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HARD PAN I TEST SERIES-TEST AND INSTRUMENTATION PLANS

Volume III
Instrumentation Plan Continued

G.E. TEMPO (DASIAC)
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November 1976

Final Report

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Prepared for
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DEFENSE NUCLEAR AGENCY
Washington, DC 20305

SPACE AND MISSILE SYSTEMS ORGANIZATION
Los Angeles, California 90009

AIR FORCE WEAPONS LABORATORY
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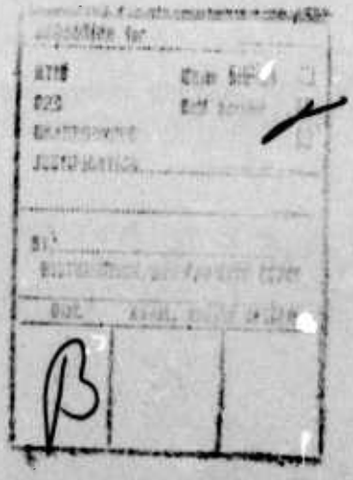

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18. SUPPLEMENTARY NOTES

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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High-explosive
Structure Medium Interaction (SMI)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The objective, test configurations, and instrumentation implementation of the HARD PAN I test series are presented in three volumes. Volume I describes the high-explosive test events (5 major and 13 calibration events) performed to obtain experimental measurements of the shock environment in the vicinity of a test structure in a layered geology due to a simulated near-surface nuclear detonation. The test geology was clay over interbedded limestone and shale. Structure medium interaction (SMI) data obtained in the test series is to be

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used in development of prediction codes for use in analyses relating to facility design, modifcation, and hardness validation and/or assessment. Berm-loaded explosive simulation technique (BLEST), a new technique for high-explosive simulation of nuclear detonation effects, is described. The first use of BLEST was in the HARD PAN I test series where it augmented the more precise HEST used to provide direct airblast loading, and increased total simulation times at acceptable additional cost. Volume I also includes specific operational plans (safety, communications, security) and data analysis requirements. Volume II (Appendix P) describes the instrumentation systems used to obtain motion, stress, and strain data from free-field and structure locations in the first three major events and the calibration events. Measurements lists are included. Volume III (Appendix P, continued) describes the instrumenting of the final two major events and lists all measurements.

CONTENTS

Volume 3

APPENDIX P (CONTINUED)

HARD PAN I INSTRUMENTATION PLANS

This volume, containing the remaining three parts of Appendix P, presents the instrumentation plans for the final two events of the HARD PAN I test series and a general description of the instrumentation used throughout the series.

PART 6

HARD PAN I-2B EVENT

1. TEST SITE LAYOUT

Figure P-32 is a plan view of the HARD PAN I-2B test site showing the test structure, the HEST cavity and the BLEST field. Figure P-33 shows the instrumentation hole layout in the HEST area and identifies specific measurement locations. Figure P-34, the associated elevation view, shows the depths at which each of the measurements is made.

2. COORDINATE SYSTEMS

Two coordinate systems were used to describe measurement locations. Structure and near field measurements were made with respect to a right-handed cylindrical coordinate system with z-direction (depth) positive downward and with azimuth angle measured clockwise (as viewed from above) from a reference azimuth. The datum azimuth was taken to be toward the simulated detonation ground zero (along the array center line) from the test structure centerline.

For free field measurements a right-handed rectangular cartesian coordinate system with downward pointing Z was used. The origin of this system was taken to be at one of the corners of the HEST cavity as indicated in figure P-32, with the positive X axis extending parallel to the array centerline and away from the simulated detonation ground zero. In this system the test structure centerline was located at X = 50 ft, Y = 44 ft.

3. INSTRUMENTATION

a. Blast Pressure

Twenty-five blast pressure gages were fielded. Seventeen of them were in free field installations and eight were mounted in the top of the test structure. Figures P-33 and P-34 show the free field locations and figure P-35 shows the structure locations. Tables P-58 and P-59 list the blast pressure measurements together with predicted levels.

b. Pneumatic Pressure

Three pressure gages were placed in a toroidal pressurized collar installed in the space between the upper and lower structures. These are listed in table P-59 and shown in figure P-35.

c. Stress

In the free field 46 soil stress gages of the WES SE type were emplaced. These are listed in table P-60 and their locations shown in figures P-33 and P-34.

Structure and near field stress measurements totalled 49. The 22 in the near field were made with the WES SE gage. The gages installed on the structure included 19 interface pressure gages (WAM) and 4 CERF developed interface stress gages, each of which measured normal stress as well as one component of interface shear stress. Table P-61 lists these measurements whose locations are shown in figure P-35.

d. Acceleration

Acceleration measurements in the free field totalled 128 (which includes 8 experimental measurements). The measurements are listed in Table P-62 and their locations are shown in figures P-34 and P-35.

In the near field there were 52 acceleration measurements and in the structure there were 42. These are listed in table P-63 and shown in figure P-36.

e. Velocity

Sixty velocity gages were emplaced in the free field at locations

shown in figures P-33 and P-34 and listed in table P-64.

There were 26 structure mounted velocity gages at locations shown in figure P-36 and listed in table P-65. Of these, six were interface velocity gages developed by CERF.

f. Relative Displacement

Ten gages were installed in the structure and near field to measure displacements of the structure parts with respect to each other and the medium. These are listed in table P-66 and shown in figure P-36.

g. Structural Steel Strain

Steel strain measurements were to be made at the 132 locations listed in table P-67 and shown in figure P-37.

h. Strong Motion Seismic

Thirteen strong motion seismic acceleration measurements were made at the five locations listed in table P-68.

i. Experimental

In addition to the experimental acceleration measurements previously mentioned, eight experimental blast pressure gages were fielded by S^3 at locations shown in figures P-33 and P-34 and listed in table P-69.

4. CHANNEL RECORD ASSIGNMENTS

AFWL Instrumentation Vans E-1, E-3, E-5, and E-9 were used to record the instrumentation channels for HP I-2B. Table P-70 lists the channels recorded together with calibration levels. Tables P-71 through P-74 show the channel assignments in a concise form.

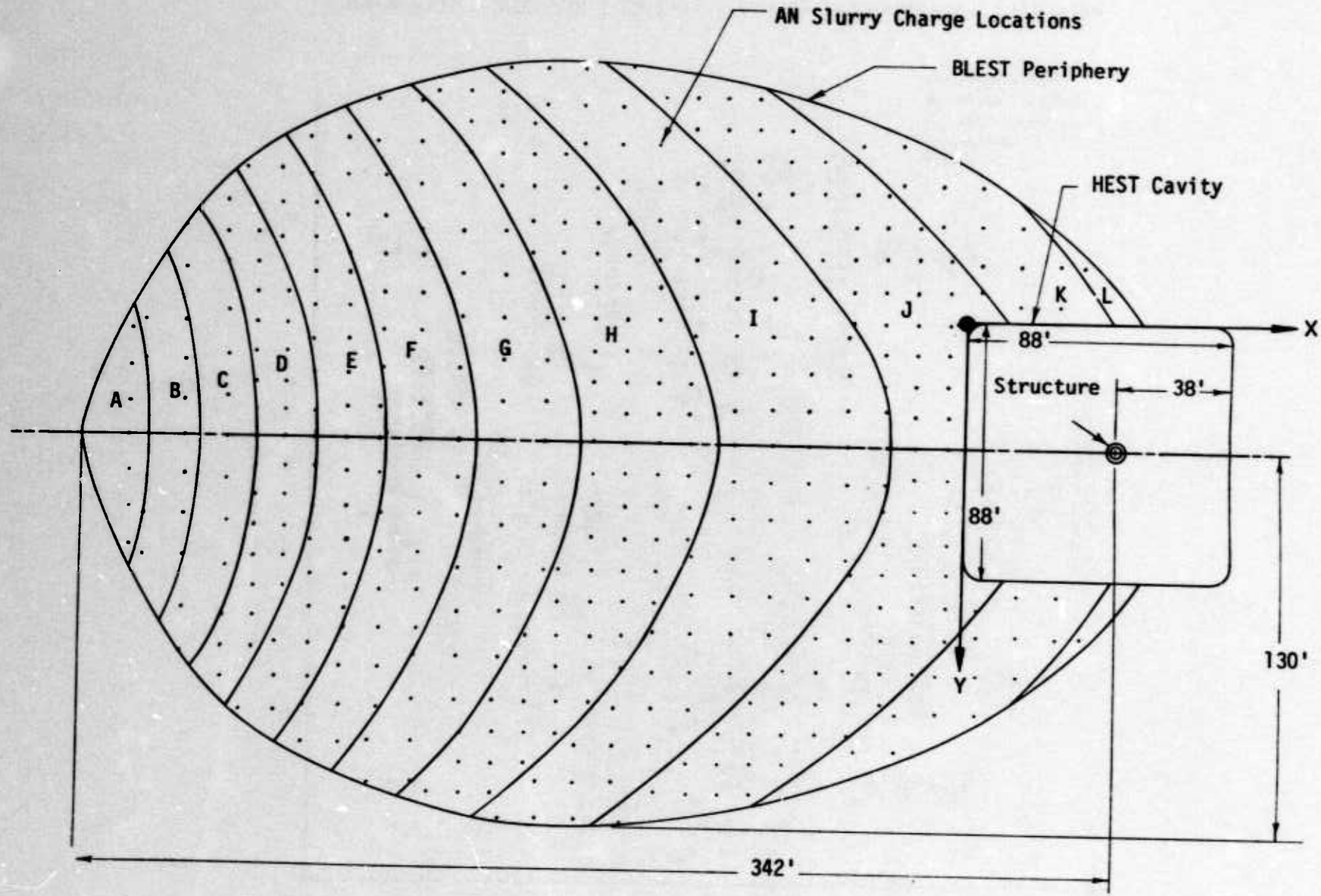


Figure P-32. Plan View of HP I-2B Test Site

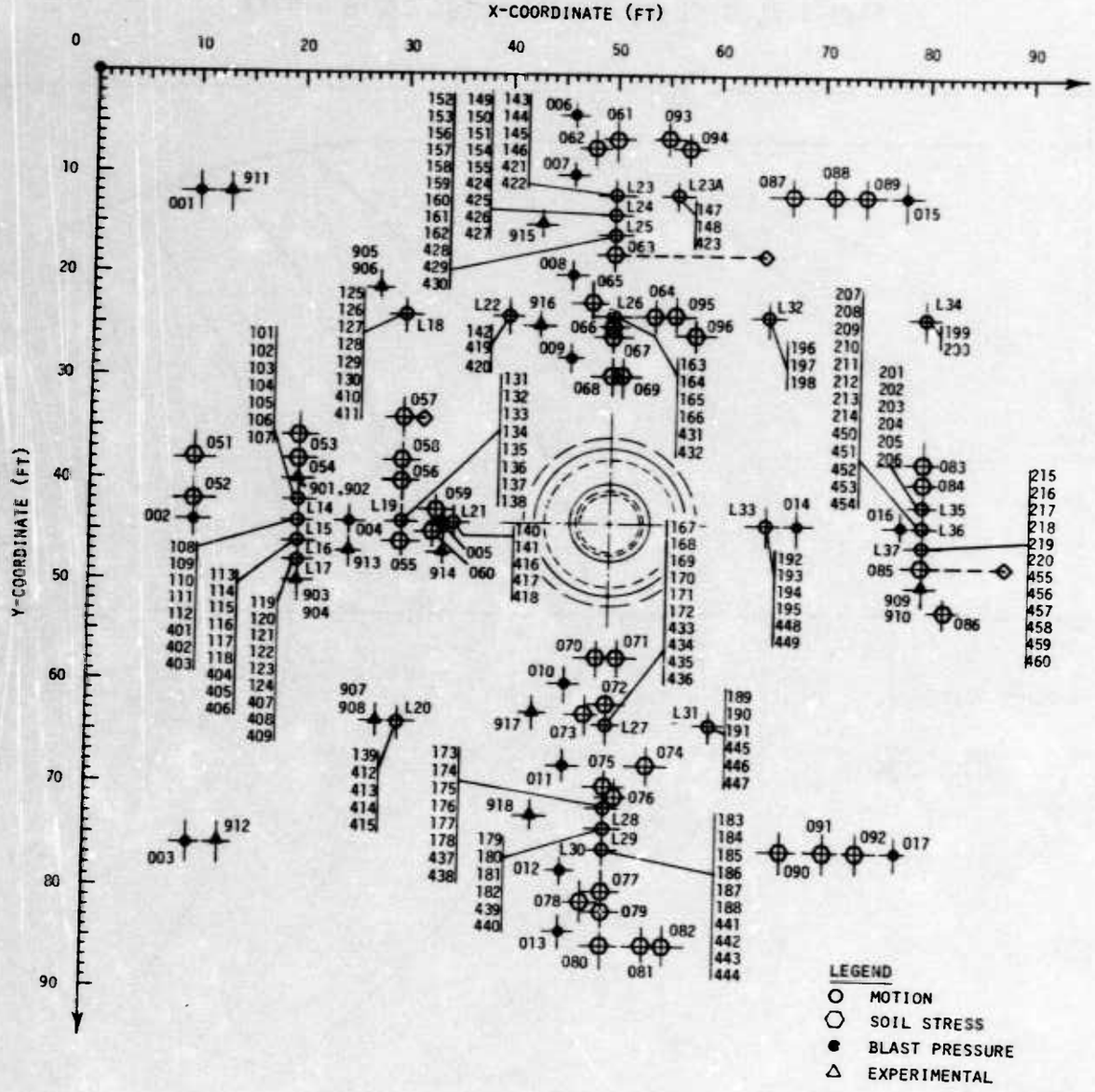


Figure P-33. HARD PAN I-2B Free Field Instrumentation - Plan View

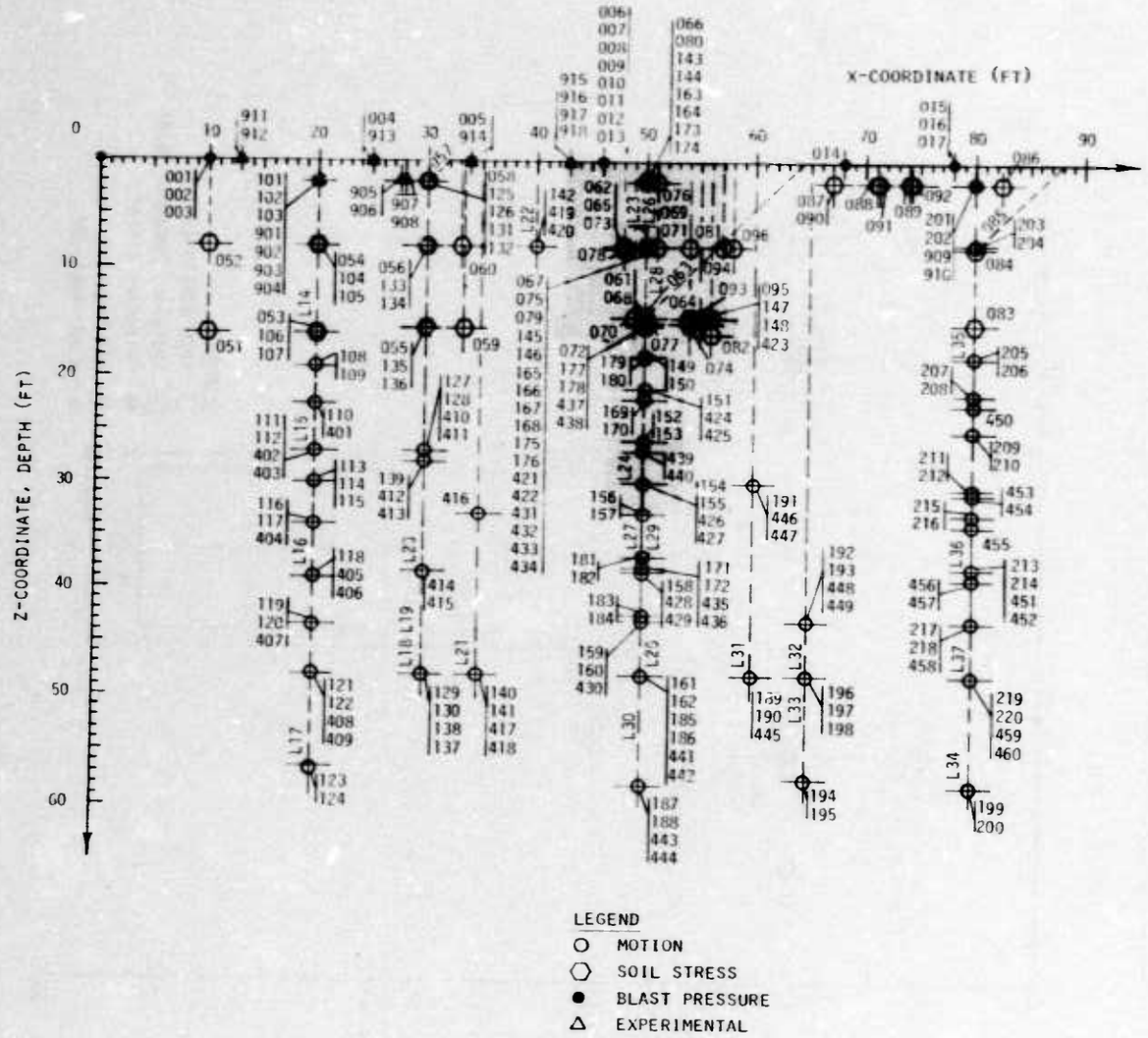


Figure P-34. HARD PAN I-2B Free Field Instrumentation - Elevation View

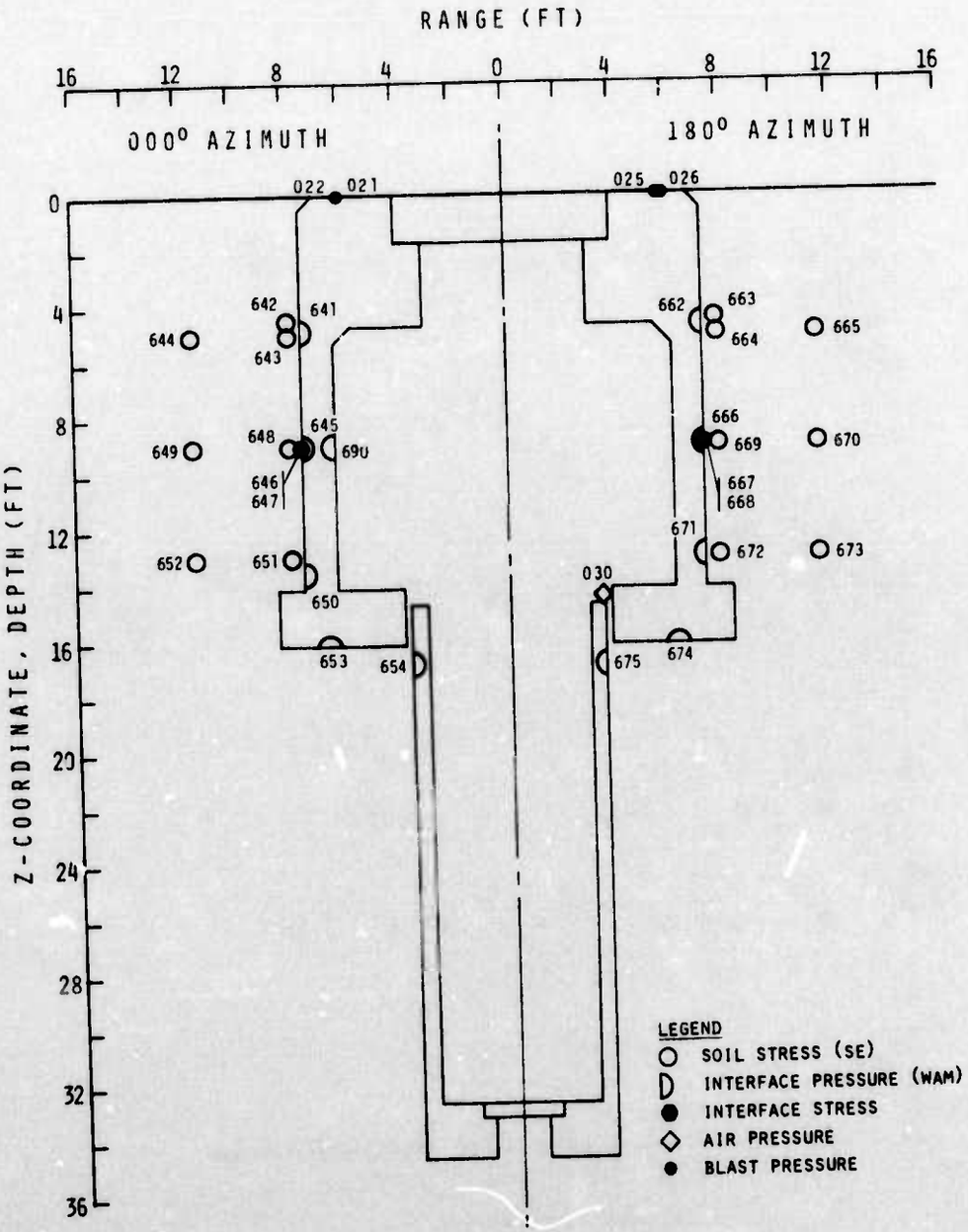


Figure P-35. Near Field and Structure Stress Measurements (000° and 180°) - HP I-2B

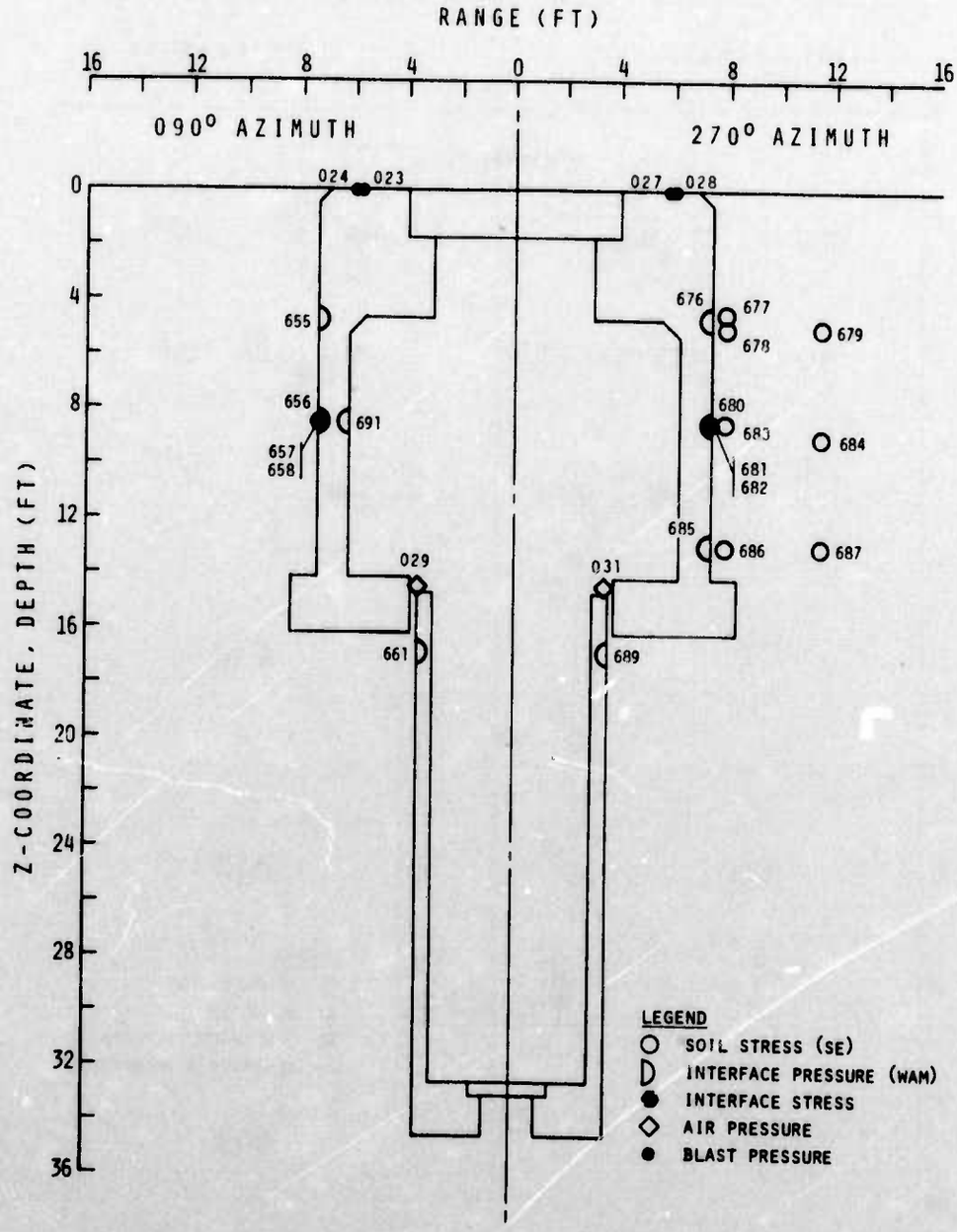


Figure P-35. Near Field and Structure Stress Measurements (090° and 270°) - HP I-2B (Continued)

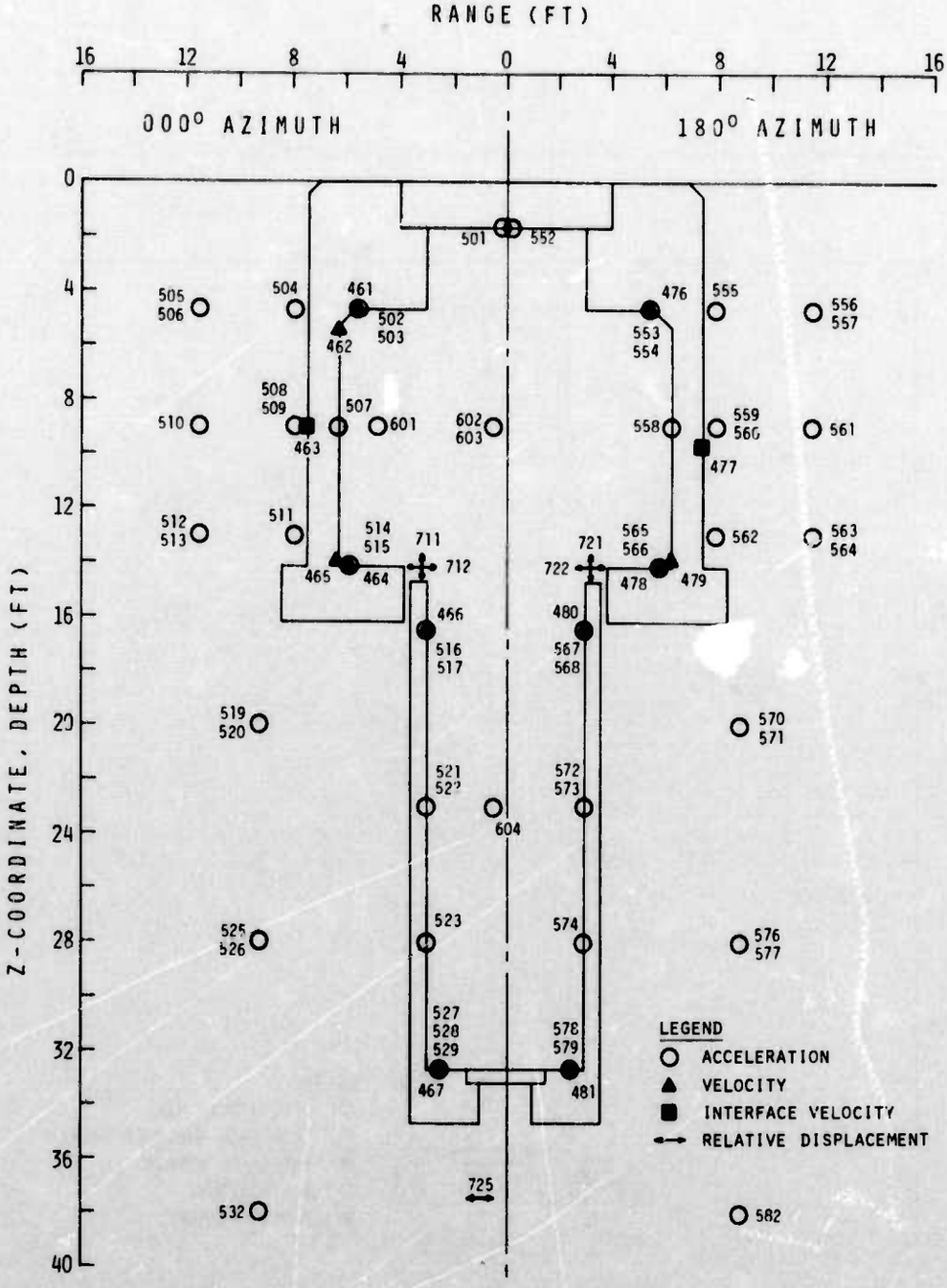


Figure P-36. Near Field and Structure Motion Measurements (000° and 180°) - HP I-2B

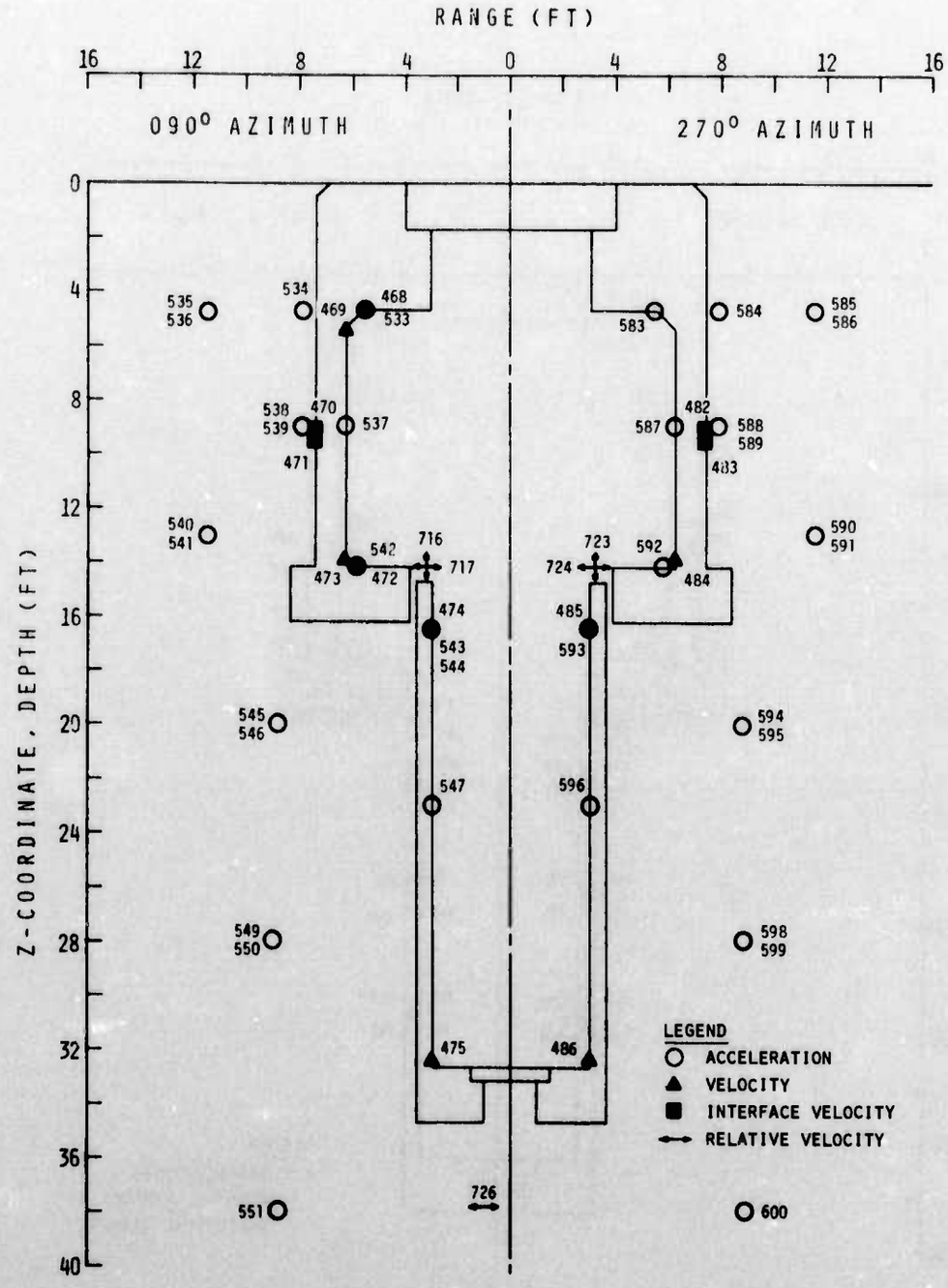


Figure P-36. Near Field and Structure Motion Measurements (090° and 270°) - HP I-2B (Continued)

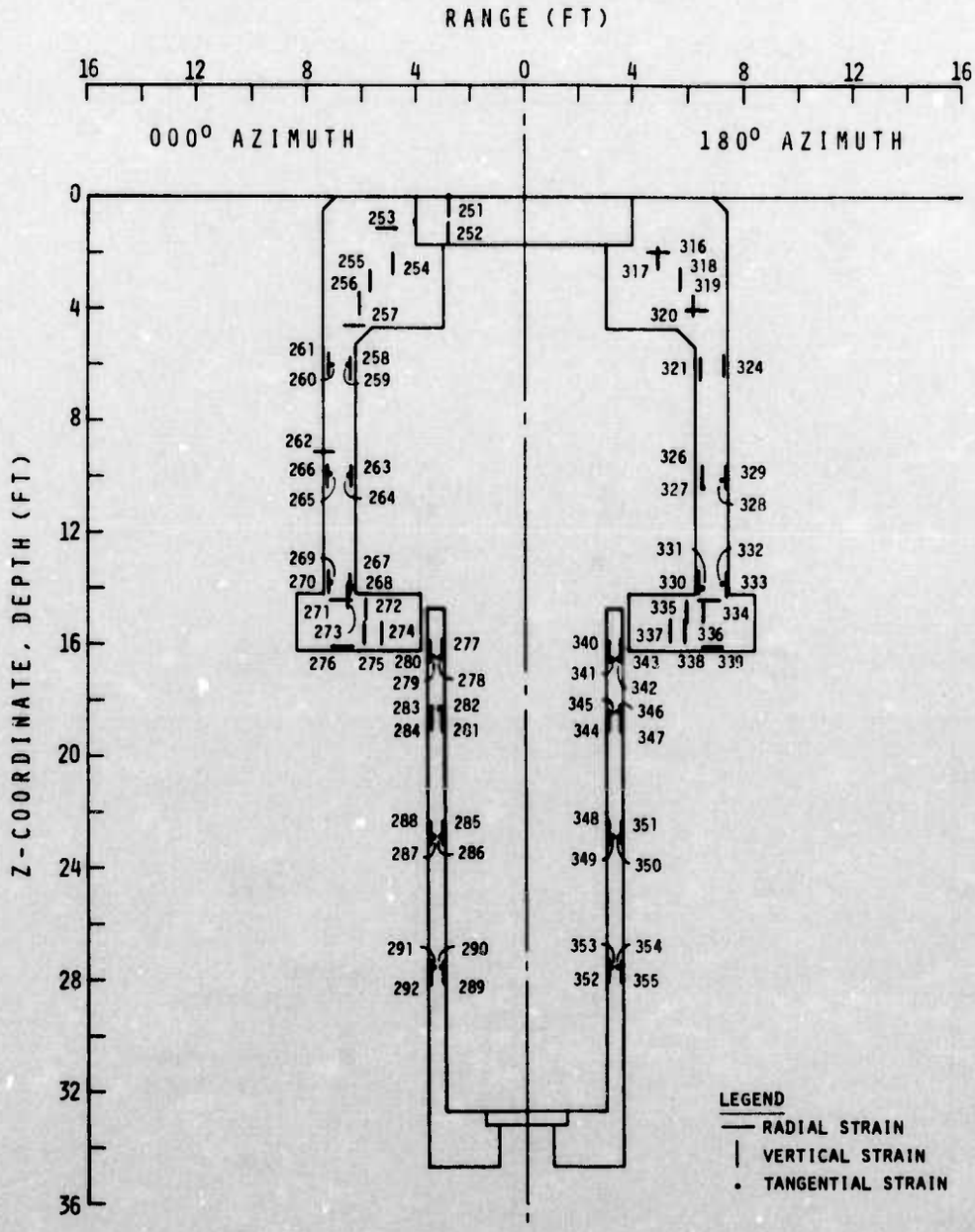


Figure P-37. Structure Steel Strain Measurements (000° and 180°) - HP I-2B

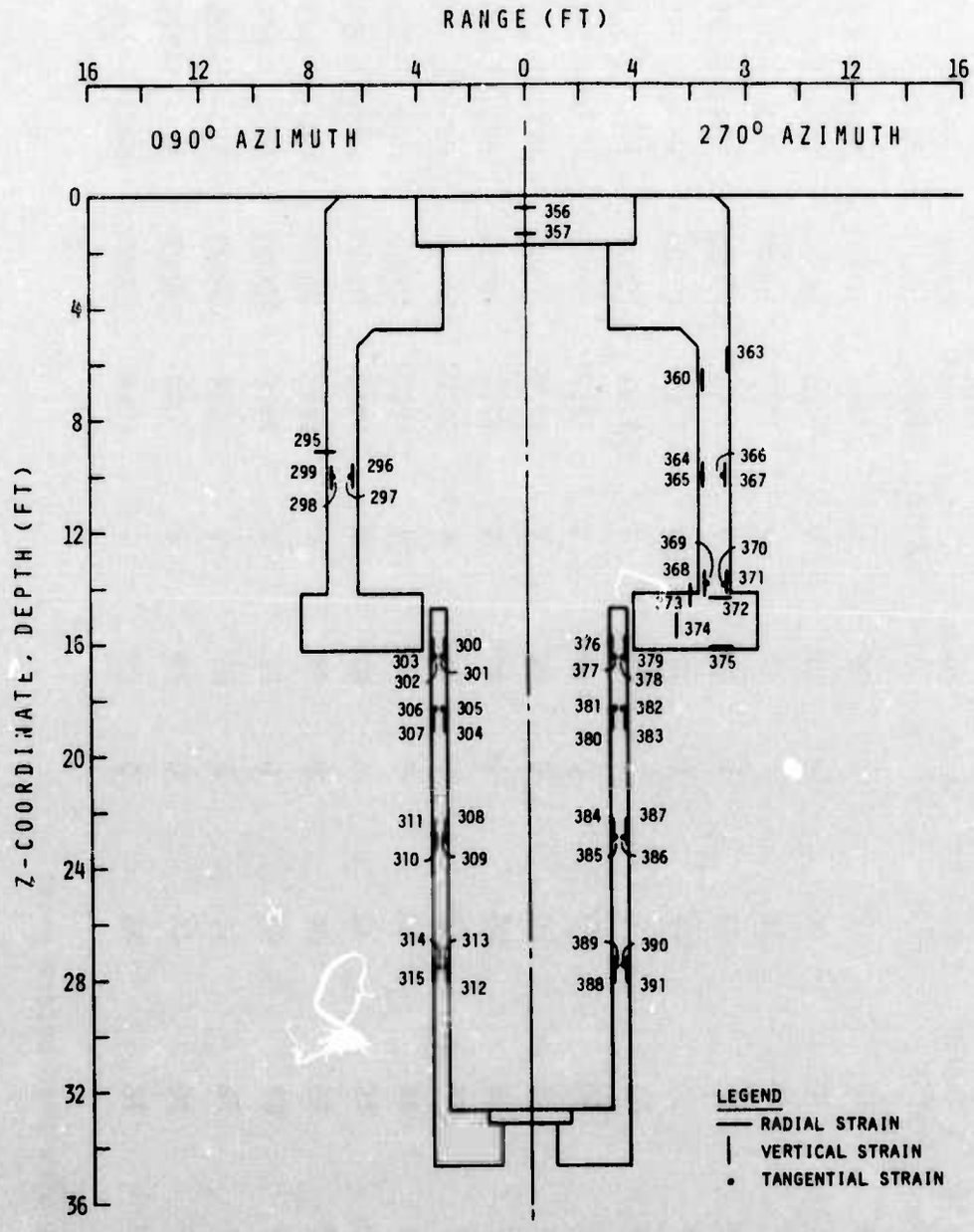


Figure P-37. Structure Steel Strain Measurements (090° and 270°) - HP I-2B (Continued)

Table P-58. Free Field Blast Pressure Measurements - HP I-2B

Meas. Number	Gen'l Loc.	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
001*	FF	10	12	0	BP	V	1407	10000	HKS-11-375	SE23
002	FF	10	44	0	BP	V	1407	10000	HKS-11-375	SE52
003	FF	10	76	0	BP	V	1407	10000	HKS-11-375	SE48
004	FF	25	44	0	BP	V	1325	10000	HKS-11-375	SE61
005	FF	34	44	0	BP	V	1280	10000	HKS-11-375	SE43
006	FF	46	4	0	BP	V	1222	10000	HKS-11-375	SE55
007	FF	46	10	0	BP	V	1222	10000	HKS-11-375	SE46
008	FF	46	20	0	BP	V	1222	10000	HKS-11-375	SE58
009*	FF	46	28	0	BP	V	1222	10000	HKS-11-375	SE51
010	FF	46	60	0	BP	V	1222	10000	HKS-11-375	SE64
011	FF	46	68	0	BP	V	1222	10000	HKS-11-375	SE49
012	FF	46	78	0	BP	V	1222	10000	HKS-11-375	SE63
013	FF	46	84	0	BP	V	1222	10000	HKS-11-375	SE62
014	FF	68	44	0	BP	V	1125	10000	HKS-11-375	SE53
015	FF	78	12	0	BP	V	1084	10000	HKS-11-375	SE47
016	FF	78	44	0	BP	V	1084	10000	HKS-11-375	SE59
017	FF	78	76	0	BP	V	1084	10000	HKS-11-375	SE50

*Measurement scratched before event

Table P-59. Structure and Near Field Blast and Air Bag Pressure Measurements - HP I-2B

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number	Remarks
021	US	0	357.91	6	BP	V	1200	10000	HKS-11-375	SE54	
022	US	0	2.09	6	BP	V	1200	5000	HKS-11-375	SD25	1
023	US	0	90	5.8	BP	V	1200	10000	HKS-11-375	SE44	
024	US	0	90	6	BP	V	1200	5000	HKS-11-375	SD27	1
025	US	0	177.91	5.8	BP	V	1200	5000	HKS-11-375	SD29	1
026	US	0	182.09	6	BP	V	1200	10000	HKS-11-375	SE56	
027	US	0	270	5.8	BP	V	1200	10000	HKS-11-375	SE57	
028	US	0	270	6	BP	V	1200	5000	HKS-11-375	SD28	1
029	LS/US	14.7	70	3.5	AP	R	50	200	XTS-1-190	A2	2
030	LS/US	14.7	160	3.5	AP	R	50	200	XTS-1-190	A5	2
031	LS/US	14.7	250	3.5	AP	R	50	500	XTS-1-190	A40	2

Remarks: 1. Carport blast diffuser used
2. Air bag pressure measurement

Table P-60. Free Field Soil Stress Measurements - HP I-2B

Meas. Number	Gen'l Loc.	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
051	FF	10	38	16	FS	H	1600	4000	SE	450
052	FF	10	42	8	FS	H	1600	4000	SE	440
053	FF	20	36	16	FS	H	1550	4000	SE	444
054	FF	20	38	8	FS	H	1550	4000	SE	400
055	FF	30	46	15.5	FS	H	1450	4000	SE	369
056	FF	30	40	8	FS	H	1450	4000	SE	304
057	FF	30	34	2	FS	45	1450	4000	SE	342
058	FF	30	38	2	FS	H	1450	4000	SE	334
059	FF	33.5	43	15.5	FS	H	1400	4000	SE	441
060	FF	33.11	45	8	FS	H	1400	4000	SE	387
061	FF	50	6.5	14.5	FS	H	1350	4000	SE	443
062	FF	48	7.5	8	FS	H	1350	4000	SE	306
063	FF	50	18	14.5	FS	45	1350	4000	SE	335
064	FF	54	24	14.5	FS	H	1350	4000	SE	336
065	FF	48	23	8	FS	H	1350	4000	SE	328
066	FF	50	25	1.92	FS	T	1350	4000	SE	359
067	FF	50	26	8	FS	H	1350	4000	SE	390
068	FF	50	29.9	14.5	FS	T	1350	4000	SE	309
069	FF	51	29.8	8	FS	T	1350	4000	SE	442
070	FF	49	57.40	14.5	FS	T	1350	4000	SE	343
071	FF	51	57.65	8	FS	T	1350	4000	SE	330

Table P-60. Free Field Soil Stress Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
072	FF	50	62	15	FS	T	1350	4000	SE	401
073	FF	48	63	8	FS	H	1350	4000	SE	429
074*	FF	54	68	15	FS	H	1350	4000	SE	433
075*	FF	50	70	8	FS	T	1350	4000	SE	451
076	FF	51	71	2	FS	T	1350	4000	SE	454
077	FF	50	80	15.1	FS	T	1350	4000	SE	461
078	FF	48	81	8.1	FS	T	1350	4000	SE	462
079	FF	50	82	8	FS	H	1350	4000	SE	471
080	FF	50	85.5	2	FS	T	1350	4000	SE	472
081	FF	54	85.5	8	FS	T	1350	4000	SE	480
082	FF	56	85.5	16	FS	T	1350	4000	SE	409
083	FF	80	38	15	FS	H	1150	4000	SE	405
084	FF	80	40	8	FS	H	1150	4000	SE	410
085	FF	80	48	8	FS	45	1150	4000	SE	426
086	FF	82.35	52.6	2	FS	H	1150	4000	SE	436
087	FF	67	12	2	FS	H	1200	4000	SE	427
088	FF	71	12	2	FS	H	1200	4000	SE	428
089	FF	74	12	2	FS	H	1200	4000	SE	420
090	FF	67	76	2	FS	H	1200	4000	SE	400
091	FF	71.17	76	2	FS	H	1200	4000	SE	439
092	FF	74.17	76	2	FS	H	1200	4000	SE	422

Table P-60. Free Field Soil Stress Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
093	FF	55	6.5	14.5	FS	T	1300	4000	SE	411
094	FF	57	7.5	8	FS	T	1300	4000	SE	406
095	FF	56	24	14.5	FS	T	1300	4000	SE	434
096	FF	58	26	8	FS	T	1300	4000	SE	414
802	FF	546.75	120.50	15.17	FS	45	4000	4000	SE	423
803	FF	546.75	-126.92	15.17	FS	45	4000	4000	SE	419
804	FF	589.08	-116.17	14.67	FS	45	4000	4000	SE	408
805	FF	594.42	-110.83	14.67	FS	45	4000	4000	SE	413
806	FF	594.42	-116.17	14.67	FS	45	4000	4000	SE	416
807	FF	672.17	- 76.00	16.00	FS	45	4000	4000	SE	432
808	FF	685.33	- 69.50	16.00	FS	45	4000	4000	SE	421
809	FF	691.92	- 60.83	16.00	FS	45	4000	4000	SE	407

Table P-61. Structure and Near Field Stress Measurements - HP I-2B

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
641	US	4.9	355.4	7.4	IP	R	1500	4000	WAM	13
642	NF	4.5	355	7.9	FS	R	1500	4000	SE	120
643	NF	5.0	355	7.9	FS	V	1500	4000	SE	430
644	NF	5.0	355	11.5	FS	V	1500	4000	SE	452
645	US	9.2	355	7.4	IP	R	2000	4000	WAM	88
646	US	9.0	8.9	7.4	IS	V	500		IS	2-75-03
647	US	9.0	8.9	7.4	IS	R	2000		IS	2-75-03
648	NF	9.0	355	7.9	FS	V	2000	4000	SE	455
649	NF	9.0	355	11.5	FS	R	2000	4000	SE	456
650	US	13.6	353.3	7.4	IP	R	2000	4000	WAM	4
651	NF	13.0	355	7.9	FS	R	2000	4000	SE	457
652	NF	13.0	355	11.5	FS	V	2000	4000	SE	458
653*	US	16.24	355	6.3	IP	V	2000	4000	WAM	89
654	LS	16.9	0	3.6	IP	R	1500	4000	WAM	71
655	US	4.7	89.5	7.4	IP	R	1500	4000	WAM	16
656	US	8.5	90	7.4	IP	R	2000	4000	WAM	9
657	US	8.5	93.9	7.4	IS	V	500		IS	2-75-039
658*	US	8.5	93.7	7.4	IS	T	500		IS	2-75-039
661*	LS	16.9	90	3.6	IP	R	1500	4000	WAM	65
662	US	4.7	176.4	7.4	IP	R	1500	4000	WAM	14
663	NF	4.5	175	7.9	FS	R	1500	4000	SE	463

Table P-61. Structure and Near Field Stress Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
664	NF	5.0	175	7.9	FS	V	1500	4000	SE	464
665	NF	5.0	175	11.5	FS	V	1500	4000	SE	465
666	US	8.96	176.5	7.4	IP	R	2000	4000	WAM	10
667	US	9.04	188.1	7.4	IS	V	500		IS	2-75-037
668	US	9.04	188.1	7.4	IS	R	2000		IS	2-75-037
669	NF	9.0	175	7.9	FS	V	2000	4000	SE	468
670	NF	9.0	175	11.5	FS	R	2000	4000	SE	469
671	US	13.0	175	7.4	IP	R	2000	4000	WAM	75
672	NF	13.0	175	7.9	FS	R	2000	4000	SE	470
673	NF	13.0	175	11.5	FS	V	2000	4000	SE	473
674	US	16.2	175	6.3	IP	V	2000	4000	WAM	81
675	US	16.9	180	3.6	IP	R	1500	4000	WAM	80
676	US	4.7	270	7.4	IP	R	1500	4000	WAM	8
677	NF	4.5	265	7.9	FS	R	1500	4000	SE	474
678	NF	5.0	265	7.9	FS	V	1500	4000	SE	477
679*	NF	5.0	269.5	11.5	FS	V	1500	4000	SE	478
680	US	8.5	273.2	7.44	IP	R	2000	4000	WAM	1
681*	US	8.5	273.2	7.46	IS	V	500		IS	
682	US	8.5	275	7.46	IS	T	500		IS	
683	NF	8.5	265	7.9	FS	R	2000	4000	SE	481
684	NF	9.0	265	11.5	FS	R	2000	4000	SE	482

Table P-61. Structure and Near Field Stress Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
685	US	12.96	269.4	7.4	IP	R	2000	4000	WAM	55
686	NF	13.0	265	7.9	FS	R	2000	4000	SE	483
687	NF	13.0	265	11.5	FS	V	2000	4000	SE	486
689	LS	16.9	270	3.6	IP	R	1500	4000	WAM	82
690	US	8.5	355	6.3	IP	R	1500	4000	WAM	18
691*	US	8.5	90	6.3	IP	R	1500	4000	WAM	7

*Measurement scratched before event

Table P-62. Free Field Acceleration Measurements - HP I-2B

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
101	L14	20	42	2	A	V	3000	10000	2264A	AC76
102	L14	20	42	2	A	H	2500	5000	2264A	AK03
103	L14	20	42	2	A	T	2000	5000	2264A	AJ84
104	L14	20	42	8	A	V	3000	10000	2264A	AC66
105	L14	20	42	8	A	H	2500	5000	2264A	AJ79
106*	L14	20	42	16	A	V	3000	10000	2264A	AC98
107	L14	20	42	16	A	H	2500	5000	2264A	AJ48
108	L15	20	44	19	A	V	2500	5000	2264A	AJ34
109	L15	20	44	19	A	H	2500	5000	2264A	AJ14
110	L15	20	44	22.5	A	V	1000	2000	2264A	AD77
111	L15	20	44	27	A	V	1000	2000	2264A	AD76
112	L15	20	44	27	A	H	1000	2000	2264A	AD75
113	L16	20	46	30	A	V	500	2000	2264A	AD74
114	L16	20	46	30	A	H	500	2000	2264A	AD67
115	L16	20	46	30	A	T	500	2000	2264A	AD62
116	L16	20	46	34	A	V	400	2000	2264A	AD58
117	L16	20	46	34	A	H	400	2000	2264A	AD56
118	L16	20	46	39	A	V	300	2000	2264A	AD55
119	L17	20	48	43.5	A	V	300	2000	2264A	AD54
120	L17	20	48	43.5	A	H	400	2000	2264A	AD53
121	L17	20	48	48	A	V	300	2000	2264A	AB99

Table P-62. Free Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
122	L17	20	48	48	A	H	400	2000	2264A	AD89
123	L17	20	48	56.75	A	V	240	2000	2264A	AB49
124	L17	20	48	56.75	A	H	240	2000	2264A	AB48
125	L18	30	24	2	A	V	2400	5000	2264A	AE90
126	L18	30	24	2	A	H	2400	5000	2264A	AE96
127	L18	30	24	27	A	V	900	2000	2264A	AB34
128	L18	30	24	27	A	H	900	2000	2264A	AB31
129	L18	30	24	48	A	V	300	2000	2264A	AB23
130	L18	30	24	48	A	H	400	2000	2264A	AB19
131	L19	30	44	2	A	V	3000	10000	2264A	AC64
132	L19	30	44	2	A	H	2400	5000	2264A	AD85
133	L19	30	44	8	A	H	2400	5000	2264A	AE02
134	L19	30	44	8	A	T	2000	5000	2264A	AF32
135	L19	30	44	15.5	A	V	2400	5000	2264A	AE29
136*	L19	30	44	15.5	A	H	2400	5000	2264A	AE08
137	L19	30	44	48	A	V	240	2000	2264A	AD88
138	L19	30	44	48	A	H	240	2000	2264A	AD87
139	L20	30	64	28	A	V	500	2000	2264A	AB12
140	L21	35	44	48	A	V	300	2000	2264A	AD85
141	L21	35	44	48	A	H	300	2000	2264A	AD83
142	L22	40	24	8	A	T	2400	5000	2264A	AE97

Table P-62. Free Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
143	L23	50	50	2	A	V	3000	10000	2264A	AC63
144	L23	50	50	2	A	H	2500	5000	2264A	AG18
145	L23	50	50	8	A	V	2400	5000	2264A	AG19
146	L23	50	50	8	A	H	2400	5000	2264A	AG10
147	L23A	56	12	14.5	A	V	2400	5000	2264A	AG07
148	L23A	56	12	14.5	A	T	2000	5000	2264A	AG04
149	L24	50	14	18	A	V	2400	5000	2264A	AG25
150	L24	50	14	18	A	H	2400	5000	2264A	AG32
151	L24	50	14	21	A	V	1000	2000	2264A	AD48
152	L25	50	16	26	A	V	1000	2000	2264A	AD47
153	L25	50	16	26	A	H	1000	2000	2264A	AD45
154	L24	50	14	30	A	V	500	2000	2264A	AD44
155	L24	50	14	30	A	H	500	2000	2264A	AD42
156	L25	50	16	33	A	V	400	2000	2264A	AD41
157	L25	50	16	33	A	H	400	2000	2264A	AD39
158	L25	50	16	38.5	A	V	300	2000	2264A	AD37
159	L25	50	16	43	A	V	300	2000	2264A	AD31
160	L25	50	16	43	A	T	200	2000	2264A	AD30
161	L25	50	16	48	A	V	300	2000	2264A	AD29
162	L25	50	16	48	A	H	400	2000	2264A	AD26
163	L26	50	24	2	A	V	2400	5000	2264A	AD54

Table P-62. Free Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
164	L26	50	24	2	A	T	2400	5000	2264A	AD84
165	L26	50	24	8	A	V	2400	5000	2264A	AE03
166	L26	50	24	8	A	T	2400	5000	2264A	AE86
167	L27	50	64	8	A	V	2400	5000	2264A	AF07
168	L27	50	64	8	A	T	2400	5000	2264A	AE89
169	L27	50	64	22	A	V	1000	2000	2264A	AB43
170	L27	50	64	22	A	T	1000	2000	2264A	AB42
171	L27	50	64	38	A	H	400	2000	2264A	AB41
172	L27	50	64	38	A	T	240	2000	2264A	AB39
173	L28	50	72	2	A	V	3000	10000	2264A	AC56
174	L28	50	72	2	A	H	2500	5000	2264A	AG34
175	L28	50	72	8	A	V	3000	10000	2264A	AC02
176	L28	50	72	8	A	T	2400	5000	2264A	AG39
177	L28	50	72	15	A	V	2400	5000	2264A	AG38
178	L28	50	72	15	A	H	2400	5000	2264A	AF04
179	L29	50	74	18.08	A	V	2400	5000	2264A	AF06
180	L29	50	74	18.08	A	T	2400	5000	2264A	AD01
181	L29	50	74	37	A	V	400	2000	2264A	AD24
182	L29	50	74	37	A	H	400	2000	2264A	AD23
183	L30	50	76	42.5	A	V	300	2000	2264A	AD22
184	L30	50	76	42.5	A	H	400	2000	2264A	AD21

Table P-62. Free Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
185	L30	50	76	48	A	V	240	2000	2264A	AD18
186	L30	50	76	48	A	H	240	2000	2264A	AD16
187	L30	50	76	58	A	V	240	2000	2264A	AD12
188	L30	50	76	58	A	H	240	2000	2264A	AD10
189	L31	60	64	48	A	V	240	2000	2264A	AB06
190	L31	60	64	48	A	H	240	2000	2264A	AB03
191*	L31	60	64	30	A	T	240	2000	2264A	AB02
192	L33	65	44	43	A	V	300	2000	2264A	AD81
193	L33	65	44	43	A	H	300	2000	2264A	AD79
194	L33	65	44	57.5	A	V	200	2000	2264A	AB52
195	L33	65	44	57.5	A	H	200	2000	2264A	AB50
196	L32	65	24	48	A	V	240	2000	2264A	AB18
197	L32	65	24	48	A	H	240	2000	2264A	AB17
198	L32	65	24	48	A	T	240	2000	2264A	AB16
199	L34	80	24	58	A	V	240	2000	2264A	AB09
200	L34	80	24	58	A	H	240	2000	2264A	AB08
201	L35	80	42	2	A	V	3000	10000	2264A	AB98
202	L35	80	42	2	A	H	2500	5000	2264A	AD20
203	L35	80	42	7.83	A	V	3000	10000	2264A	AB81
204	L35	80	42	7.83	A	H	2500	5000	2264A	AD37
205	L35	80	42	18	A	V	3000	10000	2264A	AB78

Table P-62. Free Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
206	L35	80	42	18	A	H	2500	5000	2264A	AD40
207	L36	80	44	21.5	A	V	2250	5000	2264A	AD52
208	L36	80	44	21.5	A	H	2250	5000	2264A	AD03
209	L36	80	44	25	A	V	1000	2000	2264A	AD09
210	L36	80	44	25	A	H	1000	2000	2264A	AD08
211	L36	80	44	30.5	A	V	1000	2000	2264A	AD07
212	L36	80	44	30.5	A	H	1000	2000	2264A	AD06
213	L36	80	44	38	A	V	500	2000	2264A	AD05
214	L36	80	44	38	A	T	500	2000	2264A	AD04
215	L37	80	46	33	A	V	400	2000	2264A	AB64
216	L37	80	46	33	A	H	400	2000	2264A	AB62
217	L37	80	46	43	A	V	300	2000	2264A	AB59
218	L37	80	46	43	A	H	400	2000	2264A	AB57
219	L37	80	46	48	A	V	300	2000	2264A	AB54
220	L37	80	46	48	A	H	400	2000	2264A	AB53

*Measurement scratched before event

Table P-63. Structure and Near Field Acceleration Measurements - HP I-2B

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
501	CL	1.7	0	0.2	A	R	3000	5000	2264A	AH70
502	US	4.7	0	5.5	A	R	2000	5000	2264A	AG23
503	US	4.7	0	5.5	A	V	1500	2000	2264A	AC17
504	NF	4.7	0	7.9	A	V	2000	5000	2264A	AE15
505	NF	4.7	0	11.5	A	R	2000	5000	2264A	AE06
506	NF	4.7	0	11.5	A	V	2000	5000	2264A	AD91
507	US	9	0	6.3	A	R	2000	5000	2264A	AE72
508	NF	9	0	7.9	A	R	2000	5000	2264A	AD81
509	NF	9	0	7.9	A	V	2000	5000	2264A	AD62
510	NF	9	0	11.5	A	V	2000	5000	2264A	AD60
511	NF	13	0	7.9	A	V	1500	2000	2264A	AB37
512	NF	13	0	11.5	A	R	1500	2000	2264A	AB51
513	NF	13	0	11.5	A	V	1500	2000	2264A	AB96
514	US	14.2	0	5.8	A	R	1500	2000	2264A	AB69
515	US	14.2	0	5.8	A	V	1500	2000	2264A	AB58
516	LS	16.5	0	3	A	R	1000	2000	2264A	AB86
517	LS	16.5	0	3	A	V	1000	2000	2264A	AB85
519	NF	20	353.8	9.2	A	R	1000	2000	2264A	AB92
520	NF	20	353.8	9.2	A	V	1000	2000	2264A	AB44
521	LS	23	0	3	A	R	500	2000	2264A	AB80
522	LS	23	0	3	A	V	500	2000	2264A	AC10

Table P-63. Structure and Near Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
523	LS	28	0	3	A	R	500	2000	2264A	AD93
525	NF	28	353.8	9.2	A	R	500	2000	2264A	AB87
526	NF	28	353.8	9.2	A	V	500	2000	2264A	AB84
527*	LS	32.7	0	2.5	A	R	500	2000	2264A	AC08
528	LS	32.7	0	2.5	A	V	1000	2000	2264A	AC18
529	LS	32.7	0	2.5	A	T	500	2000	2264A	AB93
532	NF	38	353.8	9.2	A	R	500	2000	2264A	AB15
533	US	4.7	90	5.5	A	R	2000	5000	2264A	AC52
534	NF	4.7	90	7.9	A	R	2000	5000	2264A	AD55
535	NF	4.7	90	11.5	A	V	2000	5000	2264A	AG70
536	NF	4.7	90	11.5	A	T	2000	5000	2264A	AH81
537	US	9	90	6.3	A	R	2000	5000	2264A	AF18
538	NF	9	90	7.9	A	R	2000	5000	2264A	AC20
539	NF	9	90	7.9	A	V	2000	5000	2264A	AJ11
540	NF	13	90	11.5	A	R	1500	2000	2264A	AB55
541	NF	13	90	11.5	A	V	1500	2000	2264A	AB25
542	US	14.2	90	5.8	A	R	1500	2000	2264A	AB78
543	LS	16.5	90	3	A	R	1000	2000	2264A	AB88
544	LS	16.5	90	3	A	T	1000	2000	2264A	AD94
545	NF	20	90	8.8	A	V	1000	2000	2264A	AB65
546	NF	20	90	8.8	A	T	1000	2000	2264A	AB30

Table P-63. Structure and Near Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
547*	LS	23	90	3	A	R	500	2000	2264A	AC95
549	NF	28	90	9	A	R	500	2000	2264A	AB38
550	NF	28	90	9	A	V	500	2000	2264A	AB97
551	NF	38	90	8.8	A	T	500	2000	2264A	AB01
552	CL	1.7	180	0.2	A	V	3000	5000	2264A	AG96
553	US	4.7	180	5.5	A	R	2000	5000	2264A	AH20
554	US	4.7	180	5.5	A	V	1500	2000	2264A	AC13
555	NF	4.7	180	7.9	A	V	2000	5000	2264A	AJ37
556	NF	4.7	180	11.5	A	R	2000	5000	2264A	AJ74
557	NF	4.7	180	11.5	A	V	2000	5000	2264A	AK32
558	US	9	180	6.3	A	R	2000	5000	2264A	AH21
559	NF	9	180	7.9	A	R	2000	5000	2264A	AG14
560	NF	9	180	7.9	A	V	2000	5000	2264A	AL06
561	NF	9	180	11.5	A	V	2000	5000	2264A	AK81
562*	NF	13	180	7.9	A	V	1500	2000	2264A	AB45
563	NF	13	180	11.5	A	R	1500	2000	2264A	AB82
564	NF	13	180	11.5	A	V	1500	2000	2264A	AB68
565	US	14.2	180	5.8	A	R	1500	2000	2264A	AB81
566	US	14.2	180	5.8	A	V	1500	2000	2264A	AB98
567	LS	16.5	180	3	A	R	1000	2000	2264A	AB95
568	LS	16.5	180	3	A	V	1000	2000	2264A	AC06

Table P-63. Structure and Near Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
570	NF	20	175.7	8.8	A	R	1000	2000	2264A	AB60
571	NF	20	175.7	8.8	A	V	1000	2000	2264A	AB66
572	LS	23	180	3	A	R	1000	2000	2264A	AB90
573	LS	23	180	3	A	V	500	2000	2264A	AB77
574*	LS	28	180	3	A	R	500	2000	2264A	AB94
576*	NF	28	175.7	8.8	A	R	500	2000	2264A	AB40
577	NF	28	175.7	8.8	A	V	500	2000	2264A	AB73
578	LS	32.7	180	2.5	A	V	1000	2000	2264A	AD91
579	LS	32.7	180	2.5	A	T	500	2000	2264A	AB11
582	NF	38	175.7	8.8	A	R	500	2000	2264A	AB35
583	US	4.7	270	5.5	A	R	2000	5000	2264A	AH33
584	NF	4.7	270	7.9	A	V	2000	5000	2264A	AK54
585	NF	4.7	270	11.5	A	V	2000	5000	2264A	AJ96
586	NF	4.7	270	11.5	A	T	2000	5000	2264A	AJ91
587	US	9	270	6.3	A	R	2000	5000	2264A	AH38
588	NF	9	270	7.9	A	R	2000	5000	2264A	AJ89
589	NF	9	270	7.9	A	V	2000	5000	2264A	AL22
590	NF	13	270	11.5	A	R	1500	2000	2264A	AB67
591	NF	13	270	11.5	A	V	1500	2000	2264A	AB47
592	US	14.2	270	5.8	A	R	1500	2000	2264A	AB70
593	LS	16.5	270	3	A	R	1000	2000	2264A	AC04

Table P-63. Structure and Near Field Acceleration Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
594	NF	20	271	8.8	A	V	1000	2000	2264A	AB29
595	NF	20	271	8.8	A	T	1000	2000	2264A	AB27
596	LS	23	271	3	A	R	500	2000	2264A	AD90
598	NF	28	271	8.8	A	R	500	2000	2264A	AB26
599	NF*	28	271	8.8	A	V	500	2000	2264A	AB22
600	NF	38	271	8.8	A	T	500	2000	2264A	AB21
601	US	9	0	4.8	A	R	500	2000	2264A	AC03
602	US	9	0	0.5	A	R	500	2000	2264A	AC14
603	US	9	0	0.5	A	V	500	2000	2264A	AC16
604	LS	23	0	0.5	A	R	500	2000	2264A	AC05

*Measurement scratched before event

Table P-64. Free Field Velocity Measurements - HP I-2B

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
401	L15	20	44	22.5	V	V	20	20	BH-V	3046
402	L15	20	44	27	V	V	12	12	BH-V	3058
403	L15	20	44	27	V	H	25	25	BH-H	1798
404	L16	20	46	34	V	V	15	15	BH-V	3039
405	L16	20	46	39	V	V	10	10	BH-V	3042
406	L16	20	46	39	V	H	20	20	BH-H	2993
407	L17	20	48	43.5	V	H	20	20	BH-H	2973
408	L17	20	48	48	V	V	10	10	BH-V	3054
409	L17	20	48	48	V	H	15	15	BH-H	3003
410	L18	30	24	27	V	V	12	12	BH-V	3061
411	L18	30	24	27	V	H	25	25	BH-H	2994
412	L20	30	64	28	V	V	15	15	BH-V	3066
413	L20	30	64	28	V	H	25	25	BH-H	2992
414	L20	30	64	38.5	V	V	15	15	BH-V	3070
415	L20	30	64	38.5	V	H	25	25	BH-H	2997
416	L21	35	45.5	33	V	V	15	15	BH-V	3064
417	L21	35	45.5	48	V	V	10	10	BH-V	3059
418	L21	35	45.5	48	V	H	15	15	BH-H	3006
419	L22	40	24	8	V	T	25	25	BH-H	2996
420	L22	40	24	8	V	V	25	25	BH-V	3035
421	L23	50	12	8	V	V	25	25	BH-V	3032

Table P-64. Free Field Velocity Measurements - HP I-2B (Continued)

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
422	L23	50	12	8	V	H	20	20	BH-H	2986
423	L23A	56	12	14.5	V	T	15	15	BH-H	1805
424	L24	50	14	21	V	V	20	20	BH-V	3018
425	L24	50	14	21	V	T	15	15	BH-H	3012
426	L24	50	14	30	V	V	15	15	BH-V	3034
427	L24	50	14	30	V	T	15	15	BH-T	1666
428	L25	50	16	36.5	V	V	10	10	BH-V	3057
429	L25	50	16	38.5	V	H	20	20	BH-H	2972
430	L25	50	16	43	V	T	10	10	BH-H	3007
431	L26	50	24	8	V	V	25	25	BH-V	3051
432	L26	50	24	8	V	T	25	25	BH-H	2987
433	L27	50	64	8	V	V	25	25	BH-V	3040
434	L27	50	64	8	V	T	25	25	BH-H	2990
435	L27	50	64	38	V	H	20	20	BH-H	3002
436	L27	50	64	38	V	T	20	20	BH-H	3004
437	L28	50	72	15	V	V	30	30	BH-V	3031
438	L28	50	72	15	V	H	30	30	BH-H	1769
439	L29	50	74	27	V	V	12	12	BH-V	3067
440	L29	50	74	27	V	H	25	25	BH-H	2991
441	L30	50	76	48	V	V	10	10	BH-V	3038
442	L30	50	76	48	V	H	15	15	BH-H	3011

Table P-64. Free Field Velocity Measurements - HP I-2B (Continued)

Meas. Number	Hole Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
443	L30	50	76	58	V	V	10	10	BH-V	3047
444	L30	50	76	58	V	H	15	15	BH-H	3000
445	L31	60	64	48	V	V	10	10	BH-V	3049
446	L31	60	64	30	V	T	20	20	BH-H	2988
447	L31	60	64	30	V	V	15	15	BH-V	3062
448	L33	65	44	43	V	V	15	15	BH-V	3055
449	L33	65	44	43	V	H	20	20	BH-H	2995
450	L36	80	44	22.5	V	V	20	20	BH-V	3053
451	L36	80	44	38	V	V	12	12	BH-V	3063
452	L36	80	44	38	V	H	25	25	BH-H	3005
453	L36	80	44	31	V	V	15	15	BH-V	3069
454	L36	80	44	31	V	T	15	15	BH-H	2989
455	L37	80	46	34	V	H	20	20	BH-H	2999
456	L37	80	46	39	V	V	10	10	BH-V	3045
457	L37	80	46	39	V	H	20	20	BH-H	2998
458	L37	80	46	43	V	V	10	10	BH-V	3052
459	L37	80	46	48	V	V	10	10	BH-V	3050
460	L37	80	46	48	V	H	15	15	BH-H	3001

Table P-65. Structure Velocity Measurements - HP I-2B

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
461	US	4.7	0	5.5	V	V	30	30	BH-V	3060
462	US	5.5	0	6.3	V	T	30	30	BH-H	2056
463	US	9	2.68	7.4	V	V	15		IV	2B-1
464	US	14.2	0	5.8	V	V	30	30	BH-V	3033
465	US	14	0	6.3	V	T	30	30	BH-H	1834
466	LS	16.5	0	3	V	V	20	20	BH-V	2212
467	LS	32.7	0	2.5	V	V	20	20	BH-V	1277
468	US	4.7	90	5.5	V	V	30	30	BH-V	3037
469	US	5.5	90	6.3	V	T	30	30	BH-H	1847
470	US	9.1	118.7	7.4	V	V	15		IV	2B-2
471	US	9.5	89.2	7.4	V	T	15		IV	2B-5
472	US	14.2	90	5.8	V	V	30	30	BH-V	3019-1
473	US	14	90	6.3	V	T	30	30	BH-H	1860
474	LS	16.5	90	3	V	T	20	20	BH-H	1771
475	LS	32.5	90	3	V	T	20	20	BH-H	1796
476	US	4.7	180	5.5	V	V	30	30	BH-V	3065
477	US	9.7	181.95	7.4	V	V	15		IV	2B-3
478	US	14.2	180	5.8	V	V	30	30	BH-V	3036
479	US	14	180	6.3	V	T	30	30	BH-H	1830
480	LS	16.5	180	3	V	V	20	20	BH-V	3029
481	LS	32.7	180	2.5	V	V	20	20	BH-V	3019

Table P-65. Structure Velocity Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
482	US	9.07	293.3	7.4	V	V	15		IV	2B-4
483	US	9.45	269.3	7.4	V	T	15		IV	2B-6
484	US	14	270	6.3	V	T	30	30	BH-H	2035
485	LS	16.5	270	3	V	T	20	20	BH-H	1843
486	LS	32.5	270	3	V	T	20	20	BH-H	1777

Table P-66. Structure and Near Field Displacement Measurements - HP I-2B

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (in)	Xducer Nominal Range (in)	Xducer Model	Xducer Serial Number	Remarks
711	US/LS	14.7	350	3.7	RD	V	-4+2	±5	PT101-RX	753-644	
712	US/LS	14.7	350	3.7	RD	R	±3	±5	PT101-RX	753-649	
716	US/LS	14.7	80	3.7	RD	V	-4+2	±5	PT101-RX	753-647	
717	US/LS	14.7	80	3.7	RD	R	±3	±5	PT101-RX	753-648	
721	US/LS	14.7	170	3.7	RD	V	-4+2	±5	PT101-RX	753-645	
722*	US/LS	14.7	170	3.7	RD	R	±3	±5	PT101-RX	753-658	
723	US/LS	14.7	260	3.7	RD	V	-4+2	±5	PT101-RX	753-646	
724	US/LS	14.7	260	3.7	RD	R	±3	±5	PT101-RX	753-656	
725	NF	37.37	0	1.0	RD	R	±6	±5	PT101-RX	753-650	1
726*	NF	37.91	90	1.0	RD	R	±6	±5	PT101-RX	753-651	1

*Measurement scratched before event - not recorded

Remarks: 1. Basement displacement measurement

Table P-67. Structure Steel Strain Measurements - HP I-2B

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (με)	Xducer Nominal Range	Xducer Model	Xducer Serial Number
251	CL	0.3	0	2.8	SE	V	2000			
252	CL	1.3	0	2.8	SE	V	2000			
253*	US	1.13	0	5.08	SE	R	1000			
254	US	2.42	0	4.92	SE	V	2000			
255	US	3.0	0	5.66	SE	V	2000			
256	US	3.83	0	6.08	SE	V	2000			
257	US	4.63	0	6.3	SE	R	1000			
258	US	6.08	0	6.42	SE	V	2000			
259	US	6.0	0	6.46	SE	T	1500			
260	US	6.0	0	7.1	SE	T	1500			
261	US	6.0	0	7.2	SE	V	2000			
262	US	9.13	343.4	7.5	SE	R	3000			
263	US	10.0	0	6.4	SE	V	2000			
264	US	9.92	1.34	6.4	SE	T	2000			
265	US	9.9	0	7.2	SE	T	2000			
266	US	10.0	0.5	7.25	SE	V	2000			
267	US	13.83	0	6.46	SE	V	2000			
268	US	13.92	0	6.42	SE	T	1500			
269	US	13.8	0	7.2	SE	T	1500			
270	US	13.75	0	7.3	SE	V	2000			
271*	US	14.42	0	6.8	SE	R	1000			

Table P-67. Structure Steel Strain Measurements - HP I-28 (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (με)	Xducer Nominal Range	Xducer Model	Xducer Serial Number
272	US	14.75	0	5.9	SE	V	1500			
273	US	14.25	0	6.5	SE	V	1500			
274	US	15.54	0	5.3	SE	V	1500			
275	US	15.56	0	5.9	SE	V	1500			
276*	US	16.08	0	6.71	SE	R	2000			
277	LS	16.2	0	3.08	SE	V	2000			
278	LS	16.45	0	3.12	SE	T	2000			
279	LS	16.45	0	3.46	SE	T	2000			
280*	LS	16.2	0	3.5	SE	V	2000			
281	LS	18.7	0	3.07	SE	V	1500			
282	LS	18.31	0	3.10	SE	T	1500			
283	LS	18.31	0	3.44	SE	T	1500			
284	LS	18.7	0	3.43	SE	V	1500			
285	LS	22.7	0	3.07	SE	V	1000			
286	LS	22.87	0	3.11	SE	T	1000			
287	LS	22.87	0	3.44	SE	T	1000			
288	LS	22.7	0	3.48	SE	V	1000			
289	LS	27.7	0	3.06	SE	V	1000			
290*	LS	27.53	0	3.10	SE	T	1000			
291	LS	27.53	0	3.40	SE	T	1000			
292	LS	27.7	0	3.47	SE	V	1000			

Table P-67. Structure Steel Strain Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (με)	Xducer Nominal Range	Xducer Model	Xducer Serial Number
295	US	9.13	103.96	7.5	SE	R	3000			
296	US	10.0	92	6.45	SE	V	2000			
297	US	10.0	91	6.46	SE	T	2000			
298	US	10.0	90	7.2	SE	T	2000			
299	US	10.0	90.5	7.25	SE	V	2000			
300	LS	16.2	90	3.08	SE	V	2000			
301	LS	16.49	90	3.12	SE	T	2000			
302	LS	16.49	90	3.46	SE	T	2000			
303	LS	16.2	90	3.50	SE	V	2000			
304	LS	18.7	90	3.07	SE	V	1500			
305	LS	18.33	90	3.11	SE	T	1500			
306	LS	18.33	90	3.44	SE	T	1500			
307	LS	18.7	90	3.5	SE	V	1500			
308	LS	22.7	90	3.08	SE	V	1000			
309	LS	22.87	90	3.12	SE	T	1000			
310	LS	22.87	90	3.46	SE	T	1000			
311	LS	22.7	90	3.5	SE	V	1000			
312	LS	27.7	90	3.06	SE	V	1000			
313*	LS	27.53	90	3.10	SE	T	1000			
314	LS	27.53	90	3.40	SE	T	1000			
315	LS	27.7	90	3.47	SE	V	1000			

Table P-67. Structure Steel Strain Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (με)	Xducer Nominal Range	Xducer Model	Xducer Serial Number
316	US	1.96	180	4.92	SE	R	1000			
317	US	2.2	180	4.88	SE	V	2000			
318	US	2.88	180	5.66	SE	V	2000			
319*	US	3.83	180	6.17	SE	V	2000			
320	US	4.0	183	6.3	SE	R	1000			
321	US	6.08	183.3	6.42	SE	V	2000			
324	US	6.0	182	7.25	SE	V	2000			
326	US	10.0	183.4	6.46	SE	V	2000			
327	US	10.42	178.5	6.46	SE	T	2000			
328*	US	10.05	179.5	7.2	SE	T	2000			
329	US	10.0	180	7.3	SE	V	2000			
330	US	13.83	183.3	6.36	SE	V	2000			
331	US	13.9	180	6.46	SE	T	1500			
332	US	13.75	180	7.2	SE	T	1500			
333	US	13.8	181	7.38	SE	V	2000			
334*	US	14.4	180	6.7	SE	R	1000			
335*	US	14.8	180	5.9	SE	V	1500			
336*	US	14.8	180	6.5	SE	V	1500			
337	US	15.5	180	5.3	SE	V	1500			
338*	US	15.5	180	5.9	SE	V	1500			
339*	US	16.1	180	6.8	SE	R	2000			

Table P-67. Structure Steel Strain Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (με)	Xducer Nominal Range	Xducer Model	Xducer Serial Number
340*	LS	16.2	180	3.08	SE	V	2000			
341	LS	16.49	180	3.12	SE	T	2000			
342	LS	16.49	180	3.44	SE	T	2000			
343	LS	16.2	180	3.48	SE	V	2000			
344	LS	18.7	180	3.08	SE	V	1500			
345	LS	18.37	180	3.12	SE	T	1500			
346	LS	18.37	180	3.44	SE	T	1500			
347	LS	18.7	180	3.50	SE	V	1500			
348	LS	22.7	180	3.08	SE	V	1000			
349	LS	22.87	180	3.12	SE	T	1000			
350	LS	22.87	180	3.46	SE	T	1000			
351	LS	22.7	180	3.5	SE	V	1000			
352	LS	22.7	180	3.06	SE	V	1000			
353	LS	27.53	180	3.11	SE	T	1000			
354	LS	27.53	180	3.43	SE	T	1000			
355	LS	27.7	180	3.47	SE	V	1000			
356*	CL	1.37	270	0	SE	R	2000			
357	CL	0.4	270	0	SE	R	2000			
360	US	6.62	266.7	6.42	SE	V	2000			
363	US	5.9	268	7.25	SE	V	2000			
364	US	10.0	266.7	6.38	SE	V	2000			

Table P-67. Structure Steel Strain Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Pred Level (με)	Xducer Nominal Range	Xducer Model	Xducer Serial Number
365	US	10.0	269	6.2	SE	T	2000			
366	US	10.0	270	7.1	SE	T	2000			
367	US	10.0	268	7.2	SE	V	2000			
368	US	13.83	266.7	6.42	SE	V	2000			
369*	US	13.84	270	6.44	SE	T	1500			
370*	US	13.9	270	7.1	SE	T	1500			
371	US	13.8	260.3	7.2	SE	V	2000			
372*	US	14.4	270	7.0	SE	R	1000			
373	US	14.25	270	5.92	SE	V	1500			
374	US	15.53	270	5.4	SE	V	1500			
375*	US	16.16	270	7.0	SE	R	2000			
376	LS	16.2	270	3.08	SE	V	2000			
377	LS	16.49	270	3.12	SE	T	2000			
378	LS	16.49	270	3.47	SE	T	2000			
379	LS	16.2	270	3.51	SE	V	2000			
380	LS	18.7	270	3.08	SE	V	1500			
381	LS	18.31	270	3.13	SE	T	1500			
382*	LS	18.31	270	3.46	SE	T	1500			
383	LS	18.7	270	3.5	SE	V	1500			
384*	LS	22.7	270	3.07	SE	V	1000			
385	LS	22.87	270	3.12	SE	T	1000			

Table P-67. Structure Steel Strain Measurements - HP I-2B (Continued)

Meas. Number	Gen'l Loc.	Depth (ft)	Azimuth (degrees)	Range (ft)	Meas. Type	Sens. Axis	Level (με)	Xducer Nominal Range	Xducer Model	Xducer Serial Number
386	LS	22.87	270	3.45	SE	T	1000			
387	LS	22.7	270	3.49	SE	V	1000			
388	LS	27.7	270	3.07	SE	V	1000			
389	LS	27.53	270	3.11	SE	T	1000			
390*	LS	27.53	270	3.44	SE	T	1000			
391*	LS	27.7	270	3.48	SE	V	1000			

*Measurement scratched before event

Table P-68. Strong Motion Seismic Measurements - HP I-2B

Meas. Number	Station Number	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
925	2	400	44	0	A	HL	3.5	5	2262C	BC17
926	2	400	44	0	A	HT	3.5	5	2262C	ZS86
927	2	400	44	0	A	VT	3.5	5	2262C	BC18
928	1	550	44	0	A	HL	2	5	2262	AB99
929	1	500	44	0	A	HT	2	5	2262	AB01
930	1	550	44	0	A	VT	2	5	2262	YL04
931	4	1050	44	0	A	HL	0.5	5	LSB	C-1
932	4	1050	44	0	A	HT	0.5	5	LSB	C-1
934	5	2060	1531	0	A	HL	0.13	1	LSB	C-5
935	5	2060	1531	0	A	HT	0.13	1	LSB	C-5
936	3	149	-292	0	A	HL	2.5	5	2262	ZA48
937	3	149	-292	0	A	HT	2.5	5	2262C	BC21
938	3	149	-292	0	A	VT	2.5	5	2262C	YR79

Table P-69. Free Field Experimental Measurements - HP I-2B

Meas. Number	Gen'l Loc.	X-Coord. (ft)	Y-Coord. (ft)	Depth (ft)	Meas. Type	Sens. Axis	Pred Level	Xducer Nominal Range	Xducer Model	Xducer Serial Number	Remarks
901	CAN #5	20	40	2	A	H	2072 g	10000 g		AC90	1
902	Can #5	20	40	2	A	V	2411 g	10000 g		AC81	1
903	Can #3	20	50	2	A	H	2429 g	10000 g		AC18	1
904	Can #3	20	50	2	A	V	2220 g	10000 g		AB14	1
905	Can #2	27.58	21.42	2	A	H	3000 g	5000 g		AH24	2
906	Can #2	27.58	21.42	2	A	H	1166 g	5000 g		AH26	1
907	Can #4	28	64	2	A	V	2238 g	10000 g		AD26	1
908	Can #4	28	64	2	A	H	2359 g	10000 g		AC77	1
909	Can #1	80	50	2	A	H	3000 g	10000 g		AB89	2
910	Can #1	80	50	2	A	H	164 g	10000 g		AC15	1
911	S1	13	12	0.1							3
912	S2	13	76	0.1							3
913	S3	25	47	0.1							3
914	S4	34	47	0.1							3
915	S5	43	15	0.1							3
916	S6	43	25	0.1							3
917	S7	43	63	0.1							3
918	S8	43	73	0.1							3

Remarks: 1. Signal amplified
2. Signal not amplified
3. S^3 experiment

Table P-70. Measurement Recording List - HARD PAN I-2B

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
001	HP-I-2B-A-E-10-12-0-BP-V	9	3	3	-	Scratched before event	
002	HP-I-2B-A-E-10-44-0-BP-V	9	3	4	-	1386.62 psi	41.7
003	HP-I-2B-A-E-10-76-0-BP-V	9	3	5	-	1404.06 psi	41.7
004	HP-I-2B-A-E-25-44-0-BP-V	9	3	6	-	1288.43 psi	41.7
005	HP-I-2B-A-E-34-44-0-BP-V	9	3	7	-	1288.09 psi	41.7
006	HP-I-2B-A-E-46-4-0-BP-V	9	3	8	-	1216.22 psi	41.7
007	HP-I-2B-A-E-46-10-0-BP-V	9	3	9	-	1235.96 psi	41.7
008	HP-I-2B-A-E-46-20-0-BP-V	9	3	10	-	1226.37 psi	41.7
009	HP-I-2B-A-E-46-28-0-BP-V	9	3	11	-	Scratched before event	
010	HP-I-2B-A-E-46-60-0-BP-V	9	3	12	-	1226.39 psi	41.7
011	HP-I-2B-A-E-46-68-0-BP-V	9	3	13	-	1213.26 psi	41.7
012	HP-I-2B-A-E-46-78-0-BP-V	9	3	14	-	1213.82 psi	41.7
013	HP-I-2B-A-E-46-84-0-BP-V	9	3	15	-	1213.73 psi	41.7
014	HP-I-2B-A-E-68-44-0-BP-V	9	3	16	-	1119.69 psi	41.7
015	HP-I-2B-A-E-78-12-0-BP-V	9	3	17	-	1090.05 psi	41.7
016	HP-I-2B-A-E-78-44-0-BP-V	9	3	18	-	1076.00 psi	41.7
017	HP-I-2B-A-E-78-76-0-BP-V	9	3	19	-	1076.92 psi	41.7
021	HP-I-2B-S-E-0-357.91-6-BP-V	9	3	20	-	1172.83 psi	50
022	HP-I-2B-S-E-0-2.09-6-BP-V	9	3	21	-	1197.86 psi	50
023	HP-I-2B-S-E-0-90-5.8-BP-V	9	3	22	-	1212.1 psi	50
024	HP-I-2B-S-E-0-90-6-BP-V	9	3	23	-	1201.47 psi	50
025	HP-I-2B-S-E-0-177.91-5.8-BP-V	9	3	24	-	1211.50 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
026	HP-I-2B-S-E-0-182.09-6-BP-V	9	3	25	-	1202.11 psi	50
027	HP-I-2B-S-E-0-270-5.8-BP-V	9	3	26	-	1201.64 psi	50
028	HP-I-2B-S-E-0-270-6-BP-V	9	3	27	-	1201.62 psi	50
029	HP-I-2B-S-E-14.7-70-3.5-AP-R	3	2	11	5	50.23 psi	50
030	HP-I-2B-S-E-14.7-160-3.5-AP-R	3	2	11	6	48.69 psi	50
031	HP-I-2B-S-E-14.7-250-3.5-AP-R	3	2	11	7	50.28 psi	50
051	HP-I-2B-F-E-10-38-16-FS-H	9	1	3	-	1442.1 psi	50
052	HP-I-2B-F-E-10-42-8-FS-H	9	1	4	-	1596.42 psi	50
053	HP-I-2B-F-E-20-36-16-FS-H	9	1	5	-	1534.39 psi	50
054	HP-I-2B-F-E-20-38-8-FS-H	9	1	6	-	1558.37 psi	50
055	HP-I-2B-F-E-30-46-15.5-FS-H	9	1	7	-	1452.62 psi	50
056	HP-I-2B-F-E-30-40-8-FS-H	9	1	8	-	1439.83 psi	50
057	HP-I-2B-F-E-30-34-2-FS-45	9	1	9	-	1456.68 psi	50
058	HP-I-2B-F-E-30-38-2-FS-H	9	1	10	-	1445.84 psi	50
059	HP-I-2B-F-E-33.5-43-15.5-FS-H	9	1	11	-	1409.98 psi	50
060	HP-I-2B-F-E-33.11-45-8-FS-H	9	1	12	-	1398.3 psi	50
061	HP-I-2B-F-E-50-6.5-14.5-FS-H	9	1	13	-	1342.46 psi	50
062	HP-I-2B-F-E-48-7.5-8-FS-H	9	2	3	-	1301.8 psi	50
063	HP-I-2B-F-E-50-18-14.5-FS-45	9	2	4	-	1349.94 psi	50
064	HP-I-2B-F-E-54-24-14.5-FS-H	9	2	5	-	1331.64 psi	50
065	HP-I-2B-F-E-48-23-8-FS-H	9	2	6	-	1330.56 psi	50
066	HP-I-2B-F-E-50-25-1.92-FS-T	9	2	7	-	1367.04 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
067	HP-I-2B-F-E-50-26-8-FS-H	9	2	8	-	1365.61 psi	50
068	HP-I-2B-F-E-50-29.9-14.5-FS-T	9	2	9	-	1827.0 psi	50
069	HP-I-2B-F-E-51-29.8-8-FS-T	9	2	10	-	1816.71 psi	50
070	HP-I-2B-F-E-49-57.40-14.5-FS-T	9	2	11	-	1355.98 psi	50
071	HP-I-2B-F-E-51-57.65-8-FS-T	9	2	12	-	1342.44 psi	50
072	HP-I-2B-F-E-50-62-15-FS-T	9	2	13	-	1353.78 psi	50
073	HP-I-2B-F-E-48-63-8-FS-H	9	4	3	-	1354.74 psi	50
074	HP-I-2B-F-E-54-68-15-FS-H	9	4	4	-	Scratched before event	
075	HP-I-2B-F-E-50-70-8-FS-T	9	4	5	-	Scratched before event	
076	HP-I-2B-F-E-51-71-2-FS-T	9	4	6	-	1346.8 psi	50
077	HP-I-2B-F-E-50-80-15.1-FS-T	9	4	7	-	1341.94 psi	50
078	HP-I-2B-F-E-48-81-8.1-FS-T	9	4	8	-	1347.17 psi	50
079	HP-I-2B-F-E-50-82-8-FS-H	9	4	9	-	1347.24 psi	50
080	HP-I-2B-F-E-50-85.5-2-FS-T	9	4	10	-	1340.88 psi	50
081	HP-I-2B-F-E-54-85.5-8-FS-T	9	4	11	-	1348.2 psi	50
082	HP-I-2B-F-E-56-85.5-16-FS-T	9	4	12	-	1348.05 psi	50
083	HP-I-2B-F-E-80-38-15-FS-H	9	4	13	-	1153.85 psi	50
084	HP-I-2B-F-E-80-40-8-FS-H	9	5	3	-	1158.43 psi	50
085	HP-I-2B-F-E-80-48-8-FS-45	9	5	4	-	1128.12 psi	50
086	HP-I-2B-F-E-82.35-52.6-2-FS-H	9	5	5	-	1132.26 psi	50
087	HP-I-2B-F-E-67-12-2-FS-H	9	5	6	-	1181.6 psi	50
088	HP-I-2B-F-E-71-12-2-FS-H	9	5	7	-	1196 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
089	HP-I-2B-F-E-74-12-2-FS-H	9	5	8	-	1216.26 psi	50
090	HP-I-2B-F-E-67-76-2-FS-H	9	5	9	-	1184.4 psi	50
091	HP-I-2B-F-E-71.17-76-2-FS-H	9	5	10	-	1193.4 psi	50
092	HP-I-2B-F-E-74.17-76-2-FS-H	9	5	11	-	1187.2 psi	50
093	HP-I-2B-F-E-55-6.5-14.5-FS-T	3	2	10	9	1297.25 psi	50
094	HP-I-2B-F-E-57-7.5-8-FS-T	3	2	10	10	1308.15 psi	50
095	HP-I-2B-F-E-56-24-14.5-FS-T	3	2	10	11	1273.64 psi	50
096	HP-I-2B-F-E-58-26-8-FS-T	3	2	11	4	1282.90 psi	50
101	HP-I-2B-F-E-20-42-2-A-V	5	1	1	15	3009.97 g	50
102	HP-I-2B-F-E-20-42-2-A-H	5	1	1	16	2513.10 g	50
103	HP-I-2B-F-E-20-42-2-A-T	5	1	1	17	1992.25 g	50
104	HP-I-2B-F-E-20-42-8-A-V	5	1	2	15	3026.15 g	50
105	HP-I-2B-F-E-20-42-8-A-H	5	1	2	16	2513.46 g	50
106	HP-I-2B-F-E-20-42-16-A-V	5	1	2	17	Scratched before event	
107	HP-I-2B-F-E-20-42-16-A-H	5	1	3	15	2513.23 g	50
108	HP-I-2B-F-E-20-44-19-A-V	5	1	3	16	2497.95 g	50
109	HP-I-2B-F-E-20-44-19-A-H	5	1	3	17	2500.38 g	50
110	HP-I-2B-F-E-20-44-22.5-A-V	5	1	1	12	999.84 g	50
111	HP-I-2B-F-E-20-44-27-A-V	5	1	1	13	999.49 g	50
112	HP-I-2B-F-E-20-44-27-A-H	5	1	1	14	999.05 g	50
113	HP-I-2B-F-E-20-46-30-A-V	5	1	2	12	495.48 g	50
114	HP-I-2B-F-E-20-46-30-A-H	5	1	2	13	498.86 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
115	HP-I-2B-F-E-20-46-30-A-T	5	1	2	14	496.64 g	50
116	HP-I-2B-F-E-20-46-34-A-V	5	1	3	12	398.89 g	50
117	HP-I-2B-F-E-20-46-34-A-H	5	1	3	13	403.56 g	50
118	HP-I-2B-F-E-20-46-39-A-V	5	1	3	14	300.13 g	50
119	HP-I-2B-F-E-20-48-43.5-A-V	5	1	1	9	309.92 g	50
120	HP-I-2B-F-E-20-48-43.5-A-H	5	1	1	10	396.02 g	50
121	HP-I-2B-F-E-20-48-48-A-V	5	1	1	11	299.89 g	50
122	HP-I-2B-F-E-20-48-48-A-H	5	1	2	9	396.72 g	50
123	HP-I-2B-F-E-20-48-56.75-A-V	5	1	2	10	240.11 g	50
124	HP-I-2B-F-E-20-48-56.75-A-H	5	1	2	11	240.94 g	50
125	HP-I-2B-F-E-30-24-2-A-V	5	1	4	15	2402.54 g	50
126	HP-I-2B-F-E-30-24-2-A-H	5	1	4	16	2393.33 g	50
127	HP-I-2B-F-E-30-24-27-A-V	5	1	4	12	900.98 g	50
128	HP-I-2B-F-E-30-24-27-A-H	5	1	4	13	898.86 g	50
129	HP-I-2B-F-E-30-24-48-A-V	5	1	3	9	296.94 g	50
130	HP-I-2B-F-E-30-24-48-A-H	5	1	3	10	400 g	50
131	HP-I-2B-F-E-30-44-2-A-V	5	1	4	17	2987.12 g	50
132	HP-I-2B-F-E-30-44-2-A-H	5	1	5	15	2398.05 g	50
133	HP-I-2B-F-E-30-44-8-A-H	5	1	5	16	2397.28 g	50
134	HP-I-2B-F-E-30-44-8-A-T	5	1	5	17	1998.14 g	50
135	HP-I-2B-F-E-30-44-15.5-A-V	5	1	6	15	2409.62 g	50
136	HP-I-2B-F-E-30-44-15.5-A-H	5	1	6	16	Scratched before event	

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
137	HP-I-2B-F-E-30-44-48-A-V	5	1	3	11	238.15 g	50
138	HP-I-2B-F-E-30-44-48-A-H	5	1	4	9	236.91 g	50
139	HP-I-2B-F-E-30-64-28-A-V	5	1	4	14	500.83 g	50
140	HP-I-2B-F-E-35-44-48-A-V	5	1	4	10	303.17 g	50
141	HP-I-2B-F-E-35-44-48-A-H	5	1	4	11	299.63 g	50
142	HP-I-2B-F-E-40-24-8-A-T	5	1	6	17	2393.85 g	50
143	HP-I-2B-F-E-50-12-2-A-V	5	1	7	15	2999.92 g	50
144	HP-I-2B-F-E-50-12-2-A-H	5	1	7	16	2507.38 g	50
145	HP-I-2B-F-E-50-12-8-A-V	5	1	7	17	2408.15 g	50
146	HP-I-2B-F-E-50-12-8-A-H	5	1	8	15	2401.78 g	50
147	HP-I-2B-F-E-56-12-14.5-A-V	5	1	8	16	2409.78 g	50
148	HP-I-2B-F-E-56-12-14.5-A-T	5	1	8	17	1993.3 g	50
149	HP-I-2B-F-E-50-14-18-A-V	5	1	5	12	2405.92 g	50
150	HP-I-2B-F-E-50-14-18-A-H	5	1	5	13	2577.54 g	50
151	HP-I-2B-F-E-50-14-21-A-V	5	1	5	14	1000.18 g	50
152	HP-I-2B-F-E-50-16-26-A-V	5	1	6	12	997.41 g	50
153	HP-I-2B-F-E-50-16-26-A-H	5	1	6	13	1001.74 g	50
154	HP-I-2B-F-E-50-14-30-A-V	5	1	6	14	496.93 g	50
155	HP-I-2B-F-E-50-14-30-A-H	5	1	7	12	500.18 g	50
156	HP-I-2B-F-E-50-16-33-A-V	5	1	7	13	397.59 g	50
157	HP-I-2B-F-E-50-16-33-A-H	5	1	7	14	399.17 g	50
158	HP-I-2B-F-E-50-16-38.5-A-V	5	1	8	12	301.44 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
159	HP-I-2B-F-E-50-16-43-A-V	5	1	8	13	300.03 g	50
160	HP-I-2B-F-E-50-16-43-A-T	5	1	5	9	200.45 g	50
161	HP-I-2B-F-E-50-16-48-A-V	5	1	5	10	299.38 g	50
162	HP-I-2B-F-E-50-16-48-A-H	5	1	5	11	400.51 g	50
163	HP-I-2B-F-E-50-24-2-A-V	5	1	9	15	2399.67 g	50
164	HP-I-2B-F-E-50-24-2-A-T	5	1	9	16	2401.19 g	50
165	HP-I-2B-F-E-50-24-8-A-V	5	1	9	17	2402.99 g	50
166	HP-I-2B-F-E-50-24-8-A-T	5	1	10	15	2401.90 g	50
167	HP-I-2B-F-E-50-64-8-A-V	5	1	10	16	2400.94 g	50
168	HP-I-2B-F-E-50-64-8-A-T	5	1	10	17	2401.2 g	50
169	HP-I-2B-F-E-50-64-22-A-V	5	1	8	14	994.28 g	50
170	HP-I-2B-F-E-50-64-22-A-T	5	1	9	12	999.6 g	50
171	HP-I-2B-F-E-50-64-38-A-H	5	1	9	13	398.82 g	50
172	HP-I-2B-F-E-50-64-38-A-T	5	1	9	14	238.93 g	50
173	HP-I-2B-F-E-50-72-2-A-V	5	1	11	15	2997.82 g	50
174	HP-I-2B-F-E-50-72-2-A-H	5	1	11	16	2490.49 g	50
175	HP-I-2B-F-E-50-72-8-A-V	5	1	11	17	3002.52 g	50
176	HP-I-2B-F-E-50-72-8-A-T	5	1	12	15	2396.22 g	50
177	HP-I-2B-F-E-50-72-15-A-V	5	1	12	16	2399.94 g	50
178	HP-I-2B-F-E-50-72-15-A-H	5	1	12	17	2410.74 g	50
179	HP-I-2B-F-E-50-74-18.08-A-V	5	1	10	12	2404.75 g	50
180	HP-I-2B-F-E-50-74-18.08-A-T	5	1	10	13	2407.52 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
181	HP-I-2B-F-E-50-74-37-A-V	5	1	10	14	399.38 g	50
182	HP-I-2B-F-E-50-74-37-A-H	5	1	11	12	400.4 g	50
183	HP-I-2B-F-E-50-76-42.5-A-V	5	1	6	9	300.24 g	50
184	HP-I-2B-F-E-50-76-42.5-A-H	5	1	6	10	400.35 g	50
185	HP-I-2B-F-E-50-76-48-A-V	5	1	6	11	240.59 g	50
186	HP-I-2B-F-E-50-76-48-A-H	5	1	7	9	240.38 g	50
187	HP-I-2B-F-E-50-76-58-A-V	5	1	7	10	239.08 g	50
188	HP-I-2B-F-E-50-76-58-A-H	5	1	7	11	240.52 g	50
189	HP-I-2B-F-E-60-64-48-A-V	5	1	8	9	240.40 g	50
190	HP-I-2B-F-E-60-64-48-A-H	5	1	8	10	237.64 g	50
191	HP-I-2B-F-E-60-64-30-A-T	5	1	11	13	Scratched before event	
192	HP-I-2B-F-E-65-44-43-A-V	5	1	8	11	299.15 g	50
193	HP-I-2B-F-E-65-44-43-A-H	5	1	9	9	300.17 g	50
194	HP-I-2B-F-E-65-44-57.5-A-V	5	1	11	11	200.12 g	50
195	HP-I-2B-F-E-65-44-57.5-A-H	5	1	12	9	198.09 g	50
196	HP-I-2B-F-E-65-24-48-A-V	5	1	9	10	238.32 g	50
197	HP-I-2B-F-E-65-24-48-A-H	5	1	9	11	237.23 g	50
198	HP-I-2B-F-E-65-24-48-A-T	5	1	10	9	238.57 g	50
199	HP-I-2B-F-E-80-24-58-A-V	5	1	12	10	237.68 g	50
200	HP-I-2B-F-E-80-24-58-A-H	5	1	12	11	239.27 g	50
201	HP-I-2B-F-E-80-42-2-A-V	5	1	13	15	2999.38 g	50
202	HP-I-2B-F-E-80-42-2-A-H	5	1	13	16	2500.75 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
203	HP-I-2B-F-E-80-42-7.83-A-V	5	1	13	17	3000.37 g	50
204	HP-I-2B-F-E-80-42-7.83-A-H	5	1	14	15	2498.68 g	50
205	HP-I-2B-F-E-80-42-18-A-V	5	1	14	16	3102.41 g	50
206	HP-I-2B-F-E-80-42-18-A-H	5	1	14	17	2473.40 g	50
207	HP-I-2B-F-E-80-44-21.5-A-V	5	1	11	14	2242.99 g	50
208	HP-I-2B-F-E-80-44-21.5-A-H	5	1	12	12	2258.61 g	50
209	HP-I-2B-F-E-80-44-25-A-V	5	1	12	13	1001.47 g	50
210	HP-I-2B-F-E-80-44-25-A-H	5	1	12	14	1000.58 g	50
211	HP-I-2B-F-E-80-44-30.5-A-V	5	1	13	12	1001.57 g	50
212	HP-I-2B-F-E-80-44-30.5-A-H	5	1	13	13	999.84 g	50
213	HP-I-2B-F-E-80-44-38-A-V	5	1	13	14	497.84 g	50
214	HP-I-2B-F-E-80-44-38-A-T	5	1	14	12	501.37 g	50
215	HP-I-2B-F-E-80-46-33-A-V	5	1	14	13	398.56 g	50
216	HP-I-2B-F-E-80-46-33-A-H	5	1	14	14	399.17 g	50
217	HP-I-2B-F-E-80-46-43-A-V	5	1	10	10	298.45 g	50
218	HP-I-2B-F-E-80-46-43-A-H	5	1	10	11	405.56 g	50
219	HP-I-2B-F-E-80-46-48-A-V	5	1	11	9	298.08 g	50
220	HP-I-2B-F-E-80-46-48-A-H	5	1	11	10	398.86 g	50
251	HP-I-2B-S-E-0.3-0-2.8-SE-V	3	1	3	1	2070.09 psi	50
252	HP-I-2B-S-E-1.3-0-2.8-SE-V	3	1	3	2	2065.42 psi	50
253	HP-I-2B-S-E-1.13-0-5.08-SE-R	3	1	3	3	Scratched before event	
254	HP-I-2B-S-E-2.42-0-4.92-SE-V	3	1	3	4	2056.07 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
255	HP-I-2B-S-E-3.0-0-5.66-SE-V	3	1	3	5	2065.42 psi	50
256	HP-I-2B-S-E-3.83-0-6.08-SE-V	3	1	3	6	2028.04 psi	50
257	HP-I-2B-S-E-4.63-0-6.3-SE-R	3	1	3	7	1032.71 psi	50
258	HP-I-2B-S-E-6.08-0-6.42-SE-V	3	1	3	8	2070.09 psi	50
259	HP-I-2B-S-E-6.0-0-6.46-SE-T	3	1	3	9	1542.06 psi	50
260	HP-I-2B-S-E-6.0-0-7.1-SE-T	3	1	3	10	1532.71 psi	50
261	HP-I-2B-S-E-6.0-0-7.2-SE-V	3	1	3	11	2032.71 psi	50
262	HP-I-2B-S-E-9.13-343.4-7.5-SE-R	3	1	3	12	2939.25 psi	50
263	HP-I-2B-S-E-10.0-0-6.4-SE-V	3	1	3	13	2074.77 psi	50
264	HP-I-2B-S-E-9.92-1.34-6.4-SE-T	3	1	3	14	2070.09 psi	50
265	HP-I-2B-S-E-9.9-0-7.2-SE-T	3	1	3	15	2065.42 psi	50
266	HP-I-2B-S-E-10.0-0.5-7.25-SE-V	3	1	3	16	2070.09 psi	50
267	HP-I-2B-S-E-13.83-0-6.46-SE-V	3	1	3	17	2051.40 psi	50
268	HP-I-2B-S-E-13.92-0-6.42-SE-T	3	1	3	18	1546.73 psi	50
269	HP-I-2B-S-E-13.8-0-7.2-SE-T	3	1	4	1	1551.40 psi	50
270	HP-I-2B-S-E-13.75-0-7.3-SE-V	3	1	4	2	1985.98 psi	50
271	HP-I-2B-S-E-14.42-0-6.8-SE-R	3	1	4	3	Scratched before event	
272	HP-I-2B-S-E-14.75-0-5.9-SE-V	3	1	4	4	1467.29 psi	50
273	HP-I-2B-S-E-14.25-0-6.5-SE-V	3	1	4	5	1490.65 psi	50
274	HP-I-2B-S-E-15.54-0-5.3-SE-V	3	1	4	6	1542.06 psi	50
275	HP-I-2B-S-E-15.56-0-5.9-SE-V	3	1	4	7	1546.73 psi	50
276	HP-I-2B-S-E-16.08-0-6.71-SE-R	3	1	4	8	Scratched before event	

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
277	HP-I-2B-S-E-16.2-0-3.08-SE-V	3	1	4	9	2056.07 psi	50
278	HP-I-2B-S-E-16.45-0-3.12-SE-T	3	1	4	10	2056.07 psi	50
279	HP-I-2B-S-E-16.45-0-3.46-SE-T	3	1	4	11	2065.42 psi	50
280	HP-I-2B-S-E-16.2-0-3.5-SE-V	3	1	4	12	Scratched before event	
281	HP-I-2B-S-E-18.7-0-3.07-SE-V	3	1	4	13	1434.58 psi	50
282	HP-I-2B-S-E-18.31-0-3.10-SE-T	3	1	4	14	1514.02 psi	50
283	HP-I-2B-S-E-18.31-0-3.44-SE-T	3	1	4	15	1542.06 psi	50
284	HP-I-2B-S-E-18.7-0-3.43-SE-V	3	1	4	11	1542.06 psi	50
285	HP-I-2B-S-E-22.7-0-3.07-SE-V	3	1	4	17	1023.36 psi	50
286	HP-I-2B-S-E-22.87-0-3.11-SE-T	3	1	4	18	1028.04 psi	50
287	HP-I-2B-S-E-22.87-0-3.44-SE-T	3	1	5	1	1028.04 psi	50
288	HP-I-2B-S-E-22.7-0-3.48-SE-V	3	1	5	2	1028.04 psi	50
289	HP-I-2B-S-E-22.7-0-3.06-SE-V	3	1	5	3	1023.36 psi	50
290	HP-I-2B-S-E-27.53-0-3.10-SE-T	3	1	5	4	Scratched before event	
291	HP-I-2B-S-E-27.53-0-3.40-SE-T	3	1	5	5	1028.04 psi	50
292	HP-I-2B-S-E-27.7-0-3.47-SE-V	3	2	10	14	1014.02 psi	50
295	HP-I-2B-S-E-9.13-103.96-7.5-SE-R	3	1	5	7	1560.75 psi	50
296	HP-I-2B-S-E-10.0-92-6.45-SE-V	3	1	5	8	2065.42 psi	50
297	HP-I-2B-S-E-10.0-91-6.46-SE-T	3	2	10	15	2000 psi	50
298	HP-I-2B-S-E-10.0-90-7.2-SE-T	3	1	5	10	2065.42 psi	50
299	HP-I-2B-S-E-10.0-90.5-7.25-SE-V	3	1	5	11	2056.07 psi	50
300	HP-I-2B-S-E-16.2-90-3.08-SE-V	3	1	5	12	2056.07 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
301	HP-I-2B-S-E-6.49-90-3.12-SE-T	3	1	5	13	2051.40 psi	50
302	HP-I-2B-S-E-6.49-90-3.46-SE-T	3	1	5	14	2051.40 psi	50
303	HP-I-2B-S-E-16.2-90-3.50-SE-V	3	1	5	15	2056.07 psi	50
304	HP-I-2B-S-E-18.7-90-3.07-SE-V	3	1	5	16	1542.06 psi	50
305	HP-I-2B-S-E-18.33-90-3.11-SE-T	3	1	5	17	1523.36 psi	50
306	HP-I-2B-S-E-18.33-90-3.44-SE-T	3	2	10	16	1500 psi	50
307	HP-I-2B-S-E-18.7-90-3.5-SE-V	3	1	6	1	1532.71 psi	50
308	HP-I-2B-S-E-22.7-90-3.08-SE-V	3	1	6	2	1023.36 psi	50
309	HP-I-2B-S-E-22.87-90-3.12-SE-T	3	1	6	3	1014.02 psi	50
310	HP-I-2B-S-E-22.87-90-3.46-SE-T	3	1	6	4	1014.02 psi	50
311	HP-I-2B-S-E-22.7-90-3.5-SE-V	3	1	6	5	1000 psi	50
312	HP-I-2B-S-E-22.7-90-3.06-SE-V	3	1	6	6	995.33 psi	50
313	HP-I-2B-S-E-27.53-90-3.10-SE-T	3	1	6	7	Scratched before event	
314	HP-I-2B-S-E-27.53-90-3.40-SE-T	3	1	6	8	267.29 psi	50
315	HP-I-2B-S-E-27.7-90-3.47-SE-V	3	1	6	9	1009.35 psi	50
316	HP-I-2B-S-E-1.96-180-4.92-SE-R	3	1	6	10	1018.69 psi	50
317	HP-I-2B-S-E-2.2-180-4.88-SE-V	3	1	6	11	2056.07 psi	50
318	HP-I-2B-S-E-2.88-180-5.66-SE-V	3	1	6	12	2051.40 psi	50
319	HP-I-2B-S-E-3.83-180-6.17-SE-V	3	1	6	13	Scratched before event	
320	HP-I-2B-S-E-4.0-183-6.3-SE-R	3	1	6	14	1060.00 psi	50
321	HP-I-2B-S-E-6.08-183.3-6.42-SE-V	3	1	6	15	2046.73 psi	50
324	HP-I-2B-S-E-6.0-182-7.25-SE-V	3	1	6	16	2070.09 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
326	HP-I-2B-S-E-10.0-183.4-6.46-SE-V	3	1	6	17	2051.40 psi	50
327	HP-I-2B-S-E-10-42-178.5-6.46-SE-T	3	1	6	18	2051.40 psi	50
328	HP-I-2B-S-E-10.05-179.5-7.2-SE-T	3	1	8	1	Scratched before event	
329	HP-I-2B-S-E-10.0-180-7.3-SE-V	3	1	8	2	2065.42 psi	50
330	HP-I-2B-S-E-13.83-183.3-6.36-SE-V	3	1	8	3	2065.42 psi	50
331	HP-I-2B-S-E-13.9-180-6.46-SE-T	3	1	8	4	1551.40 psi	50
332	HP-I-2B-S-E-13.75-180-7.2-SE-T	3	1	8	5	1546.73 psi	50
333	HP-I-2B-S-E-13.8-181-7.38-SE-V	3	1	8	6	2065.42 psi	50
334	HP-I-2B-S-E-14.4-180-6.7-SE-R	3	1	8	7	Scratched before event	
335	HP-I-2B-S-E-14.8-180-5.9-SE-V	3	1	8	8	Scratched before event	
336	HP-I-2B-S-E-14.8-180-6.5-SE-V	3	1	8	9	Scratched before event	
337	HP-I-2B-S-E-15.5-180-5.3-SE-V	3	1	8	10	1528.0	
338	HP-I-2B-S-E-15.5-180-5.9-SE-V	3	1	8	11	Scratched before event	
339	HP-I-2B-S-E-16.1-180-6.8-SE-R	3	1	8	12	Scratched before event	
340	HP-I-2B-S-E-16.2-180-3.08-SE-V	3	1	8	13	Scratched before event	
341	HP-I-2B-S-E-6.49-180-3.12-SE-T	3	1	8	14	2070.09 psi	50
342	HP-I-2B-S-E-6.49-180-3.44-SE-T	3	1	8	15	2014.02 psi	50
343	HP-I-2B-S-E-16.2-180-3.48-SE-V	3	1	8	16	2065.42 psi	50
344	HP-I-2B-S-E-18.7-180-3.08-SE-V	3	1	8	17	1429.91 psi	50
345	HP-I-2B-S-E-18.37-180-3.12-SE-T	3	2	11	1	1500.0 psi	50
346	HP-I-2B-S-E-18.37-180-3.44-SE-T	3	1	9	1	1537.38 psi	50
347	HP-I-2B-S-E-18.7-180-3.50-SE-V	3	1	9	2	1514.02 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
348	HP-I-2B-S-E-22.7-180-3.08-SE-V	3	1	9	3	1014.02 psi	50
349	HP-I-2B-S-E-22.87-180-3.12-SE-T	3	1	9	4	985.98 psi	50
350	HP-I-2B-S-E-22.87-180-3.46-SE-T	3	1	9	5	1018.69 psi	50
351	HP-I-2B-S-E-22.7-180-3.5-SE-V	3	1	9	6	1004.67 psi	50
352	HP-I-2B-S-E-22.7-180-3.06-SE-V	3	2	11	2	995.33 psi	50
353	HP-I-2B-S-E-27.53-180-3.11-SE-T	3	1	9	8	1018.69 psi	50
354	HP-I-2B-S-E-27.53-180-3.43-SE-T	3	1	9	9	1023.36 psi	50
355	HP-I-2B-S-E-27.7-180-3.47-SE-V	3	1	9	10	1004.67 psi	50
356	HP-I-2B-S-E-1.37-270-0-SE-R	3	1	9	11	Scratched before event	
357	HP-I-2B-S-E-0.4-270-0-SE-R	3	1	9	12	2060.75 psi	50
360	HP-I-2B-S-E-6.62-266.7-6.42-SE-V	3	1	9	13	2074.77 psi	50
363	HP-I-2B-S-E-5.9-268-7.25-SE-V	3	1	9	14	2056.07 psi	50
364	HP-I-2B-S-E-10.0-266.7-6.38-SE-V	3	1	9	15	2065.42 psi	50
365	HP-I-2B-S-E-10.0-269-6.2-SE-T	3	1	9	16	2121.50 psi	50
366	HP-I-2B-S-E-10.0-270-7.1-SE-T	3	1	9	17	2046.73 psi	50
367	HP-I-2B-S-E-10.0-268-7.2-SE-V	3	1	9	18	2065.42 psi	50
368	HP-I-2B-S-E-13.83-266.7-6.42-SE-V	3	1	10	1	2070.09 psi	50
369	HP-I-2B-S-E-13.84-270-6.44-SE-T	3	1	10	2	Scratched before event	
370	HP-I-2B-S-E-13.9-270-7.1-SE-T	3	1	10	3	Scratched before event	
371	HP-I-2B-S-E-13.8-260.3-7.2-SE-V	3	1	10	4	2060.75 psi	50
372	HP-I-2B-S-E-14.4-270-7.0-SE-R	3	1	10	5	Scratched before event	
373	HP-I-2B-S-E-14.25-270-5.92-SE-V	3	2	11	3	1551.40 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
374	HP-I-2B-S-E-15.53-270-5.4-SE-V	3	1	10	7	1392.52 psi	50
375	HP-I-2B-S-E-16.16-270-7.0-SE-R	3	1	10	8	Scratched before event	
376	HP-I-2B-S-E-16.2-270-3.08-SE-V	3	1	10	9	2018.69 psi	50
377	HP-I-2B-S-E-16.49-270-3.12-SE-T	3	1	10	10	2046.73 psi	50
378	HP-I-2B-S-E-16.49-270-3.47-SE-T	3	1	10	11	2056.07 psi	50
379	HP-I-2B-S-E-16.2-270-3.51-SE-V	3	1	10	12	2060.75 psi	50
380	HP-I-2B-S-E-18.7-270-3.08-SE-V	3	1	10	13	1378.50 psi	50
381	HP-I-2B-S-E-18.31-270-3.13-SE-T	3	1	10	14	1509.35 psi	50
382	HP-I-2B-S-E-18.31-270-3.46-SE-T	3	1	10	15	Scratched before event	
383	HP-I-2B-S-E-18.7-270-3.5-SE-V	3	1	10	16	1355.14 psi	50
384	HP-I-2B-S-E-22.7-270-3.07-SE-V	3	1	10	17	Scratched before event	
385	HP-I-2B-S-E-22.87-270-3.12-SE-T	3	1	10	18	1028.04 psi	50
386	HP-I-2B-S-E-22.87-270-3.45-SE-T	3	1	11	1	1032.71 psi	50
387	HP-I-2B-S-E-22.7-270-3.49 -SE-V	3	1	11	2	948.60 psi	50
388	HP-I-2B-S-E-22.7-270-3.07-SE-V	3	1	11	3	1023.36 psi	50
389	HP-I-2B-S-E-27.53-270-3.11-SE-T	3	1	11	4	1032.71 psi	50
390	HP-I-2B-S-E-27.53-270-3.44-SE-T	3	1	11	5	Scratched before event	
391	HP-I-2B-S-E-27.7-270-3.48-SE-V	3	1	10	6	Scratched before event	
401	HP-I-2B-F-E-20-44-22.5-V-V	5	1	1	6	22.51 fps	50
402	HP-I-2B-F-E-20-44-27-V-V	5	1	1	7	12.78 fps	50
403	HP-I-2B-F-E-20-44-27-V-H	5	1	1	8	28.21 fps	50
404	HP-I-2B-F-E-20-46-34-V-V	5	1	6	2	16.34 fps	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
405	HP-I-2B-F-E-20-46-39-V-V	5	1	6	3	14.40 fps	50
406	HP-I-2B-F-E-20-46-39-V-H	5	1	13	6	20.86 fps	50
407	HP-I-2B-F-E-20-48-43.5-V-H	5	1	6	5	22.32 fps	50
408	HP-I-2B-F-E-20-48-48-V-V	5	1	7	1	13.28 fps	50
409	HP-I-2B-F-E-20-48-48-V-H	5	1	7	2	24.07 fps	50
410	HP-I-2B-F-E-30-24-27-V-V	5	1	2	6	12.45 fps	50
411	HP-I-2B-F-E-30-24-27-V-H	5	1	2	7	26.74 fps	50
412	HP-I-2B-F-E-30-64-28-V-V	5	1	2	8	16.49 fps	50
413	HP-I-2B-F-E-30-64-28-V-H	5	1	3	6	27.18 fps	50
414	HP-I-2B-F-E-30-64-38.5-V-V	5	1	7	3	16.33 fps	50
415	HP-I-2B-F-E-30-64-38.5-V-H	5	1	7	4	26.88 fps	50
416	HP-I-2B-F-E-35-45.5-33-V-V	5	1	3	7	16.18 fps	50
417	HP-I-2B-F-E-35-45.5-48-V-V	5	1	7	5	10.97 fps	50
418	HP-I-2B-F-E-35-45.5-48-V-V	5	1	8	1	16.35 fps	50
419	HP-I-2B-F-E-40-24-8-V-T	5	1	3	8	25.36 fps	50
420	HP-I-2B-F-E-40-24-8-V-V	5	1	4	6	27.35 fps	50
421	HP-I-2B-F-E-50-12-8-V-V	5	1	4	7	26.47 fps	50
422	HP-I-2B-F-E-50-12-8-V-H	5	1	4	8	21.91 fps	50
423	HP-I-2B-F-E-56-12-14.5-V-T	5	1	5	6	14.90 fps	50
424	HP-I-2B-F-E-50-14-21-V-V	5	1	11	8	21.74 fps	50
425	HP-I-2B-F-E-50-14-21-V-T	5	1	5	7	15.77 fps	50
426	HP-I-2B-F-E-50-14-30-V-V	5	1	5	8	17.38 fps	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
427	HP-I-2B-F-E-50-14-30-V-T	5	1	6	6	16.89 fps	50
428	HP-I-2B-F-E-50-16-38.5-V-V	5	1	8	2	10.97 fps	50
429	HP-I-2B-F-E-50-16-38.5-V-H	5	1	8	3	21.40 fps	50
430	HP-I-2B-F-E-50-16-43-V-T	5	1	8	4	11.34 fps	50
431	HP-I-2B-F-E-50-24-8-V-V	5	1	6	7	28.04 fps	50
432	HP-I-2B-F-E-50-24-8-V-T	5	1	6	8	29.68 fps	50
433	HP-I-2B-F-E-50-64-8-V-V	5	1	7	6	28.23 fps	50
434	HP-I-2B-F-E-50-64-8-V-T	5	1	7	7	25.49 fps	50
435	HP-I-2B-F-E-50-64-38-V-H	5	1	8	5	20.76 fps	50
436	HP-I-2B-F-E-50-64-38-V-T	5	1	9	1	23.44 fps	50
437	HP-I-2B-F-E-50-72-15-V-V	5	1	12	8	27.04 fps	50
438	HP-I-2B-F-E-50-72-15-V-H	5	1	8	6	34.97 fps	50
439	HP-I-2B-F-E-50-74-27-V-V	5	1	8	7	13.50 fps	50
440	HP-I-2B-F-E-50-74-27-V-H	5	1	8	8	26.68 fps	50
441	HP-I-2B-F-E-50-76-48-V-V	5	1	9	2	12.12 fps	50
442	HP-I-2B-F-E-50-76-48-V-H	5	1	9	3	16.13 fps	50
443	HP-I-2B-F-E-50-76-58-V-V	5	1	9	4	11.53 fps	50
444	HP-I-2B-F-E-50-76-58-V-H	5	1	9	5	16.99 fps	50
445	HP-I-2B-F-E-60-64-48-V-V	5	1	10	1	12.04 fps	50
446	HP-I-2B-F-E-60-64-30-V-T	5	1	14	6	21.86 fps	50
447	HP-I-2B-F-E-60-64-30-V-V	5	1	9	7	37.57 fps	50
448	HP-I-2B-F-E-65-44-43-V-V	5	1	10	2	16.48 fps	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
449	HP-I-2B-F-E-65-44-43-V-H	5	1	10	3	16.36 fps	50
450	HP-I-2B-F-E-80-44-22.5-V-V	5	1	9	8	23.27 fps	50
451	HP-I-2B-F-E-80-44-38-V-V	5	1	10	6	12.70 fps	50
452	HP-I-2B-F-E-80-44-38-V-H	5	1	10	7	27.57 fps	50
453	HP-I-2B-F-E-80-44-31-V-V	5	1	10	8	16.34 fps	50
454	HP-I-2B-F-E-80-44-31-V-T	5	1	11	6	16.53 fps	50
455	HP-I-2B-F-E-80-46-34-V-H	5	1	11	7	23.53 fps	50
456	HP-I-2B-F-E-80-46-39-V-V	5	1	10	4	11.35 fps	50
457	HP-I-2B-F-E-80-46-39-V-H	5	1	10	5	21.063 fps	50
458	HP-I-2B-F-E-80-46-43-V-V	5	1	11	1	11.82 fps	50
459	HP-I-2B-F-E-80-46-48-V-V	5	1	11	2	12.52 fps	50
460	HP-I-2B-F-E-80-46-48-V-H	5	1	11	3	17.10 fps	50
461	HP-I-2B-S-E-4.7-0-5.5-V-V	5	1	1	1	33.40 fps	50
462	HP-I-2B-S-E-5.5-0-6.3-V-T	5	1	1	2	28.28 fps	50
463	HP-I-2B-S-E-9-2.68-7.4-V-V	5	1	1	3	15.00 fps	50
464	HP-I-2B-S-E-14.2-0-5.8-V-V	5	1	1	4	34.83 fps	50
465	HP-I-2B-S-E-14-0-6.3-V-T	5	1	1	5	32.17 fps	50
466	HP-I-2B-S-E-16.5-0-3-V-V	5	1	2	1	21.83 fps	50
467	HP-I-2B-S-E-37.2-0-2.5-V-V	5	1	14	2	13.52 fps	50
468	HP-I-2B-S-E-4.7-90-5.5-V-V	5	1	2	3	32.84 fps	50
469	HP-I-2B-S-E-5.5-90-6.3-V-T	5	1	12	6	30.97 fps	50
470	HP-I-2B-S-E-9.1-118.7-74.-V-V	5	1	2	5	15.00 fps	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
471	HP-I-2B-S-E-9.5-89.2-7.4-V-T	5	1	12	7	15.00 fps	50
472	HP-I-2B-S-E-14.2-90-5.8-V-V	5	1	3	2	33.81 fps	50
473	HP-I-2B-S-E-14-90-6.3-V-T	5	1	3	3	31.13 fps	50
474	HP-I-2B-S-E-16.5-90-3-V-T	5	1	3	4	20.93 fps	50
475	HP-I-2B-S-E-32.5-90-3-V-T	5	1	3	5	21.67 fps	50
476	HP-I-2B-S-E-4.7-180-5.5-V-V	5	1	4	1	34.25 fps	50
477	HP-I-2B-S-E-9.7-181.95-7.4-V-V	5	1	4	2	15.00 fps	50
478	HP-I-2B-S-E-14.2-180-5.8-V-V	5	1	4	3	37.42 fps	50
479	HP-I-2B-S-E-14-180-6.3-V-T	5	1	4	4	31.16 fps	50
480	HP-I-2B-S-E-16.5-180-3-V-V	5	1	4	5	22.70 fps	50
481	HP-I-2B-S-E-32.7-180-2.5-V-V	5	1	5	1	24.51 fps	50
482	HP-I-2B-S-E-9.07-293.3-7.4-V-V	5	1	5	2	15.00 fps	50
483	HP-I-2B-S-E-9.45-269.3-7.4-V-T	5	1	5	3	15.00 fps	50
484	HP-I-2B-S-E-14-270-6.3-V-T	5	1	5	4	31.15 fps	50
485	HP-I-2B-S-E-16.5-270-3-V-T	5	1	5	5	21.40 fps	50
486	HP-I-2B-S-E-32.5-270-3-V-T	5	1	6	1	30.31 fps	50
501	HP-I-2B-S-E-1.7-0-0.2-A-R	3	1	11	7	2994.3 g	50
502	HP-I-2B-S-E-4.7-0-5.5-A-R	3	1	11	8	1970.32 g	50
503	HP-I-2B-S-E-4.7-0-5.5-A-V	3	1	11	9	1486.13 g	50
504	HP-I-2B-S-E-4.7-0-7.9-A-V	3	1	11	10	2081.57 g	50
505	HP-I-2B-S-E-4.7-0-11.5-A-R	3	1	11	11	1977.06 g	50
506	HP-I-2B-S-E-4.7-0-11.5-A-V	3	1	11	12	2044.79 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
507	HP-I-2B-S-E-9-0-6.3-A-R	3	1	11	13	2035.35 g	50
508	HP-I-2B-S-E-9-0-7.9-A-R	3	1	11	14	1992.65 g	50
509	HP-I-2B-S-E-9-0-7.9-A-V	3	1	11	15	2009.97 g	50
510	HP-I-2B-S-E-9-0-11.5-A-V	3	1	11	16	1982.41 g	50
511	HP-I-2B-S-E-13-0-7.9-A-V	3	1	11	17	1530.32 g	50
512	HP-I-2B-S-E-13-0-11.5-A-R	3	1	11	18	1725.38 g	50
513	HP-I-2B-S-E-13-0-11.5-A-V	3	1	12	1	1538.6 g	50
514	HP-I-2B-S-E-14.2-0-5.8-A-R	3	1	12	2	2375.78 g	50
515	HP-I-2B-S-E-14.2-0-5.8-A-V	3	1	12	3	1495.5 g	50
516	HP-I-2B-S-E-16.5-0-3-A-R	3	1	12	4	1003.45 g	50
517	HP-I-2B-S-E-16.5-0-3-A-V	3	1	12	5	999.79 g	50
519	HP-I-2B-S-E-20-353.8-9.2-A-R	3	1	12	6	994.06 g	50
520	HP-I-2B-S-E-20-353.8-9.2-A-V	3	1	12	7	1039.02 g	50
521	HP-I-2B-S-E-23-0-3.0-A-R	3	1	12	8	512.26 g	50
522	HP-I-2B-S-E-23-0-3.0-A-V	3	1	12	9	504.31 g	50
523	HP-I-2B-S-E-28-0-3.0-A-R	3	1	12	10	476.76 g	50
525	HP-I-2B-S-E-28-353.8-9.2-A-R	3	1	12	11	492.74 g	50
526	HP-I-2B-S-E-28-353.8-9.2-A-V	3	1	12	12	489.12 g	50
527	HP-I-2B-S-E-32.7-0-2.5-A-R	3	1	12	13	Scratched before event	
528	HP-I-2B-S-E-32.7-0-2.5-A-V	3	1	12	14	1017.12 g	50
529	HP-I-2B-S-E-32.7-0-2.5-A-T	3	1	12	15	500.98 g	50
532	HP-I-2B-S-E-38-353.8-9.2-A-R	3	2	3	1	500.60 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
533	HP-I-2B-S-E-4.7-90-5.5-A-R	3	2	3	2	1947.22 g	50
534	HP-I-2B-S-E-4.7-90-7.9-A-R	3	2	3	3	1989.25 g	50
535	HP-I-2B-S-E-4.7-90-11.5-A-V	3	2	3	4	2027.08 g	50
536	HP-I-2B-S-E-4.7-90-11.5-A-T	3	2	3	5	2022.55 g	50
537	HP-I-2B-S-E-9-90-6.3-A-R	3	2	3	6	2076.14 g	50
538	HP-I-2B-S-E-9-90-7.9-A-R	3	2	3	7	1997.07 g	50
539	HP-I-2B-S-E-9-90-7.9-A-V	3	2	3	8	1960.88 g	50
540	HP-I-2B-S-E-13-90-11.5-A-R	3	2	3	9	1515 g	50
541	HP-I-2B-S-E-13-90-11.5-A-V	3	2	3	10	1505.92 g	50
542	HP-I-2B-S-E-14.2-90-5.8-A-R	3	2	3	11	1516.64 g	50
543	HP-I-2B-S-E-16.5-90-3-A-R	3	2	3	12	1003.38 g	50
544	HP-I-2B-S-E-16.5-90-3-A-T	3	2	3	13	1528.0 g	50
545	HP-I-2B-S-E-20-90-8.8-A-V	3	2	3	14	985.71 g	50
546	HP-I-2B-S-E-20-90-8.8-A-T	3	2	3	15	1007.83 g	50
547	HP-I-2B-S-E-23-90-3-A-R	3	2	3	16	Scratched before event	
549	HP-I-2B-S-E-28-90-9-A-R	3	2	3	17	499.58 g	50
550	HP-I-2B-S-E-28-90-9-A-V	3	2	3	18	497.28 g	50
551	HP-I-2B-S-E-38-90-8.8-A-T	3	2	4	1	513.76 g	50
552	HP-I-2B-S-E-1.7-180-0.2-A-V	3	2	4	2	3080.7 g	50
553	HP-I-2B-S-E-4.7-180-5.5-A-R	3	2	4	3	1996.34 g	50
554	HP-I-2B-S-E-4.7-180-5.5-A-V	3	2	4	4	1528.66 g	50
555	HP-I-2B-S-E-4.7-180-7.9-A-V	3	2	4	5	2052.52 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
556	HP-I-2B-S-E-4.7-180-11.5-A-R	3	2	4	6	1901.81 g	50
557	HP-I-2B-S-E-4.7-180-11.5-A-V	3	2	4	7	2043.87 g	50
558	HP-I-2B-S-E-9-180-6.3-A-R	3	2	4	8	1987.78 g	50
559	HP-I-2B-S-E-9-180-7.9-A-R	3	2	4	9	2016.83 g	50
560	HP-I-2B-S-E-9-180-7.9-A-V	3	2	4	10	1939.97 g	50
561	HP-I-2B-S-E-9-180-11.5-A-V	3	2	4	11	1998.28 g	50
562	HP-I-2B-S-E-13-180-7.9-A-V	3	2	4	12	Scratched before event	
563	HP-I-2B-S-E-13-180-11.5-A-R	3	2	4	13	1491.93 g	50
564	HP-I-2B-S-E-13-180-11.5-A-V	3	2	4	14	1533.55 g	50
565	HP-I-2B-S-E-14.2-180-5.8-A-R	3	2	4	15	1506.32 g	50
566	HP-I-2B-S-E-14.2-180-5.8-A-V	3	2	4	16	1518.27 g	50
567	HP-I-2B-S-E-16.5-180-3-A-R	3	2	4	17	992.56 g	50
568	HP-I-2B-S-E-16.5-180-3-A-V	3	2	4	18	1007.82 g	50
570	HP-I-2B-S-E-20-175.7-8.8-A-R	3	2	5	1	997.35 g	50
571	HP-I-2B-S-E-20-175.7-8.8-A-V	3	2	5	2	1011.91 g	50
572	HP-I-2B-S-E-23-180-3-A-R	3	2	5	3	1025.23 g	50
573	HP-I-2B-S-E-23-180-3-A-V	3	2	5	4	499.51 g	50
574	HP-I-2B-S-E-28-180-3-A-R	3	2	5	5	Scratched before event	
576	HP-I-2B-S-E-28-175.7-8.8-A-R	3	2	5	7	Scratched before event	
577	HP-I-2B-S-E-28-175.7-8.8-A-V	3	2	5	8	486.16 g	50
578	HP-I-2B-S-E-32.7-180-2.5-A-V	3	2	5	9	1006.00 g	50
579	HP-I-2B-S-E-32.7-180-2.5-A-T	3	2	5	10	496.13 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
582	HP-I-2B-S-E-38-175.7-8.8-A-R	3	2	5	11	485.55 g	50
583	HP-I-2B-S-E-4.7-270-5.5-A-R	3	2	5	12	2039.00 g	50
584	HP-I-2B-S-E-4.7-270-7.9-A-V	3	2	5	13	1983.02 g	50
585	HP-I-2B-S-E-4.7-270-11.5-A-V	3	2	5	14	2053.34 g	50
586	HP-I-2B-S-E-4.7-270-11.5-A-T	3	2	5	15	2049.21 g	50
587	HP-I-2B-S-E-9-270-6.3-A-R	3	2	5	16	1992.3 g	50
588	HP-I-2B-S-E-9-270-7.9-A-R	3	2	5	17	1990.86 g	50
589	HP-I-2B-S-E-9-270-7.9-A-V	3	2	5	18	1989.50 g	50
590	HP-I-2B-S-E-13-270-11.5-A-R	3	2	6	1	1533.07 g	50
591	HP-I-2B-S-E-13-270-11.5-A-V	3	2	6	2	1535.60 g	50
592	HP-I-2B-S-E-14.2-270-5.8-A-R	3	2	6	3	1513.51 g	50
593	HP-I-2B-S-E-16.5-270-3-A-R	3	2	6	4	1026.53 g	50
594	HP-I-2B-S-E-20-271-8.8-A-V	3	2	6	5	1000.57 g	50
595	HP-I-2B-S-E-20-271-8.8-A-T	3	2	6	6	1000.41 g	50
596	HP-I-2B-S-E-23-271-3-A-R	3	2	6	7	502.67 g	50
598	HP-I-2B-S-E-28-271-8.8-A-R	3	2	6	8	500.31 g	50
599	HP-I-2B-S-E-28-271-8.8-A-V	3	2	6	9	490.77 g	50
600	HP-I-2B-S-E-38-271-8.8-A-T	3	2	6	10	506.32 g	50
601	HP-I-2B-S-E-9-0-4.8-A-R	3	2	6	11	498.96 g	50
602	HP-I-2B-S-E-9-0-0.5-A-R	3	2	6	12	490.45 g	50
603	HP-I-2B-S-E-9-0-0.5-A-V	3	2	6	13	501.16 g	50
604	HP-I-2B-S-E-23-0-0.5-A-R	3	2	6	14	493.96 g	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
641	HP-I-2B-S-E-4.9-355.4-7.4-IP-R	3	2	6	15	1493.63 psi	50
642	HP-I-2B-S-E-4.5-355-7.9-FS-R	3	2	6	16	1500.47 psi	50
643	HP-I-2B-S-E-5-355-7.9-FS-V	3	2	6	17	1476.57 psi	50
644	HP-I-2B-S-E-5-355-11.5-FS-V	3	2	6	18	1494.88 psi	50
645	HP-I-2B-S-E-9.2-355-7.4-IP-R	3	2	8	1	480* psi	50
646	HP-I-2B-S-E-9-8.9-7.4-IS-V	3	2	8	2	487.50 psi	50
647	HP-I-2B-S-E-9-8.9-7.4-IS-R	3	2	8	3	983.25 psi	50
648	HP-I-2B-S-E-9-355-7.9-FS-V	3	2	8	4	2012.25 psi	50
649	HP-I-2B-S-E-9-355-11.5-FS-R	3	2	8	5	2040.09 psi	50
650	HP-I-2B-S-E-13.6-353.3-7.4-IP-R	3	2	8	6	2011.28 psi	50
651	HP-I-2B-S-E-13-355-7.9-FS-R	3	2	8	7	1990.42 psi	50
652	HP-I-2B-S-E-13-355-11.5-FS-V	3	2	8	8	2000.21 psi	50
653	HP-I-2B-S-E-16.24-355-6.3-IP-V	3	2	8	9	Scratched before event	
654	HP-I-2B-S-E-16.9-0-3.6-IP-R	3	2	8	10	1505.39 psi	50
655	HP-I-2B-S-E-4.7-89.5-7.4-IP-R	3	2	8	11	1493.12 psi	50
656	HP-I-2B-S-E-8.5-90-7.4-IP-R	3	2	8	12	2005.40 psi	50
657	HP-I-2B-S-E-8.5-93.9-7.4-IS-V	3	2	8	13	494.91 psi	50
658	HP-I-2B-S-E-8.5-93.7-7.4-IS-T	3	2	8	14	Scratched before event	
661	HP-I-2B-S-E-16.9-90-3.6-IP-R	3	2	8	15	Scratched before event	
662	HP-I-2B-S-E-4.7-176.4-7.4-IP-R	3	2	8	16	1506.22 psi	50
663	HP-I-2B-S-E-4.5-175-7.9-FS-R	3	2	8	17	1521.14 psi	50
664	HP-I-2B-S-E-5-175-7.9-FS-V	3	2	8	18	1500.05 psi	50

*Not calibrated used for scaling

Table P.70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
665	HP-I-2B-S-E-5-175-11.5-FS-V	3	2	9	1	1491.50 psi	50
666	HP-I-2B-S-E-8.96-176.5-7.4-IP-R	3	2	9	2	2001.53 psi	50
667	HP-I-2B-S-E-9.04-188.1-7.4-IS-V	3	2	9	3	524.22 psi	50
668	HP-I-2B-S-E-9.04-188.1-7.4-IS-R	3	2	9	4	616.43 psi	50
669	HP-I-2B-S-E-9-175-7.9-FS-V	3	2	9	5	1953.00 psi	50
670	HP-I-2B-S-E-9-175-11.5-FS-R	3	2	9	6	1960.48 psi	50
671	HP-I-2B-S-E-13-175-7.4-IP-R	3	2	9	7	2017.56 psi	50
672	HP-I-2B-S-E-13-175-7.9-FS-R	3	2	9	8	1912.31 psi	50
673	HP-I-2B-S-E-13-175-11.5-FS-V	3	2	9	9	1966.72 psi	50
674	HP-I-2B-S-E-16.2-175-6.3-IP-V	3	2	9	10	2036.09 psi	50
675	HP-I-2B-S-E-16.9-180-3.6-IP-R	3	2	9	11	1506.13 psi	50
676	HP-I-2B-S-E-4.7-270-7.4-IP-R	3	2	9	12	1494.40 psi	50
677	HP-I-2B-S-E-4.5-265-7.9-FS-R	3	2	9	13	1524.49 psi	50
678	HP-I-2B-S-E-5-265-7.9-FS-V	3	2	9	14	1532.52 psi	50
679	HP-I-2B-S-E-5-269.5-11.5-FS-V	3	2	9	15	Scratched before event	
680	HP-I-2B-S-E-8.5-273.2-8.44-IP-R	3	2	9	16	1032.67 psi	50
681	HP-I-2B-S-E-8.5-273.2-8.46-IS-V	3	2	9	17	Scratched before event	
682	HP-I-2B-S-E-8.5-275-8.46-IS-T	3	2	9	18	499.87 psi	50
683	HP-I-2B-S-E-8.5-265-7.9-FS-R	3	2	10	1	2013.38 psi	50
684	HP-I-2B-S-E-9-265-11.5-FS-R	3	2	10	2	1943.60 psi	50
685	HP-I-2B-S-E-12.96-269.4-7.4-IP-R	3	2	10	3	1958.14 psi	50
686	HP-I-2B-S-E-13-265-7.9-FS-R	3	2	10	4	2036.12 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
687	HP-I-2B-S-E-13-265-11.5-FS-V	3	2	10	5	1981.50 psi	50
689	HP-I-2B-S-E-16.9-270-3.6-IP-R	3	2	10	6	1485.02 psi	50
690	HP-I-2B-S-E-8.5-355-6.3-IP-R	3	2	10	7	1538.64 psi	50
691	HP-I-2B-S-E-8.5-90-6.3-IP-R	3	2	10	8	Scratched before event	
711	HP-I-2B-S-E-14.7-350-3.7-RD-V	3	2	11	8	2.517 in	50
712	HP-I-2B-S-E-14.7-350-3.7-RD-R	3	2	11	9	2.570 in	50
716	HP-I-2B-S-E-14.7-80-3.7-RD-V	3	2	11	10	2.577 in	50
717	HP-I-2B-S-E-14.7-80-3.7-RD-R	3	2	11	11	2.526 in	50
721	HP-I-2B-S-E-14.7-170-3.7-RD-V	3	2	11	12	2.517 in	50
722	HP-I-2B-S-E-14.7-170-3.7-RD-R	3	2	11	13	Scratched before event	
723	HP-I-2B-S-E-14.7-260-3.7-RD-V	3	2	11	14	2.519 in	50
724	HP-I-2B-S-E-14.7-260-3.7-RD-R	3	2	11	15	2.523 in	50
725	HP-I-2B-S-E-37.37-0-1-RD-R	3	2	11	16	2.524 in	50
726	HP-I-2B-S-E-37.91-90-1-RD-R	3	2	11	17	Scratched before event	
802	HP-I-2B-A-E-546.75-120.50-15.17-FS-45	9	5	13	-	4624.19 psi	50
803	HP-I-2B-A-E-546.75-(-126.92)-15.17-FS-45	9	6	3	-	Scratched before event	
804	HP-I-2B-A-E-589-08-(-116.17)-14.67-FS-45	9	6	4	-	4008.93 psi	50
805	HP-I-2B-A-E-594.43-(-110.83)-14.67-FS-45	9	6	5	-	4009.45 psi	50
806	HP-I-2B-A-E-594.42-(-116.17)-14.67-FS-45	9	6	6	-	3980.84 psi	50

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
807	HP-I-2B-A-E-672.17-(-76.00) -16.00-FS-45	9	6	7	-	3986.01 psi	50
808	HP-I-2B-A-E-685.33-(-69.50) -16.00-FS-45	9	6	8	-	4031.62 psi	50
809	HP-I-2B-A-E-691.92-(-60.83) -16.00-FS-45	9	6	9	-	4000.00 psi	50
901	HP-I-2B-X-E-20-40-2-A-H	1	1	10	-	2034.38 g	50
902	HP-I-2B-X-E-20-40-2-A-V	1	1	11	-	2558.08 g	50
903	HP-I-2B-X-E-20-50-2-A-H	1	1	4	-	2449.52 g	50
904	HP-I-2B-X-E-20-50-2-A-V	1	1	5	-	2186.60 g	50
905	HP-I-2B-X-E-27.58-21.42-2-A-H	1	1	1	2	2997.00 g	50
906	HP-I-2B-X-E-27.58-21.42-2-A-H	1	1	3	-	1159.19 g	50
907	HP-I-2B-X-E-28-64-2-A-V	1	1	6		2278.27 g	50
908	HP-I-2B-X-E-28-64-2-A-H	1	1	7	-	2402.86 g	50
909	HP-I-2B-X-E-80-50-2-A-H	1	1	1	1	3008.25 g	50
910	HP-I-2B-X-E-80-50-2-A-H	1	1	2	-	165.24 g	50
911	HP-I-2B-X-E-13-12-0.1-S^3	5	1	4	-	1508	20
912	HP-I-2B-X-E-13-76-0.1-S^3	5	1	5	-	1508	20
913	HP-I-2B-X-E-25-47-0.1-S^3	5	1	6	-	1485.0	20
914	HP-I-2B-X-E-34-47-0.1-S^3	5	1	7	-	1500.0	20
915	HP-I-2B-X-E-43-15-0.1-S^3	5	1	8	-	1503.0	20
916	HP-I-2B-X-E-43-25-0.1-S^3	5	1	9	-	1508.0	20
917	HP-I-2B-X-E-43-63-0.1-S^3	5	1	10	-	1500.0	20

Table P-70. Measurement Recording List - HARD PAN I-2B (Continued)

Measure Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
918	HP-I-2B-X-E-43-73-0.1-S[3]	5	1	11	-	1478	20
925	HP-I-2B-F-E-400-44-0-A-HL	1	1	12	1	3.5 g	30
926	HP-I-2B-F-E-400-44-0-A-HT	1	1	12	2	3.5 g	35
927	HP-I-2B-F-E-400-44-0-A-VT	1	1	12	3	3.5 g	30
928	HP-I-2B-F-E-550-44-0-A-HL	1	1	12	4	2 g	35
929	HP-I-2B-F-E-550-44-0-A-HT	1	1	12	5	2 g	30
930	HP-I-2B-F-E-550-44-0-A-VT	1	1	13	1	2 g	30
931	HP-I-2B-F-E-1050-44-0-A-HL	1	1	13	2	0.5 g	50
932	HP-I-2B-F-E-1050-44-0-A-HT	1	1	13	3	0.5 g	50
934	HP-I-2B-F-E-2060-1531-0-A-HL	1	1	13	5	0.13 g	90
935	HP-I-2B-F-E-2060-1531-0-A-HT	1	1	14	1	0.13 g	90
936	HP-I-2B-F-E-149-(-292)-0-A-HL	1	1	14	2	2.5 g	25
937	HP-I-2B-F-E-149-(-292)-0-A-HT	1	1	14	3	2.5 g	45
938	HP-I-2B-F-E-149-(-292)-0-A-VT	1	1	14	4	2.5 g	45

Table P-71. RECORD ASSIGNMENT TABLE - VAN 3 - RECORDER 1

MUX	TRACK	VCO NUMBER / DATA BANDWIDTH (kHz)																	
		1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	10/10	11/10	12/10	13/10	14/10	15/10	16/10	17/10	18/10
	1																		
	2																		
1	3	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268
2	4	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286
3	5	287	288	289	290	291		295	296		298	299	300	301	302	303	304	305	
4	6	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	324	326	327
VIDAR	7																		
5	8	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	
6	9	346	347	348	349	350	351		353	354	355	356	357	360	363	364	365	366	367
7	10	368	369	370	371	372		374	375	376	377	378	379	380	381	382	383	384	385
8	11	386	387	388	389	390	391	501	502	503	504	505	506	507	508	509	510	511	512
9	12	513	514	515	516	517	519	520	521	522	523	525	526	527	528	529			
	13																		
	14																		

Table P-72. RECORD ASSIGNMENT TABLE - VAN 3 - RECORDER 2

MUX	TRACK	VCO NUMBER / DATA BANDWIDTH (kHz)																	
		1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	10/10	11/10	12/10	13/10	14/10	15/10	16/10	17/10	18/10
	1																		
	2																		
1	3	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	549	550
2	4	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568
3	5	570	571	572	573	574		576	577	578	579	582	583	584	585	586	587	588	589
4	6	590	591	592	593	594	595	596	598	599	600	601	602	603	604	641	642	643	644
VIDAR	7																		
5	8	645	646	647	648	649	650	651	652	653	654	655	656	657	658	661	662	663	664
6	9	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682
7	10	683	684	685	686	687	689	690	691	093	094	095			292	297	306		
8	11	345	352	373	096	029	030	031	711	712	716	717	721	722	723	724	725	726	
9	12																		
	13																		
	14																		

Table P-73. RECORD ASSIGNMENT TABLE - VAN 5 - RECORDER 1

MUX	TRACK	VCO NUMBER / DATA BANDWIDTH (kHz)																	
		1/1	2/1	3/1	4/1	5/1	6/2	7/2	8/2	9/4	10/4	11/4	12/8	13/8	14/8	15/16	16/16	17/16	—
1	1	461	462	463	464	465	401	402	403	119	120	121	110	111	112	101	102	103	
2	2	466		468		470	410	411	412	122	123	124	113	114	115	104	105	106	
3	3		472	473	474	475	413	416	419	129	130	137	116	117	118	107	108	109	
4	4	476	477	478	479	480	420	421	422	138	140	141	127	128	139	125	126	131	
5	5	481	482	483	484	485	423	425	426	160	161	162	149	150	151	132	133	134	
6	6	486	404	405		407	427	431	432	183	184	185	152	153	154	135	136	142	
7	7	408	409	414	415	417	433	434		186	187	188	155	156	157	143	144	145	
8	8	418	428	429	430	435	438	439	440	189	190	192	158	159	169	146	147	148	
9	9	436	441	442	443	444		447	450	193	196	197	170	171	172	163	164	165	
10	10	445	448	449	456	457	451	452	453	198	217	218	179	180	181	166	167	168	
11	11	458	459	460			454	455	424	219	220	194	182	191	207	173	174	175	
12	12						469	471	437	195	199	200	208	209	210	176	177	178	
13	13						406						211	212	213	201	202	203	
14	14		467				446						214	215	216	204	205	206	

Table P-74. RECORD ASSIGNMENT TABLE - VAN 9 - RECORDERS 1-6

RECORDER NUMBER	RECORDER TYPE	TRACK													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	CP-100			051	052	053	054	055	056	057	058	059	060	061	
2	CP-100			062	063	064	065	066	067	068	069	070	071	072	
4	CP-100			073	074	075	076	077	078	079	080	081	082	083	
5	CP-100			084	085	086	087	088	089	090	091	092		802	
6	CP-100			803	804	805	806	807	808	809					
3	SABRE-5			001	002	003	004	005	006	007	008	009	010	011	012
		TRACK													
		15	16	17	18	19	20	21	22	23	24	25	26	27	28
		013	014	015	016	017	021	022	023	024	025	026	027	028	

PART 7

HARD PAN I-3 EVENT

1. TEST SITE LAYOUT

Figure P-38 is a plan view of the HARD PAN I-3 test configuration. Figure P-39 is a plan view of the HEST area showing the locations of all free field measurements. Figure P-40 (in six parts) shows measurement locations in elevation view.

2. COORDINATE SYSTEMS

Free field measurements are located with respect to a rectangular cartesian coordinate system whose origin is at the upper left hand corner of the HEST cavity as shown in figure P-38. The positive X-axis extends parallel to the array centerline away from the simulated detonation ground zero as shown in that figure.

Structure and near field measurement location are defined in a cylindrical coordinate system similar to that for HP I-2B. In the rectangular coordinate system the structure centerline is at X = 150 ft, Y = 60 ft.

3. INSTRUMENTATION

a. Blast Pressure

Table P-75 lists the 32 free field blast pressure gages in HP I-3. Their locations are shown in figures P-39 and P-40. Table P-76 lists the eight structure mounted blast pressure gages which are shown in figure P-41.

b. Pneumatic Pressure

Three pressure gages measured air pressure in the inflatable collar between the upper and lower structure parts. Locations are shown in figure P-41 and the measurements are listed in Table P-87.

c. Stress

Forty-five soil stress measurements were made in the free field as listed in Table P-77 with locations shown in figures P-39 and P-40.

Twelve soil stress measurements were made in the BLEST field. These are listed in Table P-78.

Twenty-two soil stress measurements were made in the structure near field at locations indicated in table P-79 and shown in figure P-41.

Installed in the structure were 22 WAM gages and two interface shear gages. The latter were configured to measure two components of shear as well as normal stress. Figure P-41 and table P-79 apply here.

The Event 1 upper structure was emplaced at the location shown in figure P-39. It had four WAM gages with locations indicated in table P-79.

d. Acceleration

There were 206 transducers installed in the free field to measure acceleration. These are listed in table P-80 and shown in figures P-39 and P-40.

Fifty-three near field accelerometer installations are listed in table P-81 and shown in figure P-42. Shown on that figure and listed in that table are the 49 structure mounted accelerometers.

e. Velocity

Free field velocity transducer emplacements totalled 56 as listed in table P-82.

Structure mounted velocity transducers were 26 in number, with six being CERF developed interface velocity sensing devices. Table P-83 and figure P-42 apply to these.

f. Relative Displacement

Twelve relative displacement gages were installed in the structure. These are listed in table P-84 and shown in figure P-42.

g. Structure Steel Strain

Steel strain measurement channels were 143 in number and are listed in table P-85 and shown in figure P-43.

h. Strong Motion Seismic

Table P-86 lists the twelve accelerometers installed at four strong motion seismic stations.

i. Special Measurements

To determine blast effects at the trailer shelter, two pressure gages were installed. These are listed in table P-87.

j. Time-of-arrival

As listed in table P-88, a total of 115 TOA gages were installed in the HEST and BLEST areas.

4. CHANNEL RECORD ASSIGNMENTS

AFWL Instrumentation Vans E-1, E-3, E-5, and E-9 were used to record the instrumentation channels to HP I-3. Table P-89 is a listing of all channels recorded together with calibration levels. The record assignments are also shown in tables P-90 through P-94.

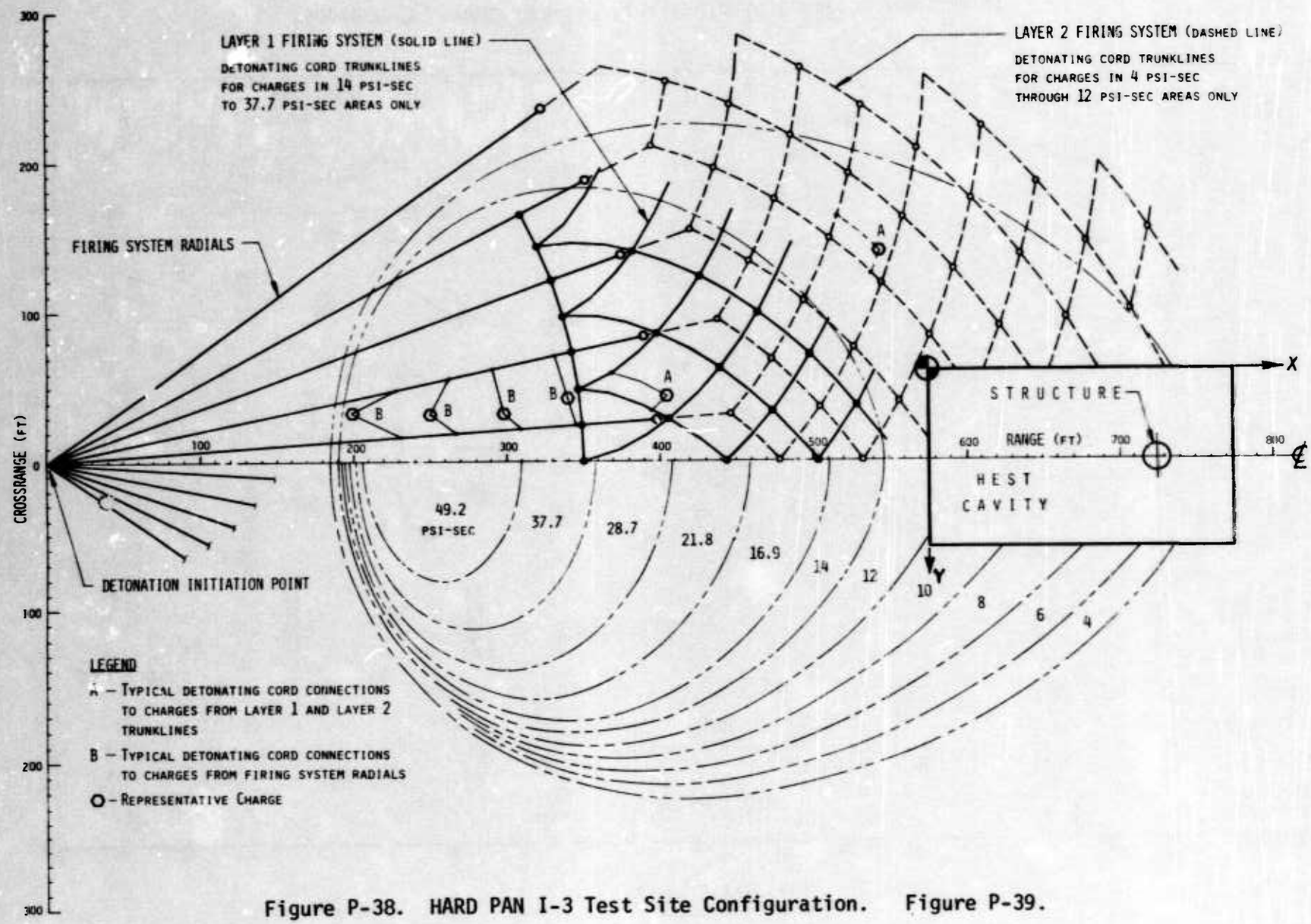


Figure P-38. HARD PAN I-3 Test Site Configuration. Figure P-39.

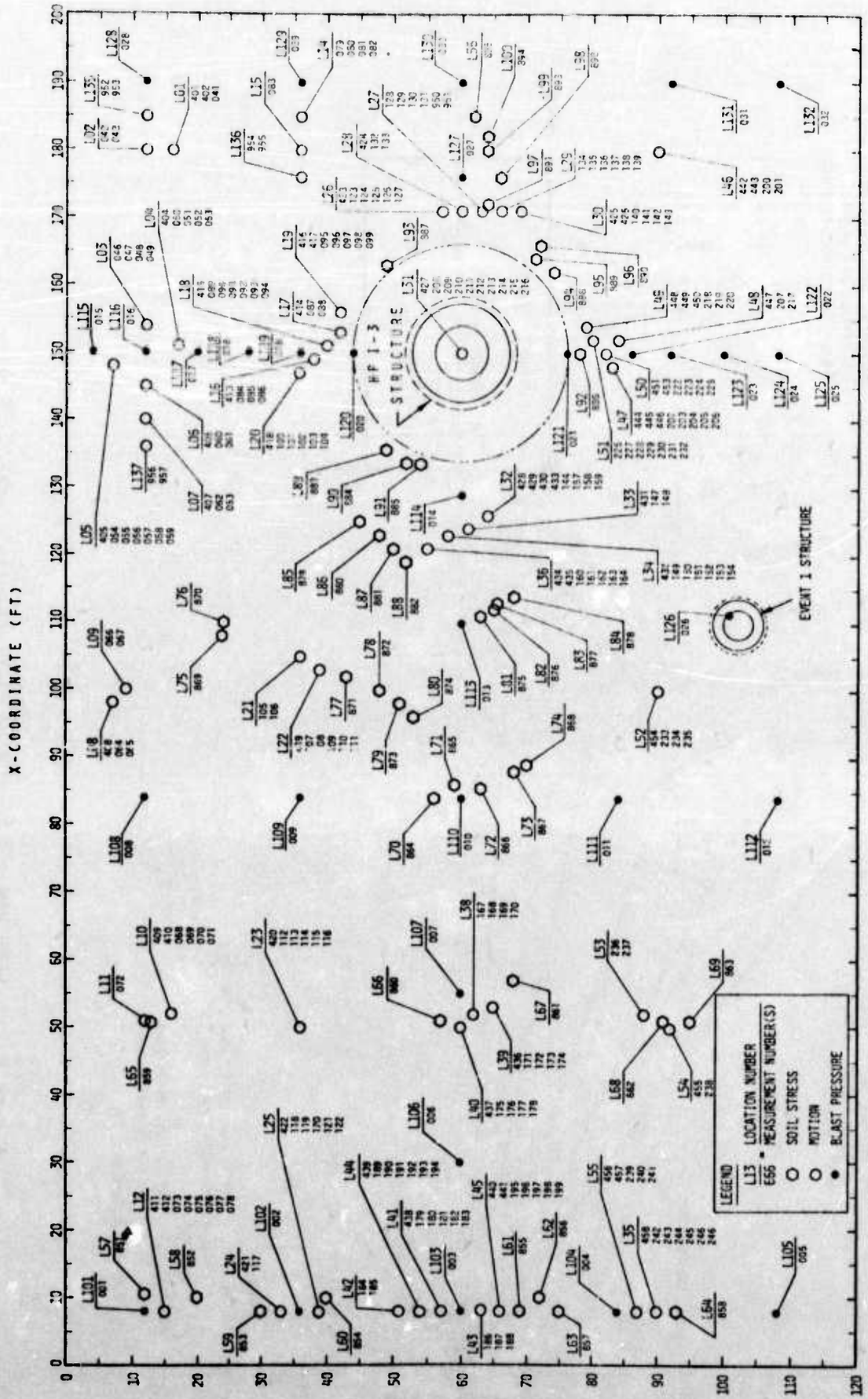


Figure P-39. HARD PAN I-3 Free Field Instrumentation Layout

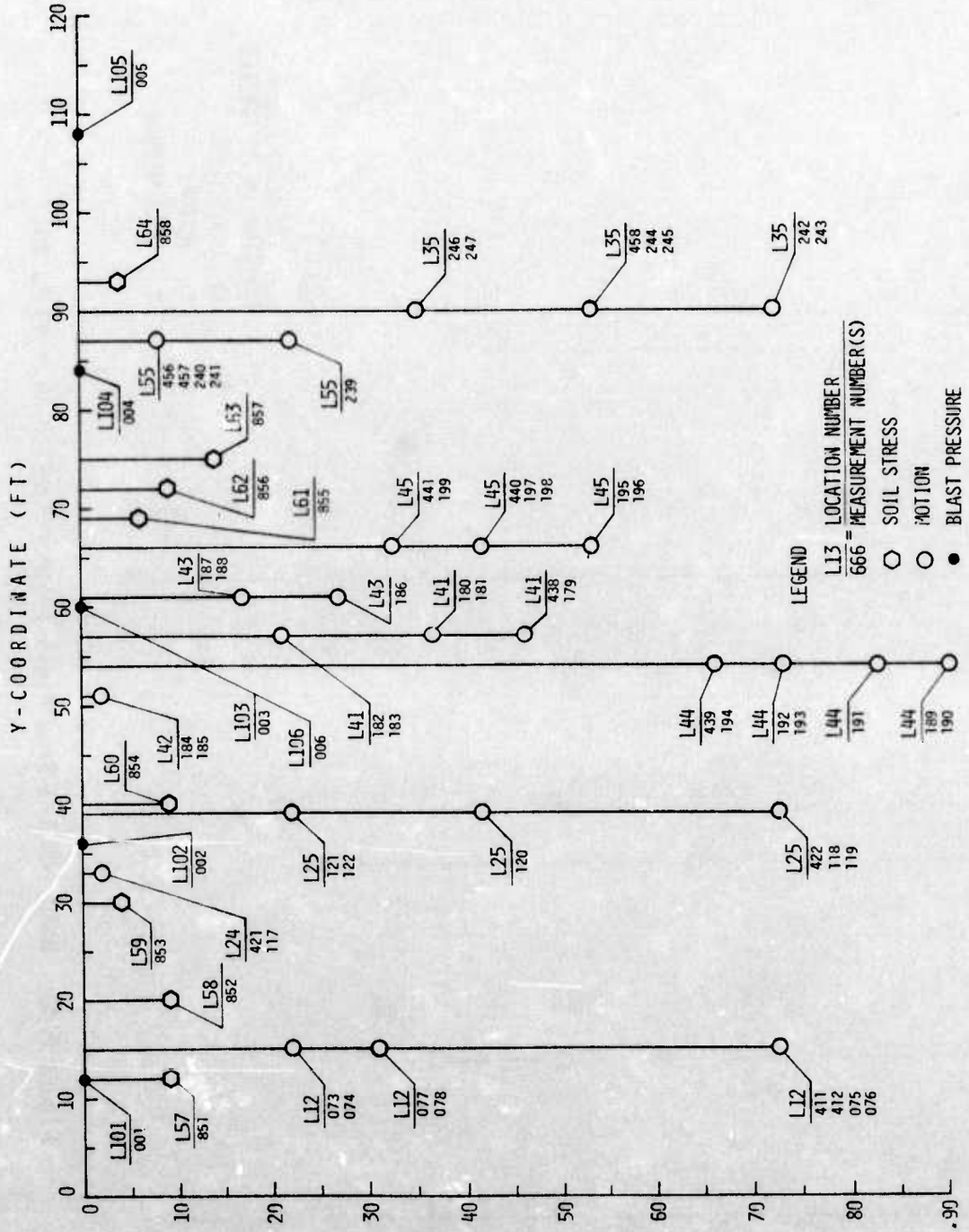


Figure P-40. HARD PAN I-3 Free Field Instrumentation (X = 0 to 40)

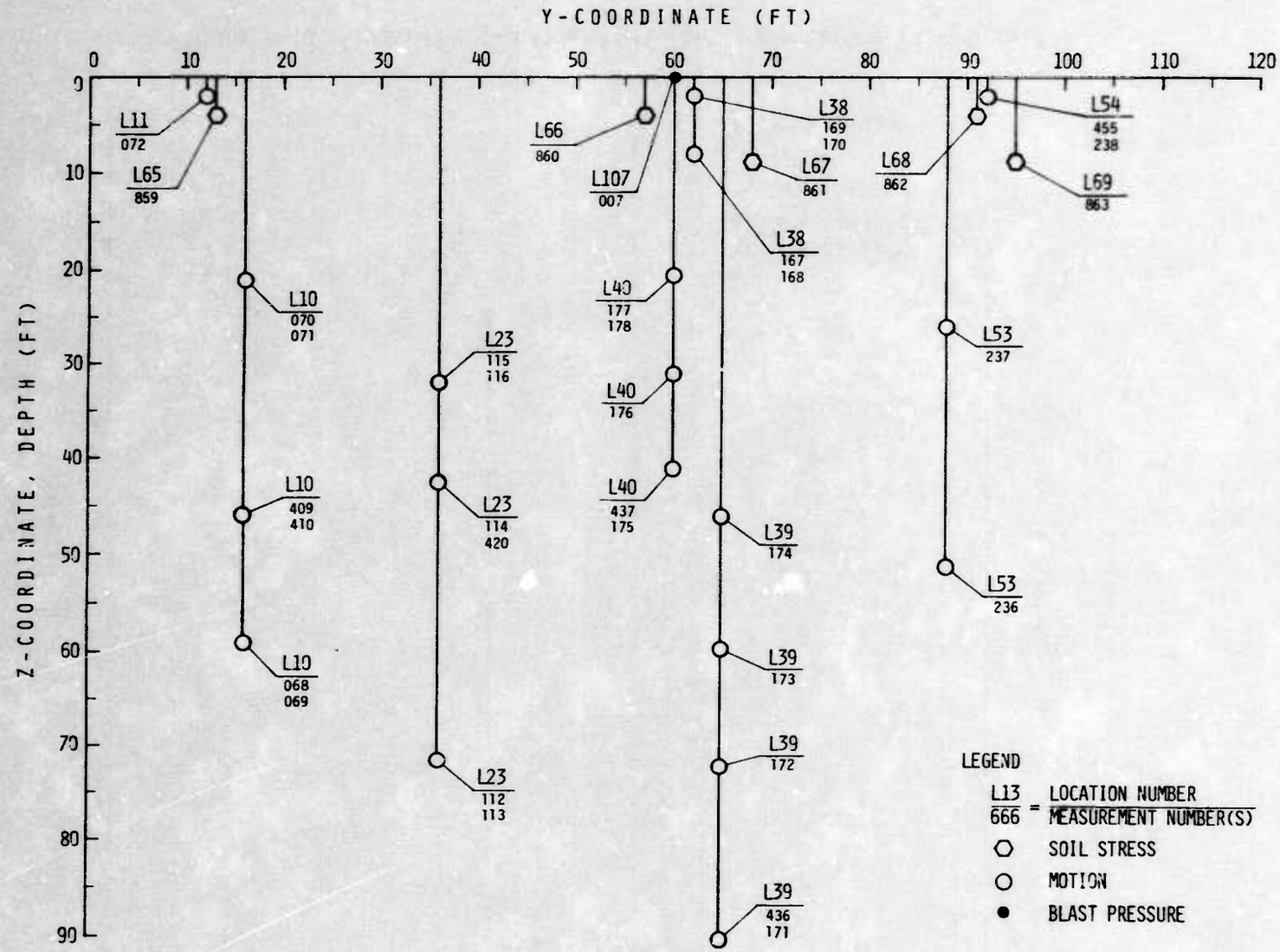


Figure P-40. HARD PAN I-3 Free Field Instrumentation (X = 40 to 80)

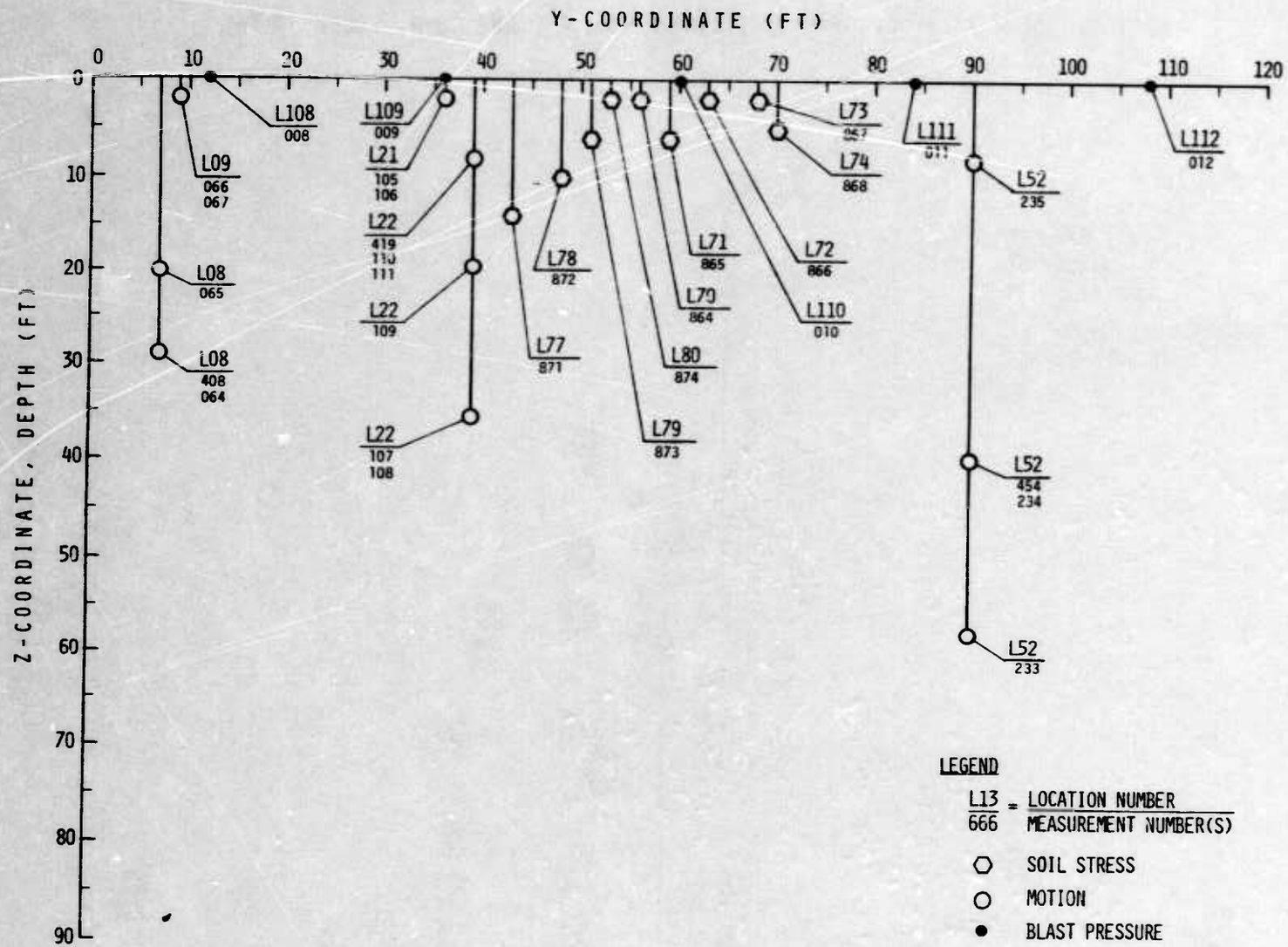


Figure P-40. HARD PAN I-3 Free Field Instrumentation (X = 80 to 107)

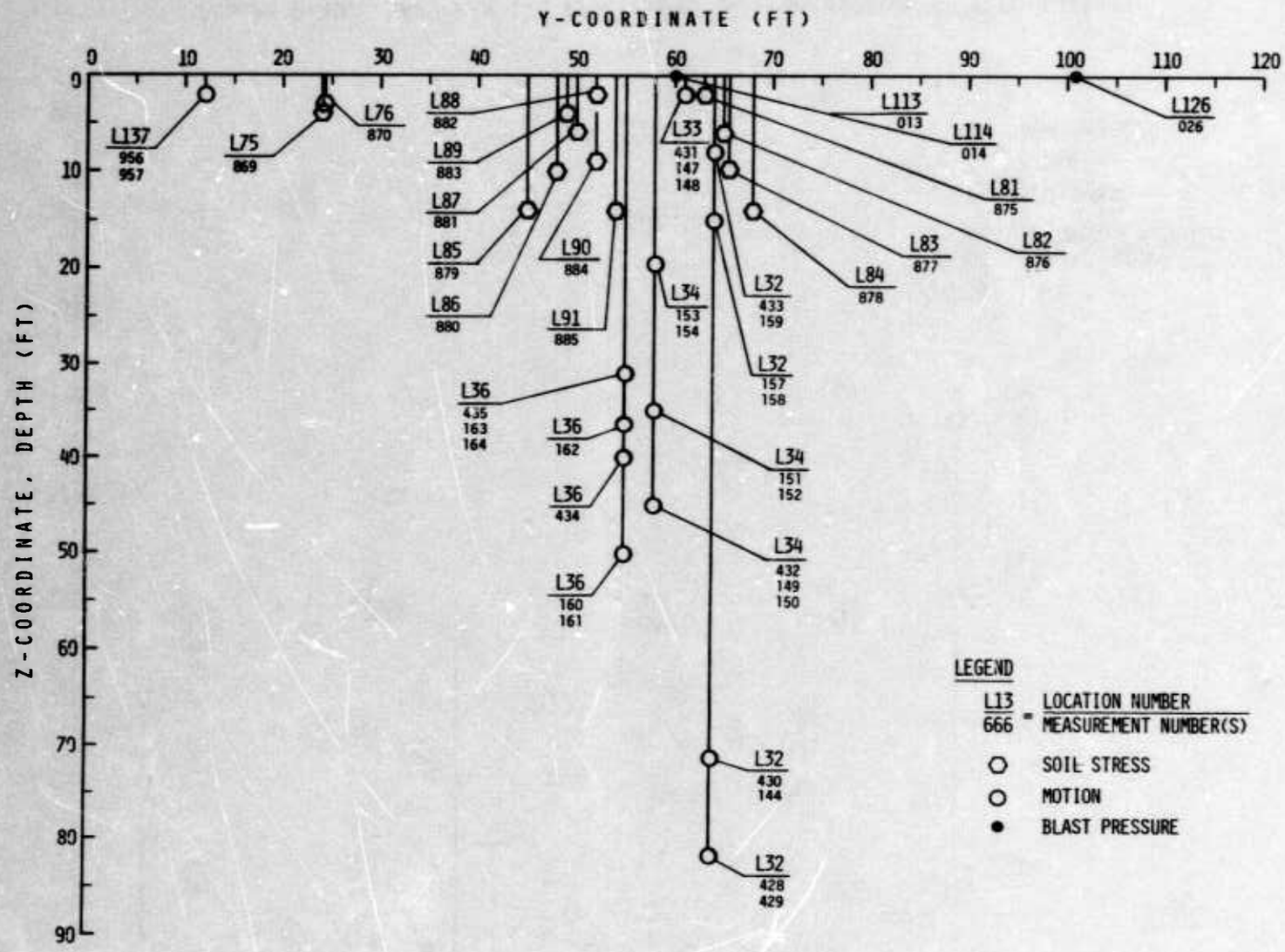


Figure P-40. HARD PAN I-3 Free Field Instrumentation (X = 107 to 138)

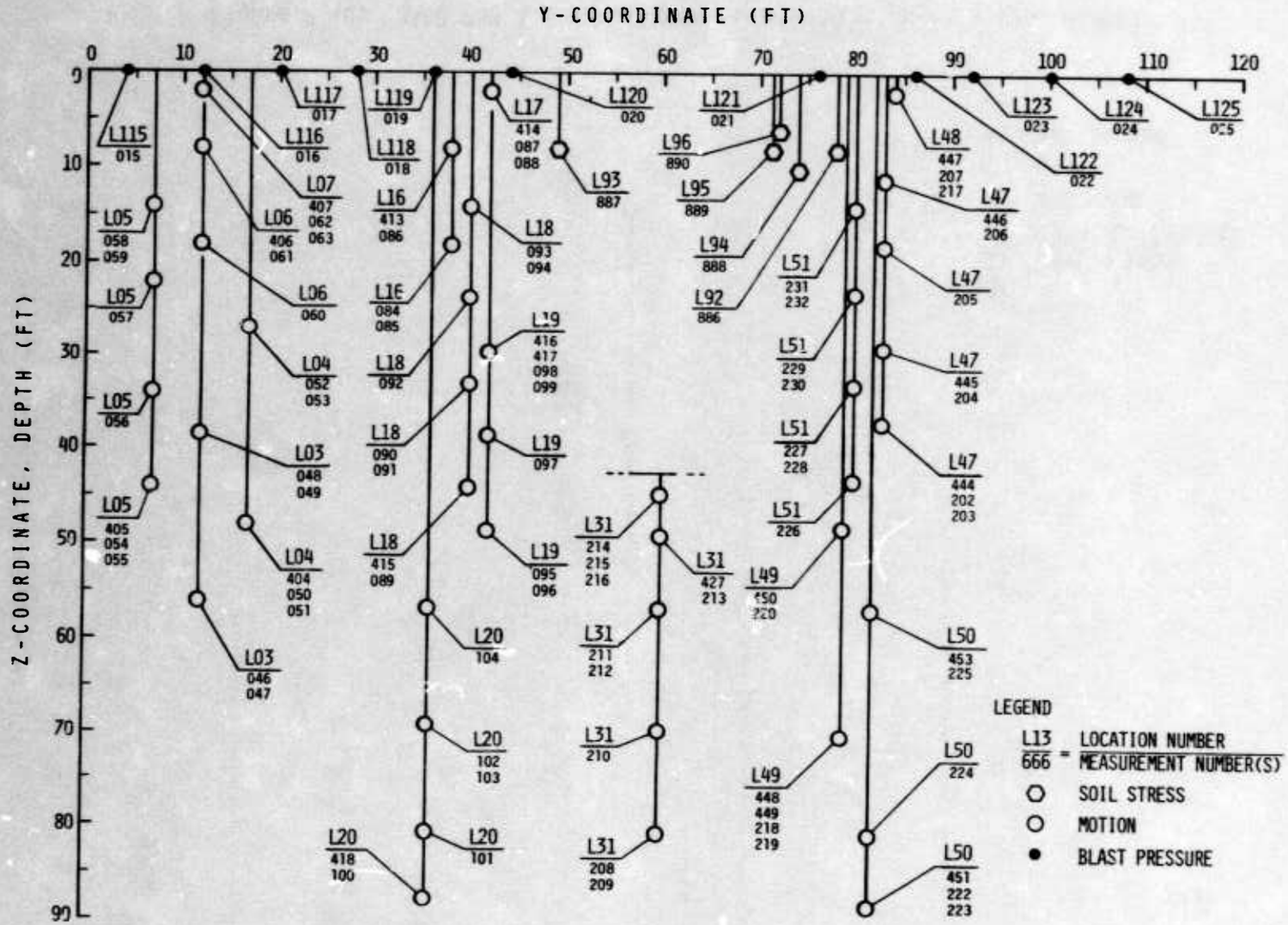


Figure P-40. HARD PAN I-3 Free Field Instrumentation (X = 138 to 170)

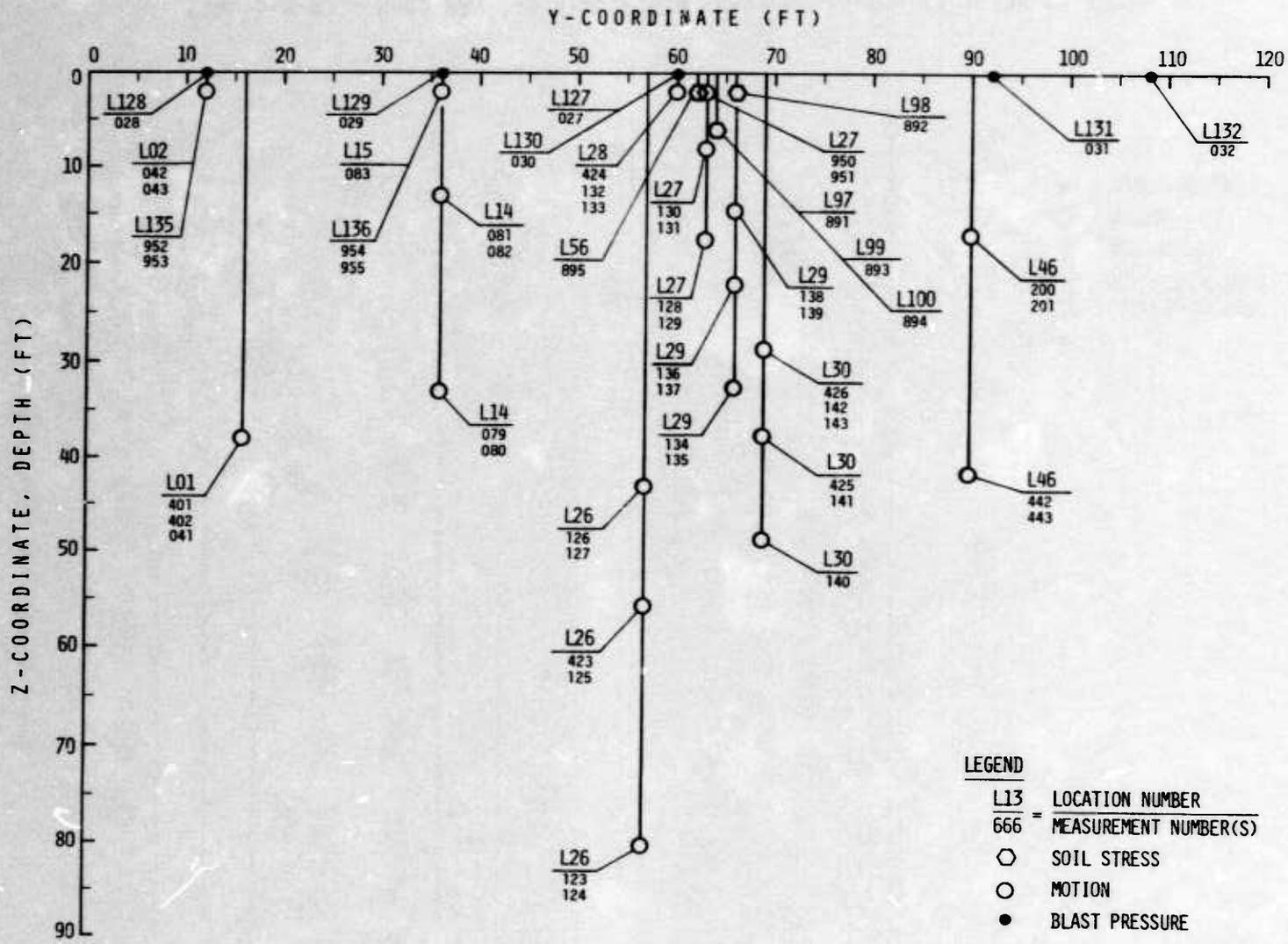


Figure P-40. HARD PAN I-3 Free Field Instrumentation (X = 170 to 200)

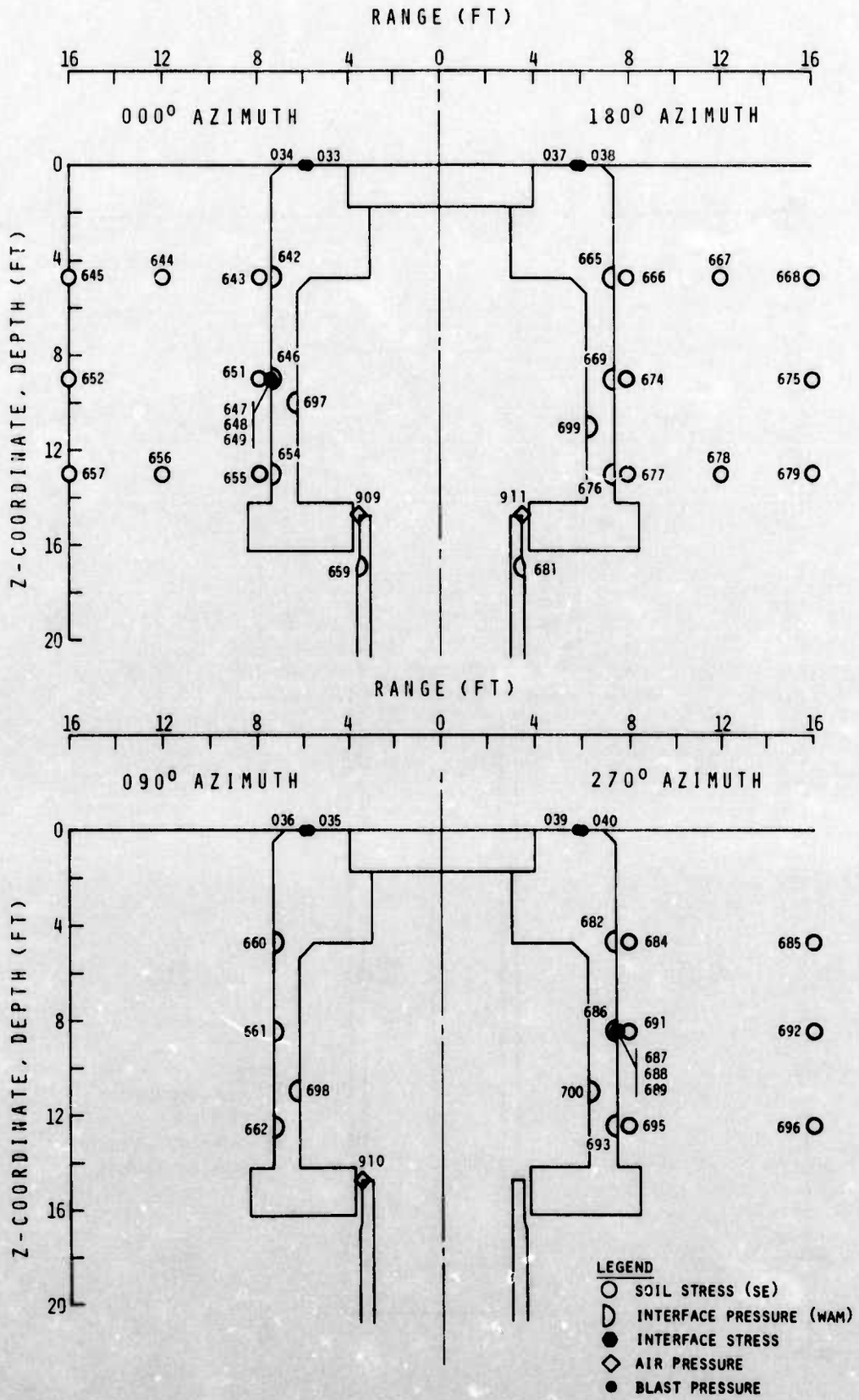


Figure P-41. Structure and Near Field Stress Measurements

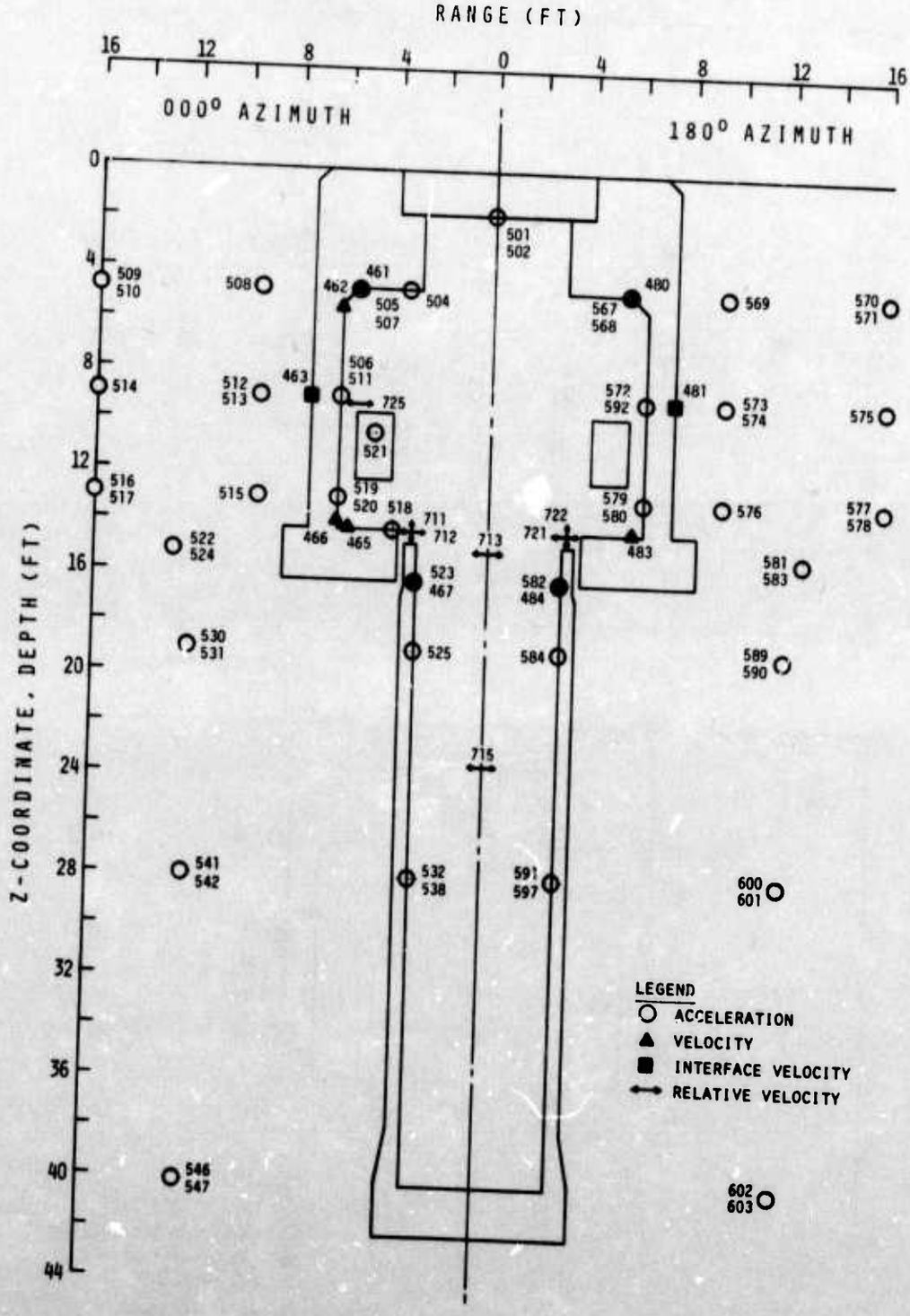


Figure P-42. Near Field and Structure Motion Measurements (000° and 180°) - HP I-3

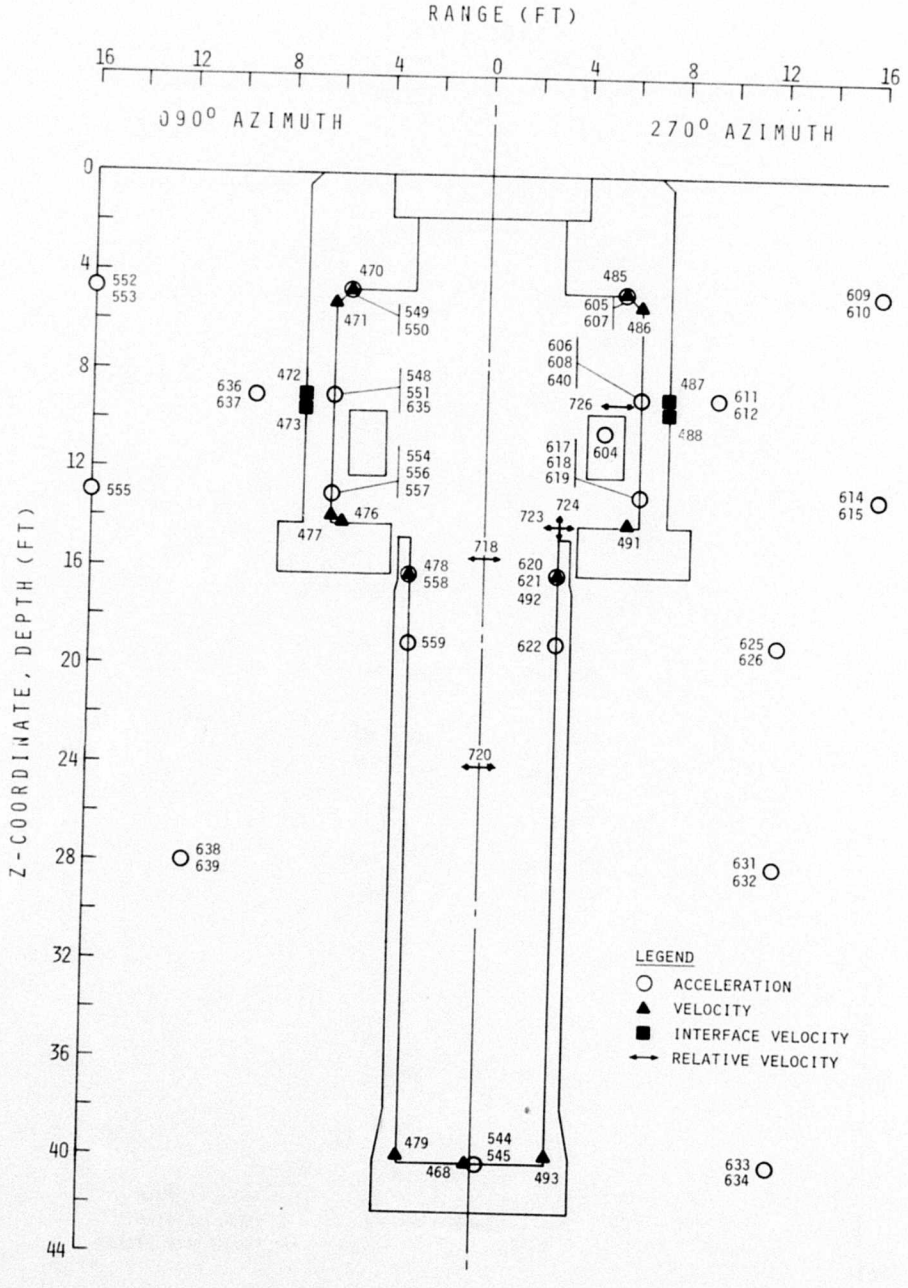


Figure P-42. Near Field and Structure Motion Measurements (090° and 270°) - HP I-3

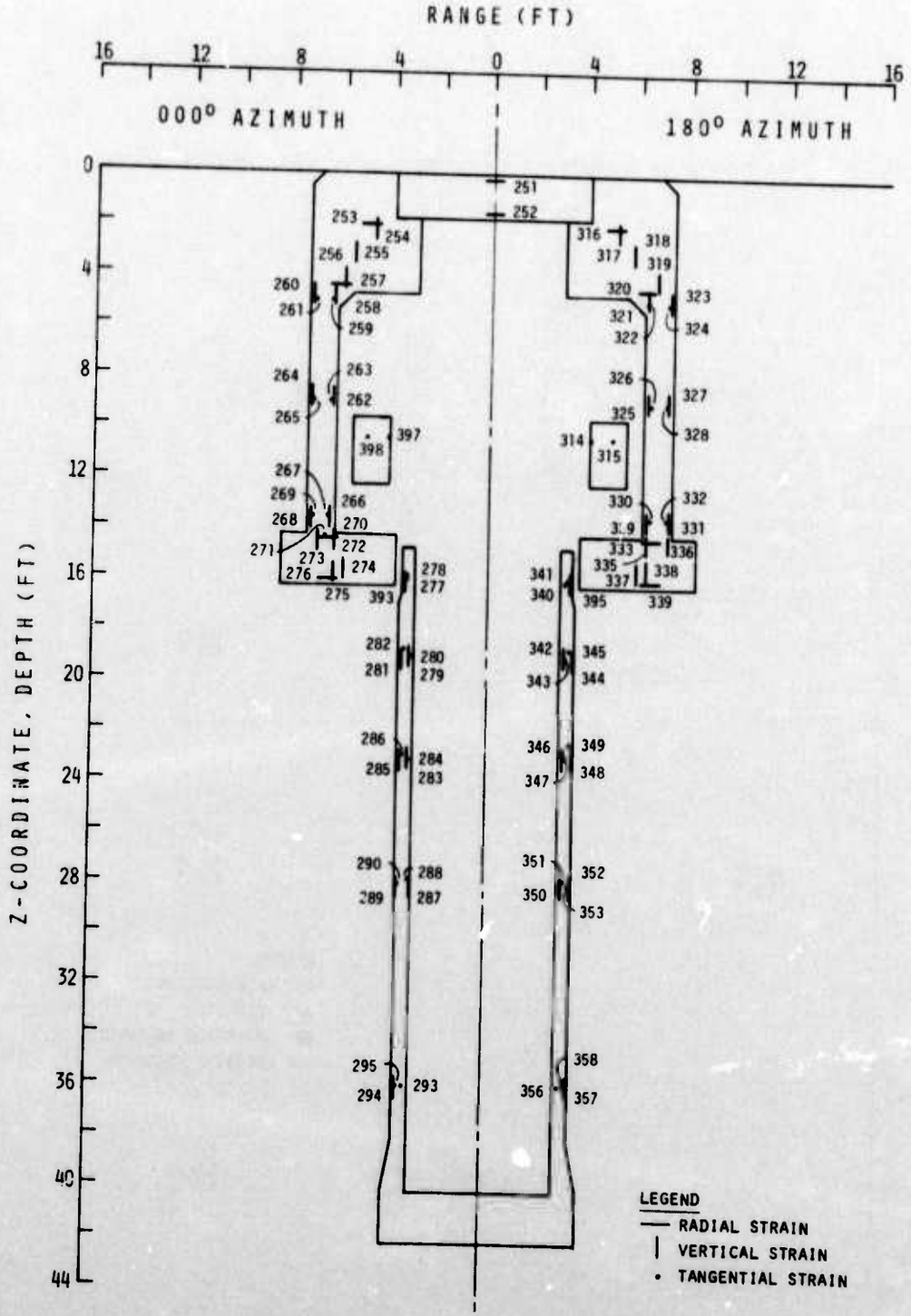


Figure P-43. Structure Steel Strain Measurements (000° and 180°) - HP I-3

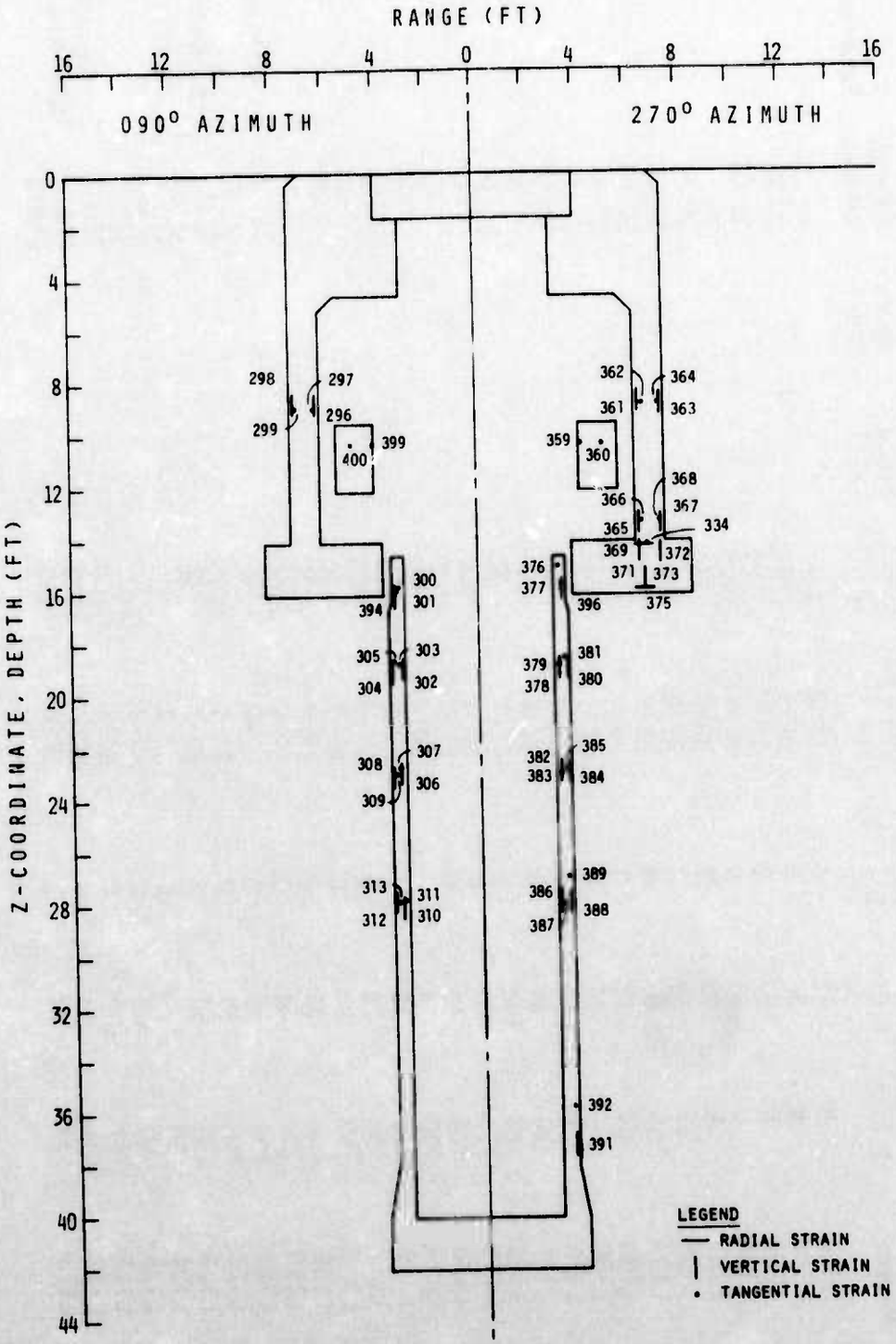


Figure P-43. Structure Steel Strain Measurements (090° and]70°) - HP I-3

Table P-75. Free Field Blast Pressure Measurements - HP I-3

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number	Remarks
001	L101	8	12	0	BP-V	2260			SE 48	
002	L102	8	36	0	BP-V	2260			SE 64	
003	L103	8	60	0	BP-V	2260			SE 61	
004	L104	8	84	0	BP-V	2260			SE 47	
005	L105	8	108	0	BP-V	2260			SE 62	
006	L106	30	60	0	BP-V	2000			SE 44	
007	L107	55	60	0	BP-V	1800			SE 56	
008	L108	84	12	0	BP-V	1550			SE 46	
009	L109	84	36	0	BP-V	1550			SE 50	
010	L110	84	60	0	BP-V	1550			SE 52	
011	L111	84	84	0	BP-V	1550			SE 58	
012	L112	84	108	0	BP-V	1550			SE 59	
013	L113	110	60	0	BP-V	1400			SE 53	
014	L114	129	60	0	BP-V	1300			SE 54	
015	L115	150	4	0	BP-V	1200			49	
016	L116	150	12	0	BP-V	1200			SE060	
017	L117	150	20	0	BP-V	1200			1-19	
018	L118	150	28	0	BP-V	1200			1-27	
019	L119	150	36	0	BP-V	1200			1-29	
020	L120	150	44	0	BP-V	1200			SE065	Pipe Mount
021	L121	150	76	0	BP-V	1200			SE 63	
022	L122	150	86	0	BP-V	1200			SE066	Pipe Mount
023	L123	150	92	0	BP-V	1200			SE067	
024	L124	150	100	0	BP-V	1200			SE068	
025	L125	150	108	0	BP-V	1200			SE069	
026	L126	111.3	100.7	0	BP-V	1200			SE007	On structure S-1
027	L127	176	60	0	BP-V	1100			SE015	Pipe Mount
028	L128	190	12	0	BP-V	1000			SE011	

Table P-75. Free Field Blast Pressure Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number	Remarks
029	L129	190	36	0	BP-V	1000			SE027	
030	L130	190	60	0	BP-V	1000			SD002	
031	L131	190	92	0	BP-V	1000			SD 25	
032	L132	190	108	0	BP-V	1000			SD 29	

Table P-76. Structure and Near Field Blast Pressure Measurements - HP I-3

Measure. Number	General Location	Depth Z (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number	Remarks
033	US	0	0	5.8	BPV	1200			SE021	
034	US	0	0	6.0	BPV	1200			SE025	
035	US	0	90	5.8	BPV	1200			SE033	
036	US	0	90	6.0	BPV	1200			SE030	
037	US	0	180	5.8	BPV	1200			E 26	
038	US	0	180	6.0	BPV	1200			SE038	
039	US	0	270	5.8	BPV	1200			SE019	
040	US	0	270	6.0	BPV	1200			SD030	

Table P-77. Free Field Soil Stress Measurements - HP I-3

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
851	L57	10.6	12	9	FS-T	3500	4000	SE	346
852	L58	10.1	20	9	FS-H	3500	4000	SE	425
853	L59	8	30	4	FS-V	3000	4000	SE	146
854	L60	10	40	9	FS-H	3500	4000	SE	396
855	L61	8	69	7	FS-V	3500	4000	SE	417
856	L62	10	72	9	FS-H	3500	4000	SE	460
857	L63	8	75	14	FS-H	3500	4000	SE	502
858	L64	8	93	4	FS-V	3000	4000	SE	394
859	L65	50.83	13	4	FS-V	3000	4000	SE	230
861	L67	57	68	8.803	FS-H	3000	4000	SE	212
862	L68	51	91	4	FS-V	3000	4000	SE	209
863	L69	51	95	8.67	FS-T	3000	4000	SE	192
864	L70	84	56	2	FS-H	2500	4000	SE	184
865	L71	86	59	6	FS-H	2500	4000	SE	430
866	L72	85.5	63	2	FS-H	2500	4000	SE	418
867	L73	88	68	2	FS-V	2000	4000	SE	219
868	L74	89	70	5	FS-V	3000	4000	SE	436
869	L75	108	24	4	FS-H	2500	4000	SE	351
870	L76	110	24.2	3	FS-V	2500	4000	SE	476
871	L77	102	43	14	FS-H	3000	4000	SE	431
872	L78	100	48	10	FS-H	3000	4000	SE	352
873	L79	98	51	6	FS-H	2500	4000	SE	484
874	L80	96	53	2	FS-H	2500	4000	SE	388
875	L81	111	63	2	FS-H	2000	4000	SE	149
876	L82	112	65	6	FS-H	2500	4000	SE	180
877	L83	113	66.5	9.71	FS-H	2500	4000	SE	172
878	L84	114	68	14	FS-H	3000	4000	SE	197
879	L85	125	45	14	FS-H	3000	4000	SE	316

Table P-77. Free Field Soil Stress Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
880	L86	123	48	10	FS-H	2500	4000	SE	453
883	L89	135.7	49	4	FS-H	2500	4000	SE	207
884	L90	133.83	52	9	FS-H	2500	4000	SE	819
885	L91	133.6	54	14	FS-H	3000	4000	SE	520
886	L92	150	78	8	FS-T	2000	4000	SE	815
887	L93	163	49	8	FS-H	2500	4000	SE	808
888	L94	162	74	10	FS-V	2500	4000	SE	828
889	L95	164	71.25	8	FS-T	2000	4000	SE	518
890	L96	166	72	6	FS-T	2500	4000	SE	141
891	L97	172	64	6	FS-T	2000	4000	SE	303
892	L98	176	66	2	FS-H	2000	4000	SE	121
893	L99	180	64	6	FS-H	2000	4000	SE	142
894	L100	182	64	6	FS-T	1800	4000	SE	155
895	L56	185	62	2	FS-V	2000	4000	SE	178

Table P-78. BLEST Field Soil Stress Measurements - HP I-3

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
801		500.1	129.7	14.5	FS-45	4000	4000	SE	412
802		505.45	123.5	14.5	FS-45	4000	4000	SE	188
803		505.45	129.7	14.5	FS-45	4000	4000	SE	229
804		499.25	150.1	14.5	FS-45	4000	4000	SE	128
805		505.65	150.2	14.5	FS-45	4000	4000	SE	124
806		505.65	156.2	14.5	FS-45	4000	4000	SE	800
807		502.85	171.9	14.5	FS-45	4000	4000	SE	851
808		508.2	172.1	14.1	FS-45	4000	4000	SE	832
809		508.1	176.6	14.3	FS-45	4000	4000	SE	833
810		505.1	192.0	13.8	FS-45	4000	4000	SE	812
811		511.4	192.0	14.1	FS-45	4000	4000	SE	824
812		511.7	198.6	13.7	FS-45	4000	4000	SE	838

Table P-79. Structure and Near Field Stress Measurements - HP I-3

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number	Remarks
642	US	4.7	355	7.4	IPR	1500			1010	
643	NF	4.7	355	7.9	FSR	1500			174	
644	NF	4.7	355	12.0	FSV	1500			464	
645	NF	4.7	355	16.0	FSR	1500			125	
646	US	9.0	355	7.4	IPR	2000			1008	
647	US	9.0	10	7.4	ISVS	500			2-75-036	
648	US	9.0	10	7.4	ISTS	500			2-75-036	
649	US	9.0	10	7.4	ISR	2000			2-75-036	
651	NF	9.0	355	7.9	FSR	2000			821	
652	NF	9.0	355	16.0	FSR	2000			519	
654	US	13.0	355	7.4	IPR	2000			1002	
655	NF	13.0	355	7.9	FSR	2000			829	
656	NF	13.0	355	12.0	FSV	2000			807	
657	NF	13.0	355	16.0	FSR	2000			521	
659	LS	16.9	355	3.6	IPR	1500			16	
660	US	4.7	90	7.4	IPR	1500			1011	
661	US	8.5	90	7.4	IPR	2000			1001	
662	US	12.5	90	7.4	IPR	2000			1000	
665	US	4.7	175	7.4	IPR	1500			1009	
666	NF	4.7	175	7.9	FSR	1500			455	
667	NF	4.7	175	12.0	FSV	1500			164	
668	NF	4.7	175	16.0	FSR	1500			474	
669	US	9.0	175	7.4	IPR	2000			1003	
674	NF	9.0	175	7.9	FSR	2000			175	
675	NF	9.0	175	16.0	FSR	2000			522	
676	US	13.0	175	7.4	IPR	2000			1004	
677	NF	13.0	175	7.9	FSR	2000			826	
678	NF	13.0	175	12.0	FSV	2000			517	
679	NF	13.0	175	16.0	FSR	2000			804	
681	LS	16.9	175	3.6	IPR	1500			5	
684	NF	4.7	265	16.0	FSR	1500			477	
685	NF	4.7	265	16.0	FSR	1500			457	

Table P-79. Structure and Near Field Stress Measurements - HP I-3 (Continued)

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number	Remarks
686	US	8.5	270	7.4	IPR	2000			1007	
687	US	8.5	275	7.4	ISVS	500			10-75-40	
688	US	8.5	275	7.4	ISTS	500			10-75-40	
689	US	8.5	275	7.4	ISR	2000			10-75-40	
691	NF	8.5	265	7.9	FSR	2000			120	
692	NF	8.5	265	16.0	FSR	2000			456	
693	US	12.5	270	7.4	IPR	2000			1005	
695	NF	12.5	265	7.9	FSR	2000			501	
696	NF	12.5	265	16.0	FSR	2000			827	
697	US	10.0	0	5.9	IPR	2000			1012	
698	US	11.0	90	6.3	IPR	2000			17	
699	US	11.0	180	6.3	IPR	2000			18	
700	US	11.0	270	6.3	IPR	2000			19	
701	E1US				IPR	2000			117	E1 US
702	E1US				IPR	2000			129	E1 US
703	E1US				IPR	2000			128A	E1 US
704	E1US				IPR	2000			100	E1 US

	X	Y	Z
701	106.3	102	2.5
702	106.3	102.4	4.5
703	111.85	98.8	6.5
704	111.3	105.45	4.5

Table P-80. Free Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
041	L01	180	16	38	AV	300	2000	2264A	AC 66
042	L02	180	12	2	AV	3000	5000	2264A	AL 33
043	L02	180	12	2	AH	2000	5000	2264A	AL 30
046	L03	154	12	56	AV	250	2000	2264A	AC 77
047	L03	154	12	56	AH	250	2000	2264A	AC 89
048	L03	154	12	38.5	AV	250	2000	2264A	AC 26
049	L03	154	12	38.5	AH	400	2000	2264A	AC 48
050	L04	151	17	48	AV	250	2000	2264A	AC 75
051	L04	151	17	48	AH	250	2000	2264A	AC 30
052	L04	151	17	27	AV	750	2000	2264A	AC 82
053	L04	151	17	27	AH	750	2000	2264A	AC 34
054	L05	148	7	44	AV	250	2000	2264A	AC 32
055	L05	148	7	44	AT	200	2000	2264A	AC 52
056	L05	148	7	34	AV	500	2000	2264A	AC 56
057	L05	148	7	22	AV	1500	5000	2264A	AK 27
059	L05	148	7	14	AH	3000	5000	2264A	AL 49
060	L06	145	12	18	AV	2000	5000	2264A	AK 45
061	L06	145	12	8	AH	2500	5000	2264A	AK 84
062	L07	140	12	2	AV	3000	5000	2264A	AK 72
063	L07	140	12	2	AH	2000	5000	2264A	AK 82
064	L08	98	7	29	AV	750	2000	2264A	AC 36
065	L08	98	7	20	AV	2000	5000	2264A	AJ 17
066	L09	100	9	2	AV	3000	5000	2264A	AJ 63
067	L09	100	9	2	AH	2000	5000	2264A	AK 60
068	L10	52	16	59	AH	250	2000	2264A	AC 71
069	L10	52	16	59	AT	250	2000	2264A	AC 54
070	L10	52	16	21	AV	1500	5000	2264A	AJ 90
071	L10	52	16	21	AT	1000	2000	2264A	AC 86
072	L11	51	12	2	AV	3000	5000	2264A	AJ 73

Table P-80. Free Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
073	L12	8	15	22	AV	1500	5000	2264A	AL 24
074	L12	8	15	22	AH	1500	5000	2264A	AG 20
075	L12	8	15	72.5	AV	150	500	2260C	AA 96
076	L12	8	15	72.5	AH	200	2000	2264A	AB 74
077	L12	8	15	31	AV	600	2000	2264A	AC 87
078	L12	8	15	31	AH	750	2000	2264A	AC 49
079	L14	185	36	33	AV	500	2000	2264A	AC 85
080	L14	185	36	33	AH	750	2000	2264A	AC 78
081	L14	185	36	13	AV	3000	5000	2264A	AL 37
082	L14	185	36	13	AH	3000	5000	2264A	AL 38
083	L15	180	36	2	AV	3000	5000	2264A	AL 10
084	L16	149	38	18	AV	2000	5000	2264A	AJ 32
085	L16	149	38	18	AH	2000	5000	2264A	AK 79
086	L16	149	38	8	AV	3000	5000	2264A	AJ 97
087	L17	153	42	2	AV	3000	5000	2264A	AK 66
088	L17	153	42	2	AH	3000	5000	2264A	AK 35
089	L18	151	40	44	AV	300	2000	2264A	AD 73
090	L18	151	40	33	AV	350	2000	2264A	AD 61
091	L18	151	40	33	AT	300	2000	2264A	AD 35
092	L18	151	40	23.5	AV	800	2000	2264A	AD 34
093	L18	151	40	14	AV	3000	5000	2264A	AK 77
094	L18	151	40	14	AT	2500	5000	2264A	AK 98
095	L19	156	42	48.5	AV	250	2000	2264A	AD 96
096	L19	156	42	48.5	AH	300	2000	2264A	AC 21
097	L19	156	42	38.5	AH	500	2000	2264A	AD 52
098	L19	156	42	29.5	AV	500	2000	2264A	AD 50
099	L19	156	42	29.5	AH	500	2000	2264A	AD 80
100	L20	147	36	87.5	AV	100	250	2260C	AE 22
101	L20	147	36	80.5	AV	150	250	2260C	AE 12

Table P-80. Free Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
102	L20	147	36	69	AV	150	250	2260C	AG 35
103	L20	147	36	69	AT	100	250	2260C	AG 34
104	L20	147	36	56.5	AV	200	2000	2264A	AD 43
105	L21	105	36	2	AV	3000	5000	2264A	AK 58
106	L21	105	36	2	AH	3000	5000	2264A	AK 46
107	L22	103	39	35.5	AV	400	2000	2264A	AC 98
109	L22	103	39	19.5	AV	2000	5000	2264A	AK 34
110	L22	103	39	8	AV	3000	5000	2264A	AK 44
111	L22	103	39	8	AH	2500	5000	2264A	AK 40
112	L23	50	36	71.5	AV	150	500	2260C	AA 66
113	L23	50	36	71.5	AH	150	500	2260C	AA 93
114	L23	50	36	42.6	AV	300	2000	2264A	AC 11
115	L23	50	36	32	AV	500	2000	2264A	AC 97
116	L23	50	36	32	AT	400	2000	2264A	AD 32
117	L24	8	33	2	AV	5000	10000	2264A	AC 49
118	L25	8	39	72.5	AV	150	500	2260C	AC 15
119	L25	8	39	72.5	AH	200	2000	2264A	AB 56
120	L25	8	39	41.5	AV	400	2000	2264A	AC 59
121	L25	8	39	22	AV	3000	5000	2264A	AE 69
122	L25	8	39	22	AH	3000	5000	2264A	AJ 82
123	L26	171	57	80	AV	150	250	2260C	AG 37
124	L26	171	57	80	AH	150	250	2260C	AG 43
125	L26	171	57	55.5	AV	400	2000	2264A	AD 59
126	L26	171	57	43	AV	400	2000	2264A	AD 49
127	L26	171	57	43	AH	400	2000	2264A	AC 41
128	L27	171	53	17.5	AV	2000	5000	2264A	AF 62
129	L27	171	53	17.5	AH	2000	5000	2264A	AF 64
130	L27	171	63	8	AV	3000	5000	2264A	AF 75
131	L27	171	63	8	AT	2000	5000	2264A	AF 72
132	L28	171	60	2	AV	3000	5000	2264A	AF 56

Table P-80. Free Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
133	L28	171	60	2	AH	3000	5000	2264A	AF 33
134	L29	171	66	32.5	AV	400	2000	2264A	AB 36
135	L29	171	66	32.5	AH	400	2000	2264A	AC 67
136	L29	171	66	22	AV	1000	2000	2264A	AC 99
137	L29	171	66	22	AH	1200	2000	2264A	AC 62
138	L29	171	66	14.5	AV	3000	5000	2264A	AF 58
139	L29	171	66	14.5	AH	3000	5000	2264A	AF 97
140	L30	171	69	48.5	AV	400	2000	2264A	AC 58
141	L30	171	69	37.5	AV	400	2000	2264A	AC 60
142	L30	171	69	28.5	AV	500	2000	2264A	AC 23
143	L30	171	69	28.5	AH	500	2000	2264A	AC 31
144	L32	126	64	71	AV	150	250	2260C	AG 48
147	L33	124	61	2	AV	3000	5000	2264A	AJ 51
148	L33	124	61	2	AH	3000	5000	2264A	AJ 24
149	L34	123	58	45	AV	400	2000	2264A	AC 24
150	L34	123	58	45	AH	400	2000	2264A	AC 64
151	L34	123	58	35	AV	400	2000	2264A	AC 70
152	L34	123	58	35	AH	500	2000	2264A	AC 33
153	L34	123	58	19.5	AV	2000	5000	2264A	AF 93
154	L34	123	58	19.5	AH	2000	5000	2264A	AG 12
157	L32	126	64	15	AV	3000	5000	2264A	AF 52
158	L32	126	64	15	AT	1500	5000	2264A	AF 49
159	L32	126	64	8	AV	3000	5000	2264A	AF 48
160	L36	121	55	50	AV	400	2000	2264A	AC 19
161	L36	121	55	50	AH	400	2000	2264A	AD 95
162	L36	121	55	36.5	AV	400	2000	2264A	AD 97
163	L36	121	55	31	AV	500	2000	2264A	AE 01
164	L36	121	55	31	AH	500	2000	2264A	AD 98
167	L38	52	62	8	AV	3500	10000	2264A	AD 60
168	L38	52	62	8	AH	3500	10000	2264A	AD 59

Table P-80. Free Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
169	L38	52	62	2	AV	3500	10000	2264A	AD 43
170	L38	52	62	2	AV	3500	10000	2264A	AB 05
171	L39	53	65	90	AV	100	250	2260C	AG 38
172	L39	53	65	72	AV	150	500	2260C	AC 46
173	L39	53	65	59.5	AH	200	2000	2264A	AE 02
174	L39	53	65	46	AV	400	2000	2264A	AC 51
175	L40	50	60	41	AH	500	2000	2264A	AC 29
176	L40	50	60	31	AV	500	2000	2264A	AD 69
177	L40	50	60	20.5	AV	2000	5000	2264A	AH 78
178	L40	50	60	20.5	AH	2000	5000	2264A	AH 75
179	L41	8	57	46	AH	400	2000	2264A	AC 45
180	L41	8	57	36.5	AV	400	2000	2264A	AC 61
181	L41	8	57	36.5	AH	500	2000	2264A	AC 72
182	L41	8	57	21	AV	2500	5000	2264A	AF 42
183	L41	8	57	21	AH	2500	5000	2264A	AF 43
184	L42	8	51	2	AV	5000	10000	2264A	AB 84
185	L42	8	51	2	AH	5000	10000	2264A	AC 34
186	L43	8	63	27	AV	1000	2000	2264A	AC 73
187	L43	8	63	17	AV	4000	10000	2264A	AB 06
188	L43	8	63	17	AH	4000	10000	2264A	AB 76
189	L44	8	54	90	AV	100	250	2260C	AG 40
190	L44	8	54	90	AH	150	500	2260C	AE 68
191	L44	8	54	82.5	AV	100	500	2260C	AB 01
192	L44	8	54	73	AV	150	500	2260C	AD 66
193	L44	8	54	73	AH	150	500	2260C	AD 90
194	L44	8	54	66	AV	200	2000	2264A	AD 38
195	L45	8	66	53	AV	400	2000	2264A	AC 38

Table P-80. Free Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
196	L45	8	66	53	AH	400	2000	2264A	AC 12
197	L45	8	66	41.5	AV	400	2000	2264A	AC 53
198	L45	8	66	41.5	AV	500	2000	2264A	AC 68
199	L45	8	66	32.5	AV	750	2000	2264A	AC 81
200	L46	180	90	17	AV	3000	5000	2264A	AF 90
201	L46	180	90	17	AH	3000	5000	2264A	AF 91
202	L47	148	83	37	AV	400	2000	2264A	AC 96
203	L47	148	83	37	AT	400	2000	2264A	AD 27
204	L47	148	83	29	AV	500	2000	2264A	AD 40
205	L47	148	83	18	AV	2500	5000	2264A	AF 83
206	L47	148	83	11	AV	3000	5000	2264A	AF 92
207	L48	152	84	2	AV	3000	5000	2264A	AF 36
208	L31	150	60	80.5	AV	150	250	2264A	BG 79
209	L31	150	60	80.5	AH	150	250	2260C	BG 91
210	L31	150	60	69.5	AV	150	250	2260C	BG 69
211	L31	150	60	56.5	AV	250	250	2260C	BH 07
212	L31	150	60	56.5	AH	300	250	2260C	BG 68
213	L31	150	60	49	AV	400	5000	2264A	AE 14
214	L31	150	60	44.5	AV	400	1000	2262	CH 13
215	L31	150	60	44.5	AV	400	5000	2264A	AD 31
216	L31	150	60	44.5	AH	400	1000	2262	CG 85
217	L48	152	84	2	AH	3000	5000	2264A	AG 16
218	L49	154	79	70	AV	150	500	2260C	AE 52
219	L49	154	79	70	AH	200	2000	2264A	AD 78
220	L49	154	79	48	AH	500	2000	2264A	AE 81
222	L50	150	82	88	AV	100	500	2260C	AE 25
223	L50	150	82	88	AH	100	500	2260C	AB 40
224	L50	150	82	80.5	AV	100	500	2260C	AD 74
225	L50	150	82	56.5	AV	400	2000	2264A	AE 41
226	L51	152	80	43	AV	400	2000	2264A	AD 86

Table P-80. Free Field Acceleration Measurements - HP I-3

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
227	L51	152	80	33	AV	400	2000	2264A	AD 60
228	L51	152	80	33	AH	500	2000	2264A	AD 28
229	L51	152	80	23	AV	1000	2000	2264A	AD 19
230	L51	152	80	23	AH	1000	2000	2264A	AC 79
231	L51	152	80	14	AH	3000	5000	2264A	AG 17
232	L51	152	80	14	AT	1500	5000	2264A	AF 98
233	L52	100	90	57.5	AV	400	2000	2264A	AC 84
234	L52	100	90	39.5	AH	300	2000	2264A	AD 17
235	L52	100	90	8	AV	3000	5000	2264A	AF 99
236	L53	52	88	41	AV	500	2000	2264A	AC 74
238	L54	50	92	2	AV	5000	10000	2264A	AC 78
240	L55	8	87	8	AV	4000	10000	2264A	AC 67
241	L55	8	87	8	AH	4000	10000	2264A	AC 82
242	L35	8	90	72	AV	150	500	2260C	AD 82
243	L35	8	90	72	AH	150	500	2260C	AC 72
244	L35	8	90	53	AV	500	2000	2264A	AC 57
245	L35	8	90	53	AH	500	2000	2264A	AC 46
246	L35	8	90	35	AV	750	2000	2264A	AC 44
247	L35	8	90	35	AH	750	2000	2264A	AC 01
950	L27	171	63	2	AV	1240	5000	2264A	AG13
951	L27	171	63	2	AH	1190	5000	2264A	AK28
952	L135	185	12	2	AH	2450	10000	2264A	AD57
953	L135	185	12	2	AH	3000	10000	2264A	AD73
954	L136	176	36	2	AH	2440	10000	2264A	AC18
955	L136	176	36	2	AV	2220	10000	2264A	AB14
956	L137	136	12	2	AH	3000	5000	2264A	AH24
957	L137	136	12	2	AH	1170	5000	2264A	AH86

Table P-81. Structure and Near Field Acceleration Measurements - HP I-3

Measure. Number	Location Number	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
501	CL	1.6	0	0	AV	3000	5000	2264A	AL07
502	CL	1.6	0	0	AV	3000	5000	2264A	AL08
504	US	4.7	0	3.5	AV	2000	5000	2264A	AL09
505	US	4.7	0	5.5	AR	2000	5000	2264A	AL14
506	US	9.0	0	6.3	AV	1500	2000	2264A	AB89
507	US	4.7	0	5.5	AV	1500	2000	2264A	AC40
508	L138	4.7	0	9.4	AV	2000	5000	2264A	AK50
509	L141	4.7	0	16.0	AV	2000	5000	2264A	AK61
510	L141	4.7	0	16.0	AR	2000	5000	2264A	AK89
511	US	9.0	0	6.3	AR	2000	5000	2264A	AL15
512	L138	9.0	0	9.4	AV	2000	5000	2264A	AK99
513	L138	9.0	0	9.4	AR	2000	5000	2264A	AK90
514	L141	9.0	0	16.0	AV	2000	5000	2264A	AK49
515	L138	13.0	0	9.4	AV	1500	2000	2264A	AC50
516	L141	13.0	0	16.0	AV	1500	2000	2264A	AB90
517	L141	13.0	0	16.0	AR	1500	2000	2264A	AB80
518	US	14.2	0	4.0	AV	2000	5000	2264A	AL18
519	US	13.0	0	6.3	AV	1500	2000	2264A	AC92
520	US	13.0	0	6.3	AR	2000	5000	2264A	AL21
521	US	10.4	0	4.8	AR	2000	5000	2264A	AJ21
522	L140	15.2	0	12.7	AV	1500	2000	2264A	AC93
523	LS	16.2	0	3.0	AR	1000	2000	2264A	AD01
524	L140	15.2	0	12.7	AR	1500	2000	2264A	AD11
525	LS	19.0	0	3.0	AR	1000	2000	2264A	AF53A
530	L139	19.0	0	12.0	AV	1000	2000	2264A	AC10
531	L139	19.0	0	12.0	AR	1000	2000	2264A	AB85
532	LS	28.0	0	3.0	AV	500	2000	2264A	AF44A
538	LS	28.0	0	3.0	AR	500	2000	2264A	AF31A
541	L139	28.0	0	12.0	AV	500	2000	2264A	AB81
542	L139	28.0	0	12.0	AR	500	2000	2264A	AB77

Table P-81. Structure and Near Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
544	LS	40.2	270	0.2	AV	1000	2000	2264A	AF06A
545	LS	40.2	270	0.2	AR	500	2000	2264A	AF07A
546	L139	40.2	0	12.0	AV	500	2000	2264A	AC06
547	L139	40.2	0	12.0	AR	500	2000	2264A	AC13
548	US	9.0	90	6.3	AV	1500	2000	2264A	AF08A
549	US	4.7	90	5.5	AR	2000	5000	2264A	AL01
550	US	4.7	90	5.5	AV	1500	2000	2264A	AF09A
551	US	9.0	90	6.3	AT	2000	5000	2264A	AL02
552	L144	4.7	90	16.0	AV	2000	5000	2264A	AK87
553	L144	4.7	90	16.0	AR	2000	5000	2264A	AK08
554	US	13.0	90	6.3	AR	2000	5000	2264A	AL05
555	L144	13.0	90	16.0	AR	500	2000	2264A	AF10A
556	US	13.0	90	6.3	AT	1500	5000	2264A	AJ76
557	US	13.0	90	6.3	AV	1500	2000	2264A	AF11A
558	LS	16.2	90	3.0	AV	1000	2000	2264A	AF41A
559	LS	19.0	90	3.0	AR	1000	2000	2264A	AF47A
567	US	4.7	180	5.5	AR	2000	5000	2264A	AL23
568	US	4.7	180	5.5	AV	1500	2000	2264A	AF14A
569	L145	4.7	180	9.4	AV	2000	5000	2264A	AH20
570	L148	4.7	180	16.0	AV	2000	5000	2264A	AK17
571	L148	4.7	180	16.0	AR	2000	5000	2264A	AK59
572	US	9.0	180	6.3	AR	2000	5000	2264A	AL27
573	L145	9.0	180	9.4	AV	2000	5000	2264A	AK41
574	L145	9.0	180	9.4	AR	2000	5000	2264A	AK65
575	L148	9.0	180	16.0	AV	2000	5000	2264A	AK26
576	L145	13.0	180	9.4	AV	1500	2000	2264A	AF16A
577	L148	13.0	180	16.0	AV	1500	2000	2264A	AF17A
578	L148	13.0	180	16.0	AR	1500	2000	2264A	AF18A
579	US	13.0	180	6.3	AR	2000	5000	2264A	AL48
580	US	13.0	180	6.3	AV	1500	2000	2264A	AF20A
581	L147	15.2	180	12.7	AV	1500	2000	2264A	AF21A

Table P-81. Structure and Near Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
582	LS	16.2	180	3.0	AR	1000	2000	2264A	AF22A
583	L147	15.2	180	12.7	AR	1500	2000	2264A	AF23A
584	LS	19.0	180	3.0	AR	1000	2000	2264A	AF24A
589	L146	19.0	180	12.0	AV	1000	2000	2264A	AF25A
590	L146	19.0	180	12.0	AR	1000	2000	2264A	AF27A
591	LS	28.0	180	3.0	AV	500	2000	2264A	AF28A
592	US	9.0	180	6.3	AV	1500	2000	2264A	AF29A
597	LS	28.0	180	3.0	AR	500	2000	2264A	AF30A
600	L146	28.0	180	12.0	AV	500	2000	2264A	AB95
601	L146	28.0	180	12.0	AR	500	2000	2264A	AB78
602	L146	28.0	180	12.0	AR	500	2000	2264A	AC17
603	L146	40.2	180	12.0	AR	500	2000	2264A	AB93
604	R	10.4	270	4.8	AR	2000	5000	2264A	AF53
605	US	4.7	270	5.5	AR	2000	5000		AL31
606	US	9.0	270	6.3	AV	1500	2000	2264A	AF32A
607	US	4.7	270	5.5	AV	1500	2000	2264A	AF33A
608	US	9.0	270	6.3	AT	2000	5000	2264A	AF82
609	L151	4.7	270	16.0	AV	2000	5000	2264A	AK86
610	L151	4.7	270	16.0	AR	2000	5000	2264A	AK93
611	L149	9.0	270	9.4	AV	2000	5000	2264A	AK13
612	L149	9.0	270	9.4	AR	2000	5000	2264A	AK47
614	L151	13.0	270	16.0	AV	1500	2000	2264A	AF39A
615	L151	13.0	270	16.0	AR	1500	2000	2264A	AF40A
617	US	13.0	270	6.3	AV	1500	2000	2264A	AF34A
618	US	13.0	270	6.3	AR	2000	5000	2264A	AL42
619	US	13.0	270	6.3	AT	2000	5000	2264A	AL44
620	LS	16.2	270	3.0	AR	1000	2000	2264A	AF36A
621	LS	16.2	270	3.0	AV	1000	2000	2264A	AF37A

Table P-81. Structure and Near Field Acceleration Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
622	LS	19.0	270	3.0	AR	1000	2000	2264A	AF38A
625	L150	19.0	270	12.0	AV	1000	2000	2264A	AB69
626	L150	19.0	270	12.0	AR	1000	2000	2264A	AB88
631	L150	28.0	270	12.0	AV	500	2000	2264A	AD90
632	L150	28.0	270	12.0	AR	500	2000	2264A	AC18
633	L150	40.2	270	12.0	AV	500	2000	2264A	AB58
634	L150	40.2	270	12.0	AR	500	2000	2264A	AB86
635	US	9.0	90	6.3	AR	2000	5000	2264A	AL46
636	L142	9.0	90	9.4	AV	2000	5000	2264A	AK53
637	L142	9.0	90	9.4	AR	2000	5000	2264A	AK25
638	L143	28.0	90	12.0	AV	500	2000	2264A	AF42A
639	L143	28.0	90	12.0	AR	500	2000	2264A	AF43A
640	US	9.0	270	6.3	AR	2000	5000	2264A	AL47

Table P-82. Free Field Velocity Measurements - HP I-3

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
401	L01	180	16	38	VV	10			3029
402	L01	180	16	38	VH	20			1804
404	L04	151	17	48	VV	10			3078
405	L05	148	7	44	VV	10			3082
406	L06	145	12	8	VH	20			1665
407	L07	140	12	2	VV	30			3028
408	L08	98	7	29	VV	12			3076
409	L10	52	16	46	VH	15			1776
410	L10	52	16	46	VT	10			2064
411	L12	8	15	72.5	VV	5			2309
412	L12	8	15	72.5	VH	10			1808
413	L16	149	38	8	VV	25			4096
414	L17	153	42	2	VV	30			3068
415	L18	151	40	44	VV	10			4091
416	L19	156	42	38.5	VH	20			2225
417	L19	156	42	29.5	VV	20			3043
418	L20	147	36	87.5	VV	3			4089
419	L22	103	39	8	VV	25			3087
420	L23	50	36	46	VV	10			3075
421	L24	8	33	2	VV	30			2953
422	L25	8	39	72.5	VV	5			3081
423	L26	171	57	55.5	VV	10			4103
424	L28	171	60	2	VV	30			3041
425	L30	171	69	37.5	VV	10			4104
426	L30	171	69	28.5	VV	15			4109
427	L31	150	60	49	VV	10			2826
428	L32	126	64	81.5	VV	5			4114
429	L32	126	64	81.5	VH	5			1766
430	L32	126	64	71	VV	5			4107
431	L33	124	61	2	VV	30			3086

Table P-82. Free Field Velocity Measurements - HP I-3 (Continued)

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
432	L34	123	58	45	VH	15			1797
433	L32	126	64	8	VV	25			4106
434	L36	121	55	40	VV	10			4111
435	L36	121	55	31	VV	15			4112
436	L39	53	65	90	VV	3			4090
437	L40	50	60	41	VH	15			2232
438	L41	8	57	46	VH	15			1851
439	L44	8	54	66	VV	5			4093
440	L45	8	66	41.5	VV	10			4097
441	L45	8	66	32.5	VV	10			4092
442	L46	180	90	41.5	VV	10			4108
443	L46	180	90	41.5	VH	15			1789
444	L47	148	83	37	VT	10			2050
445	L47	148	83	29	VV	15			4105
446	L47	148	83	11	VV	20			3030
447	L48	152	84	2	VV	30			2959
448	L49	154	79	70	VV	5			4118
449	L49	154	79	70	VH	10			1819
450	L49	154	79	48	VH	15			1861
451	L50	150	82	88	VV	3			4113
453	L50	150	82	56.5	VV	7			4095
454	L52	100	90	39.5	VH	20			1836
455	L54	50	92	2	VV	30			3017
456	L55	8	87	8	VV	25			4088
457	L55	8	87	8	VH	25			1835
458	L35	8	90	53	VV	10			4094

Table P-83. Structure Velocity Measurements - HP I-3

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (fps)	Xducer Nominal Range (fps)	Xducer Model	Xducer Serial Number
461	US	4.7	0	5.5	VV	30			
462	US	5.5	0	6.3	VT	30			3033
463	US	9.0	2.5	7.4	IVV	15			1830
465	US	14.2	0	5.8	VV	30			
466	US	14.0	0	6.3	VT	30			3036
467	LS	16.2	0	3.0	VV	20			2035
468	LS	40.2	90	0.2	VV	20			3019-1
470	US	5.5	90	6.3	VT	30			1435
471	US	5.5	90	6.3	VT	30			1277
472	US	9.0	115	7.4	IVV	15			1796
473	US	9.5	90	7.4	IVT	15			
476	US	14.2	90	5.8	VV	30			
477	US	14.0	90	6.3	VT	30			2212
478	LS	16.2	90	3.0	VT	20			1834
479	LS	40.0	90	3.0	VT	20			1847
480	US	4.7	180	5.5	VV	30			1860
481	US	9.0	182.5	7.4	IVV	15			2194
483	US	14.2	180	5.8	VV	30			
484	LS	16.2	180	3.0	VV	20			3019
485	US	4.7	270	5.5	VV	30			1447
486	US	5.5	270	6.3	VT	30			3037
487	US	9.0	295	7.4	IVV	15			1771
488	US	9.5	270	7.4	IVT	15			
491	US	14.2	270	5.8	VV	30			
492	LS	16.2	270	3.0	VT	20			3065
493	LS	40.0	270	3.0	VT	20			2056
									1843

Table P-84. Structure Displacement Measurements - HP I-3

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (in)	Xducer Nominal Range (in)	Xducer Model	Xducer Serial Number
711	US/LS	14.7	350	3.7	RDV	-4 + 2			0753644
712	US/LS	14.7	350	3.7	RDR	±4			0753655
713	LS	15.0	0 (to 180)	3.0	RDR	±6			0753649
715	LS	23.5	0 (to 180)	3.0	RDR	±6			0753651
718	LS	15.5	90 (to 270)	3.0	RDR	±6			0753648
720	LS	24.0	90 (to 270)	3.0	RDR	±6			0753650
721	US/LS	14.7	170	3.7	RDR	±4			0753656
722	US/LS	14.7	170	3.7	RDV	-4 + 2			0753645
723	US/LS	14.7	260	3.7	RDR	±4			0753657
724	US/LS	14.7	260	3.7	RDV	-4 + 2			0753646
725	US/R	9.0	0	6.1	RDR	-6 + 2			658
726	US/R	9.0	270	6.1	RDR	±4			647

Table P-85. Structure Steel Strain Measurements - HP I-3

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
251	CL	0.2	0	0	SE-R	1500			
252	CL	1.5	0	0	SE-R	1500			
253	US	2.0	0	5.0	SE-R	1000			
254	US	2.2	0	4.8	SE-V	2000			
255	US	3.1	359.5	5.6	SE-V	2000			
256	US	4.1	0	6.0	SE-V	2000			
257	US	4.4	0	6.2	SE-R	1000			
258	US	4.8	0	6.4	SE-V	2000			
259	US	5.0	0	6.5	SE-T	1500			
260	US	4.8	0	7.25	SE-V	2000			
261	US	5.0	0	7.2	SE-T	1500			
262	US	8.8	0	6.4	SE-V	2000			
263	US	9.0	0	6.5	SE-T	2000			
264	US	8.8	0	7.25	SE-V	2000			
265	US	9.0	0	7.2	SE-T	2000			
266	US	13.6	0	6.5	SE-V	2000			
267	US	13.5	0	6.5	SE-T	1500			
268	US	13.6	0	7.25	SE-V	2000			
269	US	13.5	0	7.2	SE-T	1500			
270	US	14.4	0	6.5	SE-R	1500			
271	US	14.3	0	6.7	SE-T	1000			
272	US	14.5	0	6.3	SE-V	1000			
273	US	14.5	0	7.0	SE-V	1000			
274	US	15.6	0.25	5.9	SE-V	1000			
275	US	15.7	0.25	6.3	SE-V	1000			
276	US	16.4	0	6.5	SE-R	2000			
277	LS	16.0	0	3.3	SE-T	2000			
278	LS	15.92	357.1	3.3	SE-T	2000			
279	LS	19.0	356.3	3.2	SE-V	1000			
280	LS	19.0	3.7	3.1	SE-T	1000			
281	LS	19.0	4.1	3.5	SE-V	1000			
282	LS	18.7	358.6	3.4	SE-T	1000			

Table P-85. Structure Steel Strain Measurements - HP I-3 (Continued)

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
283	LS	23.0	355.1	3.2	SE-V	1000			
284	LS	23.1	0	3.2	SE-T	1000			
285	LS	23.1	4.1	3.5	SE-V	1000			
286	LS	22.9	0	3.4	SE-T	1000			
287	LS	28.1	0	3.0	SE-V	1000			
288	LS	27.8	0	3.0	SE-V	1000			
289	LS	28.15	0	3.6	SE-V	1000			
290	LS	28.0	0	3.6	SE-T	1000			
293	LS	36.0	0	3.2	SE-T	1000			
294	LS	36.1	2	3.5	SE-V	1000			
295	LS	36.0	0	3.45	SE-T	1000			
296	US	8.8	90	6.4	SE-V	2000			
297	US	9.0	90	6.5	SE-T	2000			
298	US	8.8	89.75	7.25	SE-V	2000			
299	US	9.0	90	7.2	SE-T	2000			
300	LS	15.9	90	3.2	SE-T	2000			
301	LS	16.0	90	3.3	SE-T	2000			
302	LS	19.0	95.7	3.1	SE-V	1000			
303	LS	18.8	90	3.2	SE-T	1000			
304	LS	19.2	94.1	3.5	SE-V	1000			
305	LS	18.75	90	3.5	SE-T	1000			
306	LS	23.0	94.5	3.2	SE-V	1000			
307	LS	22.8	89.3	3.2	SE-T	1000			
308	LS	23.2	93.4	3.5	SE-V	1000			
309	LS	23.0	91.4	3.4	SE-T	1000			
310	LS	28.1	93.0	3.2	SE-V	1000			
311	LS	27.9	90	3.2	SE-V	1000			
312	LS	28.1	92.75	3.5	SE-V	1000			
313	LS	28.0	90	3.4	SE-T	1000			
314	R	10.4	205	4.1	SE-T	2000			

Table P-85. Structure Steel Strain Measurements - HP I-3 (Continued)

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
315	R	10.4	205	5.0	SE-T	2000			
316	US	2.0	180	5.0	SE-R	1000			
317	US	2.2	180	5.1	SE-V	2000			
318	US	3.0	180	5.75	SE-V	2000			
319	US	4.1	180	6.2	SE-V	2000			
320	US	4.5	180	6.25	SE-R	1000			
321	US	4.8	180	6.3	SE-V	2000			
322	US	5.0	180	6.3	SE-T	1500			
323	US	4.9	179.5	7.25	SE-V	2000			
324	US	5.0	180	7.2	SE-T	1500			
325	US	8.9	180.5	6.4	SE-V	2000			
326	US	9.0	180	6.5	SE-T	2000			
327	US	8.9	179.5	7.2	SE-V	2000			
328	US	9.0	180	7.2	SE-T	2000			
329	US	13.6	180	6.4	SE-V	2000			
330	US	13.5	180	6.5	SE-T	1500			
331	US	13.6	179.5	7.25	SE-V	2000			
332	US	13.5	180	7.1	SE-T	1500			
333	US	14.3	179.5	6.6	SE-R	1500			
334	US	14.3	271	6.7	SE-T	1000			
336	US	14.5	179.5	7.25	SE-V	1000			
337	US	15.6	180.5	6.0	SE-V	1000			
338	US	15.5	180	6.4	SE-V	1000			
339	US	16.0	180	6.5	SE-R	2000			
340	LS	16.1	180	3.2	SE-T	2000			
341	LS	16.0	175.7	3.3	SE-T	2000			
342	LS	19.0	185.3	3.2	SE-V	1000			
343	LS	19.0	180	3.2	SE-T	1000			
344	LS	19.1	184.15	3.5	SE-V	1000			
345	LS	18.7	180	3.4	SE-T	1000			

Table P-85. Structure Steel Strain Measurements - HP I-3

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level (psi)	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
346	LS	23.0	185.2	3.2	SE-V	1000			
347	LS	22.9	179.3	3.2	SE-T	1000			
348	LS	23.04	182.7	3.5	SE-V	1000			
349	LS	22.4	177.9	3.45	SE-T	1000			
350	LS	28.1	184.5	3.2	SE-V	1000			
351	LS	27.8	180	3.2	SE-T	1000			
352	LS	28.1	180	3.5	SE-T	1000			
353	LS	28.0	177.9	3.45	SE-T	1000			
356	LS	36.0	178.1	3.2	SE-T	1000			
357	LS	36.0	179.0	3.5	SE-V	1000			
358	LS	36.0	176.9	3.4	SE-T	1000			
359	R	10.4	265	4.1	SE-T	2000			
360	R	10.4	265	5.0	SE-T	2000			
361	US	8.8	269.5	6.4	SE-V	2000			
362	US	8.9	270	6.5	SE-T	2000			
363	US	8.9	270	7.25	SE-V	2000			
364	US	8.9	270.5	7.2	SE-T	2000			
365	US	13.5	269.5	6.4	SE-V	2000			
366	US	13.4	270.5	6.5	SE-T	1500			
367	US	13.5	270	7.2	SE-V	2000			
368	US	13.4	270.5	7.2	SE-T	1500			
369	US	14.3	270	6.6	SE-R	1500			
371	US	14.6	270	6.4	SE-V	1000			
372	US	14.6	269.5	7.2	SE-V	1000			
373	US	15.6	270.5	6.6	SE-V	1000			
375	US	16.0	270	6.6	SE-R	2000			
376	LS	15.1	270	3.2	SE-T	2000			
377	LS	15.8	270	3.3	SE-T	2000			
378	LS	19.0	276	3.2	SE-V	1000			
379	LS	18.9	270	3.2	SE-T	1000			
380	LS	19.0	273.4	3.5	SE-V	1000			

Table P-85. Structure Steel Strain Measurements - HP I-3 (Continued)

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level Type	Xducer Nominal Range (psi)	Xducer Model	Xducer Serial Number
381	LS	18.6	270	3.4	SE-T	1000			
382	LS	23.0	277.5	3.2	SE-V	1000			
383	LS	23.1	270	3.2	SE-T	1000			
384	LS	23.0	272.4	3.5	SE-V	1000			
385	LS	22.9	270	3.4	SE-T	1000			
386	LS	28.0	274.6	3.1	SE-V	1000			
387	LS	28.1	270	3.2	SE-T	1000			
388	LS	28.0	271.4	3.45	SE-V	1000			
389	LS	27.0	269.3	3.41	SE-T	1000			
391	LS	37.4	270.7	3.5	SE-V	1000			
392	LS	35.9	268.6	3.45	SE-T	1000			
393	LS	16.1	4.3	3.4	SE-V	2000			
394	LS	16.2	94.3	3.3	SE-V	2000			
395	LS	16.1	183.5	3.4	SE-V	2000			
396	LS	16.0	273.35	3.3	SE-V	2000			
397	R	10.4	0	4.1	SE-T	2000			
398	R	10.4	0	5.0	SE-T	2000			

Table P-86. Strong Motion Seismic Measurements - HP I-3

Measure. Number	Location Number	Location X (ft)	Location Y (ft)	Depth Z (ft)	Measure. Type	Pred. Level (g)	Xducer Nominal Range (g)	Xducer Model	Xducer Serial Number
816		399	-870	0	AHL	3.5			
817		399	-870	0	AHT	3.5			
818		399	-870	0	AVT	3.5			
820		936	611	0	AHT	7.0			
821		936	611	0	AVT	7.0			
822		1100	60	0	AHL	4.75			
823		1100	60	0	AHT	4.75			
824		1100	60	0	AVT	4.75			
825		2200	60	0	AHL	1.0			
826		2200	60	0	AHT	1.0			
827		2200	60	0	AVT	1.0			

Table P-87. Special Measurements - HP I-3

Measure. Number	General Location	Depth (ft)	Azimuth (degrees)	Range (ft)	Measure. Type	Pred. Level	Xducer Nominal Range	Xducer Model	Xducer Serial Number	Remarks
909	US/LS	14.7	10	3.5	AP-0	50 psi	100 psi	XTS-1-190	S37	
910	US/LS	14.7	100	3.5	AP-0	50 psi	100 psi	XTS-1-190	B11	
911	US/LS	14.7	190	3.5	AP-0	50 psi	100 psi	XTS-1-190	S15	

Measure. Number	General Location	Location X(ft)	Location Y(ft)	Depth Z(ft)	Measure. Type	Pred. Level	Xducer Nominal Range	Xducer Model	Xducer Serial Number	Remarks
912	Trailers	1100	-1290	-20	BP-S	.2 psi	5 psi			Outside Shelter
913	Trailers	1100	-1290	-10	BP-S	.1 psi	5 psi			Inside Shelter

Table P-88. Time-of-Arrival Measurements - HP I-3

Measurement Number	Location X (ft)	Location Y (ft)	Measurement Type	Gage Type
1001	0	0	TOA	Pin
1002	201	0	TOA	Pin
1003	350	0	TOA	Pin
1004	443.43	0	TOA	Pin
1005	503.16	0	TOA	Pin
1006	478.48	0	TOA	Pin
1007	533.37	0	TOA	Pin
1008	266.6	0	TOA	Pin
1009	318.4	0	TOA	Pin
1010	266.6	16.40	TOA	Pin
1011	405.98	28.41	TOA	Pin
1012	473.52	32.97	TOA	Pin
1013	528.73	35.71	TOA	Pin
1014	446.91	31.25	TOA	Pin
1015	505.75	35.46	TOA	Pin
1016	556.97	39.70	TOA	Pin
1017	318.4	21.6	TOA	Pin
1018	667.27	94.85	TOA	Pin
1019	346.59	48.71	TOA	Pin
1020	439.11	61.71	TOA	Pin
1021	498.26	70.03	TOA	Pin
1022	473.82	66.59	TOA	Pin
1023	528.05	74.35	TOA	Pin
1024	576.93	81.98	TOA	Pin
1025	623.28	87.69	TOA	Pin
1026	637.67	135.19	TOA	Pin
1027	679.73	144.27	TOA	Pin
1028	398.08	84.61	TOA	Pin
1029	464.29	98.69	TOA	Pin
1030	438.21	93.14	TOA	Pin
1031	496.61	104.90	TOA	Pin
1032	546.47	116.38	TOA	Pin
1033	593.23	126.27	TOA	Pin
1034	647.58	185.49	TOA	Pin
1035	687.75	197.61	TOA	Pin
1036	336.44	96.47	TOA	Pin
1037	426.25	122.23	TOA	Pin
1038	459.93	131.87	TOA	Pin
1039	512.70	147.02	TOA	Pin
1040	560.43	160.99	TOA	Pin
1041	604.78	173.30	TOA	Pin
1042	211.00	86.40	TOA	Pin
1043	276.4	125.00	TOA	Pin
1044	612.07	223.17	TOA	Pin
1045	382.43	139.19	TOA	Pin

Table P-88. Time-of-Arrival Measurements - HP I-3 (Cont.)

Measurement Number	Location X (ft)	Location Y (ft)	Measurement Type	Gage Type
1046	420.98	153.23	TOA	Pin
1047	476.48	173.43	TOA	Pin
1048	525.16	191.14	TOA	Pin
1049	569.41	208.01	TOA	Pin
1050	266.6	-16.4	TOA	Pin
1051	405.98	-28.41	TOA	Pin
1052	473.52	-32.97	TOA	Pin
1053	528.73	-35.71	TOA	Pin
1054	446.91	-31.25	TOA	Pin
1055	505.75	-35.46	TOA	Pin
1056	556.97	-39.70	TOA	Pin
1057	318.4	-21.6	TOA	Pin
1058	667.27	-94.85	TOA	Pin
1059	346.59	-48.71	TOA	Pin
1060	439.11	-61.71	TOA	Pin
1061	498.26	-70.03	TOA	Pin
1062	473.82	-66.59	TOA	Pin
1063	528.05	-74.35	TOA	Pin
1064	576.93	-81.98	TOA	Pin
1065	623.28	-87.69	TOA	Pin
1066	637.67	-135.19	TOA	Pin
1067	679.73	-144.27	TOA	Pin
1068	398.08	-84.61	TOA	Pin
1069	464.29	-98.69	TOA	Pin
1070	438.21	-93.14	TOA	Pin
1071	496.61	-104.90	TOA	Pin
1072	546.47	-116.38	TOA	Pin
1073	593.23	-126.27	TOA	Pin
1074	647.58	-185.49	TOA	Pin
1075	687.75	-197.61	TOA	Pin
1076	336.44	-96.47	TOA	Pin
1077	426.25	-122.23	TOA	Pin
1078	459.93	-131.87	TOA	Pin
1070	512.70	-147.02	TOA	Pin
1080	560.43	-160.99	TOA	Pin
1081	604.78	-173.30	TOA	Pin
1082	211.00	-86.40	TOA	Pin
1083	276.4	-125.0	TOA	Pin
1084	612.07	-223.17	TOA	Pin
1085	382.43	-139.19	TOA	Pin
1086	420.98	-153.23	TOA	Pin
1087	476.48	-173.43	TOA	Pin
1088	525.16	-191.14	TOA	Pin
1089	569.41	-208.01	TOA	Pin
1090	0	0	TOA	Pin

Table P-88. Time-of-Arrival Measurements - HP I-3 (Cont.)

Measurement Number	Location X (ft)	Location Y (ft)	Measurement Type	Gage Type
1101	0.380	-56	TOA	Break-wire
1102	7.885	-48	TOA	Break-wire
1103	15.229	-40	TOA	Break-wire
1104	22.427	-32	TOA	Break-wire
1105	29.484	-24	TOA	Break-wire
1106	36.422	-16	TOA	Break-wire
1107	43.245	-8	TOA	Break-wire
1108	49.974	0	TOA	Break-wire
1109	56.609	8	TOA	Break-wire
1110	63.172	16	TOA	Break-wire
1111	69.661	24	TOA	Break-wire
1112	76.083	32	TOA	Break-wire
1113	82.458	40	TOA	Break-wire
1114	88.590	48	TOA	Break-wire
1115	95.073	56	TOA	Break-wire
1116	95.073	-56	TOA	Break-wire
1117	107.562	-40	TOA	Break-wire
1118	119.974	-24	TOA	Break-wire
1119	132.359	-8	TOA	Break-wire
1120	138.557	0	TOA	Break-wire
1121	144.766	8	TOA	Break-wire
1122	150.995	16	TOA	Break-wire
1123	157.245	24	TOA	Break-wire
1124	169.849	40	TOA	Break-wire
1125	182.620	56	TOA	Break-wire

Table P-89. Measurement Recording List - HP I-3

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
001	HP I-3-A-E-8-12-0-BP-V	9	3	3		2260.40 psi	
002	HP I-3-A-E-8-36-0-BP-V	9	3	4		2182.16 psi	
003	HP I-3-A-E-8-60-0-BP-V	9	3	5		2217.82 psi	
004	HP I-3-A-E-8-84-0-BP-V	9	3	6		2258.44 psi	
005	HP I-3-A-E-8-108-0-BP-V	9	3	7		2236.62 psi	
006	HP I-3-A-E-30-60-0-BP-V	9	3	8		2077.45 psi	
007	HP I-3-A-E-55-60-0-BP-V	9	3	9		1746.15 psi	
008	HP I-3-A-E-84-12-0-BP-V	9	3	10		1531.50 psi	
009	HP I-3-A-E-84-36-0-BP-V	9	3	11		1574.86 psi	
010	HP I-3-A-E-84-60-0-BP-V	9	3	12		1549.94 psi	
011	HP I-3-A-E-84-84-0-BP-V	9	3	13		1550.25 psi	
012	HP I-3-A-E-84-108-0-BP-V	9	3	14		1507.99 psi	
013	HP I-3-A-E-110-60-0-BP-V	9	3	15		1310.04 psi	
014	HP I-3-A-E-129-60-0-BP-V	9	3	16		1246.10 psi	
015	HP I-3-A-E-150-4-0-BP-V	9	3	17		1172.39 psi	
016	HP I-3-A-E-150-12-0-BP-V	9	3	18		1236.10 psi	
017	HP I-3-A-E-150-20-0-BP-V	9	3	19		1170.07 psi	
018	HP I-3-A-E-150-28-0-BP-V	9	3	20		1243.17 psi	
019	HP I-3-A-E-150-36-0-BP-V	9	3	21		1188.48 psi	
020	HP I-3-A-E-150-44-0-BP-V	9	3	22		1190.53 psi	
021	HP I-3-A-E-150-76-0-BP-V	9	3	23		1180.93 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
022	HP I-3-A-E-150-86-0-BP-V	9	3	24		1193.58 psi	
023	HP I-3-A-E-150-92-0-BP-V	9	3	25		1214.10 psi	
024	HP I-3-A-E-150-100-0-BP-V	9	3	26		1198.23 psi	
025	HP I-3-A-E-150-108-0-BP-V	9	3	27		1207.60 psi	
026	HP I-3-S-E-111.3-100.7-0-BP-V	9	1	3		1190.53 psi	
027	HP I-3-S-E-176-60-0-BP-V	9	1	4		1093.16 psi	
028	HP I-3-S-E-190-12-0-BP-V	9	1	5		984.14 psi	
029	HP I-3-S-E-190-36-0-BP-V	9	1	6		975.34 psi	
030	HP I-3-S-E-190-60-0-BP-V	9	1	7		995.32 psi	
031	HP I-3-S-E-190-92-0-BP-V	9	1	8		977.18 psi	
032	HP I-3-S-E-190-108-0-BP-V	9	1	9		995.50 psi	
033	HP I-3-S-E-0-0-5.8-BP-V	9	1	10		1195.99 psi	
034	HP I-3-S-E-0-0-6.0-BP-V	9	1	11		1196.61 psi	
035	HP I-3-S-E-0-90-5.8-BP-V	9	4	8		1143.74 psi	
036	HP I-3-S-E-0-90-6.0-BP-V	9	1	13		1192.09 psi	
037	HP I-3-S-E-0-180-5.8-BP-V	9	2	3		1152.17 psi	
038	HP I-3-S-E-0-180-6.0-BP-V	9	2	4		1186.97 psi	
039	HP I-3-S-E-0-270-5.8-BP-V	9	2	5		1184.63 psi	
040	HP I-3-S-E-0-270-6.0-BP-V	9	2	6		1195.67 psi	
041	HP I-3-F-E-180-16-38-A-V	9	5	3		298.50 g	
042	HP I-3-F-E-180-12-2-A-V	9	5	4		3009.60 g	
043	HP I-3-F-E-180-12-2-A-H	9	5	5		2000.63 g	
046	HP I-3-F-E-154-12-56-A-V	9	5	6		254.57 g	

Table P-89. Measurement Reccrding List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
047	HP I-3-F-E-154-12-56-A-H	9	5	7		249.22 g	
048	HP I-3-F-E-154-12-38.5-A-V	9	5	8		235.19 g	
049	HP I-3-F-E-154-12-38.5-A-H	9	5	9		401.94 g	
050	HP I-3-F-E-151-17-48-A-V	9	5	10		248.95 g	
051	HP I-3-F-E-151-17-48-A-H	9	5	11		248.43 g	
052	HP I-3-F-E-151-17-27-A-V	9	5	12		749.05 g	
053	HP I-3-F-E-151-17-27-A-H	9	5	13		780.52 g	
054	HP I-3-F-E-148-7-44-A-V	9	6	3		250.49 g	
055	HP I-3-F-E-148-7-44-A-T	9	6	4		199.65 g	
056	HP I-3-F-E-148-7-34-A-V	9	6	5		503.79 g	
057	HP I-3-F-E-148-7-22-A-V	9	6	6		1510.44 g	
059	HP I-3-F-E-148-7-14-A-H	9	6	8		3026.04 g	
060	HP I-3-F-E-145-12-18-A-V	9	6	9		2001.04 g	
061	HP I-3-F-E-145-12-8-A-H	9	6	10		2499.88 g	
062	HP I-3-F-E-140-12-2-A-V	9	6	11		2888.96 g	
063	HP I-3-F-E-140-12-2-A-H	9	6	12		1930.58 g	
064	HP I-3-F-E-98-7-29-A-V	9	6	13		764.46 g	
065	HP I-3-F-E-98-7-20-A-V	3	2	10	18	1987.68 g	
066	HP I-3-F-E-100-9-2-A-V	3	2	11	1	2094.51 g	
067	HP I-3-F-E-100-9-2-A-H	3	2	11	2	1983.28 g	
068	HP I-3-F-E-52-16-59-A-H	3	2	11	3	247.38 g	
069	HP I-3-F-E-52-16-59-A-T	3	2	11	4	252.01 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
070	HP I-3-F-E-52-16-21-A-V	3	2	11	5	1481.55 g	
071	HP I-3-F-E-52-16-21-A-T	3	2	11	6	1023.85 g	
072	HP I-3-F-E-51-12-2-A-V	3	2	11	7	3115.20 g	
073	HP I-3-F-E-8-15-22-A-V	3	2	11	8	1490.53 g	
074	HP I-3-F-E-8-15-22-A-H	3	2	11	9	1475.36 g	
075	HP I-3-F-E-8-15-72.5-A-V	3	2	11	10	158.58 g	
076	HP I-3-F-E-8-15-72.5-A-V	3	2	11	11	198.05 g	
077	HP I-3-F-E-8-15-31-A-V	3	2	11	12	610.08 g	
078	HP I-3-F-E-8-15-31-A-H	3	2	11	13	756.01 g	
079	HP I-3-F-E-185-36-33-A-V	3	2	11	14	499.80 g	
080	HP I-3-F-E-185-36-33-A-H	3	2	11	15	752.35 g	
081	HP I-3-F-E-185-36-13-A-V	3	2	11	16	3040.72 g	
082	HP I-3-F-E-185-36-13-A-H	3	2	11	17	2939.65 g	
083	HP I-3-F-E-180-36-2-A-V	3	2	11	18	2868.21 g	
084	HP I-3-F-E-149-38-18-A-V	3	2	12	1	2004.58 g	
085	HP I-3-F-E-149-38-18-A-H	3	2	12	2	1998.47 g	
086	HP I-3-F-E-149-38-8-A-V	3	2	12	3	3075.84 g	
087	HP I-3-F-E-153-42-2-A-V	3	2	12	4	3058.72 g	
088	HP I-3-F-E-153-42-2-A-H	3	2	12	5	2960.00 g	
089	HP I-3-F-E-151-40-44-A-V	3	2	12	6	300.92 g	
090	HP I-3-F-E-151-40-33-A-V	3	2	12	7	349.33 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
091	HP I-3-F-E-151-40-33-A-T	3	2	12	8	303.45 g	
092	HP I-3-F-E-151-40-23.5-A-V	3	2	12	9	779.89 g	
093	HP I-3-F-E-151-40-14-A-V	3	2	12	10	2970.82 g	
094	HP I-3-F-E-151-40-14-A-T	3	2	12	11	2565.29 g	
095	HP I-3-F-E-156-42-48.5-A-V	3	2	12	12	252.63 g	
096	HP I-3-F-E-156-42-48.5-A-H	3	2	12	13	298.37 g	
097	HP I-3-F-E-156-42-38.5-A-H	3	2	12	14	507.54 g	
098	HP I-3-F-E-156-42-29.5-A-V	5	1	7	9	499.87 g	
099	HP I-3-F-E-156-42-29.5-A-H	5	1	8	9	499.73 g	
100	HP I-3-F-E-147-36-87.5-A-V	1	3	1	1	99.81 g	
101	HP I-3-F-E-147-36-80.5-A-V	1	3	1	2	150.55 g	
102	HP I-3-F-E-147-36-69-A-V	1	3	1	3	149.60 g	
103	HP I-3-F-E-147-36-69-A-T	1	3	1	4	99.92 g	
104	HP I-3-F-E-147-36-56.5-A-V	5	1	9	9	200.24 g	
105	HP I-3-F-E-105-36-2-A-V	5	1	10	14	2923.23 g	
106	HP I-3-F-E-105-36-2-A-H	5	1	11	14	2990.01 g	
107	HP I-3-F-E-103-39-35-A-V	5	1	10	9	399.60 g	
109	HP I-3-F-E-103-39-19.5-A-V	5	1	12	14	2000.18 g	
110	HP I-3-F-E-103-39-8-A-V	5	1	13	14	3006.56 g	
111	HP I-3-F-E-103-39-8-A-H	5	1	14	14	2499.52 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
112	HP I-3-F-E-50-36-71.5-A-V	1	3	3	5	149.85 g	
113	HP I-3-F-E-50-36-71.5-A-H	1	1	12	3	150.39 g	
114	HP I-3-F-E-50-36-42.6-A-V	5	1	12	9	300.12 g	
115	HP I-3-F-E-50-36-32-A-V	5	1	13	9	499.88 g	
116	HP I-3-F-E-50-36-32-A-T	5	1	14	9	400.26 g	
117	HP I-3-F-E-8-33-2-A-V	5	1	2	17	4993.82 g	
118	HP I-3-F-E-8-39-72.5-A-V	1	1	12	4	150.67 g	
119	HP I-3-F-E-8-39-72.5-A-H	5	1	6	10	200.25 g	
120	HP I-3-F-E-8-39-41.5-A-V	5	1	7	10	400.50 g	
121	HP I-3-F-E-8-39-22-A-V	5	1	1	15	3006.12 g	
122	HP I-3-F-E-8-39-22-A-H	5	1	2	15	3016.44 g	
123	HP I-3-F-E-171-57-80-A-V	1	3	1	5	149.93 g	
124	HP I-3-F-E-171-57-80-A-H	1	3	2	1	149.73 g	
125	HP I-3-F-E-171-57-55.5-A-V	5	1	8	10	400.50 g	
126	HP I-3-F-E-171-57-43-A-V	5	1	9	10	400.30 g	
127	HP I-3-F-E-171-57-43-A-H	5	1	10	10	400.42 g	
128	HP I-3-F-E-171-53-17.5-A-V	5	1	3	15	2004.99 g	
129	HP I-3-F-E-171-53-17.5-A-H	5	1	4	15	1994.62 g	
130	HP I-3-F-E-171-63-8-A-V	5	1	5	15	2149.59 g	
131	HP I-3-F-E-171-63-8-A-T	5	1	6	15	2788.45 g	
132	HP I-3-F-E-171-60-2-A-V	5	1	7	15	2992.09 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
133	HP I-3-F-E-171-60-2-A-H	5	1	8	15	2993.41 g	
134	HP I-3-F-E-171-66-32.5-A-V	5	1	11	10	400.77 g	
135	HP I-3-F-E-171-66-32.5-A-H	5	1	12	10	400.60 g	
136	HP I-3-F-E-171-66-22-A-V	5	1	13	10	1001.65 g	
137	HP I-3-F-E-171-66-22-A-H	5	1	14	10	1201.25 g	
138	HP I-3-F-E-171-66-14.5-A-V	5	1	9	15	2995.56 g	
139	HP I-3-F-E-171-66-14.5-A-H	5	1	10	15	2997.08 g	
140	HP I-3-F-E-171-69-48.5-A-V	5	1	5	11	401.14 g	
141	HP I-3-F-E-171-69-37.5-A-V	5	1	6	11	400.18 g	
142	HP I-3-F-E-171-69-28.5-A-V	5	1	7	11	501.03 g	
143	HP I-3-F-E-171-69-28.5-A-V	5	1	8	11	501.07 g	
144	HP I-3-F-E-126-64-71-A-V	1	3	2	2	148.59 g	
147	HP I-3-F-E-124-61-2-A-V	5	1	2	16	2993.11 g	
148	HP I-3-F-E-124-61-2-A-H	5	1	3	16	3000.59 g	
149	HP I-3-F-E-123-58-45-A-V	5	1	11	11	401.86 g	
150	HP I-3-F-E-123-58-45-A-H	5	1	12	11	399.52 g	
151	HP I-3-F-E-123-58-35-A-V	5	1	13	11	400.27 g	
152	HP I-3-F-E-123-58-35-A-H	5	1	14	11	498.48 g	
153	HP I-3-F-E-123-58-19.5-A-V	5	1	4	16	1991.29 g	
154	HP I-3-F-E-123-58-19.5-A-H	5	1	5	16	2011.13 g	
157	HP I-3-F-E-126-64-15-A-V	5	1	13	15	3009.91 g	
158	HP I-3-F-E-126-64-15-A-T	5	1	14	15	1500.79 g	
159	HP I-3-F-E-126-64-8-A-V	5	1	1	16	2999.92 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
160	HP I-3-F-E-121-55-50-A-V	5	1	1	12	400.03 g	
161	HP I-3-F-E-121-55-50-A-H	5	1	2	12	402.72 g	
162	HP I-3-F-E-121-55-36.5-A-V	5	1	3	12	400.01 g	
163	HP I-3-F-E-121-55-31-A-V	5	1	4	12	500.44 g	
164	HP I-3-F-E-121-55-31-A-V	5	1	5	12	500.41 g	
167	HP I-3-F-E-52-62-8-A-V	5	1	5	17	3509.46 g	
168	HP I-3-F-E-52-62-8-A-V	5	1	6	17	3500.88 g	
169	HP I-3-F-E-52-62-2-A-V	5	1	3	17	3492.80 g	
170	HP I-3-F-E-52-62-2-A-V	5	1	4	17	3495.23 g	
171	HP I-3-F-E-53-65-90-A-V	1	3	2	3	99.80 g	
172	HP I-3-F-E-53-65-72-A-V	1	3	2	4	382.20 g	
173	HP I-3-F-E-53-65-59.5-A-H	5	1	6	12	200.64 g	
174	HP I-3-F-E-53-65-46-A-V	5	1	7	12	398.62 g	
175	HP I-3-F-E-50-60-41-A-H	5	1	8	12	499.36 g	
176	HP I-3-F-E-50-60-31-A-V	1	1	12	5	500.66 g	
177	HP I-3-F-E-50-60-20.5-A-V	5	1	1	17	1965.82 g	
178	HP I-3-F-E-50-60-20.5-A-H	3	2	10	15	1975.44 g	
179	HP I-3-F-E-8-57-46-A-H	5	1	9	12	400.19 g	
180	HP I-3-F-E-8-57-36.5-A-V	5	1	10	12	400.60 g	
181	HP I-3-F-E-8-57-36.5-A-H	5	1	11	12	447.89 g	
182	HP I-3-F-E-8-57-21-A-V	5	1	6	16	2487.20 g	
183	HP I-3-F-E-8-57-21-A-H	5	1	7	16	2496.27 g	
184	HP I-3-F-E-8-51-2-A-V	5	1	7	17	4994.48 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
185	HP I-3-F-E-8-51-2-A-H	5	1	8	17	5069.70 g	
186	HP I-3-F-E-8-63-27-A-V	5	1	12	12	1000.12 g	
187	HP I-3-F-E-8-63-17-A-V	5	1	9	17	3999.17 g	
188	HP I-3-F-E-8-63-17-A-H	5	1	10	17	3995.36 g	
189	HP I-3-F-E-8-54-90-A-V	1	3	2	5	100.36 g	
190	HP I-3-F-E-8-54-90-A-H	1	1	13	1	150.40 g	
191	HP I-3-F-E-8-54-82.5-A-V	1	1	13	2	100.02 g	
192	HP I-3-F-E-8-54-73-A-V	1	1	13	3	151.38 g	
193	HP I-3-F-E-8-54-73-A-H	1	1	13	4	149.95 g	
194	HP I-3-F-E-8-54-66-A-V	5	1	13	12	200.00 g	
195	HP I-3-F-E-8-66-53-A-V	5	1	14	12	400.37 g	
196	HP I-3-F-E-8-66-53-A-H	5	1	1	13	400.06 g	
197	HP I-3-F-E-8-66-41.5-A-V	5	1	2	13	400.06 g	
198	HP I-3-F-E-8-66-41.5-A-V	5	1	3	13	502.80 g	
199	HP I-3-F-E-8-66-32.5-A-V	5	1	4	13	750.43 g	
200	HP I-3-F-E-180-90-17-A-V	5	1	8	16	3019.14 g	
201	HP I-3-F-E-180-90-17-A-H	5	1	9	16	3296.70 g	
202	HP I-3-F-E-148-83-37-A-V	5	1	5	13	398.49 g	
203	HP I-3-F-E-148-83-37-A-T	5	1	6	13	389.86 g	
204	HP I-3-F-E-148-83-29-A-V	5	1	7	13	500.41 g	
205	HP I-3-F-E-148-83-18-A-V	5	1	10	16	2555.17 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
206	HP I-3-F-E-148-83-11-A-V	5	1	11	16	2378.32 g	
207	HP I-3-F-E-152-84-2-A-V	5	1	12	16	3009.30 g	
208	HP I-3-F-E-150-60-80.5-A-V	1	3	3	1	149.76 g	
209	HP I-3-F-E-150-60-80.5-A-H	1	3	3	2	150.34 g	
210	HP I-3-F-E-150-60-69.5-A-V	1	3	3	3	150.89 g	
211	HP I-3-F-E-150-60-56.5-A-V	1	3	3	4	246.20 g	
212	HP I-3-F-E-150-60-56.5-A-H	1	3	14	5	299.62 g	
213	HP I-3-F-E-150-60-49-A-V	5	1	11	15	399.68 g	
214	HP I-3-F-E-150-60-44.5-A-V	5	1	9	11	387.25 g	
215	HP I-3-F-E-150-60-44.5-A-V	5	1	12	15	400.96 g	
216	HP I-3-F-E-150-60-44.5-A-H	5	1	10	11	401.10 g	
217	HP I-3-F-E-152-84-2-A-H	5	1	13	16	3005.84 g	
218	HP I-3-F-E-154-79-70-A-V	1	1	13	5	149.26 g	
219	HP I-3-F-E-154-79-70-A-H	5	1	8	13	199.87 g	
220	HP I-3-F-E-154-79-48-A-H	5	1	9	13	499.60 g	
222	HP I-3-F-E-150-82-88-A-V	1	1	14	1	100.06 g	
223	HP I-3-F-E-150-82-88-A-H	1	1	14	2	100.04 g	
224	HP I-3-F-E-150-82-80.5-A-V	1	1	14	3	100.00 g	
225	HP I-3-F-E-150-82-56.5-A-V	5	1	10	13	399.94 g	
226	HP I-3-F-E-152-80-43-A-V	5	1	11	13	400.52 g	
227	HP I-3-F-E-152-80-33-A-V	5	1	12	13	400.18 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
228	HP I-3-F-E-152-80-33-A-H	5	1	13	13	499.56 g	
229	HP I-3-F-E-152-80-23-A-V	5	1	14	13	994.50 g	
230	HP I-3-F-E-152-80-23-A-H	5	1	1	14	1002.06 g	
231	HP I-3-F-E-152-80-14-A-H	5	1	14	16	3015.73 g	
232	HP I-3-F-E-152-80-14-A-T	3	2	10	16	1518.30 g	
233	HP I-3-F-E-100-90-57.5-A-V	5	1	2	14	398.35 g	
234	HP I-3-F-E-100-90-39.5-A-H	5	1	3	14	299.09 g	
235	HP I-3-F-E-100-90-8-A-V	3	2	10	17	2891.99 g	
236	HP I-3-F-E-52-88-41-A-V	5	1	4	14	499.15 g	
238	HP I-3-F-E-52-92-2-A-V	5	1	11	17	4995.80 g	
240	HP I-3-F-E-8-87-8-A-V	5	1	13	17	3996.64 g	
241	HP I-3-F-E-8-87-8-A-H	5	1	14	17	3913.10 g	
242	HP I-3-F-E-8-90-72-A-V	5	1	6	9	150.42 g	
243	HP I-3-F-E-8-90-72-A-H	1	1	14	4	150.19 g	
244	HP I-3-F-E-8-90-53-A-V	5	1	6	14	499.50 g	
245	HP I-3-F-E-8-90-53-A-H	5	1	7	14	498.85 g	
246	HP I-3-F-E-8-90-35-A-V	5	1	8	14	750.40 g	
247	HP I-3-F-E-8-90-35-A-H	5	1	9	14	751.73 g	
251	HP I-3-S-E-0.2-0-0-SE-R	3	1	3	1	1546.76 psi	
252	HP I-3-S-E-1.5-0-0-SE-R	3	1	3	2	1537.42 psi	
253	HP I-3-S-E-2.0-0-5.0-SE-R	3	1	3	3	982.26 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
254	HP I-3-S-E-2.2-0-4.8-SE-V	3	1	3	4	2046.77 psi	
255	HP I-3-S-E-3.1-359.5-5.6-SE-V	3	1	3	5	2060.79 psi	
256	HP I-3-S-E-4.1-0-6.0-SE-V	3	1	3	6	1990.70 psi	
257	HP I-3-S-E-4.4-0-6.2-SE-R	3	1	3	7	1032.73 psi	
258	HP I-3-S-E-4.8-0-6.4-SE-V	3	1	3	8	2065.47 psi	
259	HP I-3-S-E-5.0-0-6.5-SE-T	3	1	3	9	1514.05 psi	
260	HP I-3-S-E-4.8-0-7.25-SE-V	3	1	3	10	2070.14 psi	
261	HP I-3-S-E-5.0-0-7.2-SE-T	3	1	3	11	1542.09 psi	
262	HP I-3-S-E-8.8-0-6.4-SE-V	3	1	3	12	1542.09 psi	
263	HP I-3-S-E-9.0-0-6.5-SE-T	3	1	3	13	2149.58 psi	
264	HP I-3-S-E-8.8-0-7.25-SE-V	3	1	3	14	2060.79 psi	
265	HP I-3-S-E-9.0-0-7.2-SE-T	3	1	3	15	2060.79 psi	
266	HP I-3-S-E-13.6-0-6.5-SE-V	3	1	3	16	2084.16 psi	
267	HP I-3-S-E-13.5-0-6.5-SE-T	3	1	3	17	1560.78 psi	
268	HP I-3-S-E-13.6-0-7.25-SE-V	3	1	3	18	2046.77 psi	
269	HP I-3-S-E-3.5-0-7.2-SE-T	3	1	4	1	1565.45 psi	
270	HP I-3-S-E-14.4-0-6.5-SE-R	3	1	4	2	1546.76 psi	
271	HP I-3-S-E-14.3-0-6.7-SE-T	3	1	4	3	1028.06 psi	
272	HP I-3-S-E-14.5-0-6.3-SE-V	3	1	4	4	1009.37 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
273	HP I-3-S-E-14.5-0-7.0-SE-V	3	1	4	5	1037.41 psi	
274	HP I-3-S-E-15.6-0.25-5.9-SE-V	3	1	4	6	1037.41 psi	
275	HP I-3-S-E-15.7-0.25-6.3-SE-V	3	1	4	7	1032.73 psi	
276	HP I-3-S-E-16.4-0-6.5-SE-R	3	1	4	8	2056.12 psi	
277	HP I-3-S-E-16.0-0-3.3-SE-T	3	1	4	9	2060.79 psi	
278	HP I-3-S-E-15.92-357.1-3.3-SE-T	3	1	4	10	2056.12 psi	
279	HP I-3-S-E-19.0-356.3-3.2-SE-V	3	1	4	11	981.33 psi	
280	HP I-3-S-E-19.0-3.7-3.1-SE-T	3	1	4	12	1032.73 psi	
281	HP I-3-S-E-19.0-4.1-3.5-SE-V	3	1	4	13	1037.41 psi	
282	HP I-3-S-E-18.7-358.6-3.4-SE-T	3	1	4	14	1028.06 psi	
283	HP I-3-S-E-23.0-355.1-3.2-SE-V	3	1	4	15	1046.75 psi	
284	HP I-3-S-E-23.1-0-3.2-SE-T	3	1	4	16	1032.73 psi	
285	HP I-3-S-E-23.1-4.1-3.5-SE-V	3	1	4	17	1042.08 psi	
286	HP I-3-S-E-22.9-0-3.4-SE-T	3	1	4	18	1028.06 psi	
287	HP I-3-S-E-28.1-0-3.0-SE-V	3	1	5	1	1028.06 psi	
288	HP I-3-S-E-27.8-0-3.0-SE-V	3	1	5	2	1032.73 psi	
289	HP I-3-S-E-28.15-0-3.6-SE-V	3	1	5	3	1028.06 psi	
290	HP I-3-S-E-28.0-0-3.6-SE-T	3	1	5	4	1046.75 psi	
293	HP I-3-S-E-36.0-0-3.2-SE-T	3	1	5	5	1032.73 psi	
294	HP I-3-S-E-36.1-2-3.5-SE-V	3	1	5	6	1037.41 psi	
295	HP I-3-S-E-36.0-0-3.45-SE-T	3	1	5	7	1042.08 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
296	HP I-3-S-E-8.8-90-6.4-SE-V	3	1	5	8	2060.79 psi	
297	HP I-3-S-E-9.0-90-6.5-SE-T	3	1	5	9	2060.79 psi	
298	HP I-3-S-E-8.8-89.75-7.25-SE-V	3	1	5	10	2070.14 psi	
299	HP I-3-S-E-9.0-90-7.2-SE-T	3	1	5	11	2056.12 psi	
300	HP I-3-S-E-15.9-90-3.2-SE-T	3	1	5	12	1967.33 psi	
301	HP I-3-S-E-16.0-90-3.3-SE-T	3	1	5	13	2056.12 psi	
302	HP I-3-S-E-19.0-95.7-13.1-SE-V	3	1	5	14	1037.41 psi	
303	HP I-3-S-E-18.8-90-3.2-SE-T	3	1	5	15	1064.38 psi	
304	HP I-3-S-E-19.2-94.1-3.5-SE-V	3	1	5	16	1037.41 psi	
305	HP I-3-S-E-18.75-90-3.5-SE-T	3	1	5	17	1042.08 psi	
306	HP I-3-S-E-23.0-94.5-3.2-SE-V	3	1	5	18	1032.73 psi	
307	HP I-3-S-E-22.8-89.3-3.2-SE-T	3	1	6	1	1032.73 psi	
308	HP I-3-S-E-23.2-93.4-3.5-SE-V	3	1	6	2	1028.06 psi	
309	HP I-3-S-E-23.0-91.4-3.4-SE-T	3	1	6	3	1023.39 psi	
310	HP I-3-S-E-28.1-93.0-3.2-SE-V	3	1	6	4	1018.71 psi	
311	HP I-3-S-E-27.9-90-3.2-SE-V	3	1	6	5	1037.41 psi	
312	HP I-3-S-E-28.1-92.75-3.5-SE-V	3	1	6	6	1018.71 psi	
313	HP I-3-S-E-28.0-90-3.4-SE-T	3	1	6	7	1014.04 psi	
314	HP I-3-S-E-10.4-205-4.1-SE-T	3	1	6	8	1042.08 psi	
315	HP I-3-S-E-10.4-205-5.0-SE-T	3	1	6	9	1032.73 psi	
316	HP I-3-S-E-2.0-180-5.0-SE-R	3	1	6	10	1023.39 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
317	HP I-3-S-E-2.2-180-5.1-SE-V	3	1	6	11	2074.81 psi	
318	HP I-3-S-E-3.0-180-5.75-SE-V	3	1	6	12	2060.79 psi	
319	HP I-3-S-E-4.1-180-6.2-SE-V	3	1	6	13	2070.14 psi	
320	HP I-3-S-E-4.5-180-6.25-SE-R	3	1	6	14	990.68 psi	
321	HP I-3-S-E-4.8-180-6.25-SE-V	3	1	6	15	2065.47 psi	
322	HP I-3-S-E-5.0-180-6.3-SE-T	3	1	6	16	1532.74 psi	
323	HP I-3-S-E-4.9-179.5-7.25-SE-V	3	1	6	17	2065.47 psi	
324	HP I-3-S-E-5.0-180-7.2-SE-T	3	1	6	18	1514.05 psi	
325	HP I-3-S-E-8.9-180.5-6.4-SE-V	3	1	8	1	2065.47 psi	
326	HP I-3-S-E-9.0-180-6.5-SE-T	3	1	8	2	2065.47 psi	
327	HP I-3-S-E-8.9-179.5-7.2-SE-V	3	1	8	3	2056.12 psi	
328	HP I-3-S-E-9.0-180-7.2-SE-T	3	1	8	4	2056.12 psi	
329	HP I-3-S-E-13.6-180-6.4-SE-V	3	1	8	5	2070.14 psi	
330	HP I-3-S-E-13.5-180-6.5-SE-T	3	1	8	6	1551.44 psi	
331	HP I-3-S-E-13.6-179.5-7.25-SE-V	3	1	8	7	2079.48 psi	
332	HP I-3-S-E-13.5-180-7.1-SE-T	3	1	8	8	1532.74 psi	
333	HP I-3-S-E-14.3-179.5-6.6-SE-R	3	1	8	9	1546.76 psi	
334	HP I-3-S-E-14.3-271-6.7-SE-T	3	1	8	10	1042.80 psi	
336	HP I-3-S-E-14.5-179.5-7.25-SE-V	3	1	8	12	1051.42 psi	
337	HP I-3-S-E-15.6-180.5-6.0-SE-V	3	1	8	13	1046.75 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
338	HP I-3-S-E-15.5-180-6.4-SE-V	3	1	8	14	1037.41 psi	
339	HP I-3-S-E-16.0-180-6.5-SE-R	3	1	8	15	2065.47 psi	
340	HP I-3-S-E-16.1-180-3.2-SE-T	3	1	8	16	2065.47 psi	
341	HP I-3-S-E-16.0-175.7-3.3-SE-T	3	1	8	17	2070.14 psi	
342	HP I-3-S-E-19.0-185.3-3.2-SE-V	3	1	8	18	1046.75 psi	
343	HP I-3-S-E-19.0-180-3.2-SE-T	3	1	9	1	1051.42 psi	
344	HP I-3-S-E-19.1-184.15-3.5-SE-V	3	1	9	2	1037.41 psi	
345	HP I-3-S-E-18.7-180-3.4-SE-T	3	1	9	3	1023.39 psi	
346	HP I-3-S-E-23.0-185.2-3.2-SE-V	3	1	9	4	1051.42 psi	
347	HP I-3-S-E-22.9-179.3-3.2-SE-T	3	1	9	5	1032.73 psi	
348	HP I-3-S-E-23.04-182.7-3.5-SE-V	3	1	9	6	1032.73 psi	
349	HP I-3-S-E-22.4-177.9-3.45-SE-T	3	1	9	7	1037.41 psi	
350	HP I-3-S-E-28.1-184.5-3.2-SE-V	3	1	9	8	1028.06 psi	
351	HP I-3-S-E-27.8-180-3.2-SE-T	3	1	9	9	1028.06 psi	
352	HP I-3-S-E-28.1-180-3.5-SE-T	3	1	9	10	1023.39 psi	
353	HP I-3-S-E-28.0-177.9-3.45-SE-T	3	1	9	11	1037.41 psi	
356	HP I-3-S-E-36.0-178.1-3.2-SE-T	3	1	9	12	1037.41 psi	
357	HP I-3-S-E-36.0-179.0-3.5-SE-V	3	1	9	13	1042.08 psi	
358	HP I-3-S-E-36.0-176.9-3.4-SE-T	3	1	9	14	1037.41 psi	
359	HP I-3-S-E-10.4-265-4.1-SE-T	3	1	9	15	1032.73 psi	
360	HP I-3-S-E-10.4-265-5.0-SE-T	3	1	9	16	1028.06 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
361	HP I-3-S-E-8.8-269.5-6.4-SE-V	3	1	9	17	2065.47 psi	
362	HP I-3-S-E-8.9-270-6.5-SE-T	3	1	9	18	2065.47 psi	
363	HP I-3-S-E-8.9-270-7.25-SE-V	3	1	10	1	2070.14 psi	
364	HP I-3-S-E-8.9-270.5-7.2-SE-T	3	1	10	2	2042.10 psi	
365	HP I-3-S-E-13.5-269.5-6.4-SE-V	3	1	10	3	2088.83 psi	
366	HP I-3-S-E-13.4-270.5-6.5-SE-T	3	1	10	4	1546.76 psi	
367	HP I-3-S-E-13.5-270-7.2-SE-V	3	1	10	5	2065.47 psi	
368	HP I-3-S-E-13.4-270.5-7.2-SE-T	3	1	10	6	1546.76 psi	
369	HP I-3-S-E-14.3-270-6.6-SE-R	3	1	10	7	1537.42 psi	
371	HP I-3-S-E-14.6-270-6.4-SE-V	3	1	10	8	1028.06 psi	
372	HP I-3-S-E-14.6-269.5-7.2-SE-V	3	1	10	11	1028.06 psi	
373	HP I-3-S-E-15.6-270.5-6.6-SE-V	3	1	10	10	1046.75 psi	
375	HP I-3-S-E-16.0-270-6.6-SE-R	3	1	10	9	2084.16 psi	
376	HP I-3-S-E-15.1-270-3.2-SE-T	3	1	10	12	2074.81 psi	
377	HP I-3-S-E-15.8-270-3.3-SE-T	3	1	10	13	2065.47 psi	
378	HP I-3-S-E-19.0-276-3.2-SE-V	3	1	10	14	1046.75 psi	
379	HP I-3-S-E-18.9-270-3.2-SE-T	3	1	10	15	1032.73 psi	
380	HP I-3-S-E-19.0-273.4-3.5-SE-V	3	1	10	16	1023.39 psi	
381	HP I-3-S-E-18.6-270-3.4-SE-T	3	1	10	17	1023.39 psi	
382	HP I-3-S-E-23.0-277.5-3.2-SE-V	3	1	10	18	986.00 psi	
383	HP I-3-S-E-32.1-270-3.2-SE-T	3	1	11	1	1032.73 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
384	HP I-3-S-E-23.0-272.4-3.5-SE-V	3	1	11	2	1028.06 psi	
385	HP I-3-S-E-22.9-270-3.4-SE-T	3	1	11	3	1032.73 psi	
386	HP I-3-S-E-28.0-274.6-3.1-SE-V	3	1	11	4	1032.73 psi	
387	HP I-3-S-E-28.1-270-3.2-SE-T	3	1	11	5	1037.41 psi	
388	HP I-3-S-E-28.0-271.4-3.45-SE-V	3	1	11	6	1042.08 psi	
389	HP I-3-S-E-27.0-269.3-3.4-SE-T	3	1	11	7	1032.73 psi	
391	HP I-3-S-E-37.4-270.7-3.5-SE-V	3	1	11	8	1032.73 psi	
392	HP I-3-S-E-35.9-268.6-3.45-SE-T	3	1	11	9	1032.73 psi	
393	HP I-3-S-E-16.1-4.3-3.4-SE-V	3	1	11	10	2065.47 psi	
394	HP I-3-S-E-16.2-94.3-3.3-SE-V	3	1	11	11	2023.41 psi	
395	HP I-3-S-E-16.1-183.5-3.4-SE-V	3	1	11	12	2056.12 psi	
396	HP I-3-S-E-16.0-373.35-3.3-SE-V	3	1	11	13	2056.12 psi	
397	HP I-3-S-E-10.4-0-4.1-SE-T	3	1	11	14	1032.73 psi	
398	HP I-3-S-E-10.4-0-5.0-SE-T	3	1	11	15	1037.41 psi	
401	HP I-3-F-E-180-16-38-V-V	5	1	1	1	11.20 fps	
402	HP I-3-F-E-180-16-38-V-H	5	1	1	2	15.95 fps	
404	HP I-3-F-E-151-17-48-V-V	5	1	1	3	10.84 fps	
405	HP I-3-F-E-148-7-44-V-V	5	1	1	4	11.23 fps	
406	HP I-3-F-E-145-12-8-V-H	5	1	1	5	21.44 fps	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
407	HP I-3-F-E-140-12-2-V-V	5	1	1	6	32.33 fps	
408	HP I-3-F-E-98-7-29-V-V	5	1	1	7	12.84 fps	
409	HP I-3-F-E-52-16-46-V-H	5	1	1	8	15.80 fps	
410	HP I-3-F-E-52-16-46-V-T	5	1	2	1	10.18 fps	
411	HP I-3-F-E-8-15-72.5-V-V	5	1	2	2	5.14 fps	
412	HP I-3-F-E-8-15-72.5-V-H	5	1	2	3	9.98 fps	
413	HP I-3-F-E-149-38-8-V-V	5	1	2	4	26.30 fps	
414	HP I-3-F-E-153-42-2-V-V	5	1	2	5	32.74 fps	
415	HP I-3-F-E-151-40-44-V-V	5	1	2	6	9.90 fps	
416	HP I-3-F-E-156-42-38.5-V-H	5	1	2	7	21.12 fps	
417	HP I-3-F-E-156-42-29.5-V-V	5	1	2	8	22.68 fps	
418	HP I-3-F-E-147-36-87.5-V-V	5	1	3	1	3.04 fps	
419	HP I-3-F-E-103-39-8-V-V	5	1	3	2	26.02 fps	
420	HP I-3-F-E-50-36-42.6-V-V	5	1	3	3	9.93 fps	
421	HP I-3-F-E-8-33-2-V-V	5	1	3	4	29.64 fps	
422	HP I-3-F-E-8-39-72.5-V-V	5	1	3	5	5.08 fps	
423	HP I-3-F-E-171-57-55.5-V-V	5	1	3	6	10.11 fps	
424	HP I-3-F-E-171-60-2-V-V	5	1	3	7	32.67 fps	
425	HP I-3-F-E-171-69-37.5-V-V	5	1	4	1	10.28 fps	
426	HP I-3-F-E-171-69-28.5-V-V	5	1	4	2	15.94 fps	
427	HP I-3-F-E-150-60-49-V-V	5	1	4	3	10.41 fps	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
428	HP I-3-F-E-126-64-81.5-V-V	5	1	4	4	5.11 fps	
429	HP I-3-F-E-126-64-81.5-V-H	5	1	4	5	4.93 fps	
430	HP I-3-F-E-126-64-71-V-V	5	1	4	6	5.34 fps	
431	HP I-3-F-E-126-61-2-V-V	5	1	4	7	30.89 fps	
432	HP I-3-F-E-123-58-45-V-H	5	1	5	1	15.73 fps	
433	HP I-3-F-E-126-64-8-V-V	5	1	5	2	31.22 fps	
434	HP I-3-F-E-121-55-40-V-V	5	1	5	3	11.22 fps	
435	HP I-3-F-E-121-55-31-V-V	5	1	5	4	15.55 fps	
436	HP I-3-F-E-53-65-90-V-V	5	1	5	5	3.00 fps	
437	HP I-3-F-E-50-60-41-V-H	5	1	5	6	14.56 fps	
438	HP I-3-F-E-8-57-46-V-H	5	1	5	7	15.35 fps	
439	HP I-3-F-E-8-54-66-V-V	5	1	6	1	5.28 fps	
440	HP I-3-F-E-8-66-41.5-V-V	5	1	6	2	10.29 fps	
441	HP I-3-F-E-8-66-32.5-V-V	5	1	6	3	10.34 fps	
442	HP I-3-F-E-180-90-41.5-V-V	5	1	6	4	10.51 fps	
443	HP I-3-F-E-180-90-41.5-V-H	5	1	6	5	15.00 fps	
444	HP I-3-F-E-148-83-37-V-T	5	1	6	6	10.13 fps	
445	HP I-3-F-E-148-83-29-V-V	5	1	6	7	15.64 fps	
446	HP I-3-F-E-148-83-11-V-V	5	1	7	1	20.88 fps	
447	HP I-3-F-E-152-84-2-V-V	5	1	7	2	24.36 fps	
448	HP I-3-F-E-154-79-70-V-V	5	1	7	3	5.33 fps	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
449	HP I-3-F-E-154-79-70-V-H	5	1	7	4	10.49 fps	
450	HP I-3-F-E-154-79-48-V-H	5	1	7	5	10.29 fps	
451	HP I-3-F-E-150-82-88-V-V	5	1	7	6	3.09 fps	
453	HP I-3-F-E-150-82-56.5-V-V	5	1	7	7	7.36 fps	
454	HP I-3-F-E-100-90-39.5-V-H	5	1	8	1	20.42 fps	
455	HP I-3-F-E-50-92-2-V-V	5	1	8	2	31.42 fps	
456	HP I-3-F-E-8-87-8-V-V	5	1	8	3	26.76 fps	
457	HP I-3-F-E-8-87-8-V-H	5	1	8	4	25.71 fps	
458	HP I-3-F-E-8-90-53-V-V	5	1	11	4	10.37 fps	
461	HP I-3-S-E-4.7-0-5.5-V-V	5	1	8	5	29.24 fps	
462	HP I-3-S-E-5.5-0-6.3-V-T	5	1	8	6	32.68 fps	
463	HP I-3-S-E-9.0-2.5-7.4-IV-V	5	1	11	6	15.00 fps	
465	HP I-3-S-E-14.2-0-5.8-V-V	5	1	8	7	99.04 fps	
466	HP I-3-S-E-14.0-0-6.3-V-T	5	1	9	1	32.31 fps	
467	HP I-3-S-E-16.2-0-3.0-V-V	5	1	9	2	20.94 fps	
468	HP I-3-S-E-40.2-90-0.2-V-V	5	1	9	3	8.83 fps	
470	HP I-3-S-E-5.5-90-6.3-V-T	5	1	9	4	29.91 fps	
471	HP I-3-S-E-5.5-90-6.3-V-T	5	1	9	5	30.27 fps	
472	HP I-3-S-E-9.0-115-7.4-IV-V	5	1	11	7	14.99 fps	
473	HP I-3-S-E-9.5-90-7.4-IV-T	5	1	12	1	14.99 fps	
476	HP I-3-S-E-14.2-90-5.8-V-V	5	1	9	6	30.31 fps	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
477	HP I-3-S-E-14.0-90-6.3-V-T	5	1	9	7	30.71 fps	
478	HP I-3-S-E-16.2-90-3.0-V-T	5	1	10	1	39.39 fps	
479	HP I-3-S-E-40.0-90-3.0-V-T	5	1	10	2	19.57 fps	
480	HP I-3-S-E-4.7-180-5.5-V-V	5	1	10	3	31.76 fps	
481	HP I-3-S-E-9.0-182.5-7.4-IV-V	5	1	12	2	15.00 fps	
483	HP I-3-S-E-14.2-180-5.8-V-V	5	1	10	4	34.60 fps	
484	HP I-3-S-E-16.2-180-3.0-V-V	5	1	10	5	22.87 fps	
485	HP I-3-S-E-4.7-270-5.5-V-V	5	1	10	6	32.85 fps	
486	HP I-3-S-E-5.5-270-6.3-V-T	5	1	10	7	30.65 fps	
487	HP I-3-S-E-9.0-295-7.4-IV-V	5	1	12	3	15.01 fps	
488	HP I-3-S-E-9.5-270-7.4-IV-T	5	1	12	4	15.00 fps	
491	HP I-3-S-E-14.2-270-5.8-V-V	5	1	11	1	31.12 fps	
492	HP I-3-S-E-16.2-270-3.0-V-T	5	1	11	2	29.16 fps	
493	HP I-3-S-E-40.0-270-3.0-V-T	5	1	11	3	20.82 fps	
501	HP I-3-S-E-1.6-0-0-A-V	3	1	12	4	3014.69 g	
502	HP I-3-S-E-1.6-0-0-A-V	3	1	12	5	3081.62 g	
504	HP I-3-S-E-4.7-0-3.5-A-V	3	1	12	6	2020.48 g	
505	HP I-3-S-E-4.7-0-5.5-A-R	3	1	12	7	1999.86 g	
506	HP I-3-S-E-9.0-0-6.3-A-V	3	1	11	18	1509.75 g	
507	HP I-3-S-E-4.7-0-5.5-A-V	3	1	12	9	1493.46 g	
508	HP I-3-S-E-4.7-0-9.4-A-V	3	1	12	10	2031.11 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
509	HP I-3-S-E-4.7-0-16.0-A-V	3	1	12	11	1941.10 g	
510	HP I-3-S-E-4.7-0-16.0-A-R	3	1	12	12	2033.10 g	
511	HP I-3-S-E-9.0-0-6.3-A-R	3	1	12	13	1989.68 g	
512	HP I-3-S-E-9.0-0-9.4-A-V	3	1	12	14	2154.81 g	
513	HP I-3-S-E-9.0-0-9.4-A-R	3	1	12	15	1994.38 g	
514	HP I-3-S-E-9.0-0-16.0-A-V	3	1	12	16	1946.93 g	
515	HP I-3-S-E-13.0-0-9.4-A-V	3	2	12	15	1500.86 g	
516	HP I-3-S-E-13.0-0-16.0-A-V	3	2	12	16	1469.81 g	
517	HP I-3-S-E-13.0-0-16.0-A-R	3	2	3	1	1466.56 g	
518	HP I-3-S-E-14.2-0-4.0-A-V	3	2	3	2	1954.15 g	
519	HP I-3-S-E-13.0-0-6.3-A-V	3	2	3	3	1512.28 g	
520	HP I-3-S-E-13.0-0-6.3-A-R	3	2	3	4	2018.31 g	
521	HP I-3-S-E-10.0-0-4.8-A-R	3	2	3	5	1980.00 g	
522	HP I-3-S-E-15.2-0-12.7-A-V	3	2	3	6	1510.99 g	
523	HP I-3-S-E-16.2-0-3.0-A-R	3	2	3	7	1039.80 g	
524	HP I-3-S-E-15.2-0-12.7-A-R	3	2	3	8	1477.98 g	
525	HP I-3-S-E-19.0-0-3.0-A-R	3	2	3	9	995.96 g	
530	HP I-3-S-E-19.0-0-12.0-A-V	3	2	3	10	983.39 g	
531	HP I-3-S-E-19.0-0-12.0-A-R	3	2	3	11	969.80 g	
532	HP I-3-S-E-28.0-0-3.0-A-V	3	2	3	12	502.46 g	
538	HP I-3-S-E-28.0-0-3.0-A-R	3	2	3	13	487.22 g	
541	HP I-3-S-E-28.0-0-12.0-A-V	3	2	3	14	500.38 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
542	HP I-3-S-E-28.0-0-12.0-A-R	3	2	3	15	517.57 g	
544	HP I-3-S-E-40.2-270-0.2-A-V	3	2	3	16	920.88 g	
545	HP I-3-S-E-40.2-270-0.2-A-R	3	2	3	17	504.06 g	
546	HP I-3-S-E-40.2-0-12.0-A-V	3	2	3	18	496.33 g	
547	HP I-3-S-E-40.2-0-12.0-A-R	3	2	4	1	493.68 g	
548	HP I-3-S-E-9.0-90-6.3-A-V	3	1	12	3	1542.84 g	
549	HP I-3-S-E-4.7-90-5.5-A-R	9	1	12		1981.28 g	
550	HP I-3-S-E-4.7-90-5.5-A-V	3	2	4	4	1536.64 g	
551	HP I-3-S-E-9.0-90-6.3-A-T	3	2	4	5	2010.02 g	
552	HP I-3-S-E-4.7-90-16.0-A-V	3	2	4	6	1910.83 g	
553	HP I-3-S-E-4.7-90-16.0-A-R	3	2	4	7	1975.85 g	
554	HP I-3-S-E-13.0-90-6.3-A-R	3	2	4	8	2007.97 g	
555	HP I-3-S-E-13.0-90-16.0-A-R	3	2	4	9	1480.94 g	
556	HP I-3-S-E-13.0-90-6.3-A-T	3	2	4	10	1920.53 g	
557	HP I-3-S-E-13.0-90-6.3-A-V	3	2	4	11	1546.14 g	
558	HP I-3-S-E-16.2-90-3.0-A-V	3	2	4	12	992.63 g	
559	HP I-3-S-E-19.0-90-3.0-A-R	3	2	4	13	1033.79 g	
567	HP I-3-S-E-4.7-180-5.5-A-R	3	2	4	14	1926.04 g	
568	HP I-3-S-E-4.7-180-5.5-A-V	3	2	4	15	1515.70 g	
569	HP I-3-S-E-4.7-180-9.4-A-V	3	2	4	16	2023.70 g	
570	HP I-3-S-E-4.7-180-16.0-A-V	3	2	4	17	1981.96 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
571	HP I-3-S-E-4.7-180-16.0-A-R	3	2	4	18	2014.65 g	
572	HP I-3-S-E-9.0-180-6.3-A-R	3	2	5	1	1990.12 g	
573	HP I-3-S-E-9.0-180-9.4-A-V	3	2	5	2	1989.33 g	
574	HP I-3-S-E-9.0-180-9.4-A-R	3	2	5	3	1982.97 g	
575	HP I-3-S-E-9.0-180-16.0-A-V	3	2	5	4	2033.08 g	
576	HP I-3-S-E-13.0-180-9.4-A-V	3	2	5	5	1521.49 g	
577	HP I-3-S-E-13.0-180-16.0-A-V	3	2	5	6	1505.82 g	
578	HP I-3-S-E-13.0-180-16.0-A-R	3	2	5	7	1501.76 g	
579	HP I-3-S-E-13.0-180-6.3-A-R	3	2	5	8	2008.50 g	
580	HP I-3-S-E-13.0-180-6.3-A-V	3	2	5	9	1501.97 g	
581	HP I-3-S-E-15.2-180-12.7-A-V	3	2	5	10	1503.88 g	
582	HP I-3-S-E-16.2-180-3.0-A-R	3	2	5	11	981.75 g	
583	HP I-3-S-E-15.2-180-12.7-A-R	3	2	5	12	1504.33 g	
584	HP I-3-S-E-19.0-180-3.0-A-R	3	2	5	13	999.60 g	
589	HP I-3-S-E-19.0-180-12.0-A-V	3	2	5	14	1015.48 g	
590	HP I-3-S-E-19.0-180-12.0-A-R	3	2	5	15	989.06 g	
591	HP I-3-S-E-28.0-180-3.0-A-V	3	2	5	16	500.89 g	
592	HP I-3-S-E-9.0-180-6.3-A-V	3	1	12	2	506.16 g	
597	HP I-3-S-E-28.0-180-3.0-A-R	3	2	5	18	496.15 g	
600	HP I-3-S-E-28.0-180-12.0-A-V	3	2	6	1	501.48 g	
601	HP I-3-S-E-28.0-180-12.0-A-R	3	2	6	2	483.45 g	
602	HP I-3-S-E-28.0-180-12.0-A-R	3	2	6	3	496.94 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
603	HP I-3-S-E-40.2-180-12.0-A-R	3	2	6	4	485.39 g	
604	HP I-3-S-E-10.4-270-4.8-A-R	3	2	6	5	1973.54 g	
605	HP I-3-S-E-4.7-270-5.5-A-R	3	2	6	6	1946.44 g	
606	HP I-3-S-E-9.0-270-6.3-A-V	3	2	6	7	1503.55 g	
607	HP I-3-S-E-4.7-270-5.5-A-V	3	2	6	8	1459.31 g	
608	HP I-3-S-E-9.0-270-6.3-A-T	3	2	6	9	2033.30 g	
609	HP I-3-S-E-4.7-270-16.0-A-V	3	2	6	10	2042.70 g	
610	HP I-3-S-E-4.7-270-16.0-A-R	3	2	6	11	2032.05 g	
611	HP I-3-S-E-9.0-270-9.4-A-V	3	2	6	12	2010.20 g	
612	HP I-3-S-E-9.0-270-9.4-A-R	3	2	6	13	1998.44 g	
614	HP I-3-S-E-13.0-270-16.0-A-V	3	2	6	14	1483.20 g	
615	HP I-3-S-E-13.0-270-16.0-A-R	3	2	6	15	1506.88 g	
617	HP I-3-S-E-13.0-270-6.3-A-V	3	2	6	16	1499.76 g	
618	HP I-3-S-E-13.0-270-6.3-A-R	3	2	6	17	1986.91 g	
619	HP I-3-S-E-13.0-270-6.3-A-T	3	2	6	18	2064.14 g	
620	HP I-3-S-E-16.2-270-3.0-A-R	3	2	8	1	1003.45 g	
621	HP I-3-S-E-16.2-270-3.0-A-V	3	2	8	2	1014.53 g	
622	HP I-3-S-E-19.0-270-3.0-A-R	3	2	8	3	1010.35 g	
625	HP I-3-S-E-19.0-270-12.0-A-V	3	2	8	4	1036.00 g	
626	HP I-3-S-E-19.0-270-12.0-A-R	3	2	8	5	967.60 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal Level
631	HP I-3-S-E-28.0-270-12.0-A-V	3	2	8	6	505.05 g	
632	HP I-3-S-E-28.0-270-12.0-A-R	3	2	8	7	492.88 g	
633	HP I-3-S-E-40.2-270-12.0-A-V	3	2	8	8	491.70 g	
634	HP I-3-S-E-40.2-270-12.0-A-R	3	2	8	9	488.08 g	
635	HP I-3-S-E-9.0-90-6.3-A-R	3	2	8	10	2036.74 g	
636	HP I-3-S-E-9.0-90-9.4-A-V	3	2	8	11	2009.43 g	
637	HP I-3-S-E-9.0-90-9.4-A-R	3	2	8	12	2026.95 g	
638	HP I-3-S-E-28.0-90-12.0-A-V	3	2	8	13	508.42 g	
639	HP I-3-S-E-28.0-90-12.0-A-R	3	2	8	14	505.16 g	
640	HP I-3-S-E-270-6.3-A-R	3	2	8	15	1980.00 g	
642	HP I-3-S-E-4.7-355-7.4-IP-R	5	1	1	9	1447.60 psi	
643	HP I-3-S-E-4.7-355-7.9-FS-R	3	2	8	16	1562.01 psi	
644	HP I-3-S-E-4.7-355-12.0-FS-V	3	2	8	17	1484.90 psi	
645	HP I-3-S-E-4.7-355-16.0-FS-R	3	2	8	18	1552.78 psi	
646	HP I-3-S-E-9.0-355-7.4-IP-R	5	1	1	10	2013.44 psi	
647	HP I-3-S-E-9.0-10-7.4-IS-VS	1	3	4	1	499.41 psi	
648	HP I-3-S-E-9.0-10-7.4-IS-TS	1	3	4	2	500.06 psi	
649	HP I-3-S-E-9.0-10-7.4-IS-R	1	3	4	3	2001.30 psi	
651	HP I-3-S-E-9.0-355-7.9-FS-R	3	2	9	1	2055.09 psi	
652	HP I-3-S-E-9.0-355-16.0-FS-R	3	2	9	2	1937.73 psi	
654	HP I-3-S-E-13.0-355-7.4-FP-R	5	1	1	11	2045.80 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
655	HP I-3-S-E-13.0-355-7.9-FS-R	3	2	9	3	2047.11 psi	
656	HP I-3-S-E-13.0-355-12.0-FS-V	3	2	9	4	1948.86 psi	
657	HP I-3-S-E-13.0-355-16.0-FS-R	3	2	9	5	1987.90 psi	
659	HP I-3-S-E-16.9-355-3.6-IP-R	5	1	2	9	1501.87 psi	
660	HP I-3-S-E-4.7-90-7.4-IP-R	5	1	2	10	1468.32 psi	
661	HP I-3-S-E-8.5-90-7.4-IP-R	5	1	2	11	1981.44 psi	
662	HP I-3-S-E-12.5-90-7.4-IP-R	5	1	3	9	1963.15 psi	
665	HP I-3-S-E-4.7-175-7.4-IP-R	5	1	3	10	1511.39 psi	
666	HP I-3-S-E-4.7-175-7.9-FS-R	3	2	9	6	1479.36 psi	
667	HP I-3-S-E-4.7-175-12.0-FS-V	3	2	9	7	1486.02 psi	
668	HP I-3-S-E-4.7-175-16.0-FS-R	3	2	9	8	1531.80 psi	
669	HP I-3-S-E-9.0-175-7.4-IP-R	5	1	3	11	1701.05 psi	
674	HP I-3-S-E-9.0-175-7.9-FS-R	3	2	9	9	1997.17 psi	
675	HP I-3-S-E-9.0-175-16.0-FS-R	3	2	9	10	2000.63 psi	
676	HP I-3-S-E-13.0-175-7.4-IP-R	5	1	4	9	2009.32 psi	
677	HP I-3-S-E-13.0-175-7.9-FS-R	3	2	6	11	1986.60 psi	
678	HP I-3-S-E-13.0-175-12.0-FS-V	3	2	6	12	2006.68 psi	
679	HP I-3-S-E-13.0-175-16.0-FS-R	3	2	6	13	2026.52 psi	
681	HP I-3-S-E-16.9-175-3.6-IP-R	5	1	4	10	1492.11 psi	
684	HP I-3-S-E-4.7-265-7.9-FS-R	3	2	9	14	1513.05 psi	
685	HP I-3-S-E-4.7-265-16.0-FS-R	3	2	9	15	1543.18 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
686	HP I-3-S-E-8.5-270-7.4-IP-R	5	1	5	9	1993.68 psi	
687	HP I-3-S-E-8.5-275-7.4-IS-VS	1	3	4	4	499.72 psi	
688	HP I-3-S-E-8.5-275-7.4-IS-TS	1	3	4	5	506.07 psi	
689	HP I-3-S-E-8.5-275-7.4-IS-R	1	3	5	1	1997.05 psi	
691	HP I-3-S-E-8.5-265-7.9-FS-R	3	2	9	16	1983.38 psi	
692	HP I-3-S-E-8.5-265-16.0-FS-R	3	2	9	17	1989.30 psi	
693	HP I-3-S-E-12.5-270-7.4-IP-R	5	1	5	10	1959.60 psi	
695	HP I-3-S-E-12.5-265-7.9-FS-R	3	2	9	18	1997.89 psi	
696	HP I-3-S-E-12.5-265-16.0-FS-R	3	2	10	1	2036.92 psi	
697	HP I-3-S-E-10.0-0-5.9-IP-R	3	1	12	1	2034.34 psi	
698	HP I-3-S-E-11.0-90-6.3-IP-R	3	2	10	3	2001.23 psi	
699	HP I-3-S-E-11.0-180-6.3-IP-R	3	1	8	11	1940.87 psi	
700	HP I-3-S-E-11.0-270-6.3-IP-R	3	2	10	5	2009.89 psi	
701	HP I-3-S-E-106.3-102-2.5-IP-R	3	2	10	6	1978.90 psi	
702	HP I-3-S-E-106.3-102.4-4.5-IP-R	3	2	10	7	2011.12 psi	
703	HP I-3-S-E-111.85-98.80-6.5-IP-R	3	2	10	8	2055.51 psi	
704	HP I-3-S-E-111.3-105.45-4.5-IP-R	3	2	10	9	1994.44 psi	
711	HP I-3-S-E-4.7-350-3.7-RD-V	5	1	13	1	2.54 in	
712	HP I-3-S-E-14.7-350-3.7-RD-R	5	1	13	2	2.41 in	
713	HP I-3-S-E-15.0-0(to 180)-3.0-RD-R	5	1	13	3	2.50 in	
715	HP I-3-S-E-23.5-0(to 180)-3.0-RD-R	5	1	13	4	2.51 in	
718	HP I-3-S-E-15.5-90(to 270)-3.0-RD-R	5	1	13	5	2.50 in	
720	HP I-3-S-E-24.0-90(to 270)-3.0-RD-R	5	1	14	1	2.51 in	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
721	HP I-3-S-E-14.7-170-3.7-RD-R	5	1	14	2	2.51 in	
722	HP I-3-S-E-14.7-170-3.7-RD-V	5	1	14	3	2.50 in	
723	HP I-3-S-E-14.7-260-3.7-RD-R	5	1	14	4	2.50 in	
724	HP I-3-S-E-14.7-260-3.7-RD-V	5	1	14	5	2.50 in	
725	HP I-3-S-E-9.0-0-6.1-RD-R	5	1	13	8	2.99 in	
726	HP I-3-S-E-9.0-270-6.1-RD-R	5	1	14	8	2.45 in	
801	HP I-3-A-E-500.1-129.7-14.5-FS-45	9	2	7		4361.79 psi	
802	HP I-3-A-E-505.45-123.5-14.5-FS-45	9	2	8		4031.68 psi	
803	HP I-3-A-E-505.45-129.7-14.5-FS-45	9	2	9		4073.40 psi	
804	HP I-3-A-E-499.25-150.1-14.5-FS-45	9	2	10		4012.80 psi	
805	HP I-3-A-E-505.65-150.2-14.5-FS-45	9	2	11		3974.24 psi	
806	HP I-3-A-E-505.65-156.2-14.5-FS-45	9	2	12		3996.30 psi	
807	HP I-3-A-E-502.85-171.9-14.5-FS-45	9	2	13		4164.16 psi	
808	HP I-3-A-E-508.2-172.1-14.1-FS-45	9	4	3		4010.59 psi	
809	HP I-3-A-E-508.1-176.6-14.3-FS-45	9	4	4		4010.16 psi	
810	HP I-3-A-E-505.1-192.0-13.8-FS-45	9	4	5		3985.74 psi	
811	HP I-3-A-E-511.4-192.0-14.1-FS-45	9	4	6		3999.60 psi	
812	HP I-3-A-E-511.7-198.6-13.7-FS-45	9	4	7		4009.82 psi	
816	HP I-3-F-E-399-(-870)-0-A-HL	1	1	10	1	2.87 g	
817	HP I-3-F-E-399-(-870)-0-A-HT	1	1	10	2	2.89 g	
818	HP I-3-F-E-399-(-870)-0-A-VT	1	1	10	3	3.32 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
820	HP I-3-F-E-936-611-0-AH-T	1	1	10	5	6.39 g	
821	HP I-3-F-E-939-611-0-AV-T	1	1	11	1	6.01 g	
822	HP I-3-F-E-1100-60-0-AH-L	1	1	11	2	4.99 g	
823	HP I-3-F-E-1100-60-0-AH-T	1	1	11	3	4.48 g	
824	HP I-3-F-E-1100-60-0-AV-T	1	1	11	4	5.69 g	
825	HP I-3-F-E-2200-60-0-AH-L	1	1	11	5	0.99 g	
826	HP I-3-F-E-2200-60-0-AH-T	1	1	12	1	0.60 g	
827	HP I-3-F-E-2200-60-0-AV-T	1	1	12	2	0.94 g	
851	HP I-3-F-E-10.6-12-9-FS-T	1	3	5	2	3502.02 psi	
852	HP I-3-F-E-10.1-20-9-FS-H	1	3	5	3	3500.77 psi	
853	HP I-3-F-E-8-30-4-FS-V	1	3	5	4	2997.21 psi	
854	HP I-3-F-E-10-40-9-FS-H	1	3	5	5	3498.22 psi	
855	HP I-3-F-E-8-69-7-FS-V	1	3	6	1	3502.24 psi	
856	HP I-3-F-E-10-72-9-FS-H	1	3	6	2	3500.22 psi	
857	HP I-3-F-E-8-75-14-FS-H	1	3	6	3	3514.51 psi	
858	HP I-3-F-E-8-93-4-FS-V	1	3	6	4	3006.42 psi	
859	HP I-3-F-E-50.8-13-4-FS-V	1	3	7	5	2998.47 psi	
861	HP I-3-F-E-57-68-8.8-FS-H	1	3	7	2	3004.95 psi	
862	HP I-3-F-E-51-91-4-FS-V	1	3	7	3	3002.22 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
863	HP I-3-F-E-51-95-8.7-FS-T	1	3	7	4	3011.26 psi	
864	HP I-3-F-E-84-56-2-FS-H	1	3	10	1	2500.52 psi	
865	HP I-3-F-E-86-59-6-FS-H	1	3	10	2	2500.20 psi	
866	HP I-3-F-E-85.5-63-2-FS-H	9	4	11		2521.09 psi	
867	HP I-3-F-E-88-68-2-FS-V	9	4	12		2099.02 psi	
868	HP I-3-F-E-89-70-5-FS-V	9	4	13		3180.56 psi	
869	HP I-3-F-E-108-24-4-FS-H	1	3	10	3	2500.38 psi	
870	HP I-3-F-E-110-24.2-3-FS-V	1	3	10	4	2497.47 psi	
871	HP I-3-F-E-102-43-14-FS-H	1	3	10	5	2999.77 psi	
872	HP I-3-F-E-100-48-10-FS-H	1	3	11	1	3003.56 psi	
873	HP I-3-F-E-98-51-6-FS-H	1	3	11	2	2494.80 psi	
874	HP I-3-F-E-96-53-2-FS-H	1	3	11	3	2499.57 psi	
875	HP I-3-F-E-111-63-2-FS-H	1	3	11	4	2000.96 psi	
876	HP I-3-F-E-112-65-6-FS-H	1	3	11	5	2504.32 psi	
877	HP I-3-F-E-113-66.5-9.7-FS-H	1	3	12	1	2501.86 psi	
878	HP I-3-F-E-114-68-14-FS-H	1	3	12	2	3003.90 psi	
879	HP I-3-F-E-125-45-14-FS-H	1	3	12	3	2996.59 psi	
880	HP I-3-F-E-123-48-10-FS-H	1	3	12	4	2496.22 psi	
883	HP I-3-F-E-135.7-49-4-FS-H	1	3	13	2	2501.58 psi	
884	HP I-3-F-E-133.8-52-9-FS-H	1	3	13	3	2505.77 psi	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
885	HP I-3-F-E-133.6-54-14-FS-H	1	3	13	4	3001.98 psi	
886	HP I-3-F-E-150-78-8-FS-T	1	3	13	5	1999.94 psi	
887	HP I-3-F-E-163-49-8-FS-H	1	3	14	1	2503.86 psi	
888	HP I-3-F-E-162-74-10-FS-V	1	3	14	2	2500.84 psi	
889	HP I-3-F-E-164-71.25-8-FS-T	1	3	14	3	2000.99 psi	
890	HP I-3-F-E-166-72-6-FS-T	1	3	14	4	2508.21 psi	
891	HP I-3-F-E-172-64-6-FS-T	3	2	10	10	2017.64 psi	
892	HP I-3-F-E-176-66-2-FS-H	3	2	10	11	1990.04 psi	
893	HP I-3-F-E-180-64-6-FS-H	3	2	10	12	2011.01 psi	
894	HP I-3-F-E-182-64-6-FS-T	3	2	10	13	1737.63 psi	
895	HP I-3-F-E-185-62-2-FS-V	3	2	10	14	1924.67 psi	
909	HP I-3-S-E-14.7-10-3.5-AP-0	5	1	12	8	46.31 psi	
910	HP I-3-S-E-14.7-100-3.5-AP-0	5	1	12	6	49.92 psi	
911	HP I-3-S-E-14.7-190-3.5-AP-0	5	1	12	7	50.07 psi	
912	HP I-3-S-E-1100-(-1290)-(-20)-BP-S	9	4	9		.213 psi	
913	HP I-3-S-E-1100-(-1290)-(-10)-BP-S	9	4	10		.107 psi	
950	HP I-3-X-E-171-63-2-A-V	1	1	2	3	514.50 g	
951	HP I-3-X-E-171-63-2-A-H	1	1	3	3	705.61 g	
952	HP I-3-X-E-185-12-2-A-H	1	1	4	3	2003.82 g	
953	HP I-3-X-E-185-12-2-A-H	1	1	1	1	2999.96 g	

Table P-89. Measurement Recording List - HP I-3 (Continued)

Measure. Number	Measurement Designation	Van	Recorder	Track	VCO	Cal. Level Actual (EU)	% Bandedge @ Cal. Level
954	HP I-3-X-E-176-36-2-A-H	1	1	5	3	1983.79 g	
955	HP I-3-X-E-176-36-2-A-V	1	1	6	3	1642.45 g	
956	HP I-3-X-E-136-12-2-A-H	1	1	1	2	2999.70 g	
957	HP I-3-X-E-136-12-2-A-H	1	1	7	3	453.12 g	

Table P-90. Record Assignment Table - Van 1

TRACK	RECORDER #2 FM WIDE BAND BREAK WIRE TOA MUX 1 THRU 5
1	
2	MUX #1 1101 THRU 1105
3	
4	MUX #2 1106 THRU 1110
5	
6	MUX #3 1116, 1117, 1118
7	
8	VOICE IRIG "B" DIRECT (52.5 KHz ± 15%)
9	FM FIDU
10	MUX #4 1119 THRU 1122
11	
12	MUX #5 1123, 1124, 1125
13	
14	

TRACK	500 KHz Direct Record RECORDER #4 120 IPS PIN GAGE TOA MUX 1 THRU 12
1	FIDU 1002 THRU 1009
2	FIDU 1010 THRU 1017
3	FIDU 1018 THRU 1025
4	FIDU 1026 THRU 1033
5	FIDU 1034 THRU 1041
6	FIDU 1043 THRU 1049
7	FIDU 1050 THRU 1057
8	VOICE IRIG "B" DIRECT (52.5 KHz ± 15%)
9	FM FIDU
10	FIDU 1058 THRU 1065
11	FIDU 1066 THRU 1073
12	FIDU 1074 THRU 1081
13	FIDU 1082 THRU 1089
14	

Table P-90. Record Assignment Table - Van 1 (Continued)

TRACK	Recorder #1 VCO Number (Center Freq.) DBW (KHz) (KHz)				
	1-62.5	2-100	3-137.5	4-175	5-212.5
	5	5	5	5	5
1	953	956	IRIG "B"	FIDU	
2	FM WIDE BAND		950		
3	FM WIDE BAND		951		
4	FM WIDE BAND		952		
5	FM WIDE BAND		954		
6	FM WIDE BAND		955		
7	FM WIDE BAND		957		
8	VOICE IRIG "B" DIRECT (52.5 KHz ± 15%)				
9	FM FIDU				
10	816	817	818	819	820
11	821	822	823	824	825
12	826	827	113	118	176
13	190	191	192	193	218
14	222	223	224	243	

TRACK	Recorder #3 VCO Number (Center Freq.) DBW (KHz) (KHz)				
	1-62.5	2-100	3-137.5	4-176	5-212.5
	5	5	5	5	5
1	100	101	102	103	123
2	124	144	171	172	189
3	208	209	210	211	112
4	647	648	649	687	688
5	689	851	852	853	854
6	855	856	857	858	859
7		861	862	863	IRIG "B"
8	VOICE IRIG "B" DIRECT (52.5 KHz ± 15%)				
9	FM FIDU				
10	864	865	869	870	871
11	872	873	874	875	876
12	877	878	879	880	
13		883	884	885	886
14	887	888	889	890	212

Table P-91. Record Assignment Table - Van 3 - Recorder 1

MUX	TRACK	VCO NUMBER / DATA BANDWIDTH (kHz)																	
		1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	10/10	11/10	12/10	13/10	14/10	15/10	16/10	17/10	18/10
	1																		
	2																		
1	3	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268
2	4	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286
3	5	287	288	289	290	293	294	295	296	297	298	299	300	301	302	303	304	305	306
4	6	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324
VIDAR	7			FIDU		IRIG "B"													
5	8	325	326	327	328	329	330	331	332	333	334	699	336	337	338	339	340	341	342
6	9	343	344	345	346	347	348	349	350	351	352	353	356	357	358	359	360	361	362
7	10	363	364	365	366	367	368	369	371	375	373	372	376	377	378	379	380	381	382
8	11	383	384	385	386	387	388	389	391	392	393	394	395	396	397	398			506
9	12	697	592	548	501	502	504	505		507	508	509	510	511	512	513	514	FIDU	IRIG "B"
	13																		
	14																		

Table P-92. Record Assignment Table - Van 3 - Recorder 2

MUX	TRACK	VCO NUMBER / DATA BANDWIDTH (kHz)																	
		1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	10/10	11/10	12/10	13/10	14/10	15/10	16/10	17/10	18/10
	1																		
	2																		
1	3	517	518	519	520	521	522	523	524	525	530	531	532	538	541	542	544	545	546
2	4	547			550	551	552	553	554	555	556	557	558	559	567	568	569	570	571
3	5	572	573	574	575	576	577	578	579	580	581	582	583	584	589	590	591		597
4	6	600	601	602	603	604	605	606	607	608	609	610	611	612	614	615	617	618	619
VIDAR	7			FIDU		IRIG "B"													
5	8	620	621	622	625	626	631	632	633	634	635	636	637	638	639	640	643	644	645
6	9	651	652	655	656	657	666	667	668	674	675	677	678	679	684	685	691	692	695
7	10	696		698		700	701	702	703	704	891	892	893	894	895	178	232	235	065
8	11	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083
9	12	084	085	086	087	088	089	090	091	092	093	094	095	096	097	515	516	FIDU	IRIG "B"
	13																		
	14																		

Table P-93. Record Assignment Table - Van 5

MUX	TRACK	VCO NUMBER / DATA BANDWIDTH (kHz)																	
		1/1	2/1	3/1	4/1	5/1	6/2	7/2	8/2	9/4	10/4	11/4	12/8	13/8	14/8	15/16	16/16	17/16	—
1	1	401	402	404	405	406	407	408	409	642	646	654	160	196	230	121	159	177	
2	2	410	411	412	413	414	415	416	417	659	660	661	161	197	233	122	147	117	
3	3	418	419	420	421	422	423	424		662	665	669	162	198	234	128	148	169	
4	4	425	426	427	428	429	430	431		676	681		163	199	236	129	153	170	
5	5	432	433	434	435	436	437	438		688	690	140	164	202	237	130	154	167	
6	6	439	440	441	442	443	444	445		242	119	141	173	203	244	131	182	168	
7	7	446	447	448	449	450	451	453		098	120	142	174	204	245	132	183	184	
8	8	454	455	456	457	461	462	465		099	125	143	175	219	246	133	200	185	
9	9	466	467	468	470	471	476	477		104	126	214	179	220	247	138	201	187	
10	10	478	479	480	483	484	485	486		107	127	216	180	225	105	139	205	188	
11	11	491	492	493	458		463	472		108	134	149	181	226	106	213	206	238	
12	12	473	481	487	488		910	911	909	114	135	150	186	227	109	215	207	FIDU	
13	13	711	712	713	715	718	IRIG "B"	FIDU	725	115	136	151	194	228	110	157	217	240	
14	14	720	721	722	723	724	IRIG "B"	FIDU	726	116	137	152	195	229	111	158	231	241	

Table P-94. Record Assignment Table - Van 9

RECORDER NUMBER	RECORDER TYPE	TRACK													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	CP-100	VOICE	IRIG B	026	027	028	029	030	031	032	033	034	549	036	FIDU
2	CP-100	VOICE	IRIG B	037	038	039	040	801	802	803	804	805	806	807	FIDU
4	CP-100	VOICE	IRIG B	808	809	810	811	812	035	912	913	866	867	868	FIDU
5	CP-100	VOICE	IRIG B	041	042	043	046	047	048	049	050	051	052	053	FIDU
6	CP-100	VOICE	IRIG B	054	055	056	057	058	059	060	061	062	063	064	FIDU
3	SABRE-5	VOICE	IRIG B	001	002	003	004	005	006	007	008	009	010	011	012
		TRACK													
		15	16	17	18	19	20	21	22	23	24	25	26	27	28
		013	014	015	016	017	018	019	020	021	022	023	024	025	FIDU

PART 8

HARD PAN I GENERAL INSTRUMENTATION PLAN

This section addresses areas which are common to all the HARD PAN test events, such as measurement designation, transducers employed, and their connection schemes.

1. MEASUREMENT IDENTIFICATION

a. Measurement Numbers

To each transducer fielded there is assigned a unique measurement number. In general, the measurement number for active measurements consists of three digits, as 001, 184 or 601; for special measurements a letter may be appended as in the series 901, 901A, 901B, 901C. In the latter case there is still only one transducer involved, but its signal output has been conditioned in different ways before recording. Passive measurement numbers begin with the letter P. Measurement numbers for the major HARD PAN Events have been assigned as shown below. FF means free field, S/NF - structure/near field, and BL means BLEST area.

HPI-1	HPI-2A	HPI-2B	HPI-3	
001-020	001-026	001-028	001-040	Blast Pressure
101-186	101-213	101-220	041-247	Acceleration (FF)
301-394	301-378	251-391	251-400	Strain (S)
401-420	401-503	401-460	401-458	Velocity (FF)
421-430	511-520	461-486	461-493	Velocity (S)
-	531-542	-	-	Velocity (BL)
201-257	221-296	501-604	501-640	Acceleration (S/NF)
601-636	601-663	641-691	641-704	Stress (S/NF)
501-504	551-560	711-726	711-724	Displacement (S)
-	701-716	-	-	Acceleration (BL)
-	-	802-809	801-815	Stress (BL)
-	-	925-938	816-827	Strong Motion Seismic
-	-	051-096	851-895	Stress (FF)
	027	029-030	909-911	Waterstop Air Pressure (S)
901-903	901-920	901-918	950-957	Experimental
P1-P32	P1-P40	P1-P45	P1-P57	Passive (S)

b. Measurement Designation System

The Measurement Designation System consists of eight coded sets of letters and numbers which define: (1) the organization establishing the measurement requirement, (2) how the data is recorded, (3) the exact sensing location of the transducer, (4) the basic measurand, and (5) the sensing axis orientation of the transducer. The Measurement Designation has the format

	A	-	A	-	AAAA	-	NN.N	-	NNN	-	NNN.N	-	AA	-	A	A = Letter
Field	1		2		3		4		5		6		7		8	N = Number

Field 1 indicates the organization or AFWL branch establishing the measurement requirement:

F - AFWL/DES-G (Free Field)
S - AFWL/DES-S (Structure Dynamics)
X - AFWL/DED-I (Instrumentation Development)
A - AFWL/DED-A (Simulation Development)

Field 2 indicates the method of data recording:

E - Electronic
M - Mechanical
O - Optical

Field 3 denotes the general location at which the measurement is taken. For HPI-1 five general locations were defined as:

CL - Closure of Structure
LER or US - Upper Structure
LT or LS - Lower Structure
NF - Near Field - Backfilled Excavation Surrounding Structure and Cylindrical Volume Beneath It.
FF - Free Field - Beyond Near Field
BL - BLEST Explosive Area

The fourth, fifth and sixth fields define the optimal sensing locations for the measurement. Field 4 defines the depth below test bed surface (feet) in a cylindrical coordinate system (HPI-1 and HPI-2A, 2B, 3 structure measurements) or the X coordinate in a Cartesian system (HPI-2A, 2B, 3 free field measurements).

Field 5 indicates the azimuthal angle in degrees measured clockwise (looking downward) about the structure axial centerline from a reference 000 azimuth or the Cartesian system Y coordinate.

Field 6 indicates the (horizontal) radial distance in feet from the structure axial centerline or the Cartesian system 2-coordinate.

Field 7 denotes the type of basic measurand:

A - Acceleration
V - Velocity
BP - Blast Pressure
SE - Steel Strain
RD - Relative Displacement
FS - Soil Stress
IP - Interface Pressure (WAM Gage)
IS - Interface Stress (CERF Gage)
IV - Interface Relative Velocity
ID - Interface Relative Displacement

Field 8 indicates the transducer sensing axis orientation:

V - Vertical
H - Horizontal
R - Radial (Horizontal)
T - Tangential or Transverse
VS - Vertical Shear
O - Omnidirectional

A ninth field is normally used to contain the three digit measurement number. The Measurement Designation as described above will appear on all Calcomp and other computer generated plots for the convenience of the data user.

c. Measurand/Polarity Convention

The convention to be followed in setting up transducer output polarities is as follows:

(1) Steel and concrete strains - tension is positive

(2) Blast pressure, normal interface pressure and soil stress - compression is positive

(3) Interface shear stress - model movement down relative to soil to give positive output (Events 1, 2A). Model up relative to soil positive (Events 2B, 3). Model rotation clockwise relative to soil to give positive output.

(4) Acceleration and velocity - motions downward, radially outward, and azimuthally clockwise are positive (Events 1, 2A). Up, out, and clockwise are positive (Events 2B, 3).

(5) Interface relative velocity - model downward with respect to media to yield positive output (Events 1, 2A). Model up relative to media is positive (Events 2B, 3). Model motion clockwise relative to media positive.

(6) Relative displacement - upper model motion down with respect to lower model to yield positive output (Events 1, 2A). Upper model up relative to lower is positive (Events 2B, 3). Upper model motion radially outward relative to lower model for positive output. Model diameter increase is positive. Items (3)-(6) apply to cylindrical coordinate system. Positive motion in the free field Cartesian coordinate system was in the negative X direction (Event 2A), positive X-direction (Events 2B, 3), positive Y-direction (all events), positive Z-direction (Event 2A), and negative Z-direction (Events 2B, 3).

2. TRANSDUCERS

a. Velocity

Both vertical and horizontal velocity measurements will be made using the Sandia DX type velocity gages manufactured by Bell and Howell. Their specifications follow:

(1) Horizontal Velocity Transducer 364137

PERFORMANCE SPECIFICATIONS

Range:	$\pm$ 1 to $\pm$ 500 ft/sec
Undampened Natural Frequency:	3 Hz $\pm$ 0.25 Hz
Resolution:	Infinite
Linearity of Undampened Gauge:	0.5% of full scale
Repeatability of Undampened Gauge:	0.5% of full scale
Hysteresis of Undampened Gauge:	$\pm$ 0.25% of full scale
Shock Load:	5000 "g" any axis

The transducer performance will not be degraded by 5 half-sine acceleration pulses of .30 ms in duration and 5000 "g" magnitude. The special pivots are secured within the head assembly, and when subjected to the above environment,

no degration will occur beyond the specification parameters. The E-core will remain tight and in place during the shock excursion.

Temperature Sensitivity of full range: Less than 1.5% per °C.

Output:	AC differential, compatible with carrier oscillators and amplifiers.
Power Output:	1 watt maximum
Output Impedance:	(28 + j ω 0.18) ohms full bridge nominal
Excitation:	3KHz 10V RMS
Physical Specifications:	See DOD: CEC 364137
Weight:	520 grams

(2) Vertical Velocity Transducer 364142

PERFORMANCE SPECIFICATIONS

Range:	± to ± 500 ft/sec
Undampened Natural Frequency:	3 Hz ± 0.25 Hz
Resolution:	Infinite
Linearity of Undampened Gauge:	0.5% of full scale
Repeatability of Undampened Gauge:	0.5% of full scale
Hysteresis of Undampened Gauge:	± 0.25% of full scale
Zero Adjust:	Capability Provided
Shock Load:	5000 "g" any axis

The transducer performance will not be degraded by 5 half-sine acceleration pulses of .30 ms in duration and 5000 "g" magnitude. The special pivots are secured within the head assembly, and when subjected to the above environment, no degration will occur beyond the specification parameters. The E-core will remain tight and in place during the shock excursion.

Temperature Sensitivity of full range:

Output:	AC differential, compatible with carrier oscillators and amplifiers.
Power Output:	1 watt maximum
Output Impedance:	(28 + j ω 0.18) ohms full bridge nominal
Excitation:	3KHz 10V RMS
Physical Specifications:	See DOD: CEC 364142
Weight:	520 grams

The velocity gage uses a silicone fluid compound manufactured by Dow Corning, Series 210, as a damping fluid. The gage velocity range and response may be changed by using damping fluids of different viscosities. The viscosities currently available and the corresponding approximate linear ranges are:

Viscosity (Centistokes)	Approximate Linear Range (Ft/Sec)
	Brass Pendulum
7000	200
5000	100
3000	75
2000	30
1000	18
500	
200	

Because the damping fluid viscosity is temperature dependent, a number of thermistors will be installed at velocity transducer locations. Accurate calibration of these thermistors will enable the temperatures at the velocity gage locations to be determined through measurement of the thermistor resistances. These temperature determinations will be made frequently and will be logged. Those measurements made just prior to shot time will be used for data reduction.

b. Acceleration

Acceleration measurements for both free field and structures will be made using the following acceleration transducers:

Endevco 2264A-5K-R	5000g
Endevco 2261C-2500	2500g
Kulite GB1000-1000 (Modified)	1000g
Kulite GB1000-500 (Modified)	500g
Endevco 2269C-250	250g
Endevco 2262C-25	25g

Specifications for these gages appear on the following pages.

The Model 2264A Series of Piezoresistive Accelerometers is designed for use in high shock applications. Their small size and low mass assure minimum loading of the test structure.

With a nominal full scale output of 500 millivolts at 10V dc excitation, the accelerometers can be operated directly into voltmeters, oscilloscopes and many recorders without amplification. High resonance frequencies and essentially zero damping allow the accelerometers to respond accurately to fast rise time, short duration shock motion.

Piezite® Type P-16 Elements are utilized in two active arms with fixed internal bridge completion resistors to provide a low impedance full bridge circuit. With a frequency response extending down to dc or steady state acceleration, these accelerometers are ideal for the measurement of long duration motion.

Two times actual size

COMMON SPECIFICATIONS FOR THE 2264A SERIES ACCELEROMETERS
(According to ANSI and ISA Standards)

DYNAMIC

RANGES AVAILABLE	±5,000, ±10,000, ±20,000, ±50,000 g pk
OUTPUT, FULL SCALE	500 mV nominal
THERMAL SENSITIVITY SHIFT	+15/0/−15% nominal, at 0/75/150°F
Q, AT RESONANCE	50 dB, nominal
DAMPING FACTOR	0.002, nominal
TRANSVERSE SENSITIVITY	Designed for 5%, nominal

ELECTRICAL

EXCITATION[1]	10.0 V dc
ZERO MEASURAND OUTPUT	±50 mV dc maximum, at 75°F (24°C)
THERMAL ZERO SHIFT	±30 mV dc maximum, at 0°F and 150°F (−18°C and 66°C) reference 75°F
INPUT RESISTANCE (full bridge)	500 ± 100 ohms (−50 K-R: 700 ± 150 ohms)
OUTPUT RESISTANCE (full bridge)	500 ± 100 ohms (−50 K-R: 850 ± 200 ohms)
BRIDGE COMPLETION RESISTORS	500 ± 100 ohms
INSULATION RESISTANCE[2]	100 MΩ minimum at 100 V dc

NOTES:

[1]Unit is calibrated with 10.0 Volts dc excitation. Warmup time to meet all specifications is one minute. The Endevco® Model 4203 Power Supply or Model 4470 Universal Signal Conditioner is recommended as the excitation source.

[2]The sensing elements, case, and cable shield are insulated from each other. To shield the sensing elements from stray electric fields, ground the case by removing the anodize on the flange under a screw head.

[3]The suffix R after the part number indicates that bridge completion resistors are mounted within the transducer.

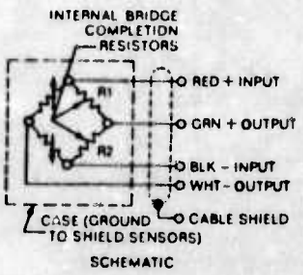
[4]Model 2264A-50K-R has been designed to withstand 100,000 g in sensitive axis, but is not tested to this level.

[5]Recommended minimum pulse duration for half-sine or triangular pulses to avoid excessive high frequency ringing. See Endevco® Piezoresistive Instruction Manual.

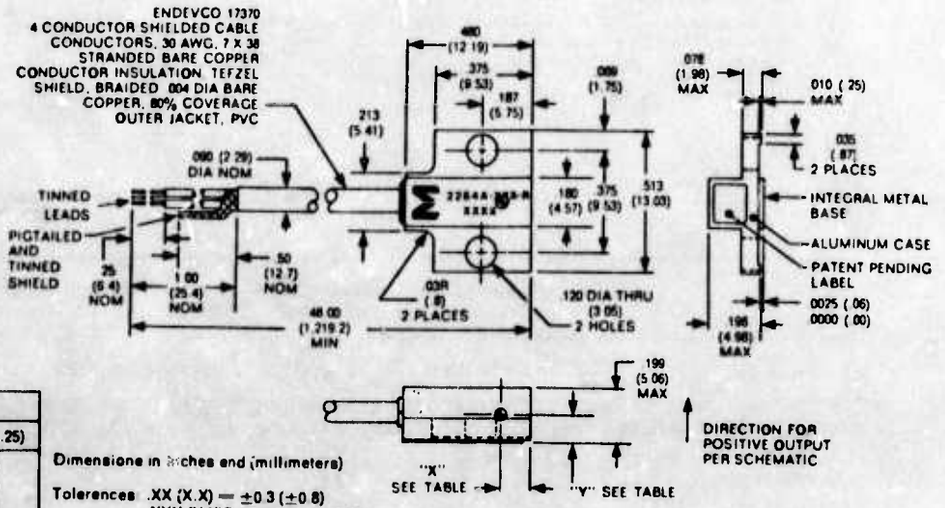
TABLE OF SPECIFIC CHARACTERISTICS

Dash Number[3]	-5K-R	-10K-R	-20K-R	-50K-R
Range, g pk	±5,000	±10,000	±20,000	±50,000
Sensitivity, mV/g, at 10 V dc, nom:	0.100	0.050	0.025	0.010
minimum:	0.075	0.037	0.018	0.007
Mounted Resonance Frequency, Hz nominal	50,000	70,000	100,000	180,000
Useful Frequency Response, Hz, dc to	8,000	9,000	12,000	30,000
Environmental Acceleration Limits Sensitive Axis, g pk	±12,500	±25,000	±50,000	±100,000[4]
Transverse Axis, g pk	±12,500	±25,000	±30,000	±50,000
Minimum Half-Sine Pulse Duration[5], μs	125	90	65	30

COMMON SPECIFICATIONS FOR THE 2264A SERIES



SCHEMATIC



CENTER OF SEISMIC MASS		
RANGE	"X" ± .030 (.76)	"Y" ± .010 (.25)
5,000 g	.094 (2.39)	.100 (2.54)
10,000 g	.090 (2.29)	.100 (2.54)
20,000 g	.099 (2.52)	.100 (2.54)
50,000 g	.105 (2.67)	.081 (2.06)

Dimensions in inches and (millimeters)

Tolerances .XX (X.X) = ±0.3 (±0.8)
.XXX (X.XX) = ±0.010 (±0.25)

PHYSICAL

WEIGHT	1.5 grams nominal, excluding cable
SENSING ELEMENTS	Piezite® Type P-16
CASE MATERIAL	Anodized Aluminum Alloy
BASE BLOCK MATERIAL	Nickel Alloy
CABLE	4-conductor integral shielded cable, 48 inches (1.2 m) long minimum, Tefzel insulated conductors, gray PVC jacket, Endevco P/N17370
MOUNTING[4]	Two flanges, drilled to clear 4-40 screws. Recommended mounting torque: 6 in-lb (0.68 Nm) maximum.
ACCESSORIES SUPPLIED	Two each EH470, 4-40 x ¼ cap screws; two 17147, flat, size 4 special washers; EHM464 hex key wrench; protective sleeve[7].

ENVIRONMENTAL

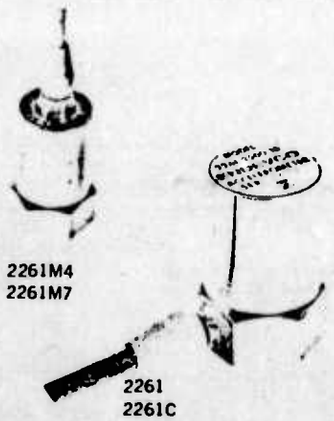
ACCELERATION LIMITS	See Table
TEMPERATURE RANGE	Operating: 0°F to 150°F (−18°C to 66°C) Non-Operating: −65°F to 200°F (−54°C to 93°C)
HUMIDITY	Epoxy sealed

NOTES: [4]Test surface must be flat to within 0.001 in. TIR and lightly greased[5] to obtain good coupling between accelerometer and test mounting surface. Tighten each screw with the fingers, then torque each screw alternately, in 1 in-lb increments to the recommended mounting torque. Screw heads must not touch case walls. Check torque on each screw after each shock input. If check is not feasible, lock screw with safety wires, an anaerobic thread sealant or other suitable means. [5]Dow Corning High Vacuum Grease is recommended.

[7]*Important:* Keep protective sleeve on unit while accelerometer is not mounted. Although these accelerometers are rated for an acceleration limit several times their operating range, they must be handled with care.

The Models 2261 and 2261C Accelerometers are designed as general purpose shock accelerometers for measurement of moderate to long duration shocks in the ±2500 g range. The high natural frequency of these units (greater than 30 kHz) and low damping (.01 of critical) permit accurate reproduction of rapid rise time inputs, while their DC response follows the longest pulses without droop or undershoot.

These transducers use Piezite® Type P-9 elements in a full bridge circuit to obtain a high level output at low impedance. The 2261C is a six-wire device that uses a pair of fixed resistors for half of the bridge to present a constant and known resistance to the extra pair of leads for shunt calibration techniques.



2261M4
2261M7

2261
2261C

Specifications for the Model 2261 and 2261C Accelerometers

(According to USASI and ISA Standards)

DYNAMIC	Model 2261	Model 2261C
RANGE	±2500 g	±2500 g
SENSITIVITY (at rated excitation)	0.1 mV/g nominal	0.05 mV/g nominal
EXCITATION	10 Vdc[1]	10 Vdc[1]
INPUT RESISTANCE	510 Ω nominal	330 Ω nominal
OUTPUT RESISTANCE	330 Ω nominal	375 Ω nominal
MOUNTED RESONANT FREQUENCY	31,000 Hz nominal	31,000 Hz nominal
FREQUENCY RESPONSE (±5%)[4]	0 to 6000 Hz	0 to 6000 Hz
DAMPING (approximately)	.01 of critical	.01 of critical
TRANSVERSE SENSITIVITY	3% maximum[2]	3% maximum[2]
LINEARITY (END POINT) AND HYSTERESIS	±2% of range	±2% of range
ZERO BALANCE (at rated excitation and +75°F)	±25 mV maximum	±3.5 mV maximum
THERMAL ZERO SHIFT	±12 mV, maximum, at −65°F and +250°F, ref. +75°F.	±6 mV, maximum, at −65°F and +250°F, ref. +75°F.
THERMAL SENSITIVITY SHIFT	−10% maximum, at −65°F and −250°F, ref. +75°F.	
INSULATION RESISTANCE[3]	100 MΩ minimum at 100 Vdc.	
WARMUP TIME	1 minute to meet all specifications.	

NOTES

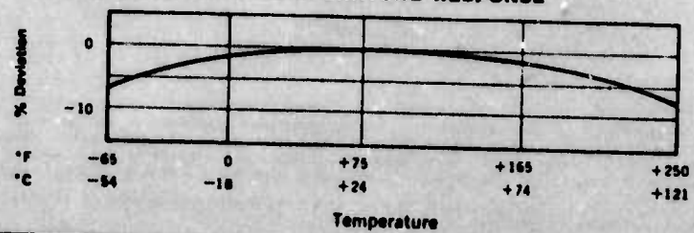
[1]Unit is calibrated at 10 Vdc. It may be operated at lower voltages but should be specified at time of order. ENDEVCO® Model 4201 or 4203 Power Supplies or Model 4400 Signal Conditioners are recommended as the excitation source.

[2]Worst case error in any axis perpendicular to sensitive axis.

[3]All leads to case (shield is common to case ground).

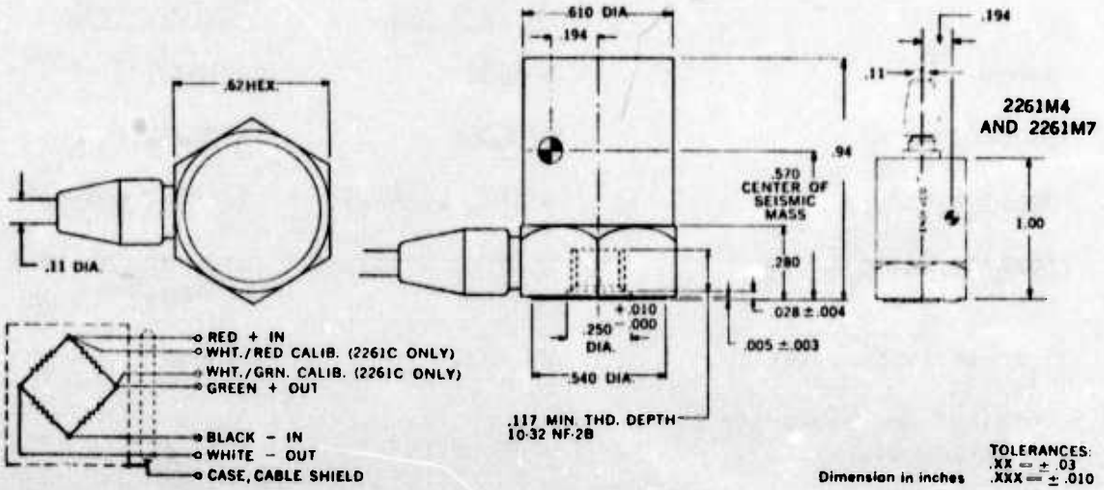
[4]In shock measurements, minimum pulse duration for half sine or trianguler pulses should exceed 0.17 milliseconds to avoid high frequency ringing. See Endevco Accelerometer Manual.

TYPICAL SENSITIVITY-TEMPERATURE RESPONSE



The curve left shows typical deviation of sensitivity with temperature. Note that although the accelerometer is well compensated over the entire range from −65°F to +250°F, there is an inner range from 0°F to +165°F over which sensitivity is extremely flat, typically less than 3% total deviation. The great majority of measurements will fall within this smaller interval.

Specifications for the Model 2261 and 2261C



PHYSICAL

WEIGHT	35.5 grams (1.25 oz.) nominal plus cable
MATERIAL	Stainless Steel
SENSING ELEMENT	Piezite® Element Type P-9
MOUNTING	Base tapped for 10-32 NF x ⅛" stud Recommended mounting torque: 18 in.-lb (20 kg-cm)
ELECTRICAL CONNECTION	2261: Two feet of integral four-conductor shielded cable, tinned leads. 2261C: Two feet of integral six-conductor shielded cable, tinned leads.
GROUNDING	Circuit is isolated, shield is common to case
ACCESSORIES INCLUDED	Mounting Stud Model 2981-3 (10-32)
OPTIONS AVAILABLE	Model 2261M4, same as Model 2261 except with top connector. Model 2261M7, same as Model 2261C except with top connector.

ENVIRONMENTAL

STATIC ACCELERATION	±7500 g
VIBRATION	±7500 g
SHOCK	±7500 g, 150 μsec half-sine pulse or longer
TEMPERATURE RANGE	
Compensated:	−54°C to +121°C (−65°F to +250°F)
Environmental Limits:	−73°C to +149°C (−100°F to +300°F)
HUMIDITY	Unit is epoxy sealed

SPECIFICATIONS FOR KULITE ACCELEROMETER MODEL NOS. GB-1000-500 & GB-1000-1000 MODIFIED

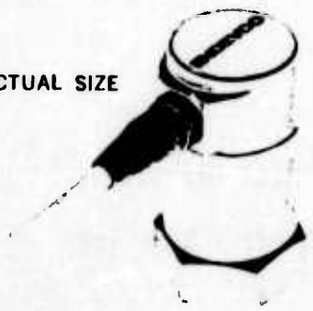
	GB-1000-500	GB-1000-1000
Range	± 500G	± 1000G
Over-Range	± 3500G	± 7000G
Mounted Natural Freq.	9 KHZ, nominal	14 KHZ, nominal
Damping Ratio	0.01 of critical nominal	0.01 of critical nominal
Transverse Sensitivity	3% max.	3% max.
Combined Non Linearity & Hysteresis	± 1% of F.S.	± 1% of F.S.
Sensitivity	0.2 mV/g, nominal	0.1 mV/g, nominal
Excitation	10 volts DC (or ACRMS)	
Input Impedance	1000 ohms nominal	
Output Impedance	500 ohms nominal	
Zero Output	± 3% of F. S. maximum	
Insulation Resistance	100 megohm min. @ 50 VDC	
Operating Temperature	-65 F to +250 F	
Compensated Temperature Range	0° F to +120 F	
Thermal Zero Shift	± 3mv over compensated temp. range	
Thermal Sensitivity Shift	± 2% over Compensated Range	
Size	5/8 hex x .785 max. height	
Weight	25 grams nominal, exclusive of cable	
Mounting	10-32 tapped hole, 10-32 threaded MTG stud furnished	
Electrical Connection	3 ft. of 5 conductor #28 AWG, shielded cable integral with unit	

Compensation	Span and zero shift components contained within unit. In addition a shunt calibration resistor to simulate 50% (nominal) of full scale with a preselected TCR that minimizes temperature effects. Shunt calibration is put into effect by shorting the 5th lead to output terminal of bridge (See Schematic
Case Material	316 Stainless Steel
Accessories Supplied	Mounting stud and Calibration Data

The Model 2260 and 2260C Accelerometers were designed to provide measurement of static and dynamic accelerations at a high signal-to-noise ratio, often without the need of auxiliary amplifications. This unique design with its high natural frequency and near zero damping provides for response from steady state to 2000 Hz without phase shift, over the entire compensated temperature range of −65° F to +250° F.

These transducers use Piezite® Type P-9 elements in a full bridge circuit to obtain a high level output at low impedance. The 2260C is a six-wire device that uses a pair of fixed resistors in half the bridge to present a fixed resistance to the extra pair of leads for shunt calibration techniques.

ACTUAL SIZE



Specifications for Model 2260 and 2260C Accelerometers

(According to USASI and ISA Standards)

DYNAMIC	Model 2260	Model 2260C
RANGE	−250 g to + 250 g	−250 g to +250 g
SENSITIVITY (at rated excitation)	1.3 mV/g nominal 1.0 mV/g minimum	0.62 mV/g nominal 0.50 mV/g minimum
EXCITATION	10 Vdc[1]	10 Vdc[1]
INPUT RESISTANCE	500 Ω nominal	333 Ω nominal
OUTPUT RESISTANCE	500 Ω nominal	375 Ω nominal
MOUNTED RESONANT FREQUENCY	14 kHz nominal 10 kHz minimum	14 kHz nominal 10 kHz minimum
FREQUENCY RESPONSE (±5%)[4]	0 to 2000 Hz	0 to 2000 Hz
DAMPING (approx.)	.01 of critical	.01 of critical
TRANSVERSE SENSITIVITY	3% maximum[2]	3% maximum[2]
LINEARITY (END POINT) AND HYSTERESIS	±1% of range	±1% of range
ZERO BALANCE (at rated excitation and +75° F)	±7 mV maximum	±3.5 mV maximum
THERMAL ZERO SHIFT	±12 mV at −65° F and +250° F, maximum, ref. +75° F.	±6 mV at −65° F and +250° F, maximum, ref. +75° F.
THERMAL SENSITIVITY SHIFT	−10% maximum, at −65° F and −250° F, ref. +75° F.	
INSULATION RESISTANCE[3]	100 MΩ minimum at 100 Vdc.	100 MΩ minimum at 100 Vdc.
WARMUP TIME	1 minute	1 minute

NOTES

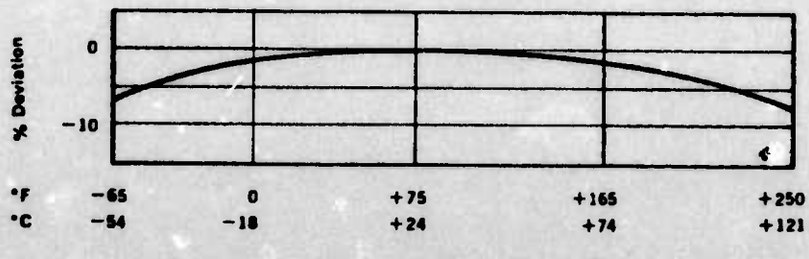
[1]Unit is calibrated at 10 Vdc. It may be operated at lower voltages but should be specified at time of order. ENDEVCO® Model 4201 or 4203 Power Supplies or 4400 Signal Conditioners are recommended excitation source.

[2]Worse case error in any axis perpendicular to sensitive axis. 1% spec available on special order.

[3]All leads to case (shield is common to case ground).

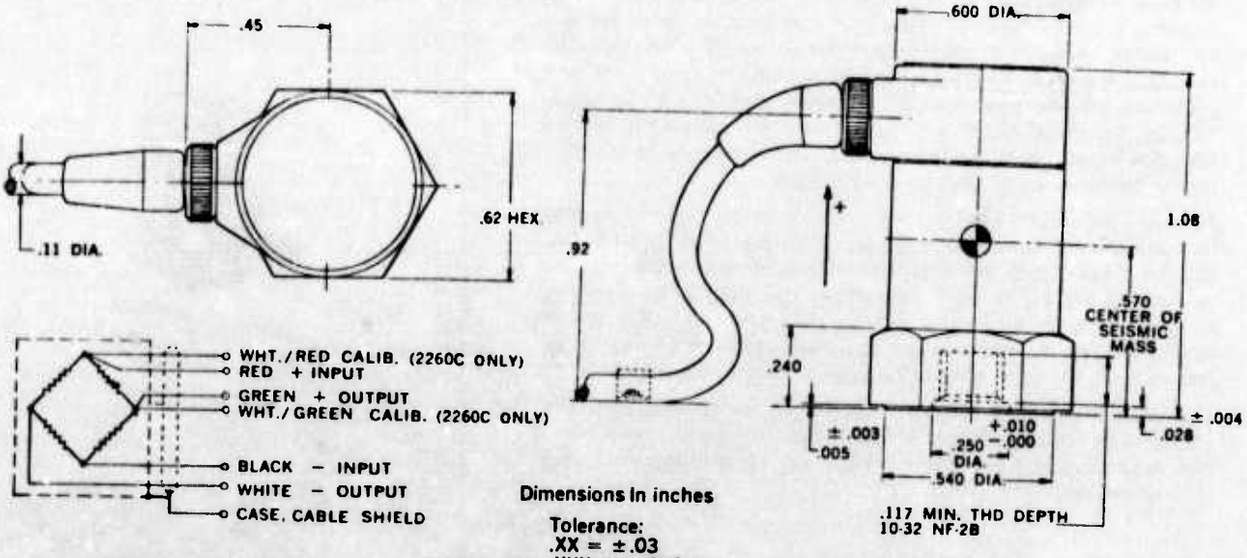
[4]In shock measurements, minimum pulse duration for half sine or trianguler pulses should exceed 0.5 milliseconds to avoid high frequency ringing. See Endevco Accelerometer Manual.

TYPICAL SENSITIVITY-TEMPERATURE RESPONSE



The curve shows typical deviation of sensitivity with temperature. Note that although the accelerometer is well compensated over the entire range from −65° F to +250° F, there is an inner range from 0° F to +165° F over which sensitivity is extremely flat, typically less than 3% total deviation. The great majority of measurements will fall within this smaller interval. Specially compensated accelerometers are available for use over a narrower range.

Specifications for Models 2260 and 2260C



Dimensions in inches

Tolerance:
.XX = ±.03
.XXX = ±.010

PHYSICAL

WEIGHT	35.5 grams (1.25 oz.) nominal, plus cable
MATERIAL	Stainless Steel
SENSING ELEMENT	Piezite® Element Type P-9
MOUNTING	Base tapped for 10-32 NF x ⅛" stud. Recommended mounting torque: 18 in.-lb. (20 kg-cm)
ELECTRICAL CONNECTION	2260: Two feet of integral four-conductor shielded cable, tinned leads. 2260C: Two feet of integral six-conductor shielded cable, tinned leads.
GROUNDING	Circuit Isolated, shield common to case.
ACCESSORIES INCLUDED	Model 2981-3 Mounting Stud (10-32)

ENVIRONMENTAL

STATIC ACCELERATION	±750 g
VIBRATION	±750 g (frequencies below 2500 Hz)
SHOCK	±750 g, 500 μsec half-sine pulse, or longer.
TEMPERATURE RANGE	Compensated: −65° F to +250° F (−54° C to +121° C) Environmental Limit: −100° F to +300° F (−73° C to +149° C)
HUMIDITY	Unit is epoxy sealed.

The Models 2262-25 and 2262C-25 Accelerometers are designed to measure a broad variety of long duration, low level acceleration phenomena. Endevco PIEZITE® Type P-11 elements are employed in a full bridge circuit to obtain a high level output of ±500 millivolts at ±25 g full scale. This output is high enough to drive most tape recorders and low frequency galvanometers directly without amplification. The Model 2262C is a 6-wire device that uses a pair of fixed resistors in half the bridge to present a fixed resistance to the extra pair of leads for shunt calibration techniques.

Although the rated range of these transducers is ±25 g, they may be used to ±50 g. A unique system of overrange stops (U.S. Pat. No. 3,474,526) limits the movement of the seismic element at accelerations of 60 g or more. This allows the units to withstand up to 80 times their rated range without calibration shift. The use of subcritical viscous damping extends their usefut frequency range and reduces the effect of spurious, high frequency vibrations.

Typical applications for these accelerometers include transportation environment testing, transient accelerations on large structural members, and combined environments of steady state acceleration plus transient inputs.

ACTUAL SIZE

SPECIFICATIONS FOR MODEL 2262-25 and 2262C-25 ACCELEROMETERS

(According to ANSI and ISA Standards)

DYNAMIC	MODEL 2262-25	MODEL 2262C-25
Rated Range	−25 to +25 g	−25 to +25 g
Useful Range	±50 g	±50 g
Overrange Limiting	±60 to ±150 g[1]	±60 to ±150 g[1]
Sensitivity (at 10 V dc)	20 mV/g, nominal	10 mV/g, nominal
Mounted Natural Frequency	2500 Hz, nominal	2500 Hz, nominal
Frequency Response	±5%, 0 to 750 Hz at +72°F (+22°C); −35%/+10%, nominal at 0°F/+200°F and 750 Hz.	
Damping Ratio (at +72°F)	0.7, nominal	0.7, nominal
Transverse Sensitivity	3% maximum[2]	3% maximum[3]
Linearity and Hysteresis	±1% of reading, maximum, to ±25 g; ±3% of reading, nominal, to ±50 g.	
Thermal Sensitivity Shift	−4%/0/−9%, nominal, at 0°/+72°/+200°F	

ELECTRICAL		
Excitation[3]	10 V dc	10 V dc
Input Resistance (at +72°F)	2100 Ω, nominal	1000 Ω, nominal
Output Resistance (at +72°F)	1400 Ω, nominal	1000 Ω, nominal
Zero Measurand Output (at 10 V dc and +72°F)	±25 mV	±25 mV
Thermal Zero Shift	±15 mV, maximum at 0°F and +200°F, reference +72°F.	
Insulation Resistance[4] (at 100 V dc)	100 MΩ, minimum	100 MΩ, minimum

NOTES:

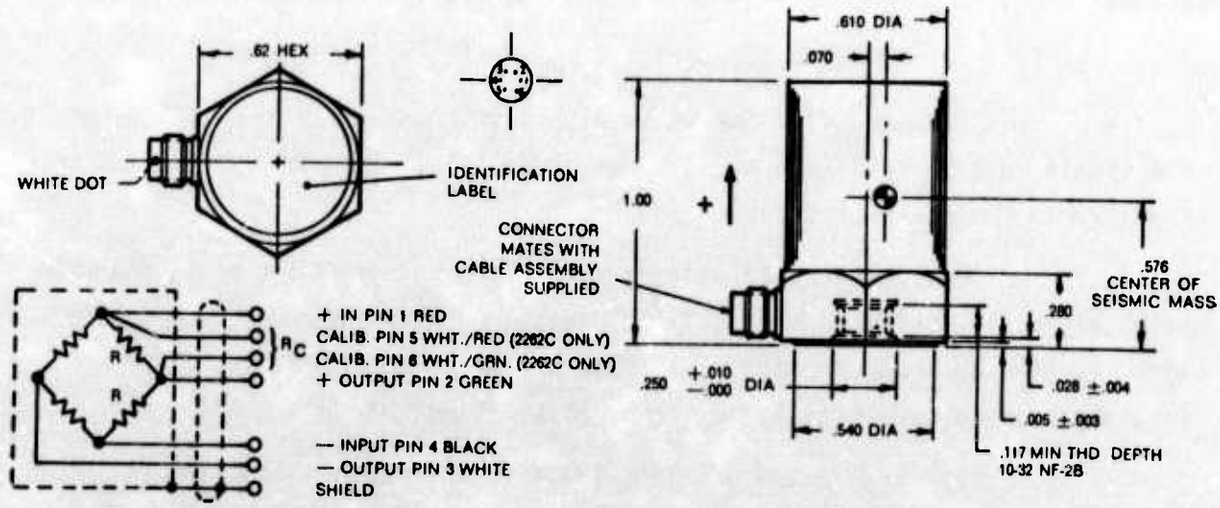
[1]Unit output is continuous between rated range and the effective limit point, with performance to ±50 g as noted.

[2]Worst case error in any axis perpendicular to the sensitive axis. 1% selection is available on special order.

[3]Unit is calibrated at 10 V dc. Lower excitation voltages may be employed but should be specified at time of order to obtain best thermal compensation. Warmup time to meet all specifications is 1.5 minutes, maximum. Endevco® Model 4203 or 4204 Power Supplies, or Model 4470 Signal Conditioner are recommended as the excitation source.

[4]All leads to case (shield is common to case ground).

SPECIFICATIONS FOR MODEL 2262-25 and 2262C-25



In model 2262C, R = 10000Ω ±1%

Dimensions in inches

Tolerances: .XX = ±0.03
.XXX = ±0.010

PHYSICAL

WEIGHT		28 gram (1 oz.), nominal, plus cable at 6 gram (0.2 oz.) per foot.
MATERIAL		Stainless Steel
SENSING ELEMENTS		PIEZITE® Type P-11
MOUNTING		Tapped hole for 10-32 x ⅛" stud. Recommended mounting torque: 18 in.-lb. (20 kg-cm).
ELECTRICAL CONNECTION		Integral 6-pin connector.
ACCESSORIES INCLUDED		Model 2981-3 Mounting Stud (10-32), or Model 2981-4 (M5 metric).
	2262-25:	Model 3022-30 Cable Assembly, 4-conductor, shielded, 30 inches long, with accelerometer mating connector.
	2262C-25:	Model 3023-30 Cable Assembly, 6-conductor, shielded, 30 inches long, with accelerometer mating connector.

ENVIRONMENTAL

ACCELERATION LIMITS	Static:	2000 g, in any direction
	Vibration:	1000 g pk, in any direction
	Shock:	2000 g, in any direction
TEMPERATURE RANGE	Operating:	0°F to +200°F (−18°C to +93°C)
	Non-operating:	−20°F to +220°F (−29°C to +104°C)
HUMIDITY		Hermetically sealed by glass to metal fusion and welding.
BASE STRAIN SENSITIVITY		0.05 equivalent g, maximum, at 250 μ in./in. strain.

c. Blast Pressure

All blast pressure measurements will be made with the Kulite HKS-5-375 series of blast pressure transducers. Specifications for these gages are as follows:

(1) Kulite HKS-5-375 Series Blast Pressure Transducer

The HKS-5-375 Series of high pressure transducers is the result of a significant state of the art advance by Kulite in the employment of microcircuitry in the field of transducers.

Manufactured by using a monolithic integrated circuit Wheatstone bridge atomically diffused on a silicon diaphragm, these devices combine the major features of microcircuitry: substantial size reduction, excellent repeatability and relaibility, low power dissipation, etc.

The high output and the low output impedance inherent in piezoresistive sensors make the transducers suitable for operation in hostile enviornments and obviate the requirement for expensive signal conditioning equipment, such as charge amplifiers and impedance matching devices.

The miniaturization process also yields a marked increase in the natural frequencies of the transducers making them suitable of blast and shock pressure measurements.

The small size, flush diaphragm and robust construction of the HKS-5-375 enable installation of the transducer directly in the wall of pressure containers eliminating costly, space consuming hardware.

The microcircuity techniques and the miniaturization process employed in the Kulite sensors combine tc yield a novel and improved device making possible reliable pressure measurements in areas previously inaccessible with conventional transducers.

The HKS-5-375 transducer is installed in a 3/8-24 threaded hole with sealing accomplishes by a copper washer. The sensing surface is covered by a silicone based thermal barrier material (GE TBS-758).

SPECIFICATIONS

	HKS-5-375-5000	HKS-5-375-10000
Pressure		
Rated (psi)	5000	10000
Maximum (psi)	7500	15000
Output-nominal (mV)	125	110
Acceleration Sensitivity		
Perpendicular (% FS/g)	.00003	.00002
Transverse (% FS/g)	.000006	.000004
Natural Frequency (kHz)	675	700
Bridge Type	Fully active four arm Wheatstone bridge diffused into silicon diaphragm	
Bridge Excitation	5V DC or AC	
Bridge Impedance	350 ohms nom.	
Zero Balance	± 7% FS	
Combined Non-Linearity and Hysteresis	± 1% FS	
Repeatability	0.25%	
Operating Temperature	-65°F to +300°F (-55°C to 150°C)	
Change of Sensitivity with Temperature	± 6%/100°F	
Resolution	Infinite	

d. Structure Steel Rebar Strain Gages

During construction of the LER and LT, strain gages were bonded to the rebar structure at selected locations to measure various vertical, tangential and radial strains in the rebar. The strain gages employed were the Type EA-06-125TG-350 manufactured by Micro-Measurements of Romulus, Michigan. The gages were applied in pairs, one on each side of the prepared rebar. Each of the gages is of planar rosette configuration, with one part sensitive to strain in the longitudinal direction and the other circumferentially. The two gages on opposite sides of the rebar are connected electrically in a full bridge configuration.

e. Soil Stress

Soil Stress measurements will be made using the SE gage manufactured by Waterways Experiment Station (WES). Specification for this gage are as follows:

Gage output (approximately)	0.20 mv/v/psi
Linear range	0 to 1800 psi
Design pressure	500 psi
Max pressure limit	2000 psi
Linearity, max	0.4 percent full range
Hysteresis, max	1.6 percent full range
Temperature range	-30 to +150 F
Suggested excitation	6 to 10 volts
Max excitation	21 volts
Acceleration sensitivity normal to diaphragm	< 0.04 psi/g
Apparent strain sensitivity	20 to 30 μin./in./psi
Thermal sensitivity (zero shift)	1 psi/F
Natural frequency	40,000 Hz
Rise time	6 μsec
Gage modulus	4.52 x 10^5 psi

f. Relative Displacement

(1) Radial Motion

Two rectilinear potentiometers to be used to measure diametral distortion of the LT are the Model 111 manufactured by Computer Instruments Corporation (CIC)

The CIC rectilinear potentiometers are standard slide-wire potentiometers in which a wiper moves over a resistance element as a shaft travels in or out of the potentiometer body.

Electrical Specifications are as follows:

Resistance	2,000 ohms ± 10%
Electrical Stroke	4 inches ± 0.005
Linearity	1% electrical stroke
Dissipation	1 watt/inch
Temperature Range	-55° to +150°C
Dielectric Strength	750 volts RMS

Mechanical Specifications are as follows:

Mechanical Travel Beyond Electrical Stroke	+ 1/16; - 0
Starting Force (Max)	8 oz @ 25°C
Stroke Velocity	50 inches/sec
Shaft is Free to Rotate	
Weight	Approx 6 ounces

The potentiometer is electrically connected into the sensing circuitry as two arms of a full bridge with the bridge completion resistors located in the Splice Bunker.

(2) Vertical Motion

Two measurements will be made of the relative vertical motion of the LER with respect to the LT using a position/displacement transducer incorporating a multiple turn linear potentiometer of Lockheed manufacture. The potentiometer is attached to the top of the LT and the end of the cable responsible for driving the wiper is attached to the LER. Relative motion between the two results in the cable being drawn out of or pulled back into the potentiometer housing. This cable motion is translated into motion of the wiper along the potentiometer resistance element. The potentiometer is connected as two arms of a full bridge, with the bridge completion resistors being located in the Splice Bunker.

g. Relative Velocity

The CERF developed relative velocity gage measures the relative velocity between two adjacent media. The gage is in two parts with a permanent magnet being embedded in one medium and a conducting coil embedded in the other. The voltage generated across the coil as a result of changing flux linkages when the magnet moves relative to the coil can be related to the relative velocity of the two media.

Figure P-44 illustrates schematically the configuration of a typical relative velocity gage installation. The coil, which is long and cylindrical, may be replaced by several coils connected in series to give greater sensitivity. Since linear gage response is lost when the magnet nears the ends of the sensing coil, the length of coil to be used in a particular application must take into account the expected relative displacements of the two media.

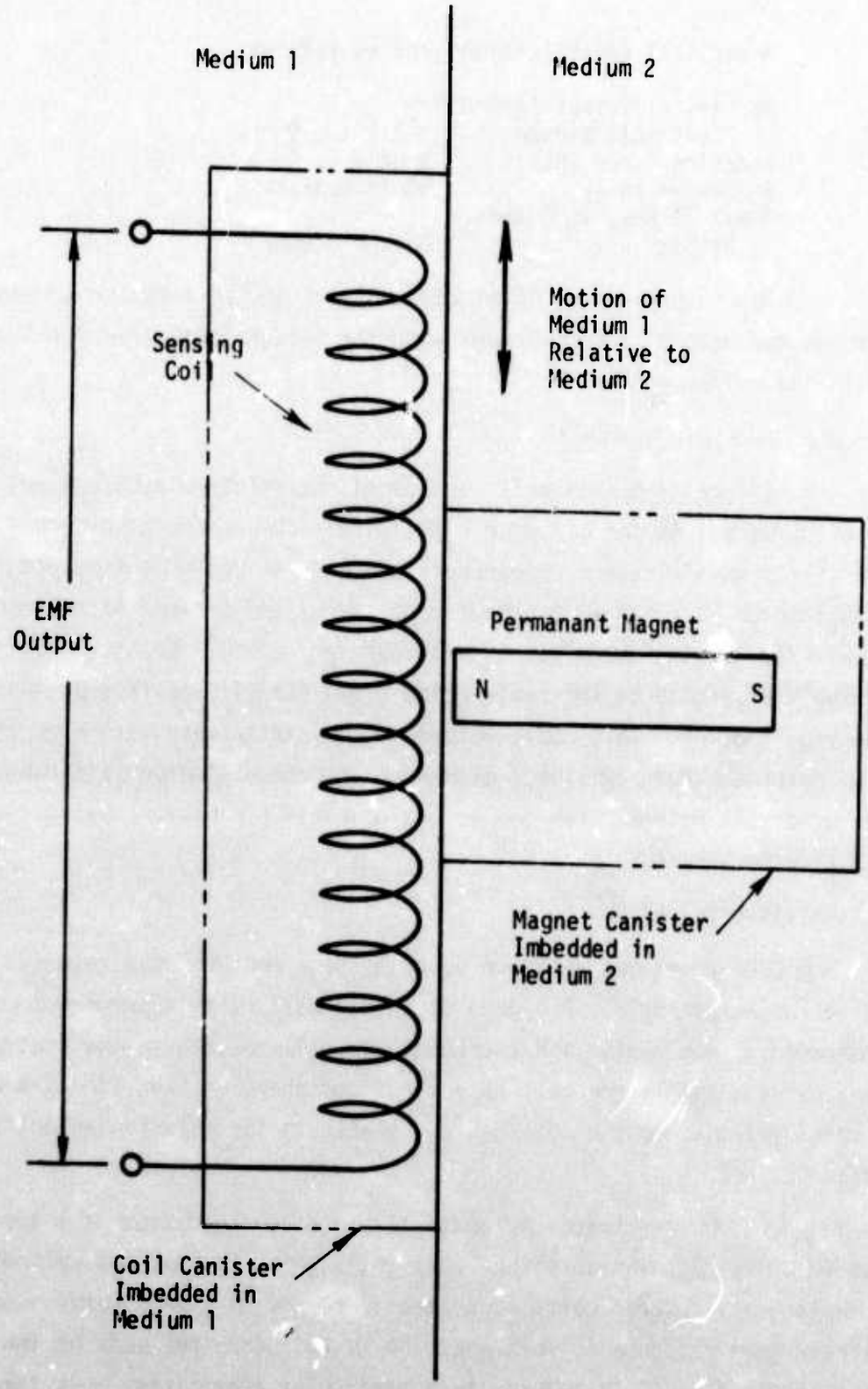


Figure P-44. CERF Single Degree of Freedom
Relative Velocity Gage

h. Interface Stress

The CERF developed interface stress transducer is designed to measure both the normal stress at the interface between two media and the shear stress. Measurement of the normal stress is done by measuring the compression of a steel column. Measurement of shear stress is accomplished by measuring the bending of the same end-loaded column. Figure P-45 is a cross section of the gage showing a typical installation at an interface, with the gage case being embedded in medium 1 and the end of the sensing column in contact with medium 2. Semiconductor strain elements are bonded to both the primary and secondary elements to sense their deformations.

For sensing column compression (normal stress measurement), both an n-type and a p-type element are bonded to opposite sides of the primary column. These are connected together in a full bridge configuration.

For sensing column bending (shear stress measurement), p-type strain elements are bonded to opposite sides of both the primary and secondary columns. The two columns are identical in both dimensions and mass so that acceleration effects can be cancelled out when the strain elements are connected to yield two arms of a full bridge. Bridge completion is accomplished with two external resistors. Although only the vertical component of shear stress will be measured in the DISC HEST event, additional strain sensing elements could be added to the gage to read shear stress in the horizontal (tangential) direction.

i. Interface Pressure

The gage which will be used to measure the pressure exerted on the structure by the surrounding medium is known as the WAM gage. It is essentially a load-cell type device dependent for its output on the compression of a strain-gaged column. Mechanical features of the gage are as illustrated in figure P-46 The four strain gage elements bonded to the load spool are connected electrically in a full bridge configuration.

For the DISC HEST event twelve WAM gages were cast into the structure at the time of construction, ten in the LER and two in the LT.

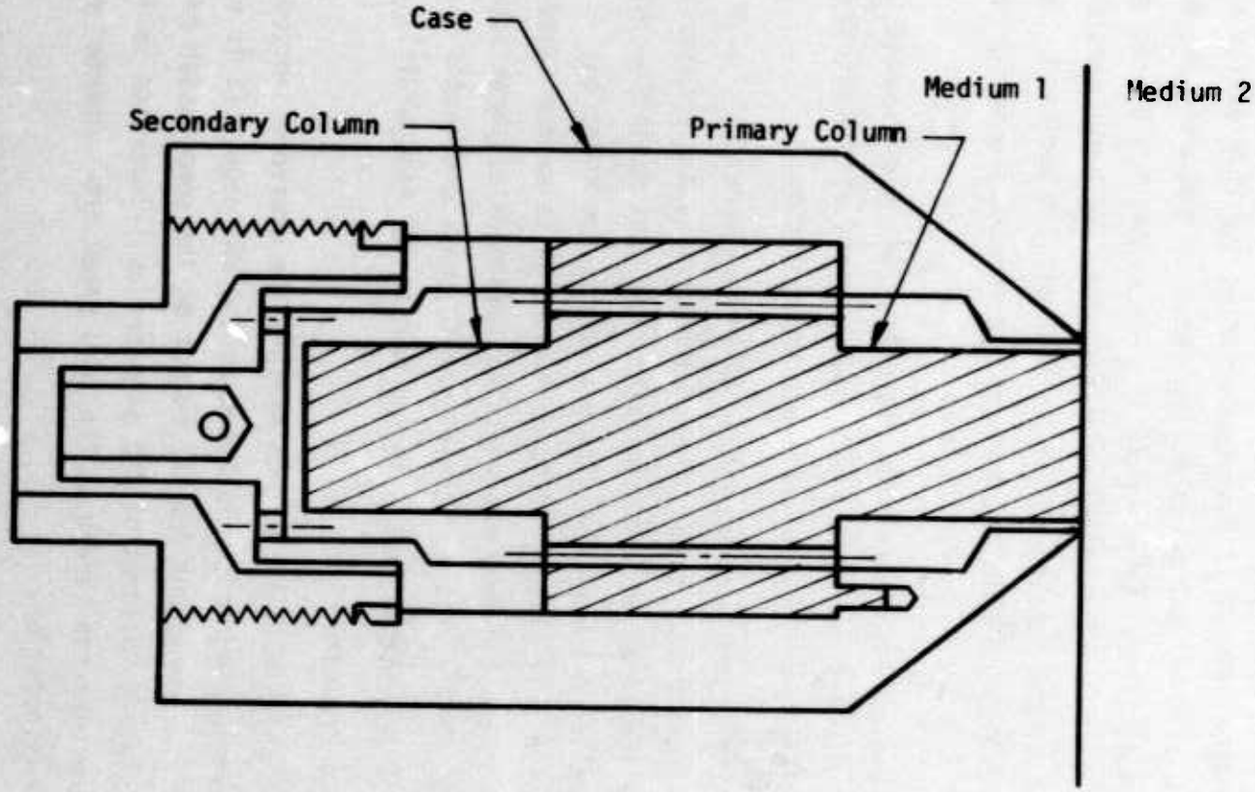


Figure P-45. CERF Interface Stress Gage

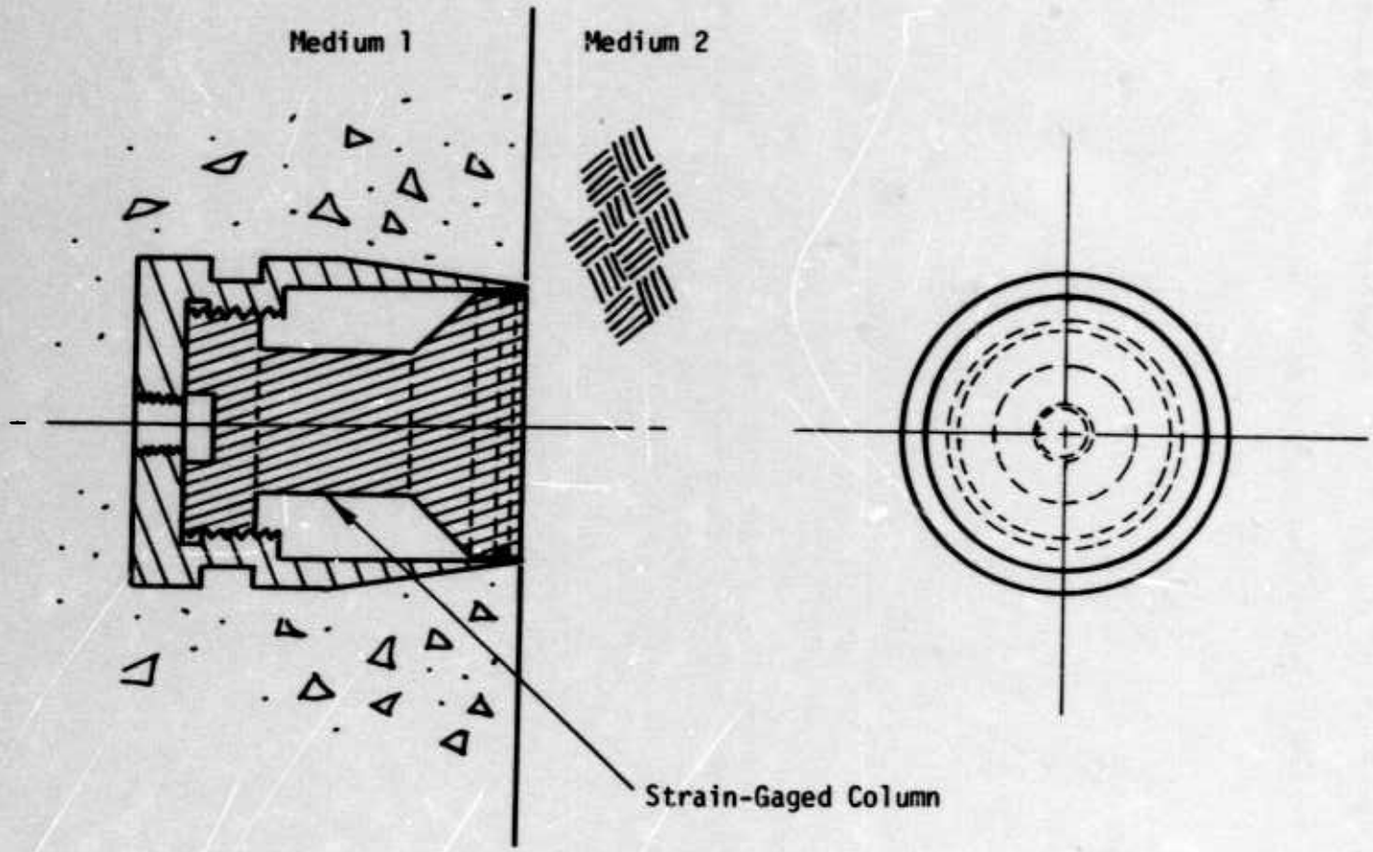


Figure P-46. WAM Interface Pressure Gage

j. Passive Scratch Gages

As a backup to the active motion instrumentation a number of scratch gages will be installed to measure relative motions of the two parts of the model and the motion of the upper part of the model with respect to the surrounding soil. These scratch gages are illustrated in figures P-47 and P-48.

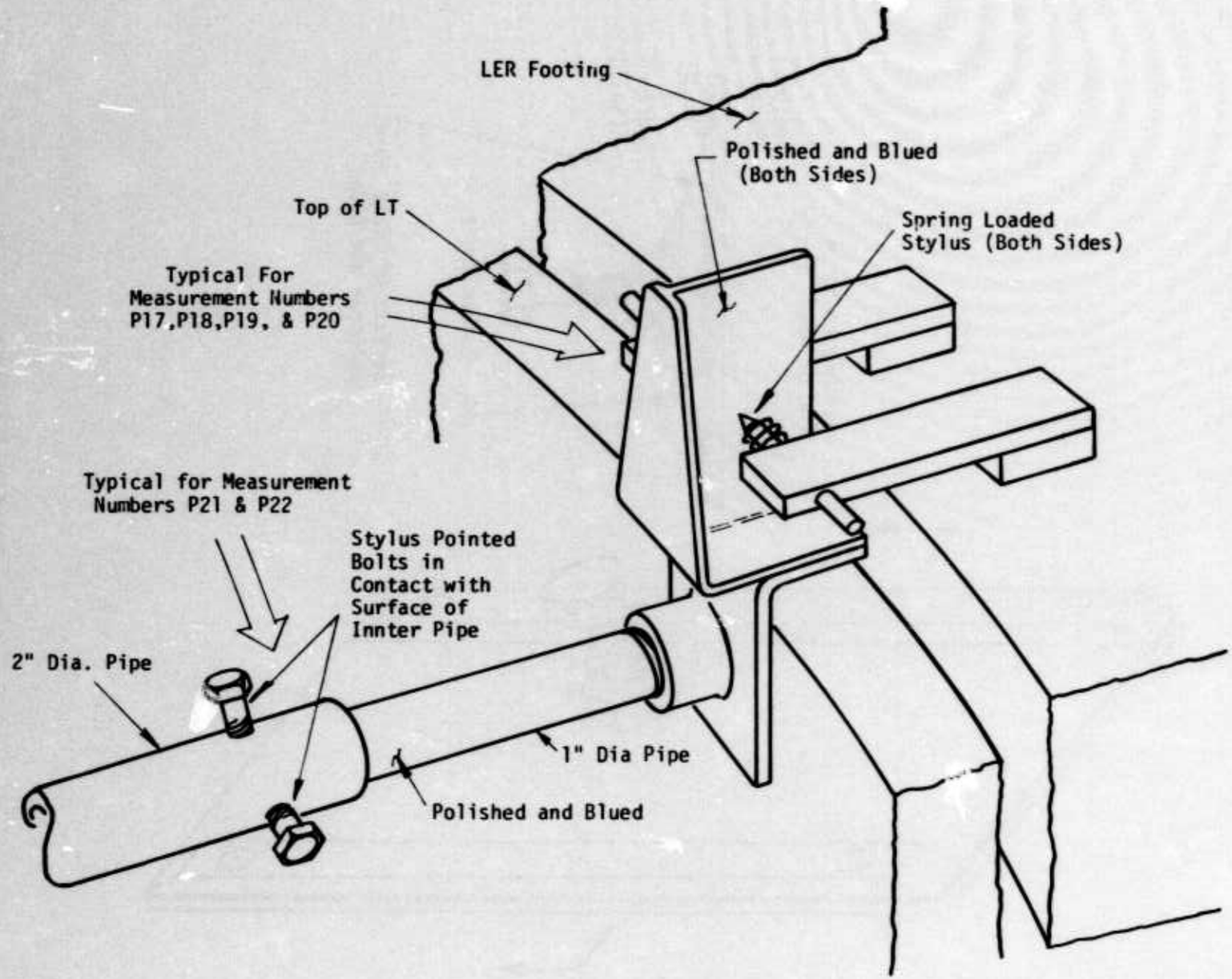


Figure P-47. Passive Relative Displacement Gages

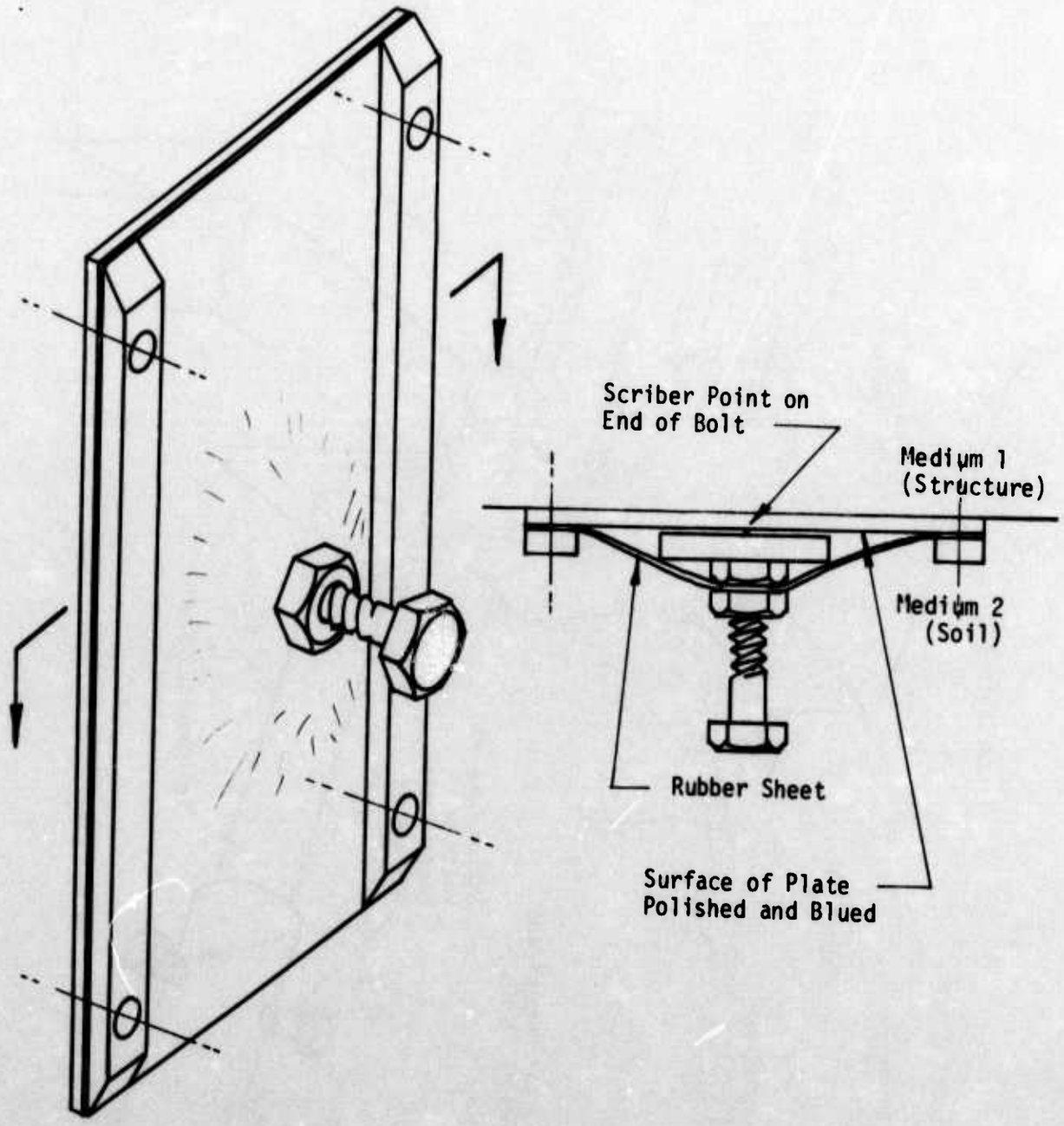


Figure P-48. Relative Slip Gage

3. CANISTER PLACEMENT IN SLANT HOLES

Placement of canisters in slant holes uses a special tool which locates canister by "distance" downhole and in "roll" about the axis of hole. It also measures the declination of the hole in the neighborhood (5 ft uphole) of the canister.

The canister is screwed onto the end of a placement rod (see figure P-49) and the placement rod is pinned to the inclinometer gage housing to prevent rotation. Care must be taken that the canister orientation is correct with respect to the inclinometer when they are connected.

Rods (square tubing) of sufficient length to permit placing the canister at the proper location downhole are attached to the other end of the inclinometer housing. These rods, of calibrated length, are attached as required to attain the desired depth.

When the desired depth has been attained the square rod is rotated to obtain a null reading on the roll inclinometer gage. The pitch inclinometer gage reading is recorded in order that the actual transducer orientation be known.

While maintaining the correct depth and roll conditions, grout is pumped downhole (through a hose) to cover the canister to approximately one foot. After the grout has set up sufficiently to hold the canister in place the positioning rod is rotated to unscrew the placement rod from the canister. The placement rod is coated with silicone grease prior to insertion downhole to prevent bonding to the grout.

After removal of the positioning device, grouting and/or filling of the hole continues to the next higher canister emplacement level where the procedure outlined above is repeated.

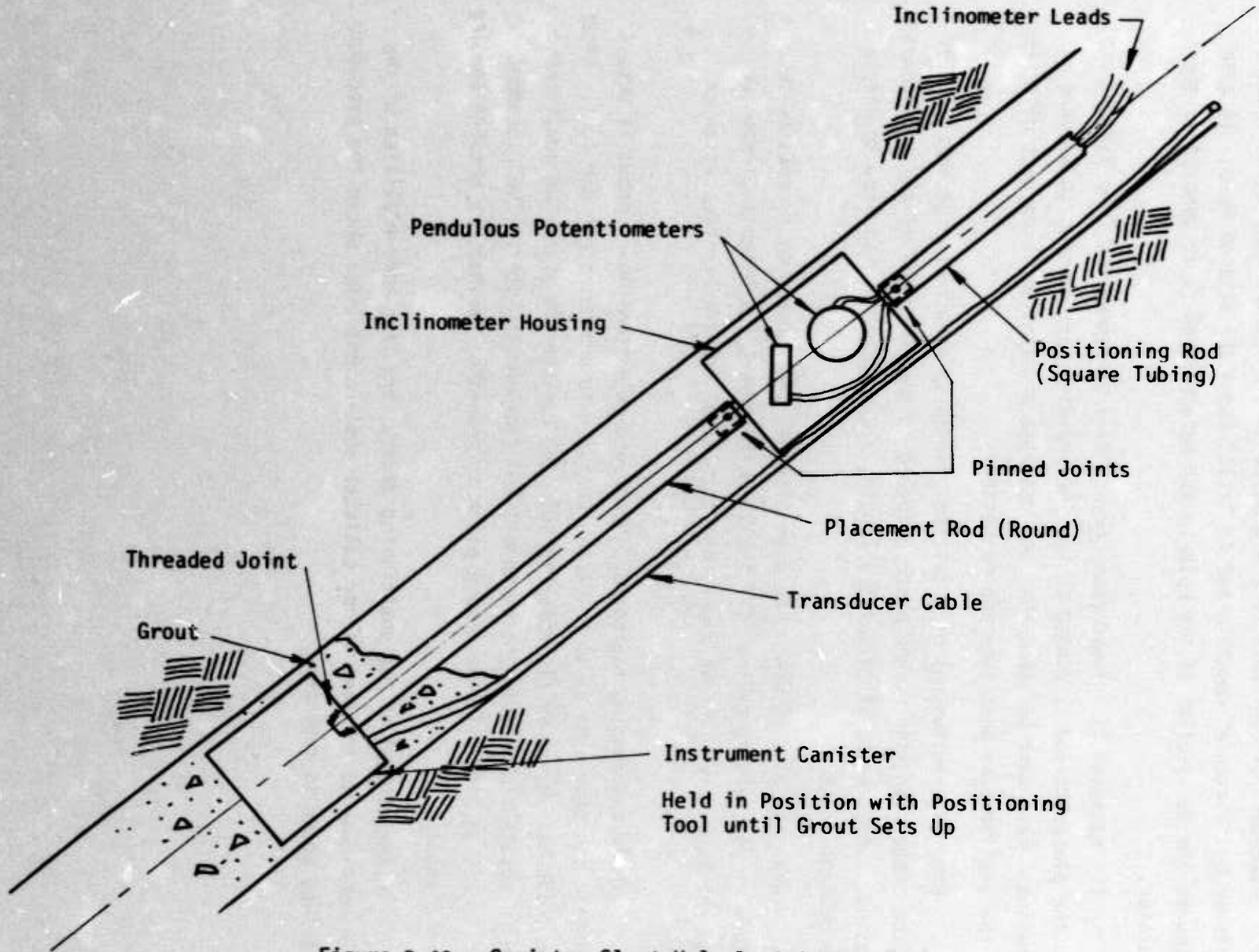


Figure P-49. Canister Slant Hole Positioning Tool

4. FREE FIELD BLAST PRESSURE GAGE INSTALLATIONS (Event HPI-1 as example)

Of the twenty blast pressure gages to be fielded, fourteen will be in free field installations along (approximately) the 000, 120, and 240° radials as shown in figure P-2 Typically, the gage mount will be fastened to a steel rebar stand which will be placed in a three foot deep hole so that the active gage face will be at the desired sensing level, namely, the surface of the HEST cavity floor. The hole will then be filled with grout to bring the surface level. Figure P-50 illustrates typical installations.

To prevent gage breakage due to excessive overpressure peaks the Primacord in the vicinity of some of the gages will be tied up in such a way that the Primacord is not closer than 12 inches to the gages. This procedure will be followed for measurement numbers 005, 013, 019, and 020 as well as for all six of the gages mounted in the top of the LER.

An alternative protective measure will be taken for the gages with measurement numbers 007 and 010. At these locations bolts will be cast into the grout column for the installation of heavy steel ported shields as illustrated in figure P-51. Neither at these particular locations nor at any of the other gages not mentioned above will the twelve inch Primacord clearance be required.

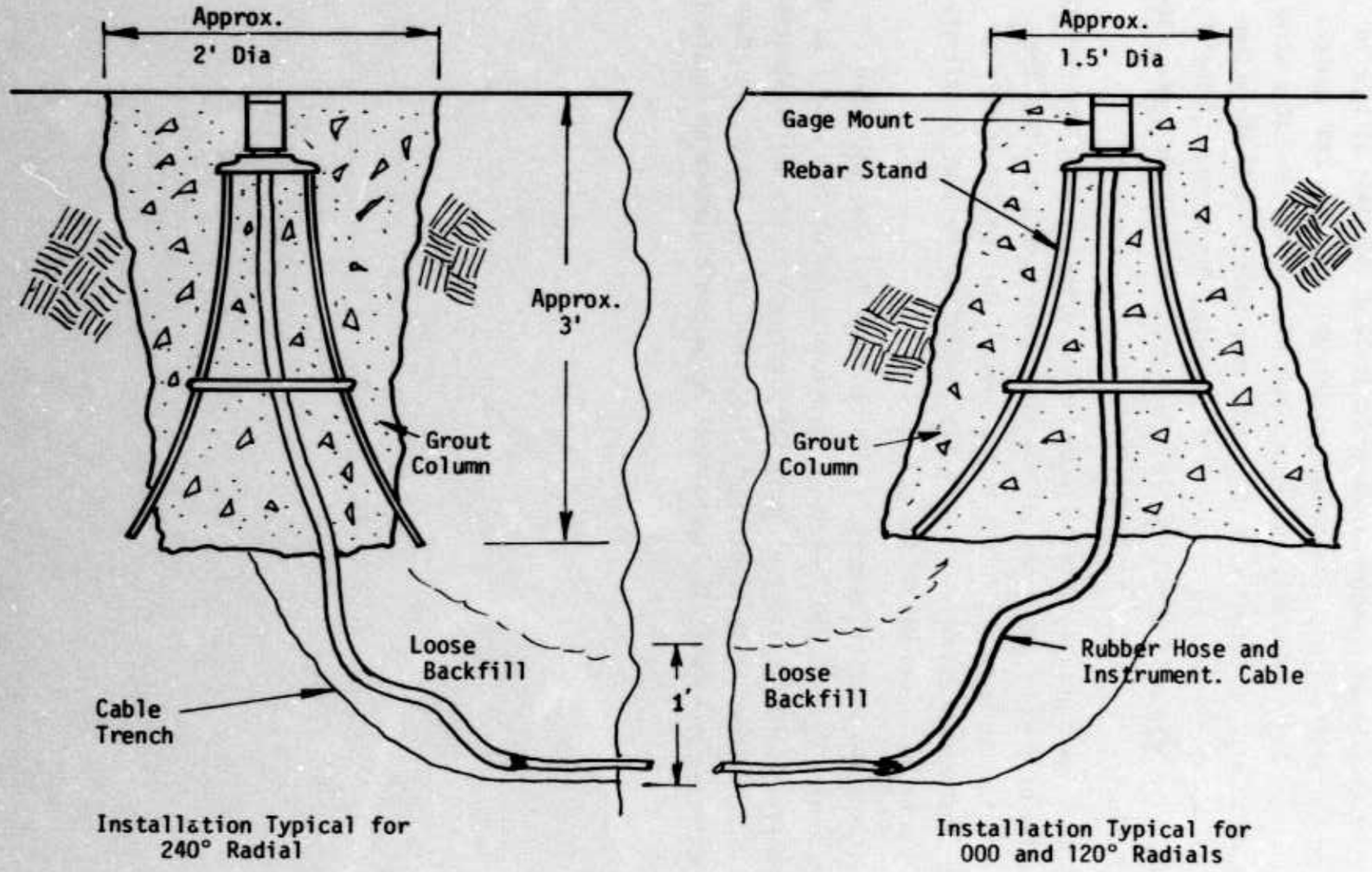
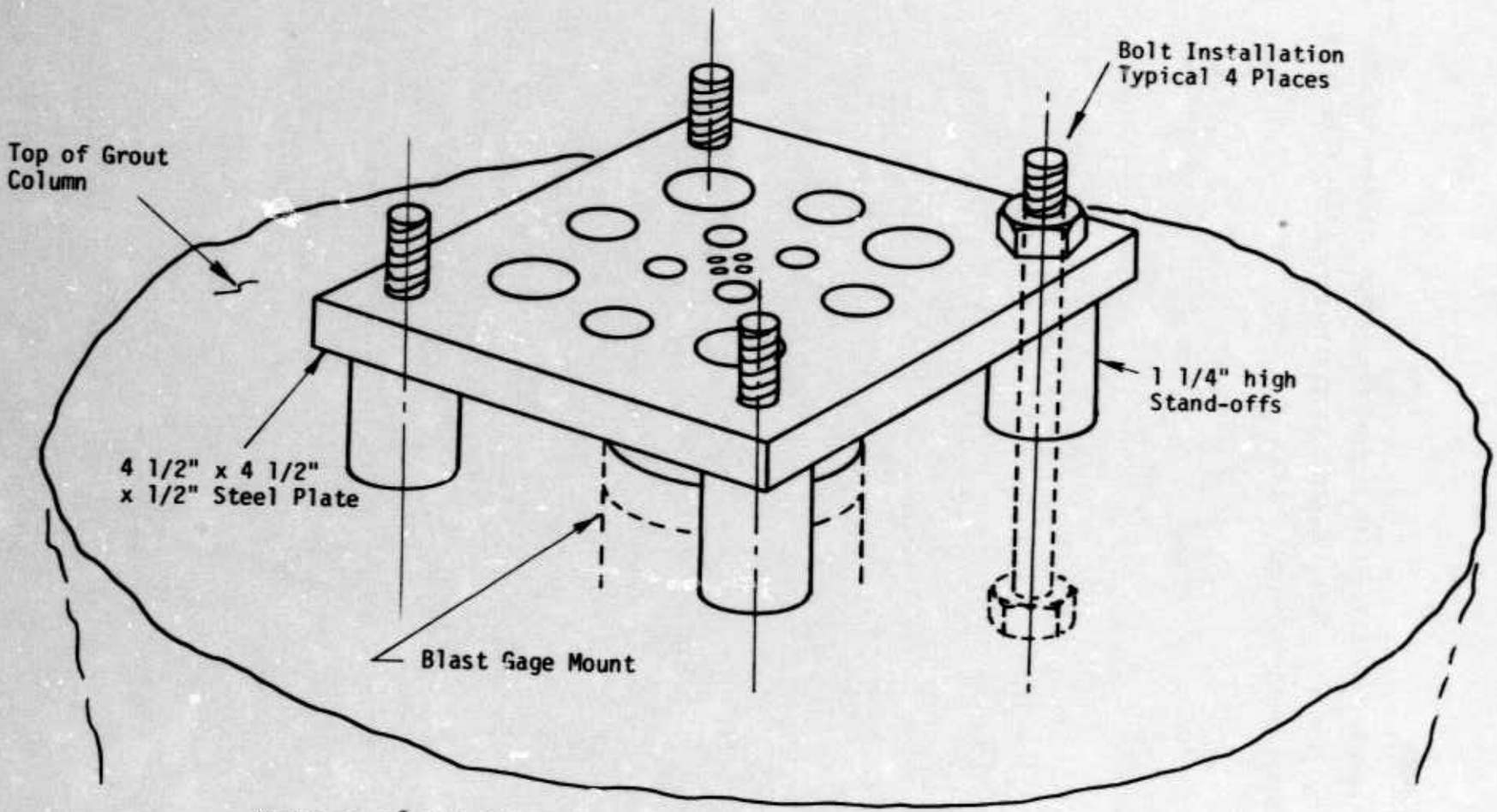


Figure P-50. Free Field Pressure Gage Installations



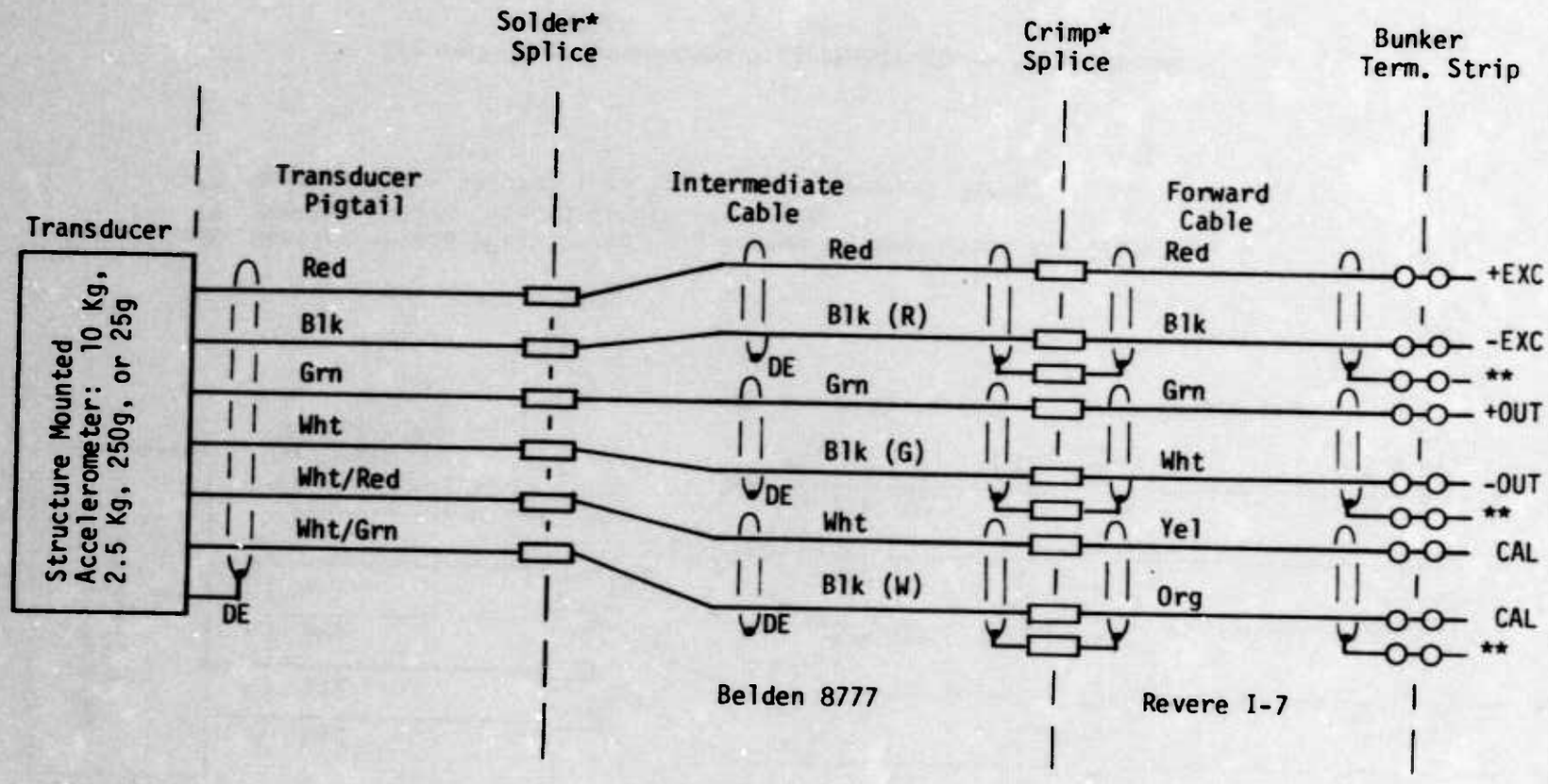
Holes in shield plate are as follows:

4 ea	0.75" Dia on 3" Dia bolt circle
4 ea	0.50" Dia on 2.5" Dia bolt circle
4 ea	0.25" Dia on 1.0" Dia bolt circle
4 ea	0.125" Dia on 0.25" Dia bolt circle

Figure P-51. Blast Shield for Blast Pressure Gages

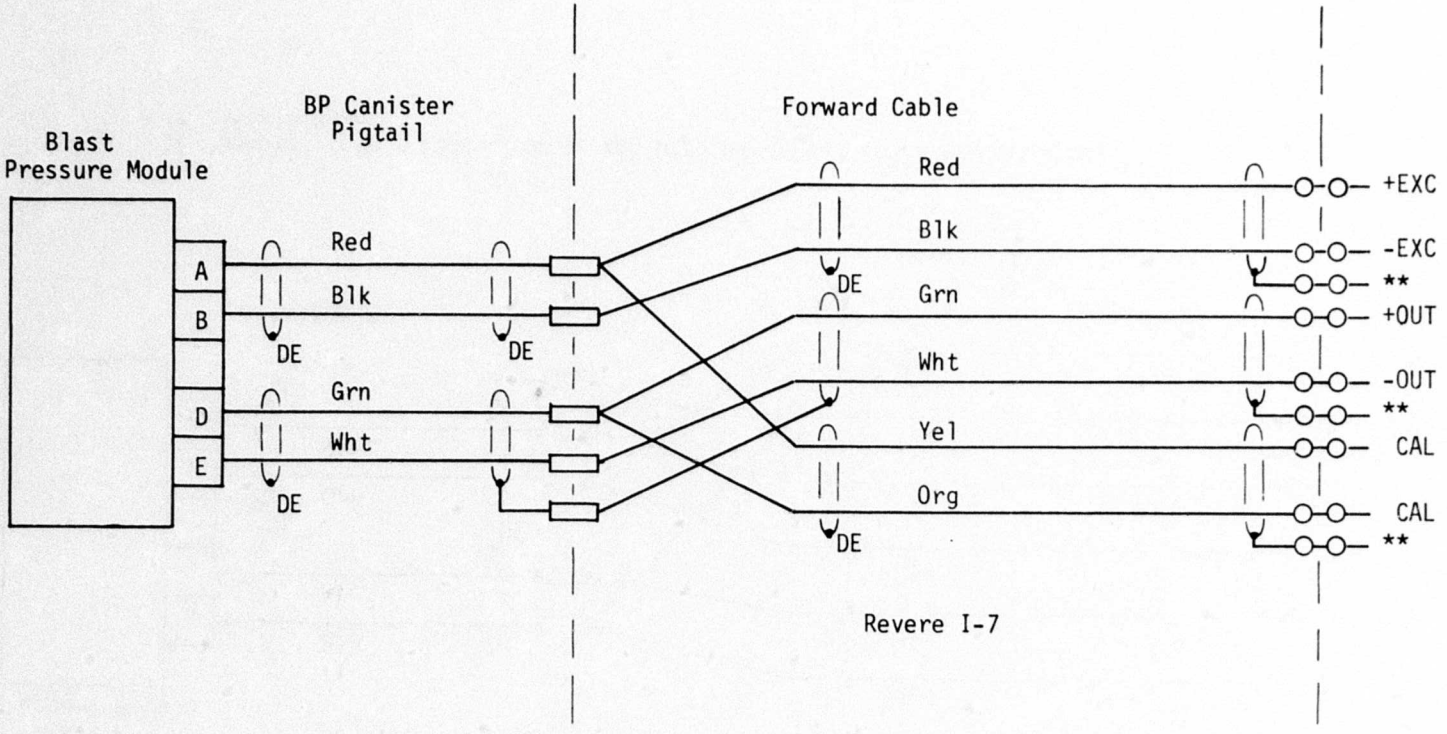
5. CONNECTION DIAGRAMS

Figures P-52 through P-69 illustrate typical connection diagrams for the active instrumentation channels. These diagrams show all connections between the transducer and the splice bunker terminal strip.



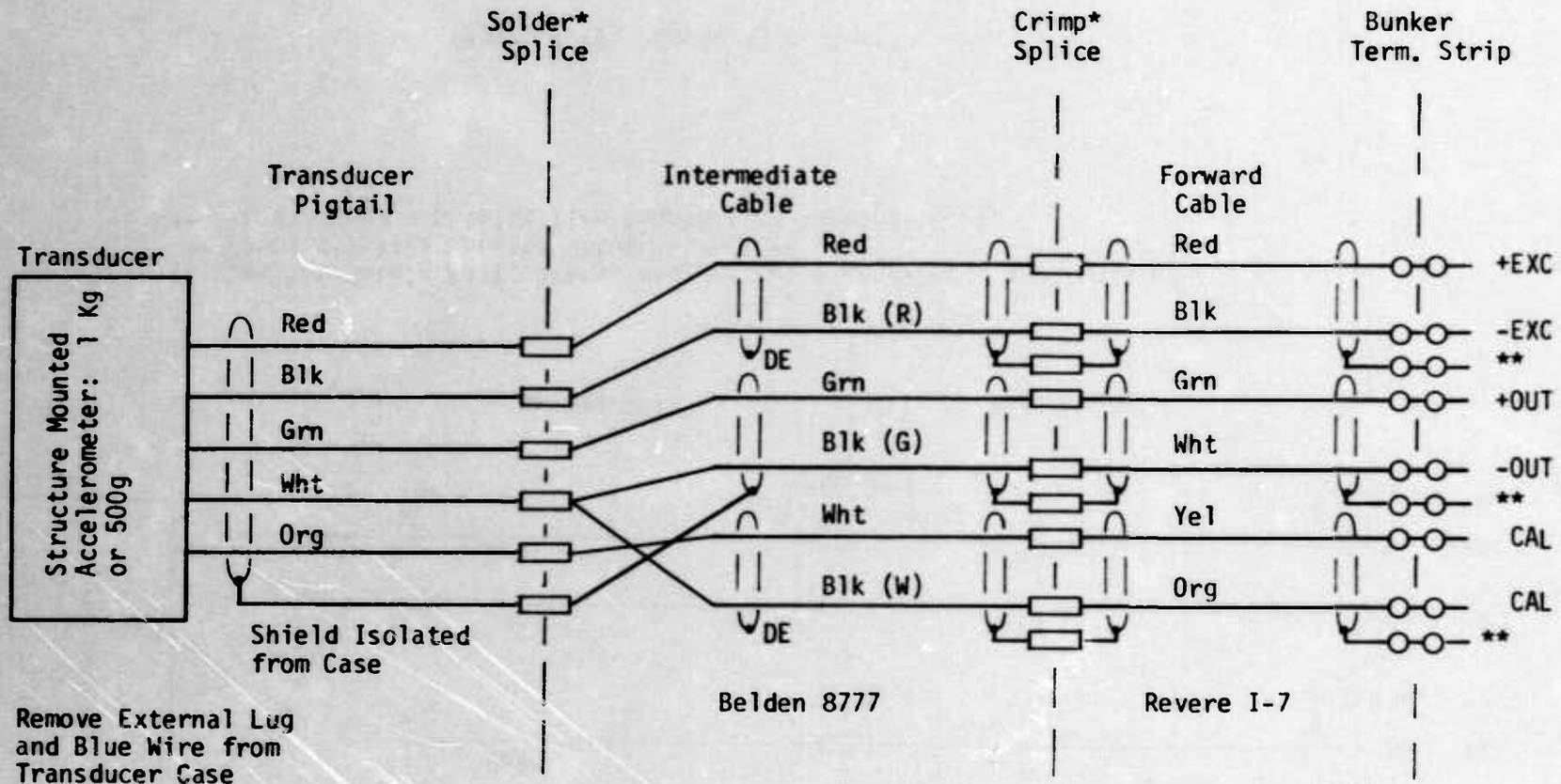
DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
* Denotes Splice Located Within Structure
** Shield Bond - Shields Tied Together at Terminal Strip

Figure P-52. Connection Diagram-Structure Acceleration - 25, 250, 2500 and 10000g



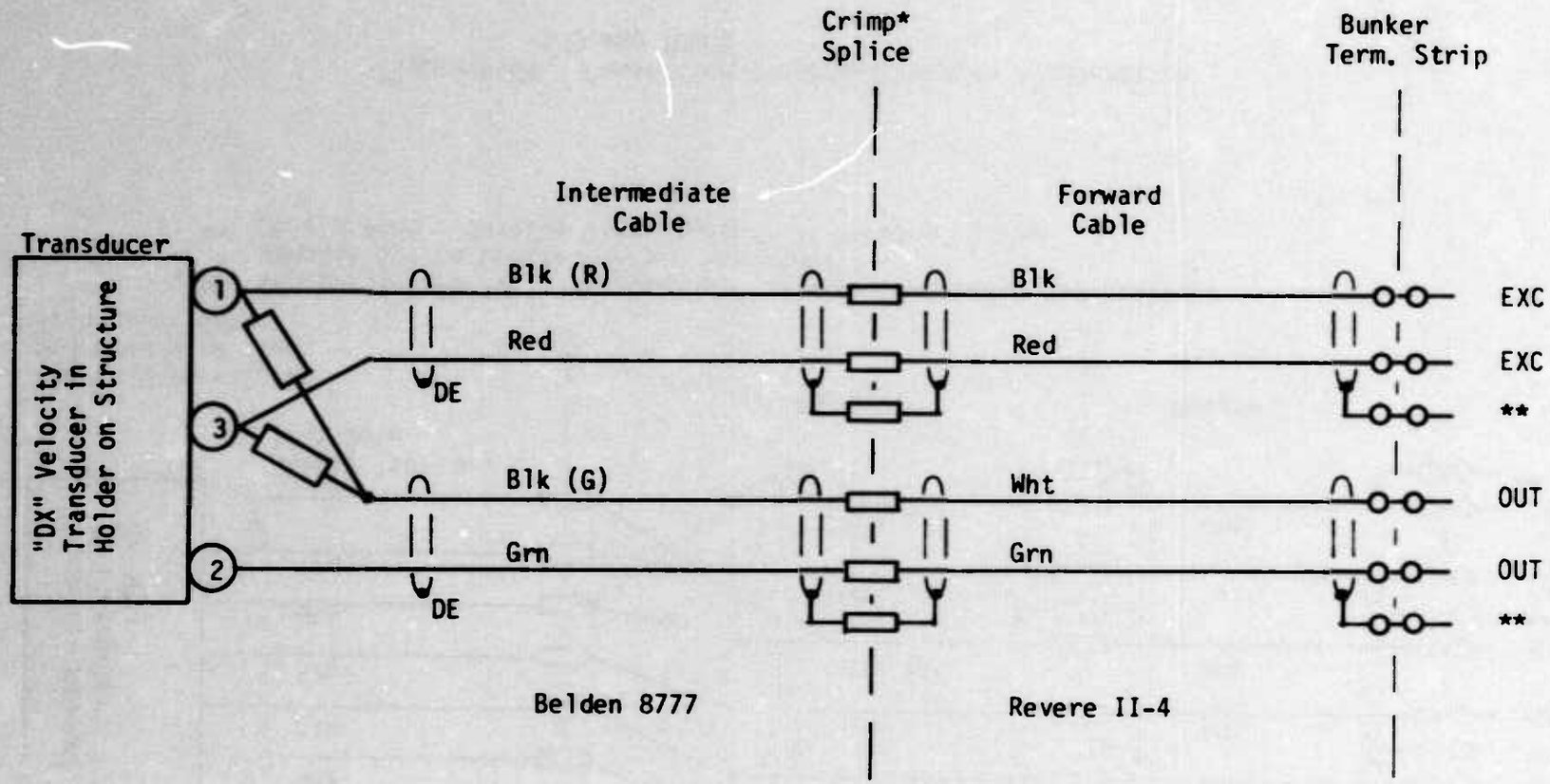
DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
** Shield Bond-Shields Tied Together at Terminal Strip

Figure P-59. Connection Diagram - Free Field Blast Pressure Using Revere I-7



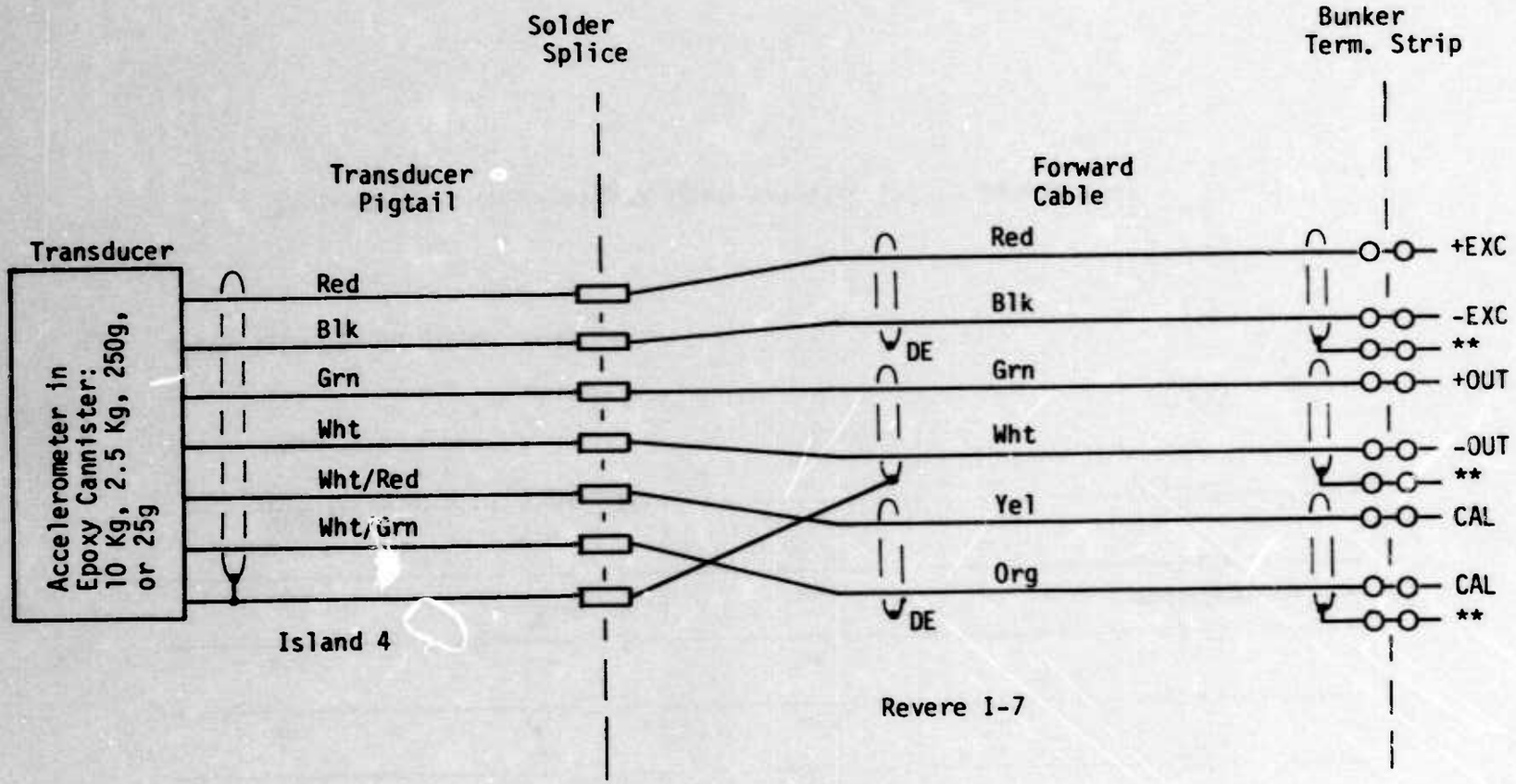
DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
* Denotes Splice Located Within Structure
** Shield Bond - Shields Tied Together at Terminal Strip

Figure P-54. Connection Diagram-Structure Acceleration - 500 and 1000g



DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
* Denotes Splice Located Within Structure
** Shield Bond - Shields Tied Together at Terminal Strip

Figure P-55. Connection Diagram - Velocity



DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
** Shield Bond - Shields Tied Together at Terminal Strip

Figure P-56. Connection Diagram-Free Field and Near Field Acceleration - 25, 250, 2500 and 10000g

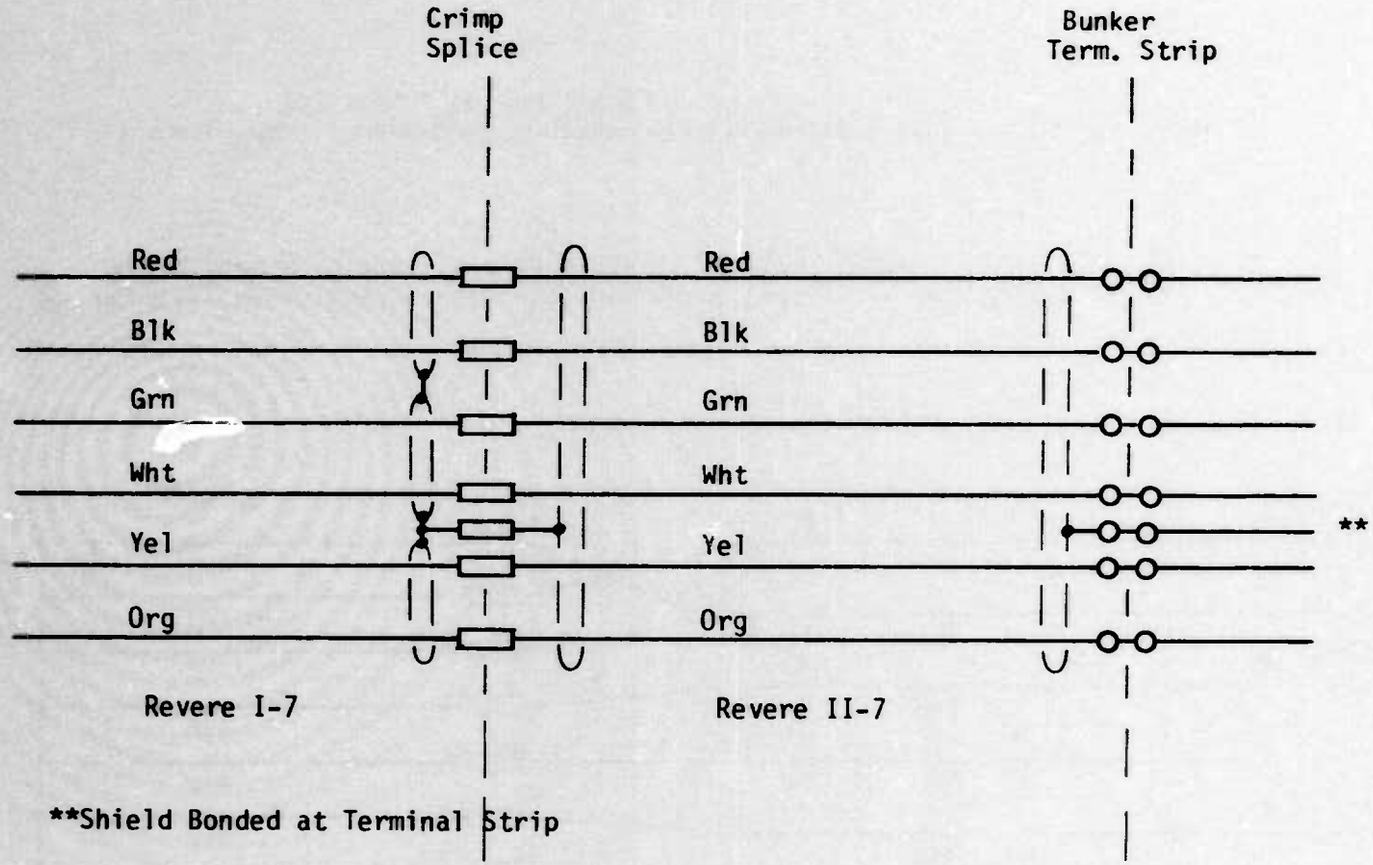
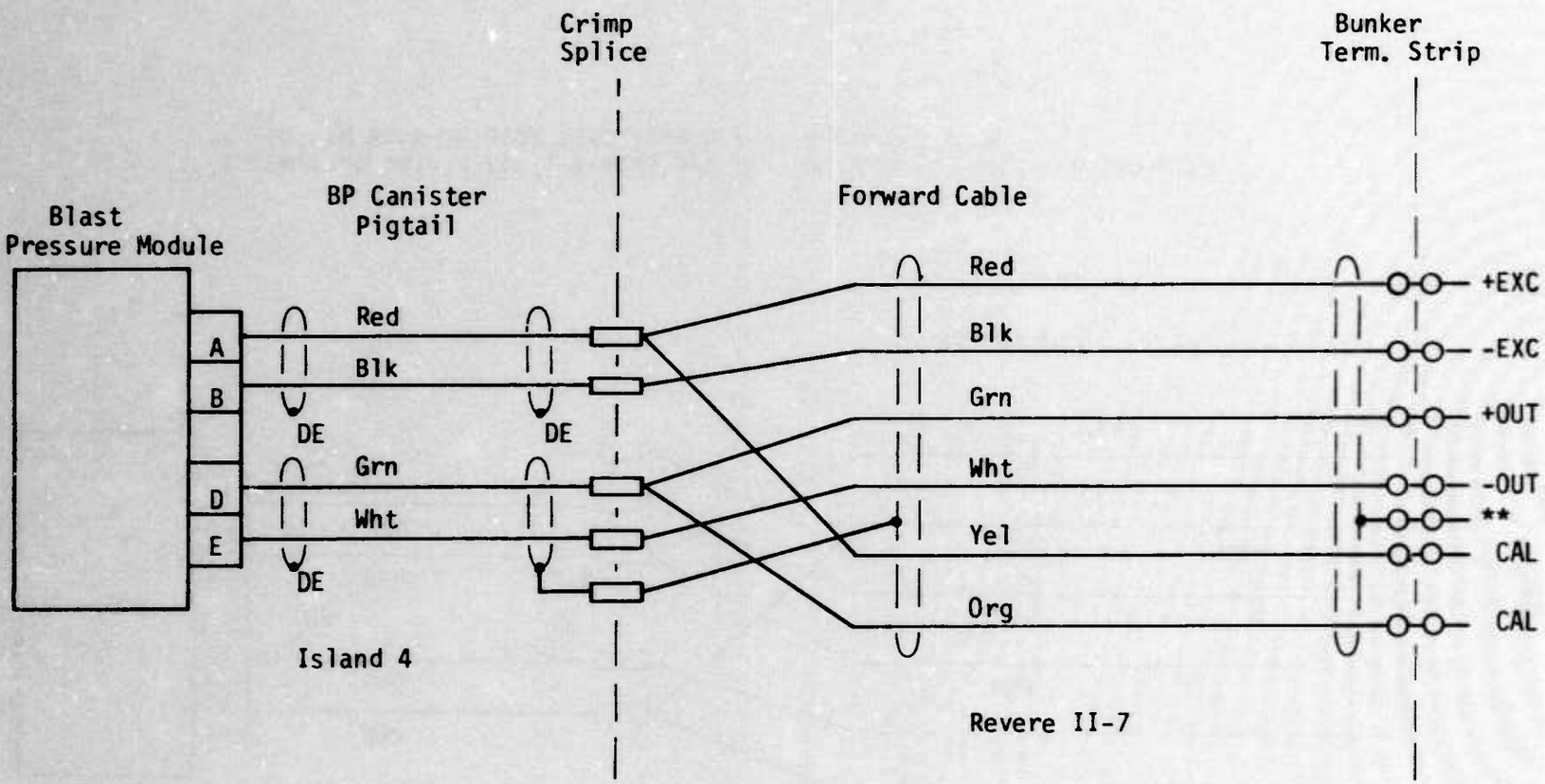
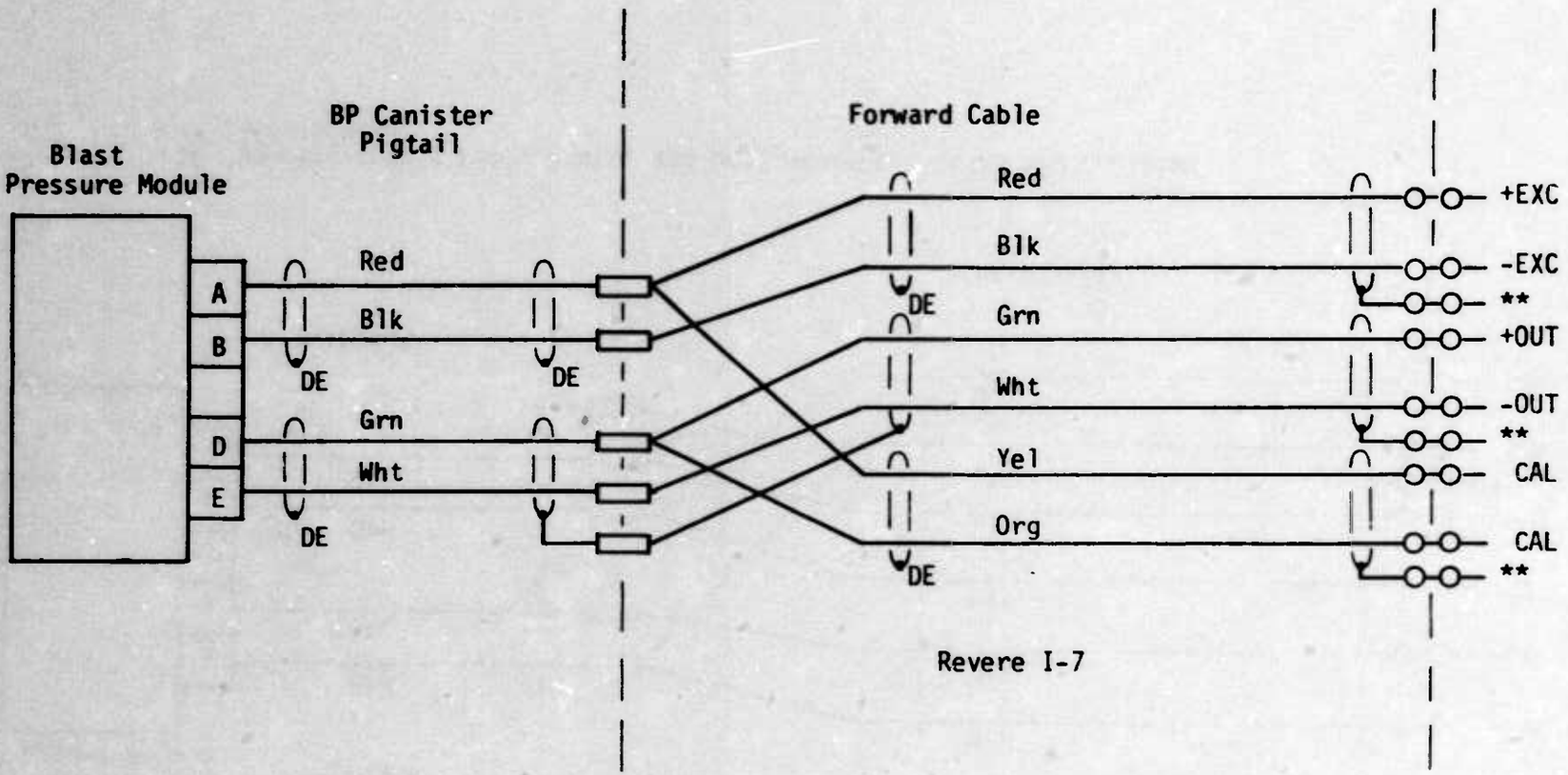


Figure P-57. Connection Diagram - Revere I-7 to Revere II-7



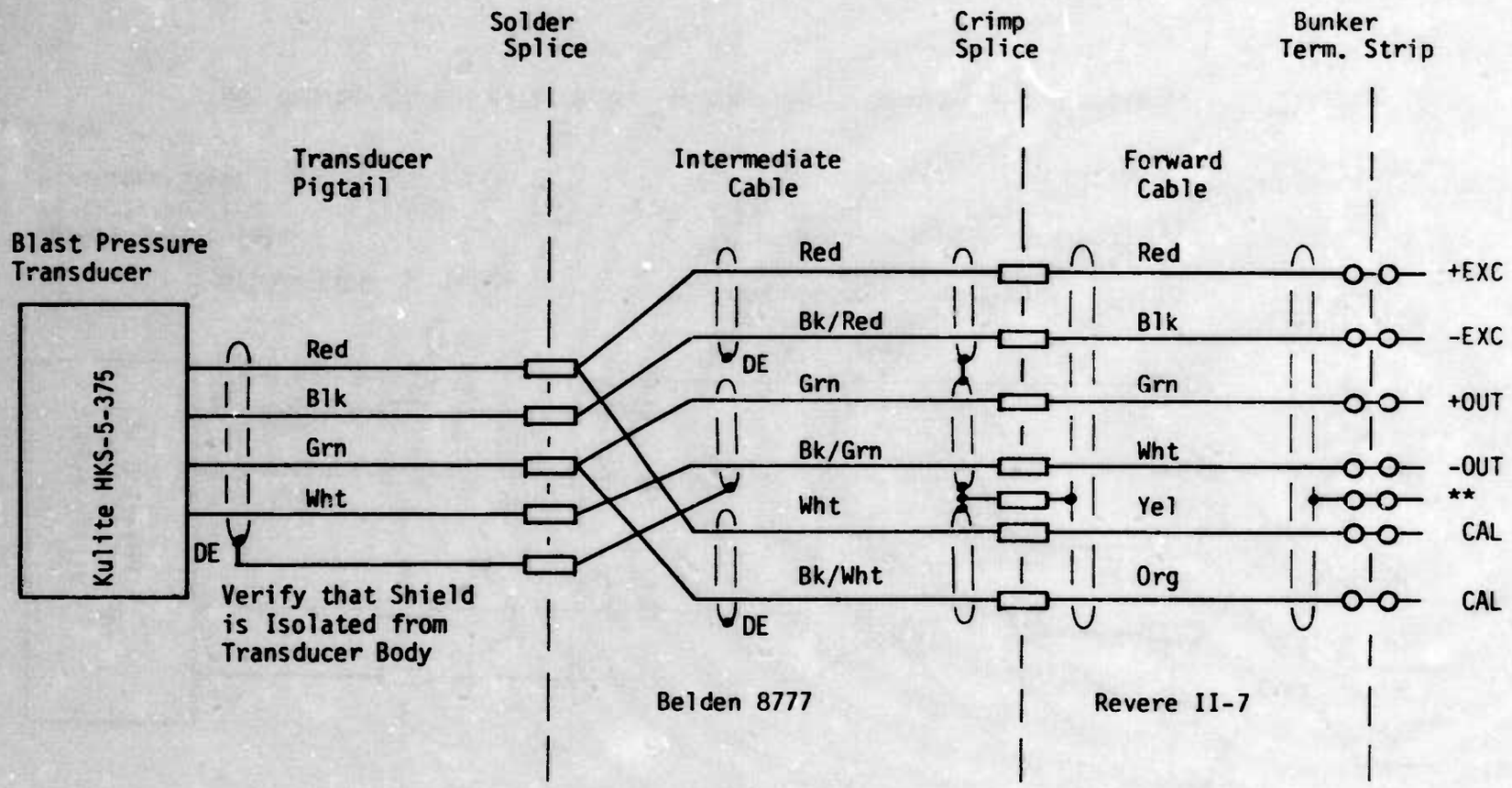
DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
** Shield Bond

Figure P-58. Connection Diagram - Free Field Blast Pressure Using Revere II-7



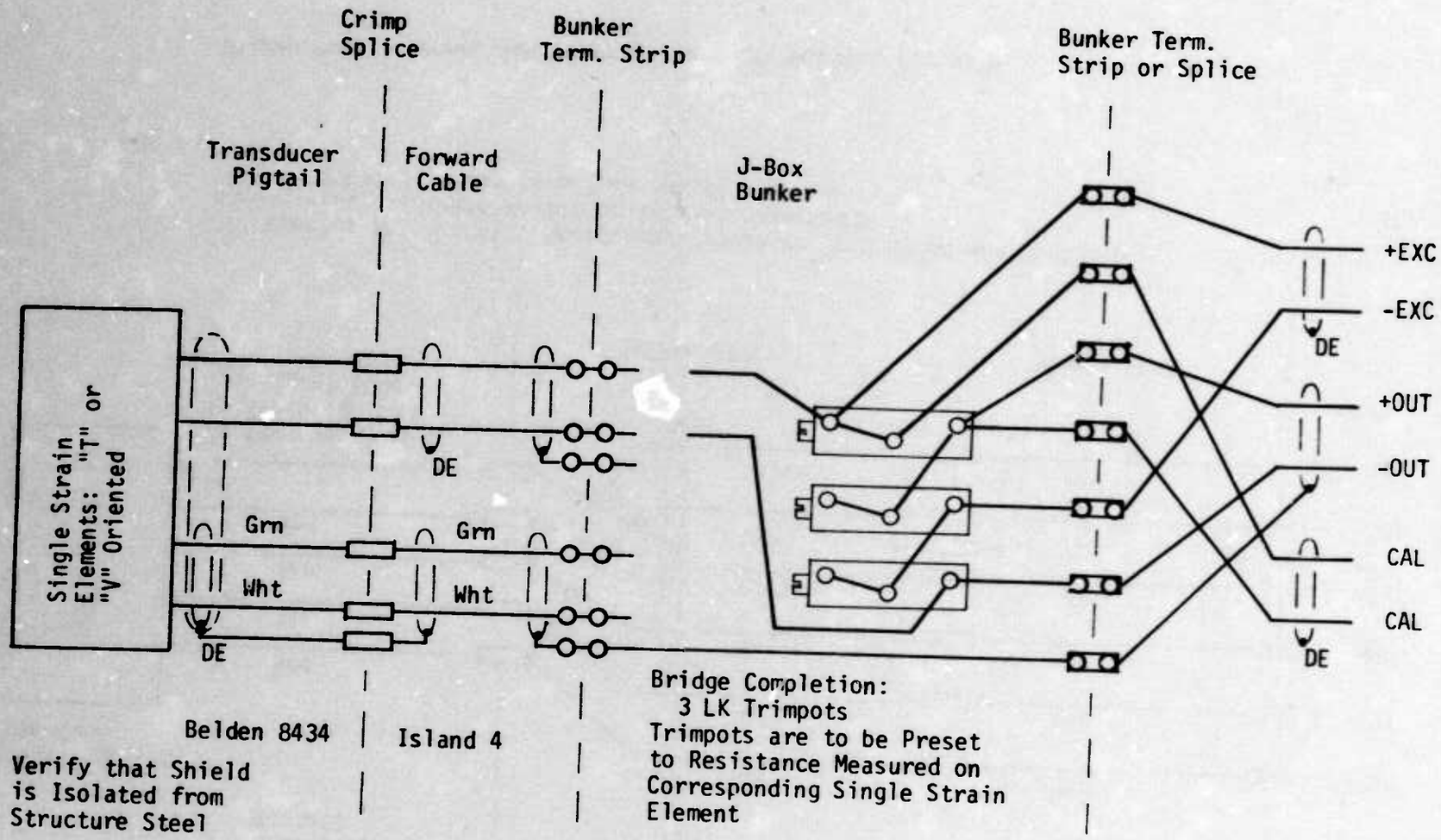
DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
** Shield Bond-Shields Tied Together at Terminal Strip

Figure P-59. Connection Diagram - Free Field Blast Pressure Using Revere I-7



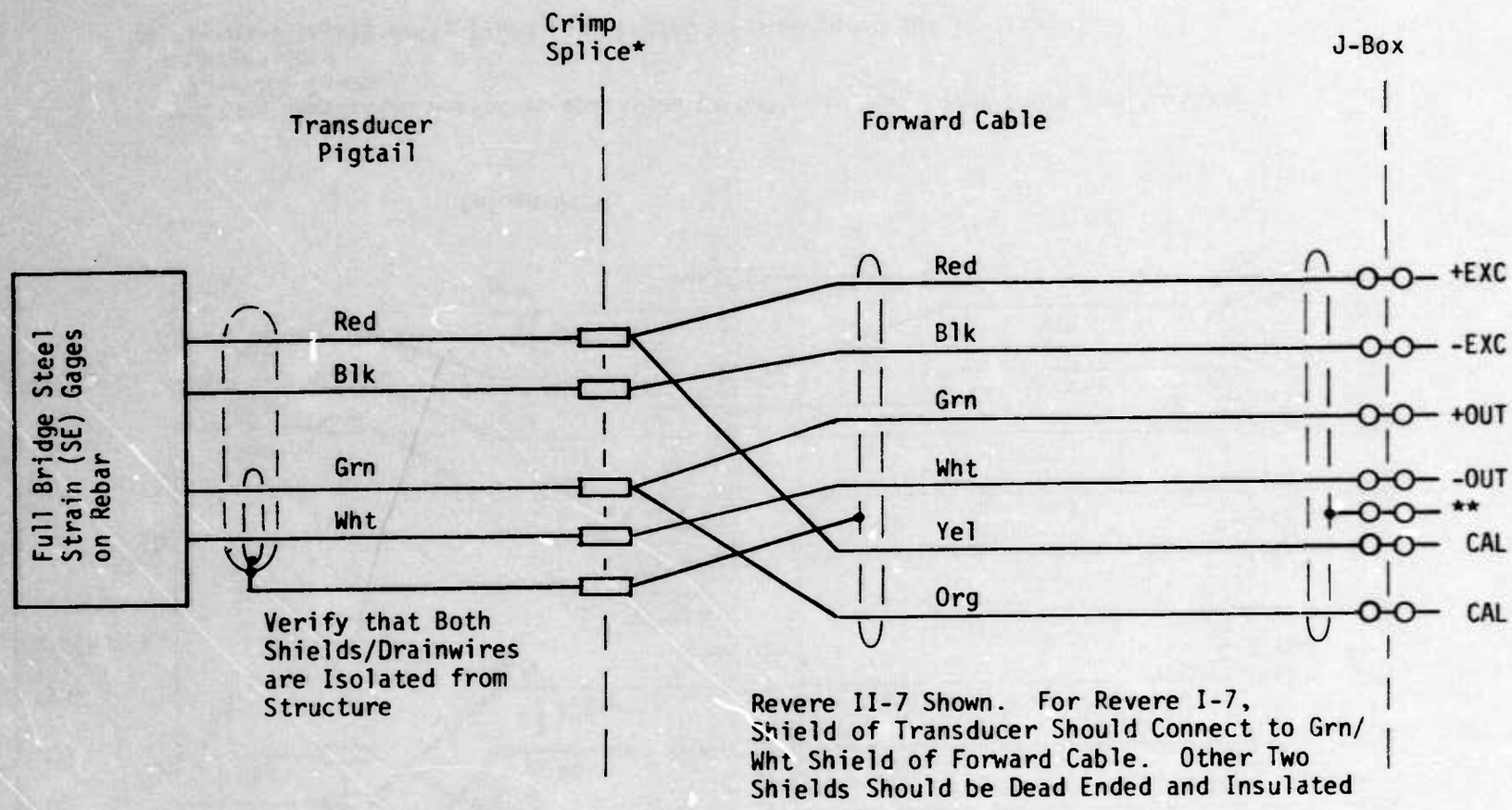
DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
Note: Provide Strain Relief on Intermediate Cable at Exit of Pass thru Tube in LER Ceiling

Figure P-60. Connection Diagram - Structure Blast Pressure



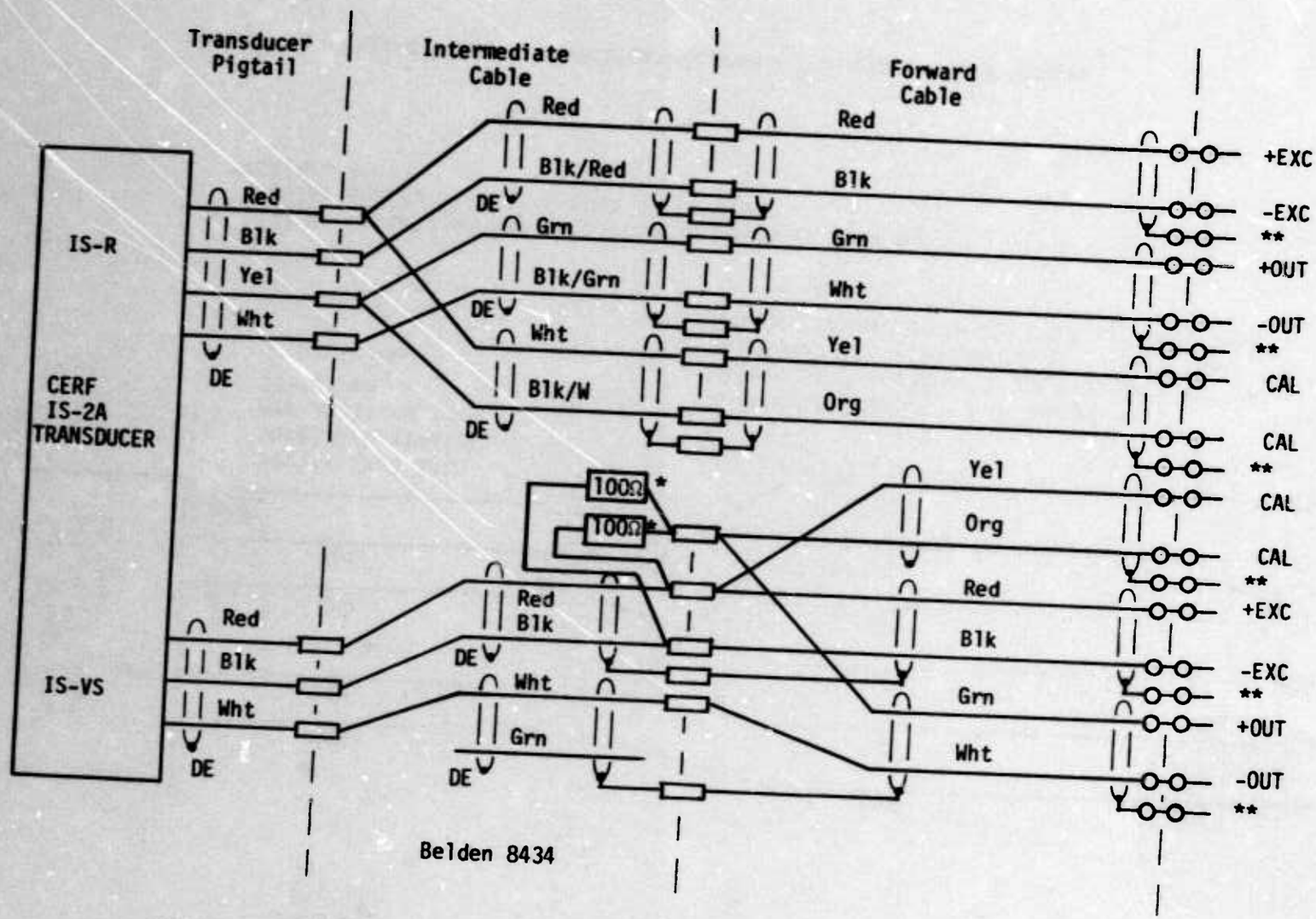
DE Denotes Shield Foil, Braid, and Drainwire Dead Ended and Isolated

Figure P-61. Connection Diagram - Structure Concrete Strain



*All Crimp Splices Are to be Checked by Jerk-Testing Cables and Pull-Testing Each Connection
**Shield Bond

Figure P-62. Connection Diagram - Structure Steel Strain

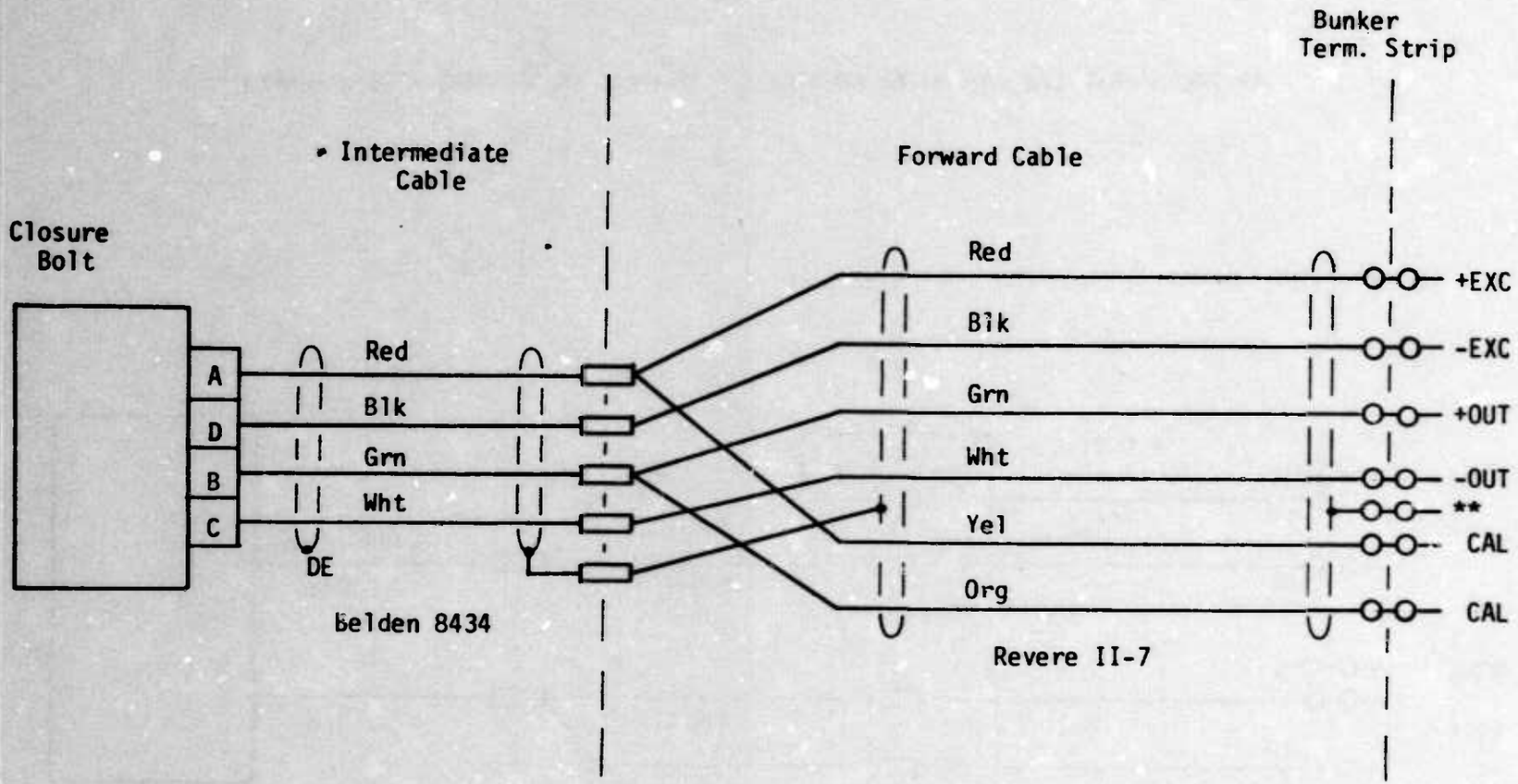


*Bridge Completion Resistors Installed at Splice. Keep Leads Short and Insulate Resistor Leads

**Shield Bond

DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated

Figure P-63. Connection Diagram - Structure Interface Stress



DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
** Shield Bond

Figure P-64. Connection Diagram - Closure Bolt Strain

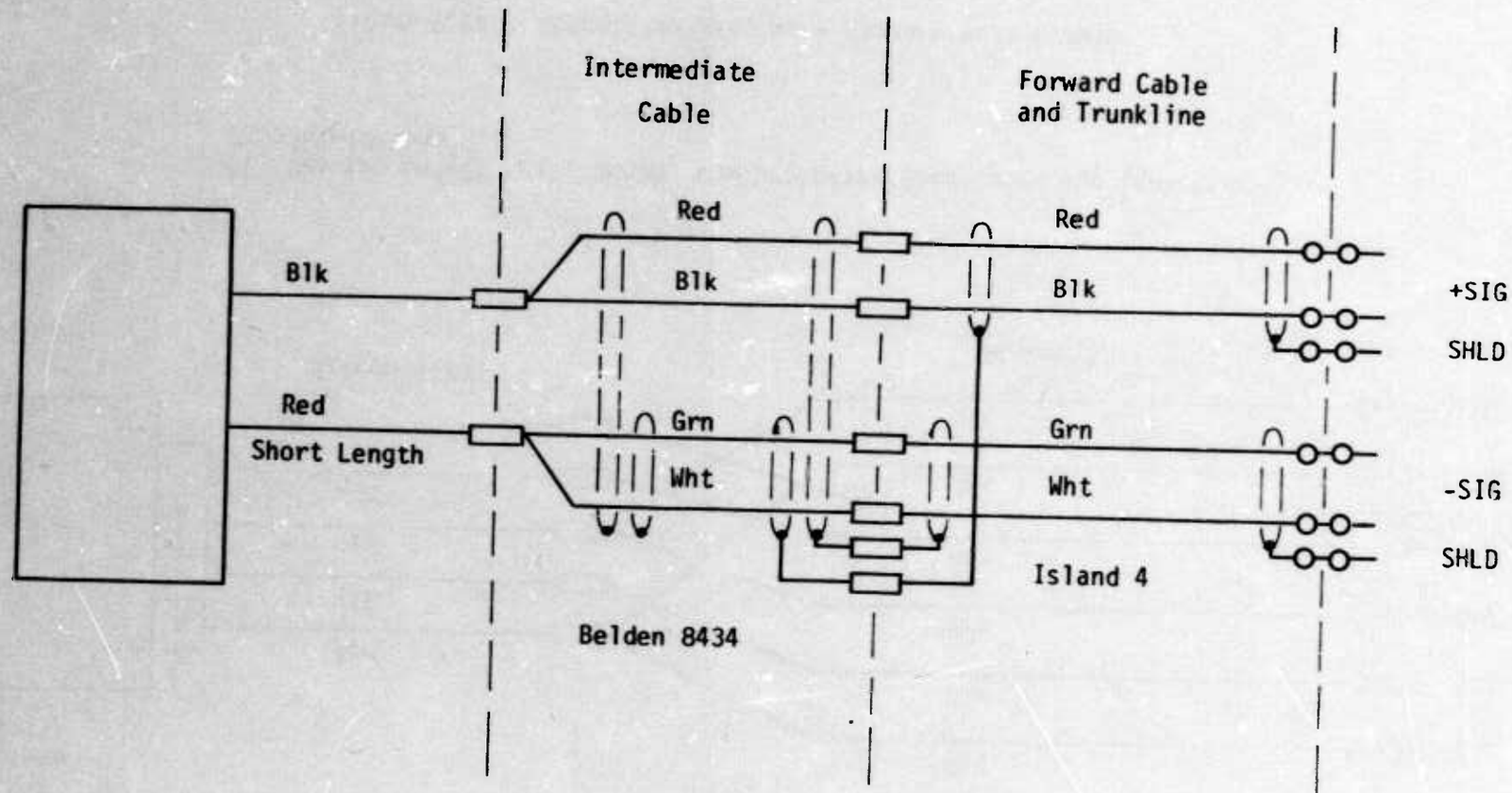


Figure P-65. Connection Diagram - Structure to Medium Relative Velocity

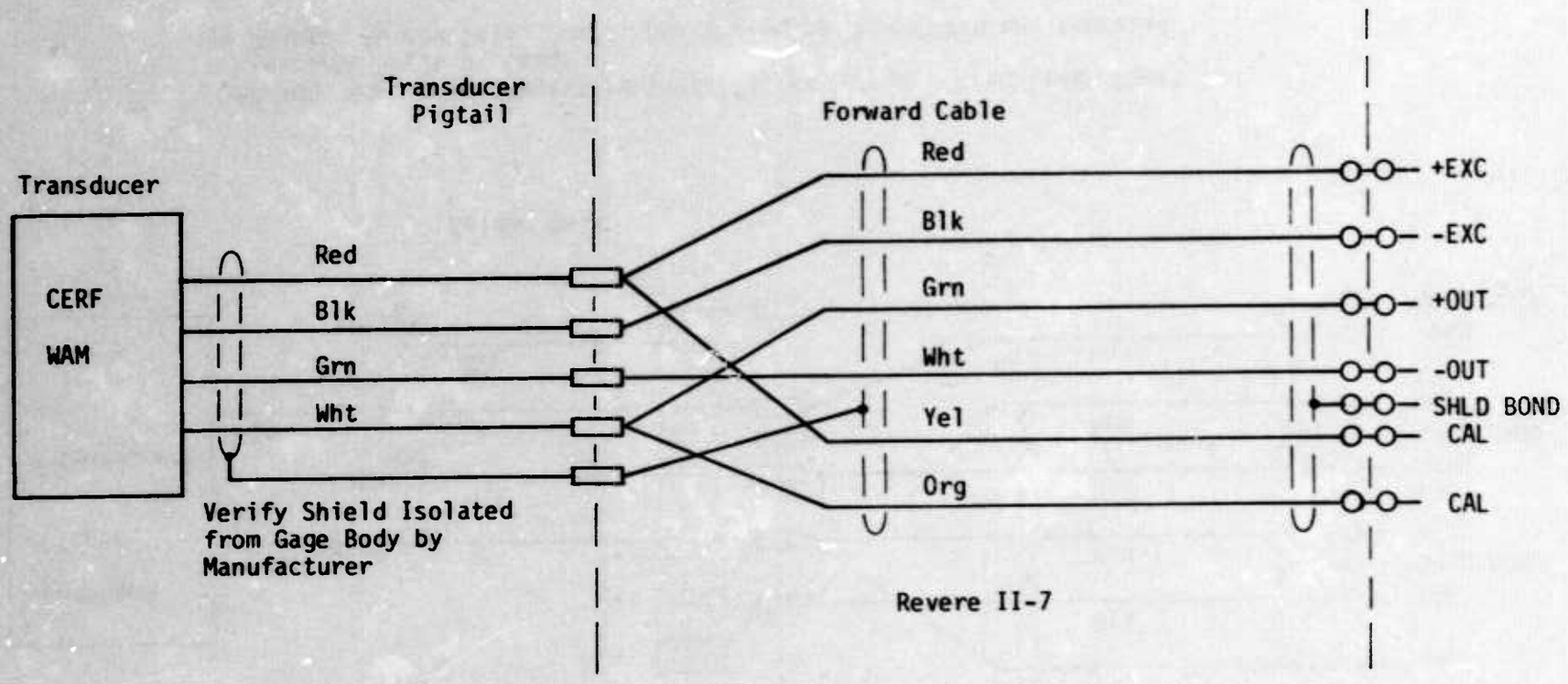
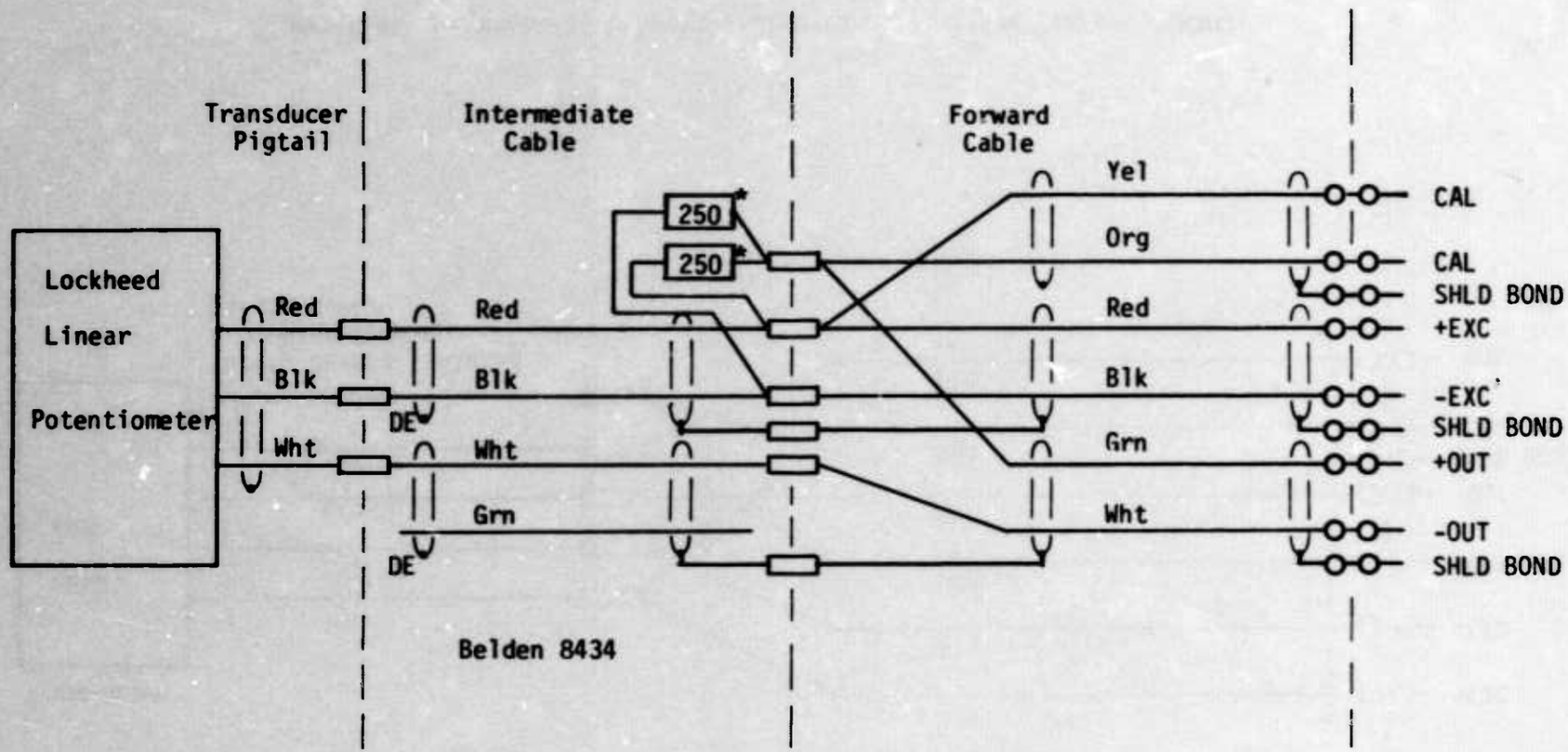
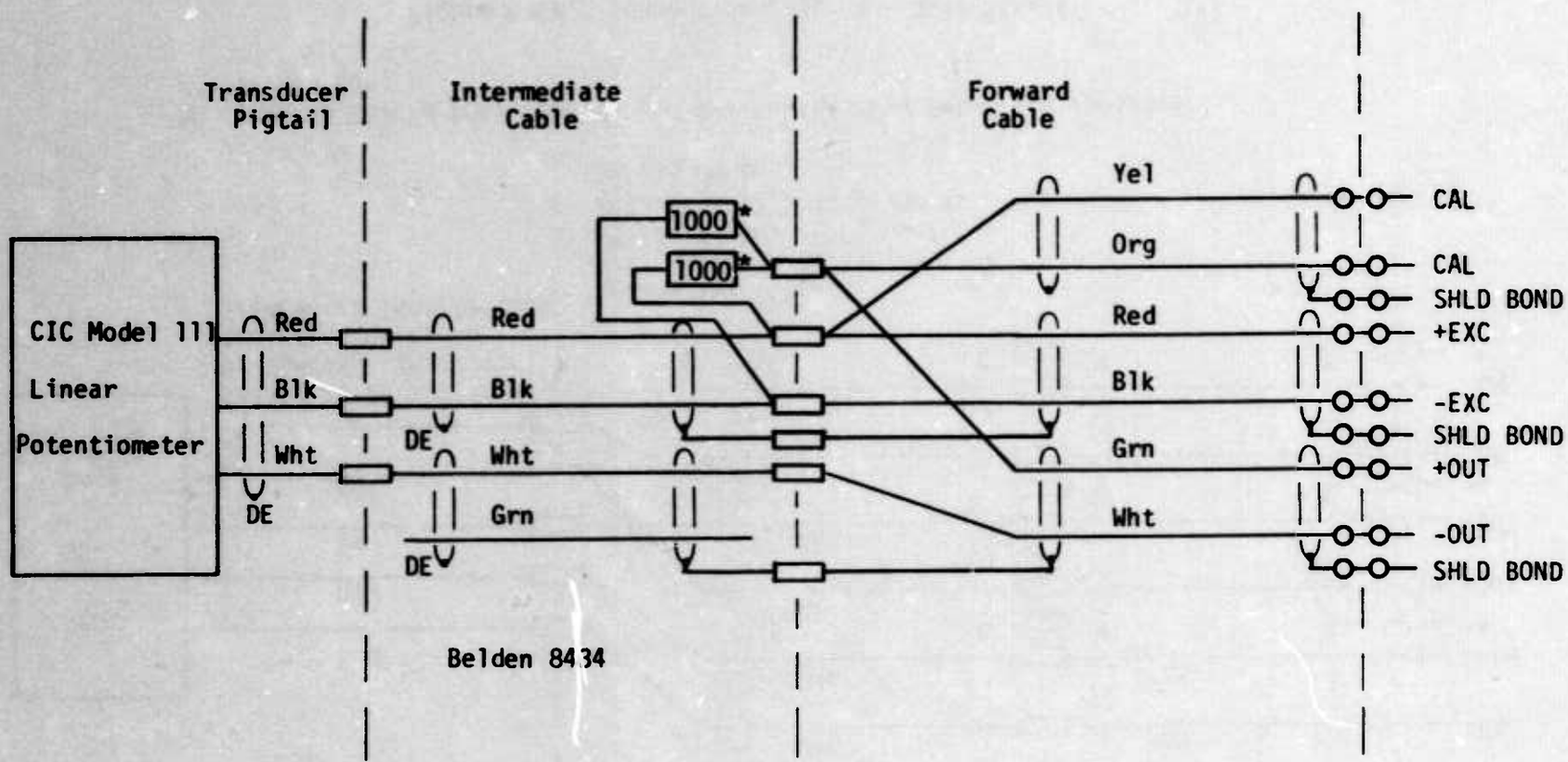


Figure P-66. Connection Diagram - Structure Interface Pressure (WAM)



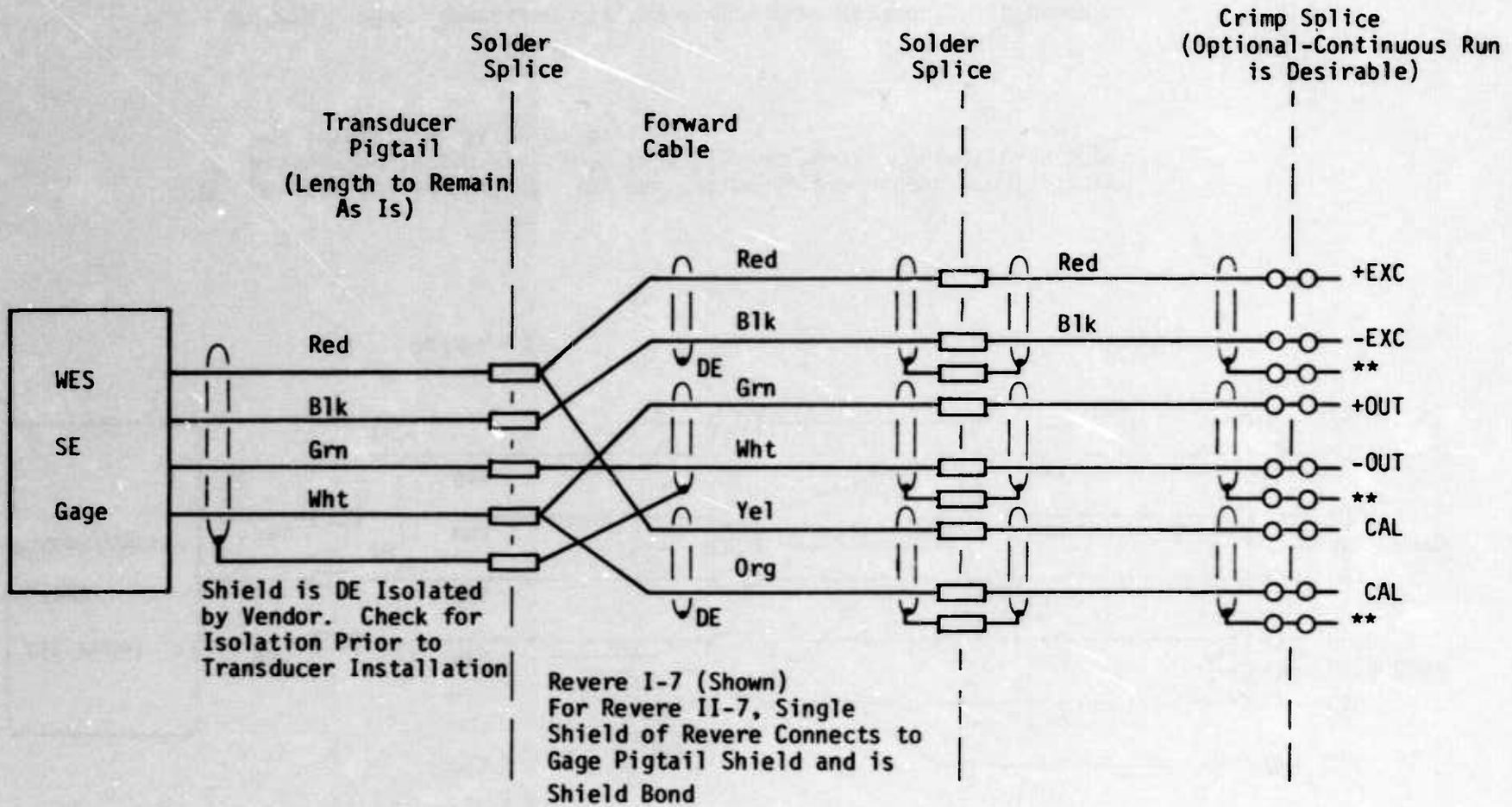
*Bridge Completion Resistors Installed at Splice. Keep Leads Short and Insulate Resistor Leads
DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated

Figure P-67. Connection Diagram - Structure Radial Displacement



DE Denotes Shield Foil, Braid, and Drainwire Dead-Ended and Isolated
* Bridge Completion Resistors Installed at Splice. Keep Leads Short and Insulate Resistor Leads

Figure P-68. Connection Diagram - Structure Vertical Displacement



DE Denotes Shield Foil, Braid, and Drawinwire Dead Ended and Isolated
** Shield Bond

Figure P-69. Connection Diagram - Soil Stress

DISTRIBUTION LIST

DDC
2 cy ATTN: TC

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