms)
- 8 Total correction
- 9 V_1 - velocity of first layer
- 10 V_2 - velocity of underlying half space
- 11 Spread number
- 12 Shot number
- 13 Geophone number

The time-distance records are shown on the schematic curves of Figure 2. Excluding test shots, 22 shots were fired.

The record sections are numbered with a plate number; the first digit is the shotpoint number, the second is the spread number. The plates are organized by shotpoint number.

Spreads were overlapped; the end traces are at the same geophone position. Therefore, the time breaks can be checked by aligning the end traces on adjacent records.

The AGC record section is the last plate. Care should be exercised in viewing this section as each two second section is normalized separately. Note that some reflections are visible even though the display is not optimal.

The 21-track field tapes and the analogue field records are included with this report. The reformatted 9-track PHOENIX tapes are the easiest to read on the UNIVAC 1108, and these tapes are included. The format of the PHOENIX headers for both traces and records is included herein. The recording of each shot is preceded by a 20-word line header. The first

TITLE: SHOT POINT SCHEMATIC		
SCALE:	APPROVED BY:	DRAWN BY <i>PB</i>
DATE:		REVISED -
<i>Micro Geophysics</i>		DRAWING NUMBER Figure 2

word of this 20-word header is the last four digits of the tape record number. Trace number 1 follows, broken into 10 2-second segments. Each of these 2-second segments has the same trace number. These were created because of problems with machine capacity as the PHOENIX computers available for processing. The 10 segments of each trace then follow until the 24 total traces have been written. All short or cal records were filled with zeros to make them 20 seconds long.

With respect to gains, the PGC of the instrument was tripped before the shot, so that the amplifiers settled to a final gain long before the energy from the shot arrived at the geophones. This gain was typically 100db and was determined by the ambient ground motion at the geophones. Each channel was carefully balanced so that trace to trace variations within a shot are very small. The geophone used was GEOSPACE HS-1, with a natural frequency of 4.5A_2 and was damped at 0.6 of critical. The typical motor constant of these geophones is .35v/in/sec.

The recordings on the tapes at 100db gain are typically one digital count per 0.007 microvolts input, so one digital count corresponds to 2.0×10^{-2} inches/second of ground motion at 100db gain. The frequency response of the system is shown in Figure 3.

TITLE:

SYSTEM RESPONSE

SCALE:

APPROVED BY:

DRAWN BY PB

DATE:

REVISED

Micro Geophysics

DRAWING NUMBER

Figure 3

PHOENIX TRACE SEQUENTIAL FORMAT

PHOENIX TRACE HEADER

<u>Bytes</u>	<u>Words</u>	<u>Fortran Index</u>	<u>Meaning</u>
0-1	1	1	CDP number
2-3	2		Total static correction
4-5	3	2	Trace number (program derived)
6-7	4		Field file number
8-9	5	3	Source position reference number
10-11	6		Field file channel number
12-13	7 -	4	Trace distance from source
14-15	8		ASTATS corrections
16-17	9	5	Trace flag 0 = Live 1 = Dead
18-19	10		Unused
20-21	11	6	Source station number
22-23	12		Unused
24-25	13	7	Receiver station number
26-27	14		Unused

NOTE:

1. The last trace in a CDP family is flagged by negative sample 5 of the trace header.
2. At the time of NMO application, sample 7 is set negative to prevent double application of normal moveout.

PHOENIX LINE HEADER

<u>Bytes</u>	<u>Words</u>	<u>Fortran Index</u>	<u>Meaning</u>
0-1	0	1	Unused
2-3	1		Job number
4-5	2	2	Line number
6-7	3		Unused
8-9	4	3	Number of shots
10-11	5		Number of channels/shots
12-13	6	4	Input reel number
14-15	7		Current reel number
16-17	8	5	Sampling interval
18-19	9		Number of samples/trace
20-21	10	6	Date
22-23	11		Date
24-25	12	7	Date
26-27	13		Date data compression mode
28-29	14	8	Starting index
30-31	15		Start of normalization window
32-33	16	9	Number of point in FFT
34-35	17		End of normalization window
36-37	18	10	Number of samples wanted
38-39	19		Normalization scale

DATA COMPRESSION MODE

Output sampling interval negative. Output number of samples is the actual number of samples on the tape.

APPENDIX I

The following tables are the static corrections applied to each trace. The relative time as shown on the records is also listed. The asterisk marks the shot time correction. A (2) or (3) marks the points for which a secondary or tertiary arrival was picked.

TIME BREAK CORRECTIONS

Shotpoint	Spread	Time
1	1	-57
1	2	-61
3	2	-90
4	2	-133
5	2	-244
7	2	-745
9	2	-682
1	3	-52
3	3	-51
4	3	-86
5	3	-203
6	3	-335
7	3	-582
9	3	-524
1	4	-42
3	4	-55
5	4	-180
6	4	-310
7	4	-539
9	4	-478
1	5	-45
7	5	-533
8	5	-488
9	5	-487

Geophone	Relative Time	Static Correction
24	1978 (6)	-50
23	1899 (6)	-49
22	1803 (6)	-48
21	1694 (5)	-47
20	1608 (4)	-48
19	1545 (3)	-48
18	1457 (3)	-48
17	1367 (3)	-47
16	1252 (2)	-44
15	1185 (2)	-44
14	1165 (2)	-46
13	1130	-45
12		-57*
11	1083	-50
10	1001	-51
9	922	-52
8	847	-53
7	771	-54
6	686	-56
5	594	-57
4	513	-59
3	395	-60
2	256	-61
1	0	-62

Spread 1

Shotpoint 1

T. Correction*

Geophone	Relative Time	Static Corrections
24	1164 (8)	-130
23	1148 (8)	-124
22	1129 (8)	-121
21	1089 (8)	-118
20	1074 (8)	-113
19	1054 (7)	-109
18	990 (4)	-105
17	1000	-98
16	938	-98
15	876	-93
14	806	-90
13	750	-87
12	0	-61*
11	697	-85
10	635	-82
9	568	-79
8	502	-77
7	460	-78
6	387	-75
5	308	-70
4	232	-67
3	144	-65
2	82	-63
1	0	-61

Spread 2

Shotpoint 1

T. Correction*

Geophone	Relative Time	Static Corrections
24	731	-208
23	687	-201
22	601	-195
21	562	-189
20	513	-183
19	461	-177
18	410	-171
17	358	-164
16	289	-165
15	264	-157
14	255	-153
13		-149
12		-52*
11	200	-142
10	172	-134
9	149	-135
8		-133
7	119	-129
6	101	-94
5	85	-119
4	69	-114
3	52	-110
2	31	-107
1	0	-102

Spread 3

Shotpoint 1

T. Correction*

Geophone	Relative Time	Static Corrections
----------	---------------	--------------------

24	1957	-144
23	1917	-138
22	1895	-135
21	1740	-132
20	1856	-127
19	1643	-123
18	1526	-119
17	1417	-112
16	1320	-112
15	1206	-107
14	1089	-104
13	956	-101
12	0	-90*
11	786	-99
10	635	-96
9	595	-94
8	325	-92
7	168	-92
6	0	-89
5	95	-85
4	250	-82
3	416	-80
2	593	-77
1	731	-75

Spread 2

Shotpoint 3

T. Correction*

Geophone	Relative Time	Static Correction
24	1090 (2)	-267
23	1045 (2)	-283
22	1032 (2)	-283
21	999 (2)	-290
20	963 (2)	-293
19	909 (2)	-300
18	847	-296
17	823	-292
16	679	-287
15	629	-273
14	568	-258
13		-247
12		-55*
11	440	-213
10	427	-225
9	372	-217
8	312	-213
7	258	-218
6	199	-206
5	135	-201
4	124	-199
3	82	-201
2	59	-198
1	0	-193

Spread 4

Shotpoint 3

T. Correction*

Geophone	Relative Time	Static Corrections
----------	---------------	--------------------

24		-225
23		-218
22	801	-212
21	763	-206
20	711	-199
19	651	-194
18	609	-188
17	511	-181
16	482	-182
15	449	-174
14	438	-170
13	407	-166
12	0	-86*
11	379	-159
10	348	-151
9	328	-152
8	329	-150
7	287	-146
6	271	-110
5	259	-136
4	242	-131
3	191	-127
2	100	-124
1	0	-119

Spread 3

Shotpoint 4

T. Corrections*

Geophone	Relative Time	Static Correction
24	0	-221
23	61	-215
22	139	-212
21	218	-209
20	283	-204
19	351	-200
18	417	-196
17	481	-189
16	566	-189
15	639	-184
14		-181
13		-176
12		-244*
11		-176
10		-173
9		-170
8		-168
7		-169
6		-166
5		-161
4		-159
3		-156
2		-154
1		-152

Spread 2

Shotpoint 5

T. Correction*

Geophone	Relative Time	Static Corrections
24	961	-284
23	922	-276
22	827	-271
21	788	-264
20	739	-258
19	672	-253
18	632	-246
17	542	-240
16	498	-240
15	456	-233
14	430	-228
13	398	-224
12		-203*
11	352	-218
10	275	-210
9	190	-211
8	0	-209
7	109	-205
6	282	-169
5	402	-195
4	520	-189
3	655	-186
2	726	-182
1	815	-178

Spread 3

Shotpoint 5

T. Correction*

Geophone	Relative Time	Static Correction
24	1145	-330
23	1099	-346
22	1089	-345
21	1046	-352
20	949	-355
19	936	-363
18	886	-359
17	762	-355
16	760	-350
15	649	-336
14	582	-321
13		-310
12		-180*
11	459	-275
10	442	-288
9	408	-280
8	331	-275
7	268	-281
6	218	-268
5	151	-264
4	122	-262
3	99	-264
2	61	-261
1	0	-256

Spread 4

Shotpoint 5

T. Correction*

Geophone	Relative Time	Static Correction
24	147	-350
23	95	-342
22	0	-336
21	89	-330
20	165	-324
19	242	-319
18	320	-312
17	367	-306
16	400	-306
15	452	-298
14	519	-294
13	580	-290
12		-335*
11	639	-283
10	697	-276
9	744	-277
8	807	-274
7	881	-271
6	953	-235
5	1027	-260
4	1114	-255
3	1193	-252
2	1263	-248
1	1338	-243

Spread 3

Shotpoint 6

T. Correction*

Geophone	Relative Time	Static Correction
24	1257 (2)	-395
23	1207 (2)	-411
22	1116 (2)	-410
21	1048 (2)	-417
20	1025 (2)	-420
19	967 (2)	-427
18	835 (2)	-424
17	781 (2)	-420
16	711	-415
15	650	-400
14		-386
13		-375
12		-310*
11		-340
10	498	-353
9	450	-345
8	380	-340
7	319	-346
6	258	-333
5	178	-329
4	160	-327
3	108	-329
2	76	-325
1	0	-321

Spread 4

Shotpoint 6

T. Correction*

Geophone	Relative Time	Static Correction
24	0	-471
23	61	-465
22	130	-463
21	198	-460
20	265	-455
19	328	-451
18	388	-446
17	428	-440
16	526	-439
15	599	-434
14	667	-432
13	749	-428
12		-745*
11	840	-426
10	916	-424
9	987	-421
8	1022	-419
7	1120	-419
6	1168	-417
5	1222	-412
4	1290	-409
3	1347	-407
2	1418	-405
1	1469	-402

Spread 2

Shotpoint 7

T. Correction*

Geophone	Relative Time	Static Correction
24	0	-473
23	47	-466
22	51	-460
21	112	-454
20	157	-448
19	220	-442
18	289	-436
17	319	-429
16	351	-430
15	396	-422
14	458	-418
13	510	-414
12		-582*
11	560	-407
10	612	-399
9	657	-400
8	709	-398
7	785	-394
6	860	-359
5	930	-384
4	1010	-379
3	1080	-375
2	1151	-367
1	1227	-372

Spread 3

Shotpoint 7

T. Correction*

Geophone	Relative Time	Static Correction
24	369	-509
23	303	-525
22	273	-525
21	203	-531
20	98	-535
19	0	-542
18	23	-538
17	129	-534
16	191	-529
15	243	-515
14	313	-500
13		-489
12		-539*
11	450	-454
10	550	-467
9	603	-459
8	632	-454
7	691	-460
6	750	-447
5	820	-443
4	873 (3)	-441
3	949 (3)	-443
2	973 (3)	-440
1	1051 (3)	-435

Spread 4

Shotpoint 7

T. Correction*

Geophone	Relative Time	Static Corrections
24	1389	-519
23	1345	-524
22	1300	-522
21	1244	-525
20	1184	-526
19	1104	-534
18	1049	-535
17	989	-537
16	912	-539
15	895	-540
14	850	-544
13	824	-548
12		-533*
11		-530
10	708	-530
9	641	-515
8		-504
7	429	-497
6	400	-488
5	325	-501
4	270	-510
3	200	-502
2	71	-497
1	0	-506

Spread 5

Shotpoint 7

T. Correction*

Geophone	Relative Time	Static Correction
24	945	-497
23	870	-501
22	828	-500
21	763	-503
20	672	-504
19	617	-511
18	545	-513
17	476	-514
16	415	-516
15	361	-517
14	370	-521
13	320	-526
12		-488*
11	178	-507
10	75	-507
9	0	-492
8	62	-482
7	155	-474
6	250	-465
5	308	-479
4	350	-487
3	351	-479
2	350	-474
1	372	-484

Spread 5

Shotpoint 8

T. Correction*

Geophone	Relative Time	Static Correction
24		-440
23		-434
22	0	-432
21	72	-428
20	148	-424
19	196	-420
18	261	-415
17	309	-409
16	391	-408
15	465	-403
14	541	-400
13		-397
12		-682*
11	706	-395
10	770	-392
9	842	-390
8	892	-388
7	978	-388
6	1029	-386
5	1083	-381
4	1146	-378
3	1207	-376
2	1273	-374
1	1339	-371

Spread 2

Shotpoint 9

T. Correction*

Geophone	Relative Time	Static Correction
24	0	-444
23	36	-437
22	32	-431
21	71	-425
20	118	-418
19	178	-413
18	235	-406
17	240	-400
16	273	-400
15	303	-393
14	353	-388
13	398	-384
12		-524*
11	442	-378
10	488	-370
9	519	-371
8	548	-369
7	639	-365
6	701	-329
5	774	-355
4	852	-349
3	929	-346
2	1034	-343
1	1067	-338

Spread 3

Shotpoint 9

T. Correction*

Geophone	Relative Time	Static Correction
24	0	-479
23	69	-495
22	140	-494
21	197	-501
20	259	-504
19	331	-511
18	420	-508
17	416	-504
16	480	-499
15	505	-484
14	554	-470
13	582	-459
12		-478*
11		-424
10	622	-437
9	697	-428
8	721	-424
7	792	-430
6	831	-417
5	862	-413
4	935	-411
3	982	-413
2	1028	-409
1	1070	-405

Spread 4

Shotpoint 9

T. Correction*

Geophone	Relative Time	Static Correction
24	0	-496
23	84	-501
22	149	-499
21	237	-502
20	300	-503
19	309	-510
18	368	-512
17	428 (2)	-514
16	490 (3)	-516
15	550 (3)	-517
14	615 (3)	-520
13	622 (3)	-525
12		-487*
11		-507
10	800 (3)	-507
9	859 (3)	-492
8		-481
7	900 (3)	-474
6	912 (3)	-465
5	932 (3)	-478
4	982 (3)	-487
3	1029 (3)	-478
2		-474
1		-483

Spread 5

Shotpoint 9

T. Correction*