Data Report No. 99-004

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1982 Kilauea (South Flank/East Rift Zone), Hawaii Experiment

The University of Wisconsin-Madison deployed an array of 11 3-component digital seismographs along the East Rift Zone of Kilauea volcano from late March to the end of April 1982 to study details of South Flank earthquakes [Savage and Meyer, 1985] (Figure 1). Three UW seismographs were co-sited with Hawaii Volcano Observatory (HVO) stations (W13, W14, and W16). The largest magnitude event recorded during the UW deployment was an $M_L = 4.2$ event on April 12, 1982 at 02:04:02.37 UT [Savage and Meyer, 1985]. The increase in local coverage and in accuracy of S-phase determination yielded improved event locations, with inclusion of smaller events than in previous studies using HVO data alone [Savage, 1984]. Event data collected by the temporary network from March to April 1982 are being made publicly available through the IRIS DMC as part of a NSF-supported project to archive historic UW-Madison digital seismic datasets collected by the research group of Prof. R. P. Meyer.

Data Collection and Processing

Data were recorded in triggered mode for all stations. Table 1 presents the station coordinates. Table 2 contains the SEGY headers set during the UW-to-SEGY format conversion process. Clock corrections are incorporated into the SEGY data. The data have been assembled in the form of an event volume. Table 3 lists the events based on information from Savage [1984].

Tape Provided

The data archive consists of one DAT tape with the event-volume data (in PASSCAL SEGY format), this report in postscript and RTF formats, and miscellaneous information.

UW Seismic Recorders

The University of Wisconsin-Madison portable digital seismic recorders are wide-dynamic-range instruments (106 dB) designed for recording seismic waves from earthquakes or explosions (Table 4) [Powell, 1983]. Data from 1-Hz Hall-Sears HS-10-1 geophones were recorded at 100-Hz sampling rates, with a 4-pole Butterworth anti-aliasing filter at 24 Hz. A 13.6 kHz Omega receiver incorporated in each seismograph recorded data from the worldwide Omega navigational network concurrently with seismic signals. A timing-correction process developed for application to the UW seismic recorders provides 1/4 sample rms time error relative to Universal Time [Schneider et al., 1987]. Ground motion may be estimated from an average value for voltage sensitivity of 150 V/m/s for the UW Hall-Sears geohones.

Related publications:

Powell, L.A., Engineering Description of the U.W. Portable Digital Seismograph, Proceedings of the Committee on Controlled Source Seismology (CCSS), Workshop on Portable Digital Seismograph Development, Los Altos, California, 121-122, 1983.

Savage, M.K., Aftershocks of an $M_L = 4.2$ earthquake on the Island of Hawaii, M.S. Thesis – University of Wisconsin-Madison, 61 pp., 1984.

Savage, M.K., and R. P. Meyer, Aftershocks of an M = 4.2 earthquake in Hawaii and comparison with long-term studies of the same volume, *Bull. Seis. Soc. Am., 75*, 759-777, 1985.

Schneider, J.F., R.C. Aster, L.A. Powell, and R.P. Meyer, Timing of portable seismographs from Omega navigation signals, *Bull. Seismo. Soc. Am.*, *77*, 1457-1478, 1987.

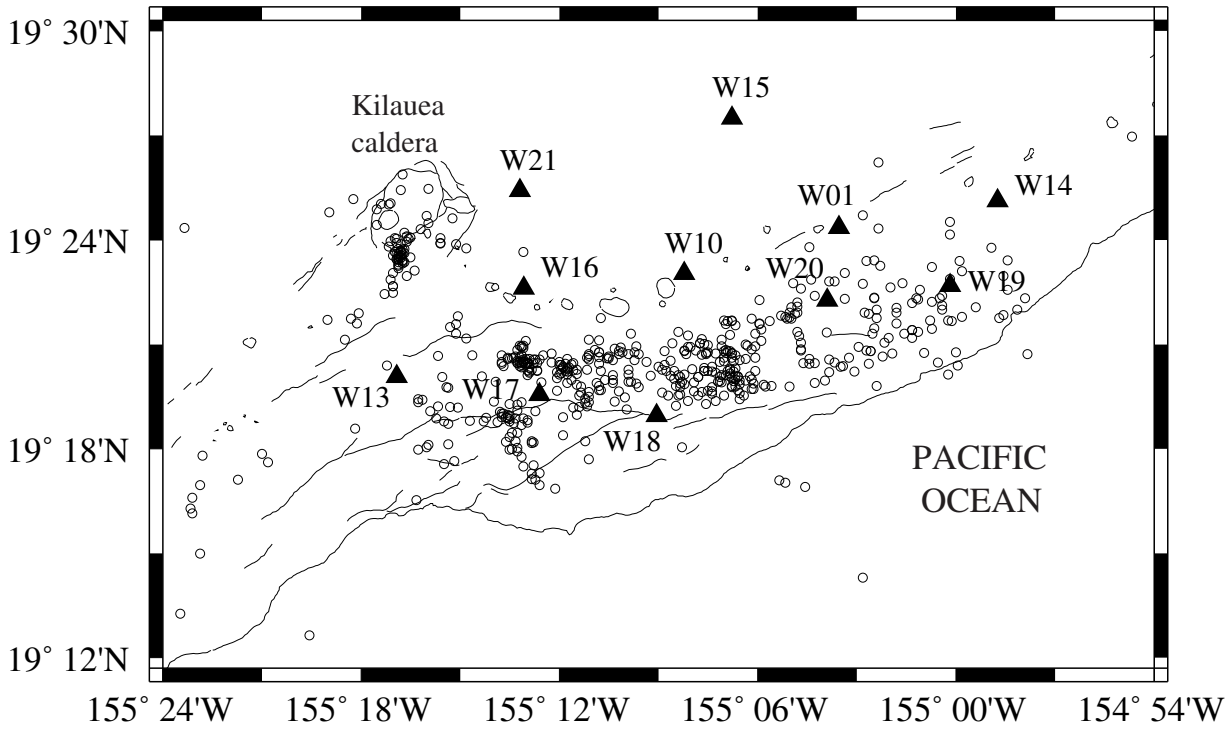

Figure 1. Map of UW station locations for the Kilauea array, 1982 (triangles) and events located by Savage [1984] (circles). UW stations cosited with HVO sites are W13 (KPN), W14 (HUL), and W16 (PAU).

Table 1. Locations of UW stations deployed in the Kilauea array, 1982.

University of Wisconsin Station List - Kilauea, Hawaii Experiment 1982						
ID	Latitude N		Longitude E		Elev. (m)	Gainconst
W01	19	24.36	155	3.54	585	32
W10	19	23.04	155	8.22	786	32
W13	19	20.08	155	16.92	907	16
W14	19	25.13	154	58.72	369	16
W15	19	27.5	155	6.77	641	32
W16	19	22.62	155	13.1	994	32
W17	19	19.56	155	12.61	829	16
W18	19	18.96	155	9.07	505	128
W19	19	22.7	155	0.19	91	64
W20	19	22.27	155	3.89	496	16
W21	19	25.42	155	13.20	1096	16

(One project participant reported a 12 db (factor of 4 gain constant) increase for the horizontal versus vertical components per station. The PASSCAL segy Gainconst headers have been set to the same gain value for both vertical and horizontal components based on instrument configuration notes of Lee Powell.)

Table 2. Portions of the PASSCAL SEGY headers used and instrument parameters

Segy Headers set via UW data archiving	Comments (standard usages followed)
lineSeq	UW Instrument event# + channel
reelSeq	UW Instrument event# + channel
event_number	Experiment Event Number
channel_number	standard (1-3:V,N,E)
traceID	standard (1)
elevationScale	standard (1)
coordScale	standard (1)
coordUnits	standard (2 for lat and long)
sampleLength	standard
num_samps*	standard
deltaSample	microseconds
samp_rate	microseconds
gainType	standard
gainConst	Standard: tr[i] (Volts) = tr[i]*scale_fac/gain
scale_fac	Scale to volts (1.9*10**-5 V/lsb)
year	Trace start time
day	
hour	
minute	
second	
m_secs	
timeBasisCode	standard usage (2 is GMT)
trigyear	trigger time (info not available)
trigday	(Trigger headers set to start time)
trighour	
trigminute	
trigsecond	
trigmills	
data_form	standard usage (1 is 32-bit)
inst_no	UW instrument number
station_name	W## with instr. number (1 to 21)
recLongOrX	receiver longitude*3600
recLatOrY	receiver latitude*3600
sourceLongOrX	source longitude*3600
sourceLatOrY	source latitude*3600
sourceDepth	source depth (m)

Table 3. Events from the Hawaii (E. Rift Zone) 1982 experiment

Id	yr	m	d	h	m	sec	Latitude N		Longitude E		Depth (km)	mag
1	82	03	28	01	08	20.23	19	18.59	155	18.15	31.44	2.40
2	82	03	28	01	55	06.64	19	22.20	155	01.30	8.63	2.10
3	82	03	28	10	45	06.37	19	22.27	155	05.92	8.46	1.80
4	82	03	28	16	56	20.25	19	19.61	155	06.56	8.19	1.80
5	82	03	28	18	35	43.55	19	21.10	155	13.00	9.36	1.60
6	82	03	28	20	39	47.32	19	19.84	155	11.49	9.69	2.90
7	82	03	28	22	28	52.63	19	17.99	155	16.28	9.43	2.30
8	82	03	28	23	58	19.86	19	16.96	155	12.58	8.43	1.50
9	82	03	29	00	03	33.41	19	20.28	155	11.17	7.59	0.00
10	82	03	29	03	55	03.15	19	20.17	155	06.82	8.28	0.00
11	82	03	29	04	00	48.66	19	20.77	155	10.83	8.90	1.90
12	82	03	29	04	00	48.66	19	20.77	155	10.83	8.90	1.80
13	82	03	29	04	06	31.79	19	24.71	155	02.83	15.54	0.00
14	82	03	29	05	00	31.28	19	20.25	155	12.64	7.87	0.00
15	82	03	29	05	37	06.19	19	20.77	155	10.09	8.03	0.00
16	82	03	29	05	53	19.06	19	20.07	155	07.80	7.55	0.00
17	82	03	29	06	06	44.97	19	21.41	155	01.31	5.71	1.40
18	82	03	29	06	06	44.98	19	21.42	155	01.32	5.46	1.00
19	82	03	29	06	24	34.23	19	20.35	155	13.16	7.64	0.10
20	82	03	29	07	08	46.32	19	20.67	155	11.08	7.45	0.00
21	82	03	29	07	44	34.98	19	20.65	155	02.24	9.40	0.00
22	82	03	29	07	46	17.62	19	20.49	155	13.29	7.76	0.00
23	82	03	29	09	19	02.15	19	20.52	155	13.08	7.53	0.20
24	82	03	29	09	19	02.15	19	20.52	155	13.10	7.53	0.20
25	82	03	29	09	44	23.00	19	20.94	155	02.97	6.81	0.00
26	82	03	29	10	28	05.32	19	21.59	155	05.95	8.20	1.40
27	82	03	29	10	28	05.32	19	21.61	155	05.94	8.20	1.40
28	82	03	29	11	14	48.04	19	20.55	155	09.75	8.07	0.00
29	82	03	29	14	12	09.52	19	19.48	155	09.99	8.05	0.00
30	82	03	29	16	16	16.34	19	20.51	155	13.72	7.91	0.00
31	82	03	29	18	38	59.43	19	21.32	155	01.59	6.35	0.00
32	82	03	29	22	38	12.22	19	21.20	155	01.30	1.62	0.00
33	82	03	29	22	39	00.42	19	20.75	155	01.95	3.26	0.00
34	82	03	29	22	55	11.72	19	21.05	155	02.17	3.49	0.20
35	82	03	29	23	12	15.68	19	19.45	155	11.22	9.08	0.20
36	82	03	29	23	52	24.93	19	20.45	155	02.65	4.61	0.00
37	82	03	29	23	55	03.16	19	26.23	155	02.32	9.93	0.00
38	82	03	29	23	55	03.73	19	23.22	155	00.70	8.46	0.00
39	82	03	30	00	19	53.52	19	22.75	155	02.84	8.35	0.00
40	82	03	30	00	30	08.54	19	20.12	155	08.38	7.78	1.80
41	82	03	30	00	47	30.93	19	20.10	155	09.21	8.60	0.00
42	82	03	30	01	27	56.01	19	18.12	155	15.94	9.26	0.80
43	82	03	30	01	51	15.83	19	21.75	155	05.10	8.20	0.00
44	82	03	30	02	07	04.84	19	20.45	155	12.89	8.34	0.20
45	82	03	30	04	18	21.71	19	19.90	155	10.38	8.71	0.00
46	82	03	30	05	00	45.08	19	22.08	155	04.98	8.87	0.00
47	82	03	30	05	52	52.11	19	21.69	155	06.99	7.49	0.00
48	82	03	30	06	18	44.42	19	22.88	155	00.20	8.20	0.00
49	82	03	30	07	40	01.96	19	23.06	155	03.37	8.45	0.00
50	82	03	30	07	41	19.77	19	20.23	155	11.73	7.93	0.00
51	82	03	30	08	06	48.33	19	19.99	155	11.62	6.07	0.00
52	82	03	30	09	15	52.86	19	19.81	155	02.41	7.79	0.00

53	82	03	30	11	19	58.42	19	21.19	155	02.02	5.13	0.00
54	82	03	30	11	39	24.59	19	19.87	155	09.64	8.36	0.00
55	82	03	30	12	06	34.82	19	16.97	155	22.84	7.04	0.70
56	82	03	30	12	30	32.27	19	20.25	155	08.52	9.92	0.00
57	82	03	30	15	44	53.87	19	20.73	154	57.84	6.59	0.00
58	82	03	30	15	45	03.99	19	18.39	155	11.88	6.93	0.00
59	82	03	30	16	01	17.75	19	20.37	155	08.98	8.14	0.00
60	82	03	30	16	04	43.72	19	21.68	155	06.75	8.69	0.00
61	82	03	30	16	17	50.42	19	20.46	155	12.98	8.15	0.00
62	82	03	30	20	40	56.92	19	20.26	155	12.96	8.14	0.00
63	82	03	30	20	45	56.95	19	20.13	155	12.96	7.11	0.10
64	82	03	30	21	16	59.76	20	00.45	155	19.31	7.82	1.90
65	82	03	30	21	25	38.95	19	18.69	155	13.13	7.58	1.40
66	82	03	30	22	09	20.94	19	20.82	155	02.61	4.61	0.00
67	82	03	30	23	08	13.78	19	24.16	155	00.16	8.09	0.00
68	82	03	30	23	11	35.22	19	20.42	155	11.99	8.58	0.00
69	82	03	30	23	39	24.32	19	17.66	155	15.18	9.24	1.70
70	82	03	30	23	39	24.38	19	18.13	155	15.34	10.01	1.70
71	82	03	31	01	12	55.83	19	14.99	155	22.83	8.55	2.60
72	82	03	31	03	07	18.64	19	20.09	155	06.85	8.61	1.90
73	82	03	31	03	46	51.52	19	20.54	155	08.67	9.38	0.00
74	82	03	31	03	56	09.51	19	20.93	155	08.03	8.44	0.00
75	82	03	31	03	56	56.35	19	17.71	155	11.13	2.05	0.20
76	82	03	31	04	16	41.42	19	20.93	155	08.08	9.14	1.70
77	82	03	31	04	18	52.64	19	20.22	155	12.90	9.01	1.70
78	82	03	31	04	51	27.94	19	21.92	155	02.76	7.55	0.00
79	82	03	31	07	06	20.89	19	19.38	155	08.09	8.64	0.00
80	82	03	31	10	01	22.79	19	16.29	155	23.18	3.04	2.20
81	82	03	31	10	44	23.95	19	16.60	155	23.10	5.51	2.10
82	82	03	31	14	08	25.03	19	23.11	154	59.81	8.69	0.00
83	82	03	31	14	53	51.35	19	20.51	155	09.35	8.23	0.00
84	82	03	31	19	02	54.02	19	18.81	155	14.70	40.19	0.70
85	82	03	31	19	03	02.18	19	19.53	155	11.43	5.00	0.00
86	82	03	31	19	21	36.45	18	22.08	155	47.27	6.83	0.00
87	82	03	31	20	15	04.20	19	18.95	155	13.51	9.98	0.00
88	82	03	31	20	49	55.38	19	19.91	155	07.05	8.18	0.00
89	82	03	31	21	08	32.36	19	18.99	155	11.48	7.61	0.00
90	82	03	31	22	29	33.91	19	20.40	154	59.95	2.57	0.00
91	82	03	31	23	08	03.09	19	20.33	155	11.75	8.00	0.00
92	82	04	01	00	05	40.27	19	20.78	155	07.47	8.45	0.00
93	82	04	01	01	00	18.97	19	20.27	155	11.56	7.61	0.00
94	82	04	01	01	50	17.81	19	23.40	154	59.88	8.41	0.00
95	82	04	01	03	17	01.37	19	18.47	155	13.25	9.10	2.00
96	82	04	01	03	21	25.63	19	17.99	155	13.47	10.02	2.20
97	82	04	01	05	52	29.95	19	22.13	155	00.42	7.01	0.00
98	82	04	01	09	24	32.43	19	20.47	155	11.56	9.09	2.00
99	82	04	01	11	03	05.63	19	20.89	155	13.09	8.16	0.00
100	82	04	01	15	07	38.49	19	19.54	155	07.82	7.00	0.00
101	82	04	01	15	47	35.71	19	23.91	155	15.61	3.47	2.90
102	82	04	01	18	03	32.35	19	21.68	155	00.14	7.16	0.00
103	82	04	01	18	14	25.47	19	20.24	155	07.52	9.33	0.20
104	82	04	01	21	50	21.97	19	21.78	155	05.06	8.88	0.00
105	82	04	02	01	30	15.93	19	21.89	155	04.87	8.26	0.00
106	82	04	02	01	30	47.60	19	22.81	155	03.81	8.93	0.20
107	82	04	02	03	06	52.94	19	21.88	155	02.64	8.23	0.00
108	82	04	02	03	28	07.51	19	19.79	155	11.34	8.61	2.20

109	82	04	02	03	47	06.40	19	22.07	154	59.38	7.87	0.00
110	82	04	02	06	29	51.29	19	20.30	155	07.99	7.62	0.20
111	82	04	02	08	05	35.54	19	20.14	155	00.25	2.79	0.00
112	82	04	02	08	30	25.19	19	21.69	155	00.79	7.48	0.00
113	82	04	02	08	49	46.39	19	18.05	155	16.03	27.56	0.00
114	82	04	02	08	54	51.70	19	20.39	155	13.70	8.19	0.00
115	82	04	02	12	42	02.37	19	18.03	155	13.29	7.85	0.00
116	82	04	02	13	24	05.33	19	22.35	155	02.47	7.97	0.00
117	82	04	02	16	14	45.24	19	20.78	155	09.74	8.30	0.00
118	82	04	02	17	56	44.12	19	21.12	155	10.79	7.72	0.20
119	82	04	02	18	14	03.35	19	20.49	155	12.27	8.34	0.00
120	82	04	02	22	02	23.84	19	22.00	155	00.43	7.59	0.00
121	82	04	02	22	38	21.82	19	19.08	155	15.89	8.78	0.30
122	82	04	02	22	54	39.44	19	22.33	155	01.19	7.88	0.00
123	82	04	02	23	46	53.17	19	20.33	155	07.62	9.09	0.00
124	82	04	03	02	21	49.48	19	22.31	155	03.38	8.55	0.00
125	82	04	03	02	23	51.47	19	20.96	155	13.11	7.59	0.00
126	82	04	03	02	24	04.79	19	20.59	155	04.43	9.61	0.00
127	82	04	03	03	24	20.61	19	20.88	155	10.30	8.57	0.00
128	82	04	03	03	34	20.84	19	17.10	155	05.32	4.73	0.00
129	82	04	03	03	34	20.89	19	17.04	155	05.16	4.98	0.00
130	82	04	03	03	42	39.76	19	00.90	155	19.91	16.23	0.10
131	82	04	03	04	10	46.33	19	22.21	155	04.79	8.89	0.00
132	82	04	03	04	37	52.87	19	18.22	155	11.22	9.56	0.00
133	82	04	03	04	47	29.58	19	21.77	154	58.69	8.25	0.00
134	82	04	03	04	58	04.99	19	21.95	155	26.25	12.50	2.20
135	82	04	03	06	14	54.86	19	22.30	155	01.17	8.49	0.00
136	82	04	03	06	40	57.47	19	20.82	155	08.84	8.58	0.00
137	82	04	03	07	20	45.76	19	20.37	155	11.88	8.16	0.00
138	82	04	03	07	49	28.45	19	20.25	155	11.85	7.77	0.00
139	82	04	03	08	13	12.90	19	20.30	155	11.92	8.38	2.10
140	82	04	03	09	09	42.74	19	22.81	155	03.67	8.34	0.00
141	82	04	03	09	34	28.89	19	21.03	155	08.55	9.09	0.00
142	82	04	03	09	52	39.66	19	20.08	155	14.35	8.55	0.00
143	82	04	03	11	42	59.00	19	22.01	155	02.42	8.12	0.00
144	82	04	03	12	19	23.66	19	20.31	155	06.83	9.40	0.00
145	82	04	03	13	49	17.38	19	23.56	155	17.01	3.19	0.80
146	82	04	03	14	53	25.38	19	23.42	155	02.44	8.96	0.00
147	82	04	03	17	28	32.95	19	18.90	155	14.20	9.00	0.40
148	82	04	03	17	39	13.98	19	22.76	155	01.63	9.39	0.00
149	82	04	03	17	49	32.13	19	20.84	155	08.19	9.43	0.00
150	82	04	03	18	20	17.88	19	20.03	155	12.04	7.52	0.00
151	82	04	03	20	18	27.06	19	19.59	155	07.38	8.75	0.00
152	82	04	03	21	20	31.16	19	20.55	155	06.53	9.64	0.00
153	82	04	03	22	20	08.53	19	21.92	155	04.78	8.73	2.10
154	82	04	03	22	29	45.38	19	21.66	155	30.09	9.55	2.00
155	82	04	03	23	02	26.60	19	18.92	155	13.60	7.54	0.00
156	82	04	03	23	40	26.29	19	22.09	155	04.82	8.42	0.00
157	82	04	04	02	39	24.38	19	21.83	155	05.25	8.81	0.00
158	82	04	04	02	42	06.08	19	22.77	155	04.91	8.57	0.00
159	82	04	04	03	40	50.25	19	20.07	155	07.79	7.86	0.00
160	82	04	04	03	48	07.58	19	20.45	155	13.72	7.85	0.00
161	82	04	04	04	00	21.25	19	20.73	155	08.18	8.54	0.00
162	82	04	04	04	47	07.43	19	22.34	155	02.48	9.50	0.00
163	82	04	04	05	27	55.33	19	18.88	155	15.75	8.35	0.30
164	82	04	04	05	30	30.33	19	26.97	154	54.63	5.91	0.00

165	82	04	04	05	39	06.36	19	22.64	155	01.97	9.59	0.00
166	82	04	04	06	02	03.59	19	20.63	155	13.38	7.78	0.00
167	82	04	04	06	20	37.31	19	20.46	155	04.61	8.23	0.00
168	82	04	04	07	08	14.62	19	23.34	155	16.76	3.02	1.90
169	82	04	04	09	25	07.57	19	20.34	155	11.72	6.25	0.10
170	82	04	04	09	31	01.95	19	23.60	155	16.84	3.06	1.40
171	82	04	04	10	04	00.45	19	22.96	154	58.54	8.16	0.00
172	82	04	04	10	17	11.37	19	15.82	155	28.45	7.40	0.50
173	82	04	04	10	29	49.49	20	00.44	156	42.65	7.56	0.00
174	82	04	04	10	44	47.74	19	20.58	155	12.88	8.20	0.00
175	82	04	04	11	51	42.55	19	20.28	155	09.90	7.81	0.00
176	82	04	04	12	22	50.53	18	53.37	155	26.20	7.00	0.00
177	82	04	04	13	07	36.65	19	21.91	155	01.79	7.87	0.00
178	82	04	04	13	29	17.84	19	20.11	155	08.67	7.71	1.70
179	82	04	04	14	02	21.88	19	21.79	154	59.84	8.19	2.40
180	82	04	04	14	21	22.99	19	16.16	155	23.10	5.77	2.10
181	82	04	04	14	36	07.69	19	14.31	155	02.84	39.13	0.00
182	82	04	04	15	48	41.45	19	21.58	155	15.12	9.10	2.00
183	82	04	04	17	26	50.71	19	20.02	155	08.50	7.97	1.80
184	82	04	04	17	27	27.65	19	21.37	155	01.16	10.72	0.00
185	82	04	04	18	13	06.22	19	23.96	155	16.61	2.08	0.40
186	82	04	04	19	25	49.18	19	19.70	155	10.82	6.87	0.00
187	82	04	04	20	22	13.78	19	20.40	155	17.24	8.25	0.00
188	82	04	04	20	33	02.02	19	19.90	155	04.27	8.27	0.00
189	82	04	04	23	15	14.38	19	26.57	154	53.93	6.92	0.00
190	82	04	05	02	58	00.22	19	21.18	155	14.83	9.39	1.50
191	82	04	05	05	17	24.16	19	20.07	155	07.16	7.77	0.00
192	82	04	05	05	24	23.45	19	22.58	154	58.44	8.03	0.00
193	82	04	05	06	03	22.88	19	21.36	155	08.40	8.31	0.00
194	82	04	05	07	28	11.95	19	36.79	155	26.35	7.12	0.00
195	82	04	05	08	58	36.81	19	20.71	155	07.67	8.94	0.00
196	82	04	05	09	57	44.24	19	24.69	155	16.01	3.50	1.60
197	82	04	05	11	11	28.55	19	20.32	155	12.90	8.04	0.00
198	82	04	05	12	37	55.32	19	19.75	155	15.39	8.34	0.00
199	82	04	05	13	17	09.18	19	25.79	155	27.77	8.03	0.60
200	82	04	05	14	19	06.32	19	19.93	155	07.22	8.97	3.00
201	82	04	05	14	55	42.67	19	19.36	155	10.34	8.39	0.00
202	82	04	05	15	51	08.18	19	20.56	155	12.60	8.49	1.80
203	82	04	05	17	26	39.66	19	20.07	155	08.35	8.07	0.00
204	82	04	05	18	02	38.43	19	25.47	155	15.96	4.87	0.00
205	82	04	05	18	07	47.98	19	19.69	155	10.76	9.18	0.00
206	82	04	05	18	22	15.78	19	19.72	155	06.20	7.67	0.00
207	82	04	05	18	45	51.86	19	20.93	155	13.12	8.19	0.00
208	82	04	05	19	48	09.38	19	20.70	155	13.73	7.63	0.00
209	82	04	05	19	57	42.99	19	23.88	155	15.15	5.33	0.30
210	82	04	06	01	03	25.70	19	18.74	155	13.36	9.32	0.00
211	82	04	06	01	12	26.47	19	22.87	155	04.40	8.26	0.00
212	82	04	06	04	23	19.11	19	20.46	155	13.03	8.67	1.60
213	82	04	06	04	31	01.14	19	23.79	155	04.45	4.96	0.00
214	82	04	06	06	09	13.59	19	23.42	154	58.41	6.73	2.20
215	82	04	06	07	09	26.20	19	20.84	155	02.68	5.62	0.00
216	82	04	06	08	29	13.42	19	24.62	155	15.24	3.96	1.20
217	82	04	06	09	05	09.23	19	19.38	155	07.25	8.04	0.00
218	82	04	06	10	53	50.86	19	23.61	155	16.92	2.81	2.20
219	82	04	06	13	21	16.10	19	17.12	155	21.74	7.30	1.80
220	82	04	06	13	42	41.30	19	20.47	155	12.64	7.59	0.00

221	82	04	06	14	01	21.47	19	20.76	155	00.97	5.64	0.00
222	82	04	06	14	24	34.05	19	19.21	155	11.42	8.60	0.00
223	82	04	06	14	34	14.60	19	20.57	155	13.10	7.82	0.00
224	82	04	04	62	39	24.72	19	21.67	155	05.65	5.83	0.00
225	82	04	06	14	58	14.01	19	19.35	155	16.24	7.96	0.00
226	82	04	06	15	43	40.92	19	13.27	155	23.48	9.92	0.00
227	82	04	06	16	38	05.44	19	23.65	155	16.83	3.20	1.30
228	82	04	06	17	13	26.84	19	22.33	154	57.88	6.75	0.00
229	82	04	06	17	57	04.84	19	21.26	155	08.08	8.67	1.90
230	82	04	06	18	48	43.46	19	20.82	155	02.57	6.68	0.00
231	82	04	06	19	59	33.78	19	20.16	155	11.47	8.09	0.00
232	82	04	06	20	20	27.43	19	20.81	155	07.01	9.34	0.00
233	82	04	06	20	45	41.29	19	24.79	155	18.98	5.98	0.20
234	82	04	06	20	58	58.91	19	20.87	155	06.16	9.04	3.00
235	82	04	06	21	16	54.47	19	21.74	155	06.18	7.86	0.00
236	82	04	06	21	31	55.03	19	20.10	155	06.67	7.69	0.00
237	82	04	06	21	48	00.90	18	52.82	155	11.20	16.63	2.30
238	82	04	06	22	49	26.63	19	20.48	155	00.53	12.98	0.00
239	82	04	06	23	57	30.29	19	18.79	155	15.49	8.83	0.00
240	82	04	07	01	54	51.21	19	21.14	155	07.06	9.41	0.00
241	82	04	07	02	27	51.40	19	20.69	155	14.66	8.06	0.00
242	82	04	07	04	44	17.66	19	20.47	155	13.26	7.83	0.00
243	82	04	07	05	30	34.02	19	19.28	155	13.26	31.20	0.00
244	82	04	07	06	53	45.56	19	20.76	155	07.57	8.05	0.00
245	82	04	07	07	01	45.45	19	19.94	155	13.89	8.67	0.00
246	82	04	07	07	10	46.58	19	20.57	155	12.79	7.90	0.00
247	82	04	07	07	47	06.40	19	19.18	155	11.60	9.01	0.00
248	82	04	07	08	24	11.84	19	19.82	155	10.83	9.44	2.00
249	82	04	07	09	11	00.51	19	20.72	155	09.59	8.42	0.00
250	82	04	07	09	12	57.61	19	20.82	155	06.89	8.89	0.00
251	82	04	07	09	23	40.25	19	18.89	155	13.59	9.34	0.00
252	82	04	07	11	06	42.77	19	23.29	155	16.87	3.63	0.30
253	82	04	07	11	41	14.99	19	20.69	155	12.48	8.10	0.00
254	82	04	07	11	59	27.42	19	22.23	155	00.73	8.13	0.00
255	82	04	07	13	03	35.45	19	20.61	155	10.56	8.04	0.00
256	82	04	07	18	02	05.20	19	20.30	155	11.77	9.20	2.10
257	82	04	07	18	05	26.50	19	20.43	155	11.63	8.20	0.00
258	82	04	07	19	01	25.05	19	24.34	155	23.32	20.26	0.00
259	82	04	07	19	42	34.70	19	19.95	155	07.15	9.20	0.00
260	82	04	07	20	54	55.05	19	21.81	155	15.05	9.35	3.00
261	82	04	07	21	19	29.42	19	22.05	155	01.80	8.60	0.00
262	82	04	07	21	49	42.17	19	20.70	155	13.11	8.26	0.60
263	82	04	07	22	12	42.94	19	20.14	155	11.79	7.79	0.00
264	82	04	07	23	30	25.31	19	19.11	155	13.25	8.55	0.40
265	82	04	07	23	47	53.04	19	19.62	155	08.90	6.45	0.00
266	82	04	07	23	52	38.93	19	20.95	155	09.64	7.39	0.00
267	82	04	08	00	59	19.32	19	20.28	155	08.88	7.95	0.00
268	82	04	08	01	31	14.32	19	20.60	155	10.52	8.01	0.00
269	82	04	08	02	05	19.24	19	20.41	155	08.81	7.70	0.00
270	82	04	08	03	19	01.56	19	21.31	155	02.50	7.47	0.00
271	82	04	08	04	56	48.50	19	19.87	155	08.32	8.39	0.20
272	82	04	08	05	47	03.31	19	23.95	155	29.17	10.73	2.40
273	82	04	08	06	57	25.50	19	19.23	155	11.14	8.17	0.00
274	82	04	08	06	58	54.65	19	18.77	155	13.84	7.87	0.00
275	82	04	08	07	22	11.42	19	21.32	155	06.05	8.51	0.00
276	82	04	08	07	29	52.38	19	19.89	155	11.73	8.58	0.00

277	82	04	08	08	31	12.91	19	21.71	155	19.03	13.11	0.00
278	82	04	08	09	16	53.06	19	20.69	155	06.63	8.27	0.10
279	82	04	08	09	30	21.70	19	16.53	155	16.34	6.30	0.00
280	82	04	08	11	20	38.61	19	20.45	155	12.99	8.21	0.50
281	82	04	08	11	28	21.87	19	20.46	155	13.14	8.10	0.20
282	82	04	08	11	49	36.18	19	22.40	155	00.44	8.57	2.30
283	82	04	08	12	17	01.01	19	21.59	155	06.98	8.49	0.00
284	82	04	08	12	43	57.78	19	21.84	154	58.58	3.90	0.00
285	82	04	08	13	06	01.22	19	18.88	155	13.09	8.61	0.00
286	82	04	08	14	59	35.43	19	23.66	155	13.10	8.04	0.30
287	82	04	08	16	34	36.05	19	20.63	155	07.01	9.19	0.00
288	82	04	08	18	36	17.42	20	00.56	155	22.75	8.58	2.70
289	82	04	08	20	03	53.94	19	23.40	155	02.68	7.87	0.00
290	82	04	08	22	53	53.13	19	19.37	155	13.99	8.63	0.00
291	82	04	09	01	05	10.30	19	23.26	155	16.89	2.73	1.60
292	82	04	09	01	24	32.52	19	20.66	155	10.51	8.60	0.00
293	82	04	09	01	37	03.32	19	21.76	155	10.72	3.57	0.00
294	82	04	09	08	52	04.26	19	20.87	155	04.68	7.88	0.00
295	82	04	09	09	45	08.04	19	20.14	155	08.22	7.93	1.40
296	82	04	09	10	36	30.72	19	21.61	155	01.81	8.41	0.00
297	82	04	09	10	52	34.86	19	17.31	155	12.61	9.12	0.10
298	82	04	09	11	28	05.88	18	49.08	155	13.09	9.65	2.40
299	82	04	09	14	00	47.90	19	20.97	155	13.08	8.25	0.00
300	82	04	09	15	51	39.82	19	20.48	155	13.07	8.10	0.00
301	82	04	09	20	11	12.38	19	18.00	155	13.41	7.78	0.30
302	82	04	09	20	46	16.07	19	23.54	155	16.89	2.91	1.50
303	82	04	09	20	51	29.48	19	20.74	155	12.23	8.73	2.10
304	82	04	09	21	39	44.48	19	51.18	155	40.93	16.43	0.40
305	82	04	09	22	44	13.58	19	20.46	155	12.80	8.26	0.00
306	82	04	10	00	34	21.18	19	20.25	155	10.71	8.40	0.00
307	82	04	10	01	10	30.62	19	21.67	155	06.90	8.80	0.00
308	82	04	10	01	52	13.37	19	23.75	155	16.65	2.89	1.50
309	82	04	10	01	55	16.17	19	25.18	155	18.22	4.44	1.50
310	82	04	10	02	02	55.22	19	21.74	155	04.96	7.84	2.20
311	82	04	10	02	24	44.74	19	20.49	155	12.96	8.47	0.00
312	82	04	10	02	34	17.97	19	23.73	155	16.74	2.83	1.40
313	82	04	10	03	23	35.59	19	19.68	155	12.04	8.14	0.00
314	82	04	10	03	49	15.80	19	19.87	155	06.11	9.32	0.00
315	82	04	10	03	50	08.02	19	18.83	155	12.96	8.47	0.00
316	82	04	10	05	13	41.29	19	19.91	155	12.52	3.60	0.00
317	82	04	10	07	02	48.23	19	24.31	155	16.19	1.34	1.40
318	82	04	10	07	22	33.61	19	19.62	155	11.33	8.42	0.00
319	82	04	10	07	38	05.95	19	24.53	155	00.19	8.78	0.30
320	82	04	10	07	48	43.24	19	21.35	155	03.89	8.38	0.60
321	82	04	10	08	53	41.06	19	20.64	155	13.20	7.73	0.00
322	82	04	10	10	36	26.33	19	20.62	155	13.54	7.65	0.00
323	82	04	10	11	28	19.65	19	20.07	155	15.56	8.21	0.00
324	82	04	10	11	35	27.80	19	21.14	155	11.09	13.50	0.00
325	82	04	10	12	29	47.30	19	18.98	155	13.53	8.42	1.90
326	82	04	10	12	36	33.42	19	20.42	155	13.14	8.11	1.30
327	82	04	10	14	31	27.22	19	20.51	155	07.11	7.19	0.00
328	82	04	10	15	25	05.36	19	26.78	154	53.34	6.69	1.90
329	82	04	10	15	50	22.77	19	19.29	155	13.48	8.92	1.20
330	82	04	10	15	59	00.27	19	18.04	155	08.28	9.16	0.10
331	82	04	10	15	59	49.56	19	23.57	155	16.83	2.74	3.10
332	82	04	10	16	16	50.92	19	20.50	155	12.01	8.08	0.00

333	82	04	10	17	32	04.47	19	23.44	155	16.86	2.98	2.00
334	82	04	10	17	33	38.74	19	23.45	155	16.91	3.26	1.30
335	82	04	10	20	50	32.25	19	19.80	155	05.05	6.21	1.30
336	82	04	11	01	51	22.31	19	22.61	155	04.68	8.78	2.90
337	82	04	11	01	58	20.37	19	20.32	155	11.87	8.12	0.00
338	82	04	11	02	41	04.96	19	18.17	155	12.85	2.77	0.00
339	82	04	11	04	08	58.16	19	18.79	155	14.27	2.74	0.00
340	82	04	11	04	37	44.05	19	21.32	155	09.84	3.09	0.00
341	82	04	11	04	40	43.65	19	20.14	155	12.01	8.57	0.00
342	82	04	11	08	27	59.77	19	20.38	155	13.23	8.33	1.40
343	82	04	11	10	03	11.95	19	19.21	155	15.27	8.88	2.40
344	82	04	11	11	20	20.98	19	24.04	155	16.94	3.17	2.40
345	82	04	11	12	34	53.23	19	19.93	155	08.28	8.61	1.80
346	82	04	11	13	22	27.46	19	20.64	155	10.83	8.25	0.00
347	82	04	11	13	40	11.06	19	20.17	155	11.93	8.30	0.00
348	82	04	11	15	52	56.84	19	23.45	155	16.95	3.09	1.50
349	82	04	11	16	25	18.84	19	20.22	155	03.07	8.11	0.00
350	82	04	11	17	14	20.79	19	20.81	155	08.25	8.72	0.00
351	82	04	11	19	21	08.23	19	23.46	155	16.89	3.24	1.30
352	82	04	11	19	36	09.10	19	23.51	155	16.52	3.27	0.00
353	82	04	11	20	25	43.77	19	22.57	155	01.10	7.00	0.20
354	82	04	11	22	55	30.52	19	22.86	155	17.07	2.91	1.50
355	82	04	12	00	27	00.91	19	19.98	155	10.35	9.31	0.00
356	82	04	12	00	37	45.19	19	20.12	155	10.40	9.27	0.30
357	82	04	12	01	21	14.43	19	22.39	155	04.27	8.92	0.00
358	82	04	12	02	04	02.45	19	20.07	155	06.59	9.50	4.20
359	82	04	12	02	08	21.89	19	19.44	155	06.52	9.39	2.30
360	82	04	12	02	11	01.25	19	21.56	155	06.66	8.20	2.30
361	82	04	12	02	13	40.13	19	20.31	155	06.65	7.83	0.00
362	82	04	12	02	14	25.11	19	19.54	155	07.04	7.13	0.40
363	82	04	12	02	15	43.83	19	19.80	155	05.74	3.34	0.00
364	82	04	12	02	15	43.90	19	20.23	155	06.72	8.24	0.00
365	82	04	12	02	16	30.06	19	18.30	155	34.64	2.05	0.00
366	82	04	12	02	18	15.27	18	20.39	154	33.58	6.83	1.50
367	82	04	12	02	20	33.58	19	19.70	155	06.62	8.13	1.50
368	82	04	12	02	33	06.67	19	21.01	155	07.61	1.31	1.90
369	82	04	12	02	35	54.61	19	20.52	155	06.70	8.53	1.90
370	82	04	12	02	37	25.86	19	19.77	155	07.38	8.86	0.00
371	82	04	12	02	40	52.39	19	19.86	155	06.52	8.14	0.00
372	82	04	12	02	43	42.24	19	19.65	155	07.35	8.54	0.00
373	82	04	12	02	44	06.39	19	20.85	155	06.94	8.05	0.00
374	82	04	12	02	44	48.86	19	21.27	155	06.84	8.17	0.00
375	82	04	12	04	02	05.13	19	19.81	155	06.78	8.84	0.00
376	82	04	12	04	12	06.02	19	20.63	155	06.05	8.46	0.00
377	82	04	12	04	22	59.83	19	20.76	155	06.97	8.23	0.00
378	82	04	12	04	27	38.90	19	20.28	155	06.84	9.00	0.00
379	82	04	12	04	36	03.17	19	19.78	155	15.40	8.12	0.00
380	82	04	12	04	43	41.37	19	23.76	155	14.84	5.45	1.00
381	82	04	12	04	54	33.51	19	19.79	155	06.65	8.44	0.00
382	82	04	12	05	02	52.81	19	20.00	155	06.65	8.03	0.00
383	82	04	12	05	16	59.05	19	24.05	155	15.59	1.56	2.20
384	82	04	12	05	54	46.07	19	10.96	155	36.99	12.52	0.00
385	82	04	12	06	40	48.27	19	19.85	155	05.84	10.13	0.00
386	82	04	12	07	35	00.33	18	38.88	155	17.29	7.10	0.00
387	82	04	12	07	43	49.77	19	20.24	155	06.09	9.29	0.00
388	82	04	12	07	50	28.88	19	20.55	155	10.39	8.04	0.00

389	82	04	12	07	54	53.53	19	18.73	155	15.36	8.96	0.00
390	82	04	12	08	05	32.97	19	20.24	155	06.93	8.01	0.20
391	82	04	12	08	54	35.33	19	23.37	155	16.88	3.07	1.40
392	82	04	12	08	58	53.42	19	20.78	155	00.00	6.92	1.40
393	82	04	12	09	02	30.26	19	24.33	155	02.36	5.96	0.00
394	82	04	12	09	35	58.54	19	22.67	155	17.06	0.27	0.10
395	82	04	12	10	06	01.55	19	17.77	155	13.13	9.33	0.00
396	82	04	12	10	44	11.30	19	19.96	155	06.35	9.32	0.00
397	82	04	12	11	02	29.08	19	19.22	155	15.66	9.02	2.40
398	82	04	12	12	49	23.20	19	20.19	155	12.88	8.30	0.00
399	82	04	12	14	24	42.19	19	19.78	155	06.78	6.81	0.00
400	82	04	12	14	25	51.59	19	22.00	154	58.14	4.14	0.00
401	82	04	12	15	08	32.86	19	20.72	155	07.59	9.02	1.40
402	82	04	12	15	09	42.48	19	19.53	155	06.39	8.57	1.40
403	82	04	12	16	04	05.61	19	19.07	155	13.77	8.65	0.00
404	82	04	12	16	23	32.91	19	21.90	155	18.07	3.21	1.00
405	82	04	12	16	44	13.24	19	24.06	155	16.96	3.12	1.30
406	82	04	12	16	55	31.92	19	19.86	155	08.20	7.29	0.00
407	82	04	12	17	15	22.42	19	21.80	155	05.14	8.42	1.50
408	82	04	12	19	56	53.08	19	20.76	155	06.80	7.81	2.20
409	82	04	12	20	41	32.34	19	21.00	155	06.38	7.96	0.00
410	82	04	12	22	23	44.69	19	18.87	155	13.50	8.76	0.00
411	82	04	12	22	57	05.35	19	19.35	155	11.12	9.25	0.00
412	82	04	12	23	46	52.15	19	19.73	155	06.14	7.68	0.00
413	82	04	13	00	15	20.16	19	20.52	155	07.03	6.96	0.00
414	82	04	13	00	40	57.68	19	20.62	155	11.18	8.15	0.00
415	82	04	13	02	01	37.77	19	20.56	155	11.13	8.22	0.60
416	82	04	13	02	10	30.64	19	20.72	155	11.13	7.77	0.00
417	82	04	13	02	55	46.05	19	21.92	155	05.07	7.85	0.00
418	82	04	13	02	56	19.07	19	23.39	155	16.74	2.71	0.00
419	82	04	13	04	36	09.54	19	22.45	155	17.28	2.71	1.10
420	82	04	13	05	40	26.44	19	20.82	155	10.20	8.02	0.00
421	82	04	13	05	58	06.18	19	20.00	155	06.21	9.07	0.00
422	82	04	13	06	06	17.36	19	20.82	155	06.86	9.02	0.00
423	82	04	13	07	04	41.50	19	20.92	155	10.12	8.11	0.00
424	82	04	13	07	41	07.50	19	20.66	155	13.35	8.76	1.00
425	82	04	13	07	52	51.09	19	19.97	155	06.56	8.86	0.10
426	82	04	13	08	01	10.55	19	20.74	155	06.80	9.70	0.00
427	82	04	13	08	14	59.63	19	20.85	155	13.28	8.02	0.00
428	82	04	13	08	15	45.20	19	18.22	155	13.34	8.98	1.20
429	82	04	13	08	25	08.48	19	12.65	155	19.58	39.88	0.00
430	82	04	13	08	47	26.58	19	20.97	155	06.32	8.27	0.00
431	82	04	13	09	09	08.41	19	19.67	155	07.47	8.06	0.50
432	82	04	13	09	09	46.34	19	20.24	155	07.64	8.79	0.00
433	82	04	13	11	32	53.50	19	19.65	155	10.22	8.86	0.50
434	82	04	13	11	41	30.10	19	24.11	155	16.61	2.92	0.40
435	82	04	13	12	03	08.42	19	24.07	155	16.49	3.10	0.40
436	82	04	13	13	43	16.26	19	19.02	155	13.74	8.87	0.00
437	82	04	13	14	01	33.44	19	18.47	155	13.41	9.79	0.80
438	82	04	13	14	03	00.83	19	17.92	155	13.28	9.69	0.30
439	82	04	13	15	01	08.23	19	20.72	155	09.92	7.98	0.10
440	82	04	13	15	36	56.02	19	20.68	155	15.67	8.52	0.30
441	82	04	13	16	12	47.27	19	17.13	155	12.87	9.04	1.80
442	82	04	13	16	18	21.23	19	25.06	155	17.12	1.42	2.10
443	82	04	13	16	30	30.58	19	17.53	155	12.77	9.80	0.00
444	82	04	13	16	32	24.91	19	08.74	155	29.91	10.52	0.90

445	82	04	13	18	02	08.19	19	21.50	155	15.31	8.88	0.00
446	82	04	13	19	40	09.68	19	20.28	155	11.47	8.14	0.00
447	82	04	13	21	05	50.38	19	20.13	155	07.05	6.72	0.00
448	82	04	13	21	29	51.79	19	20.59	155	06.38	9.56	0.00
449	82	04	13	21	39	10.12	19	20.63	155	06.79	7.66	0.00
450	82	04	13	22	02	41.29	19	21.69	155	00.24	7.78	0.00
451	82	04	13	22	18	15.68	19	20.12	155	06.96	8.42	0.00
452	82	04	13	23	13	33.53	19	20.09	155	06.59	7.66	0.30
453	82	04	13	23	37	39.74	19	23.65	155	16.98	2.83	0.90
454	82	04	13	23	49	01.23	19	23.70	155	16.79	3.05	1.30
455	82	04	13	23	50	12.45	19	20.36	155	07.35	7.39	1.30
456	82	04	14	00	50	01.76	19	16.86	155	12.10	7.22	0.50
457	82	04	14	03	05	05.28	19	19.29	155	07.56	9.11	0.00
458	82	04	14	04	37	24.02	19	22.33	155	00.47	7.54	0.00
459	82	04	14	05	02	05.70	19	19.96	155	03.97	7.33	0.00
460	82	04	14	05	06	26.20	19	19.95	155	06.69	7.83	0.00
461	82	04	14	05	24	16.09	19	19.02	155	13.68	9.22	0.00
462	82	04	14	06	15	02.00	19	20.60	155	13.41	7.99	0.00
463	82	04	14	06	20	51.03	19	22.96	155	16.64	2.90	0.40
464	82	04	14	06	21	25.32	19	23.97	155	17.08	3.10	1.10
465	82	04	14	06	21	42.70	19	21.45	155	00.75	7.08	1.10
466	82	04	14	06	44	51.83	19	24.21	155	16.69	3.05	1.80
467	82	04	14	08	06	32.15	19	19.81	155	05.58	6.89	0.00
468	82	04	14	09	16	49.18	19	17.62	155	20.85	8.37	1.70
469	82	04	14	09	36	59.81	19	20.85	155	10.90	8.40	0.00
470	82	04	14	11	39	25.12	19	23.49	155	16.82	2.87	2.70
471	82	04	14	11	57	51.17	19	23.42	155	16.71	3.36	0.20
472	82	04	14	12	17	58.51	19	17.11	155	12.72	8.93	2.00
473	82	04	14	13	41	52.46	20	05.63	155	46.21	7.84	2.70
474	82	04	14	14	22	16.24	19	18.19	155	12.78	10.54	2.00
475	82	04	14	14	24	56.47	19	18.23	155	12.81	11.88	2.00
476	82	04	14	14	30	29.06	19	14.95	155	24.50	35.46	2.80
477	82	04	14	14	34	27.47	19	17.30	155	12.85	8.23	1.50
478	82	04	14	14	44	48.80	19	18.35	155	13.48	8.40	0.10
479	82	04	14	15	15	47.40	19	19.14	155	09.95	9.51	0.00
480	82	04	14	15	38	27.95	19	21.61	155	18.14	3.59	0.30
481	82	04	14	15	38	54.44	19	17.49	155	13.10	9.44	1.10
482	82	04	14	16	13	58.01	19	18.88	155	13.34	9.14	0.00
483	82	04	14	18	32	00.64	19	18.91	155	11.86	8.08	0.60
484	82	04	14	18	55	00.24	19	20.51	155	13.23	8.23	0.20
485	82	04	14	19	04	01.45	19	20.54	155	13.26	8.40	0.30
486	82	04	14	19	57	03.73	19	19.19	155	15.08	8.75	2.00
487	82	04	14	20	59	08.03	19	25.44	155	25.62	9.03	2.00
488	82	04	15	00	00	06.07	19	21.76	155	02.39	7.19	1.60
489	82	04	15	00	38	45.70	19	23.06	155	17.06	2.81	1.00
490	82	04	15	05	29	55.90	19	20.58	155	13.03	8.67	1.80
491	82	04	15	05	40	59.84	19	23.55	155	16.80	3.10	1.90
492	82	04	15	12	37	04.42	19	23.88	155	16.78	2.79	2.40
493	82	04	15	12	40	34.68	19	23.82	155	17.17	2.56	0.80
494	82	04	15	14	52	37.63	19	20.27	155	12.64	8.65	1.30
495	82	04	15	19	20	49.29	19	17.81	155	22.80	7.51	2.10
496	82	04	15	20	43	35.10	19	21.74	155	18.29	2.61	1.40
497	82	04	15	22	40	02.53	19	23.19	155	16.84	2.98	1.80
498	82	04	15	23	57	06.95	19	17.87	155	20.98	6.96	1.70
499	82	04	16	01	27	43.42	19	20.09	155	06.22	7.61	0.10
500	82	04	16	02	29	34.93	19	23.77	154	58.93	6.53	2.00

501	82	04	16	03	42	32.47	19	20.03	155	06.78	7.58	2.00
502	82	04	16	09	37	31.07	19	21.24	155	04.76	7.12	0.00
503	82	04	16	10	00	24.39	19	17.57	155	15.51	7.85	1.20
504	82	04	16	14	35	24.90	19	23.70	155	16.81	2.86	1.80
505	82	04	16	14	36	04.17	19	23.91	155	16.91	2.90	1.90
506	82	04	16	15	00	22.84	20	04.18	155	19.82	6.97	3.60
507	82	04	16	16	14	44.44	19	20.24	155	07.62	6.25	0.00
508	82	04	17	01	04	47.60	19	20.20	155	12.04	9.46	3.00
509	82	04	17	01	15	40.76	19	20.44	155	11.82	10.02	3.70
510	82	04	17	01	19	19.61	19	20.58	155	11.79	8.36	0.50
511	82	04	17	03	24	16.23	19	22.49	155	17.06	3.21	1.10
512	82	04	17	05	47	48.02	19	20.25	155	08.76	8.22	0.30
513	82	04	17	08	31	32.41	19	21.43	155	05.87	7.85	0.20
514	82	04	17	09	59	40.16	19	24.44	155	17.53	16.16	2.00
515	82	04	17	10	23	07.46	19	19.32	155	11.22	7.66	0.00
516	82	04	17	11	20	50.74	19	25.02	155	17.17	1.38	3.90
517	82	04	17	11	50	30.75	19	24.89	155	17.50	1.65	1.30
518	82	04	17	12	26	02.38	19	25.43	155	16.77	1.59	2.20
519	82	04	17	13	38	26.87	19	20.83	155	07.88	7.63	0.30
520	82	04	17	15	01	40.17	19	19.53	155	08.69	5.75	1.10
521	82	04	17	15	35	42.72	19	25.89	155	16.71	1.50	1.50
522	82	04	17	16	09	58.89	19	20.96	155	06.07	8.09	2.20
523	82	04	17	19	23	45.63	19	25.03	155	17.38	1.31	1.40
524	82	04	17	20	34	44.00	19	08.09	155	34.82	11.50	1.40
525	82	04	17	22	13	26.71	19	19.50	155	11.07	7.54	0.30
526	82	04	17	23	29	33.60	19	20.44	155	10.78	8.39	2.00
527	82	04	18	00	00	59.09	19	20.28	155	12.83	7.45	0.00
528	82	04	18	01	19	22.59	19	21.14	155	18.47	4.34	1.10
529	82	04	18	03	21	22.25	19	20.57	155	12.74	7.98	0.20
530	82	04	18	04	07	14.71	19	19.64	155	07.68	7.37	1.80
531	82	04	18	05	10	29.32	19	20.74	155	07.29	7.37	0.00
532	82	04	18	05	42	35.60	19	42.80	155	17.54	27.24	1.80
533	82	04	18	09	17	27.86	19	20.42	155	13.00	9.14	1.80
534	82	04	18	12	17	45.32	19	20.14	155	09.90	6.70	0.10
535	82	04	18	13	22	35.12	19	19.89	155	10.89	8.26	1.70
536	82	04	18	14	08	39.32	19	24.04	155	16.58	3.96	0.90
537	82	04	18	16	16	58.24	19	21.04	155	07.73	8.50	0.00
538	82	04	18	16	16	58.36	19	21.04	155	07.73	6.97	0.50
539	82	04	18	16	16	58.38	19	21.15	155	07.67	6.73	0.50
540	82	04	18	16	26	43.33	19	20.99	155	07.48	6.98	0.00
541	82	04	18	17	51	27.67	19	19.78	155	09.59	6.96	1.60
542	82	04	18	18	08	01.93	19	19.82	155	08.48	9.14	0.00
543	82	04	19	06	08	41.91	19	20.72	155	10.20	7.16	0.50
544	82	04	19	10	12	21.67	19	23.75	155	16.84	3.01	1.10
545	82	04	19	12	23	55.93	19	21.06	155	04.66	8.83	3.80
546	82	04	19	12	40	55.91	19	20.20	155	03.81	8.28	2.10
547	82	04	19	13	00	31.49	19	19.58	155	08.32	6.51	3.90
548	82	04	19	13	02	00.67	19	20.56	155	03.82	8.91	3.90
549	82	04	19	13	09	56.74	19	23.12	155	16.35	2.60	1.80
550	82	04	19	13	12	07.31	19	20.38	155	03.40	8.18	1.80
551	82	04	19	13	14	04.12	19	20.49	155	03.67	8.07	2.20
552	82	04	19	13	57	54.06	19	20.36	155	03.48	7.60	0.20
553	82	04	19	14	04	39.39	19	20.19	155	07.24	6.34	2.00
554	82	04	19	14	53	26.48	19	20.96	155	07.09	6.49	0.00
555	82	04	19	19	17	48.88	19	18.75	155	12.94	7.44	0.30
556	82	04	19	20	45	04.19	19	19.65	155	07.90	6.74	0.50

557	82	04	19	21	00	51.36	19	20.58	155	13.54	8.75	1.80
558	82	04	20	00	21	31.71	19	19.99	155	10.63	8.91	0.00
559	82	04	20	06	54	39.24	12	25.07	149	53.17	7.13	2.70
560	82	04	20	23	25	37.80	19	20.50	155	13.07	8.71	1.50
561	82	04	21	00	40	29.04	19	19.35	155	13.12	7.86	0.30
562	82	04	21	01	37	47.40	19	19.25	155	08.44	6.05	0.00
563	82	04	21	03	57	20.30	19	21.69	155	06.75	7.66	1.30
564	82	04	21	05	12	51.00	19	21.47	155	02.48	7.04	2.40
565	82	04	21	05	50	18.51	19	20.45	155	04.44	6.90	0.30
566	82	04	21	06	42	42.65	19	20.23	155	07.40	9.27	2.50
567	82	04	21	11	46	53.51	19	55.92	155	33.79	30.02	2.60
568	82	04	21	14	58	57.51	19	19.09	155	12.70	6.53	0.20
569	82	04	21	15	48	53.14	19	20.41	155	11.93	9.02	1.60
570	82	04	21	21	16	30.66	19	19.93	155	09.86	7.06	0.00
571	82	04	21	21	17	51.37	19	19.93	155	09.87	7.34	2.30
572	82	04	22	07	55	26.96	19	19.63	155	11.08	8.53	1.80
573	82	04	22	12	30	55.92	19	16.91	155	04.58	44.95	0.70
574	82	04	22	12	39	24.23	19	23.63	155	16.70	3.01	2.10
575	82	04	22	12	49	45.15	19	23.36	155	16.66	3.05	2.00
576	82	04	22	13	58	01.27	19	18.91	155	13.75	7.86	1.40
577	82	04	22	18	25	31.06	19	18.80	155	13.52	9.18	2.60
578	82	04	22	22	07	45.75	19	20.97	155	13.21	9.45	2.80
579	82	04	23	00	40	42.05	19	23.60	155	16.74	2.88	2.50
580	82	04	23	03	52	19.57	19	23.27	155	02.30	7.58	1.70
581	82	04	23	20	25	40.44	19	21.32	155	15.11	9.12	3.40
582	82	04	23	21	36	39.08	19	15.57	155	27.06	11.59	2.80
583	82	04	23	21	36	39.20	19	16.13	155	27.46	9.84	2.80
584	82	04	23	21	36	39.29	19	17.02	155	27.88	8.00	0.00
585	82	04	24	15	42	47.75	19	20.47	155	04.26	8.14	1.40
586	82	04	24	22	13	30.43	19	55.44	155	35.55	0.24	2.50
587	82	04	24	22	13	31.49	19	56.12	155	35.70	6.47	2.90
588	82	04	25	19	18	32.51	19	19.41	155	16.12	7.65	2.30
589	82	04	25	19	18	32.57	19	19.43	155	16.28	4.00	2.30
590	82	04	26	07	33	03.87	19	24.08	155	24.83	9.42	2.40
591	82	04	26	08	17	29.34	19	21.11	155	05.87	7.28	1.50
592	82	04	26	10	53	02.13	19	19.91	155	07.95	8.79	1.80
593	82	04	26	15	57	09.85	19	19.77	155	08.36	8.11	1.60
594	82	04	26	18	39	59.91	19	19.53	155	08.42	3.57	0.10
595	82	04	27	23	13	54.09	19	18.20	155	13.63	8.96	2.00
596	82	04	28	06	23	01.40	19	20.63	155	03.26	9.11	3.40
597	82	04	30	00	02	27.71	19	22.68	155	17.01	24.75	2.00
598	82	04	30	18	33	32.97	19	20.84	155	04.68	6.73	0.00
599	82	04	30	18	48	52.76	19	21.37	155	04.81	8.83	3.40
600	82	04	30	18	55	05.39	19	23.90	155	15.59	3.14	2.50
601	82	04	30	19	16	06.38	19	23.49	155	16.87	2.96	2.60
602	82	04	30	19	20	42.20	19	24.49	155	15.93	1.36	2.40

Table 4. General specifications, University of Wisconsin-Madison digital 3-component recorders

DATA STORAGE:	5" reel 1/4" tape, 1800 feet	or	SCSI 3-1/2" disk
CAPACITY:	20 Mbyte		210 Mbyte
FORMAT:	4-track; 3-channel + error correction		multi-stream packet
DYNAMIC RANGE:	106 dB	Noise = 0.25 μV P-P	Clipping = 0.05 V P-P
CALIBRATION:	Random binary sequence and step current applied to seismometer coils through a bridge (at programmed start times)		
PASSBAND:	Low end: 2 poles at 0.09 Hz High end: 4-pole Butterworth at (0.25 * sample rate)		
SAMPLE RATE:	25, 50, 100, 200, 400 samples/second		
PRE-EVENT DELAY:	512, 1024, 2048 samples/channel		
MODES:	Programmed and/or multiple-mode triggered		
PROGRAMMING:	Time (ddd – hr:mn:sc), repeat interval and count for run, calibrate, trigger arm and disarm (24 entries)		
RUN TIMES:	Programmable to 1000 minutes in 1 sec steps with optional programmed limits on total recording time for each mode		
TRIGGER HARDWARE:	STA/delayed LTA ratio; broadband or teleseismic filtered		
TRIGGER SOFTWARE:	Three frequency band Walsh transform filter to discriminate teleseismic, regional, and noise; with independent run times		
STATUS REVIEW:	Omega signal, time, configuration, schedules, number of events recorded and time used for each mode, times of last 500 events, seismometer period and damping		
TIMING INTERNAL:	1 mHz TCXO, +/- 1 x 10^{-6} over temperature range		
EXTERNAL:	13.6 kHz Omega VLF phase recorded with seismic data;		
worldwide	coverage (except Antarctica and central Greenland) Post-processing time corrections: +/- 1 x 10^{-8} oscillator error; 1/4 sample RMS time error relative to U.T.		
POWER:	12.5 V DC +/- 20% 40 ma average current waiting for trigger 400 ma average current recording to tape 50 ma average current recording to disk		
DIMENSIONS:	56 x 33 x 40 cm		
WEIGHT:	22 kg		
TEMPERATURE:	0 deg to 50 deg C normal range (tape operates to 0 deg C) -20 deg to 70 dec C reduced spec. (disk operates to –20 deg C) -40 deg to 80 deg C storage		