

STRONG-MOTION RECORDS RECOVERED FROM  
THE MAMMOTH LAKES, CALIFORNIA, EARTHQUAKES OF 6 JANUARY 1983

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California Strong Motion Instrumentation Program  
PRELIMINARY DATA (Subject to Revision)

Office of Strong Motion Studies  
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TABLE 1

Alphabetical list of CDMG strong-motion stations located within 60 km of the  
6 January 1983 Mammoth Lakes earthquakes.

No.	Station	Coordinates	Site Geology	Structure Type/Size	Instrument Location(s)
54100	Benton	37.818°N 118.475°W	alluvium >500 m	1-story bldg	ground level
54171	Bishop	37.360°N 118.396°W	alluvium >1000 m	1-story bldg	ground level
54338	Bishop Office Bldg	37.370°N 118.396°W	alluvium >1000 m	2-story bldg	ground level 2nd, roof
54424	Bishop Paradise Lodge	37.481°N 118.602°W	~5 m alluvium over tuff	1-story bldg	ground level
54428	Chalfant	37.662°N 118.398°W	alluvium >500 m	1-story bldg	ground level
54099	Convict Creek UC Res Station	37.614°N 118.831°W	alluvium >200 m	1-story bldg	ground level
Temp	Crowley Lake Shehorn Res	37.561°N 118.743°W	alluvium ~50 m	1-story bldg	ground level
55429	June Lake Fire Station	37.783°N 119.075°W	rock (granitic)	2-story bldg	ground level
54214	Long Valley Dam	37.588°N 118.705°W	rock (Bishop tuff)	earth dam	abutment crest, face, toe
54301	Mammoth Lakes High School Gym	37.641°N 118.963°W	glacial debris ~75 m	1-story bldg	ground level roof
55098	Mono Lake	37.940°N 119.065°W	alluvium >500 m	Inst Shelter	ground level
55031	Tioga Pass	37.940°N 119.190°W	rock (granitic)	Inst Shelter	ground level
54362	Vermilion Dam	37.370°N 118.987°W	glacial debris >75 m	earth dam	abutment crest, face, toe
54384	Vermilion Dam Downstream	37.356°N 118.988°W	rock (granitic)	Inst Shelter	ground level

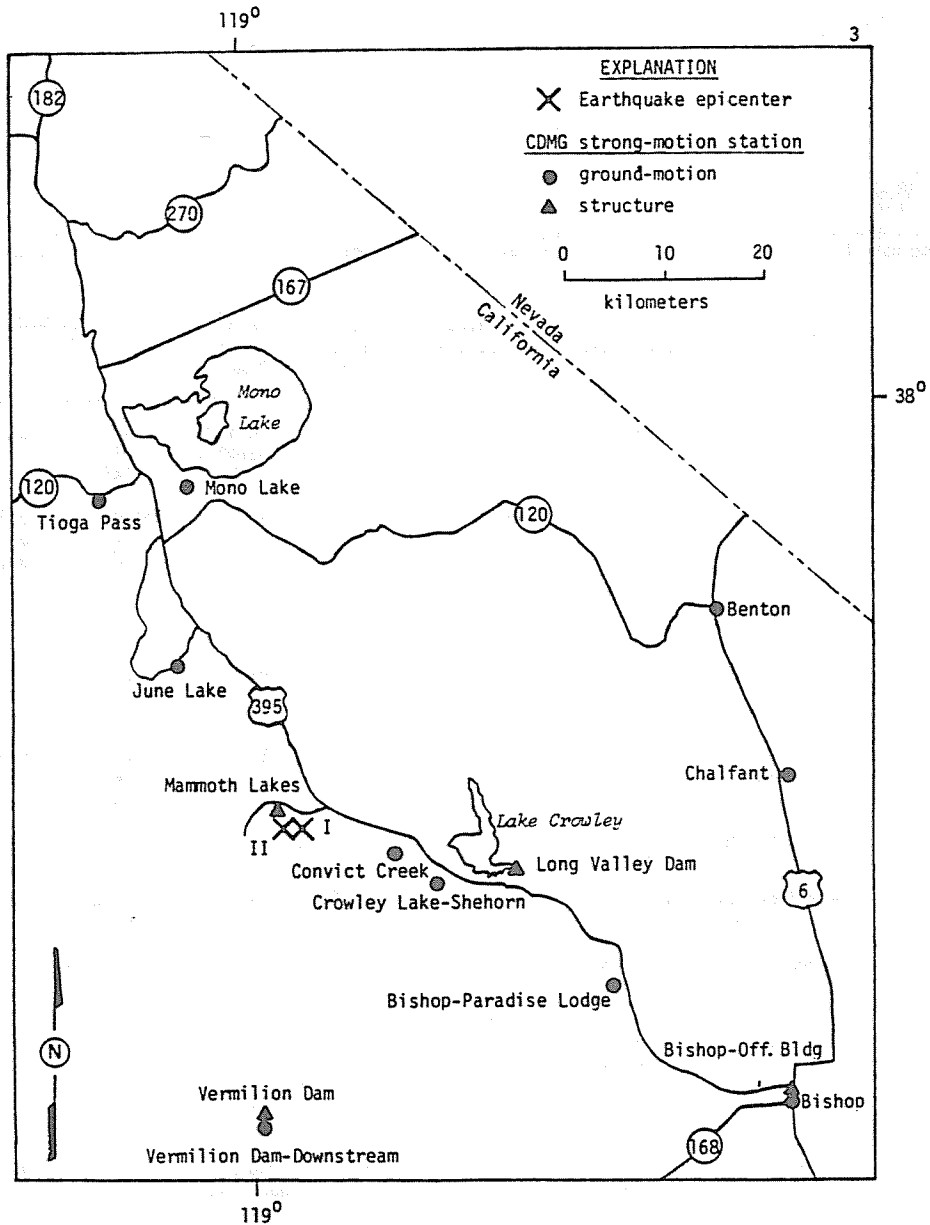


Figure 1. CDMG strong-motion stations within 60 km of the epicentral area for the 6 January 1983 Mammoth Lakes earthquakes. Epicenters (USGS) for the two earthquakes are plotted; numerals I and II indicate the 17:38 and 19:24 (PST) events respectively.

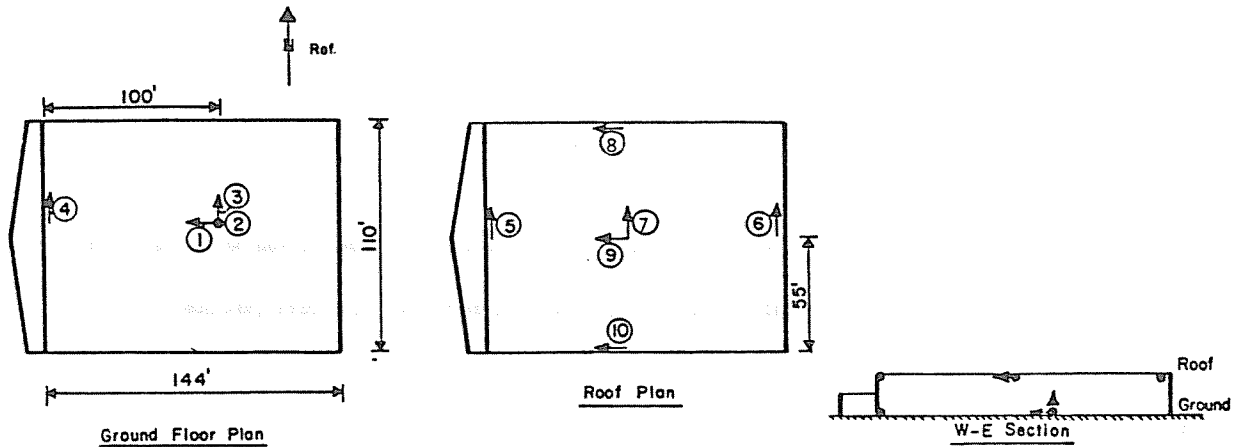


Figure 2 - Mammoth High School Gymnasium, strong-motion instrumentation scheme. Reference orientations for structure are N=344°, W=254°

TABLE 2

Strong-motion data from CDMG accelerograph stations located within 60 km of the 17:38 (PST) 6 January 1983 Mammoth Lakes earthquake. Stations are arranged in order of increasing epicentral distance.

Number	Station Name	Coordinates (degrees)	Epicentral Distance (km)	S-t <sup>1</sup> Interval (sec)	WWVB <sup>2</sup> Trigger Time	Maximum Acceleration		
						Azimuth <sup>3</sup>	Ground (g)	Structure (g)
54301	Mammoth Lakes High School Gym	37.641 N 118.963 W	3.5	0.5	radio inoperative	344	0.26	0.49
						UP	0.17	-
						254	0.20	0.46
54099	Convict Creek U.C. Research Station	37.614 N 118.831 W	8.6	1.5	38:12.7	180	0.16	-
						UP	0.10	-
						90	0.17	-
Temp	Crowley Lake Shehorn Res	37.561 N 118.743 W	18	-	-	Inoperative		
54241	Long Valley Dam	37.588 N 118.705 W	20	2.3	38:14.8	90	0.06	0.09
						UP	0.06	0.07
						360	0.08	0.13
55429	June Lake Fire Station	37.783 N 119.075 W	22	2.4	38:16.0	360	< 0.05	-
						UP	"	-
						270	"	-
54362	Vermilion Dam	37.370 N 118.987 W	29	-	-	Station not accessible		
54384	Vermilion Dam Downstream	37.356 N 118.988 W	31	-	-	Station not accessible		
54424	Bishop Paradise Lodge	37.481 N 118.602 W	33	-	-	Not	Triggered	
55098	Mono Lake	37.940 N 119.065 W	37	-	-	Station not accessible		
55031	Tioga Pass	37.940 N 119.190 W	42	-	-	Not	Triggered	
54100	Benton	37.818 N 118.475 W	45	*	radio inoperative	-	#	-
54428	Chalfant	37.662 N 118.398 W	47	-	-	Not	Triggered	
54388	Bishop Office Bldg	37.370 N 118.396 W	55	*	no radio	360	< 0.05	< 0.05
						UP	"	"
						270	"	0.05
54171	Bishop	37.360 N 118.396 W	56	-	-	Not	Triggered	

<sup>1</sup>S-wave arrival minus trigger time.

\* S-t is not recognizable.

<sup>2</sup>Trigger time in minutes and seconds after 19:00 hours (PST) on 6 January 1983 as determined from WWVB time code.

<sup>3</sup>Azimuthal direction of ground or structure acceleration for upward trace deflection on accelerogram (degrees clockwise from north).

#Benton record cannot with certainty be associated with first or second earthquake (maximum acceleration < 0.05g).

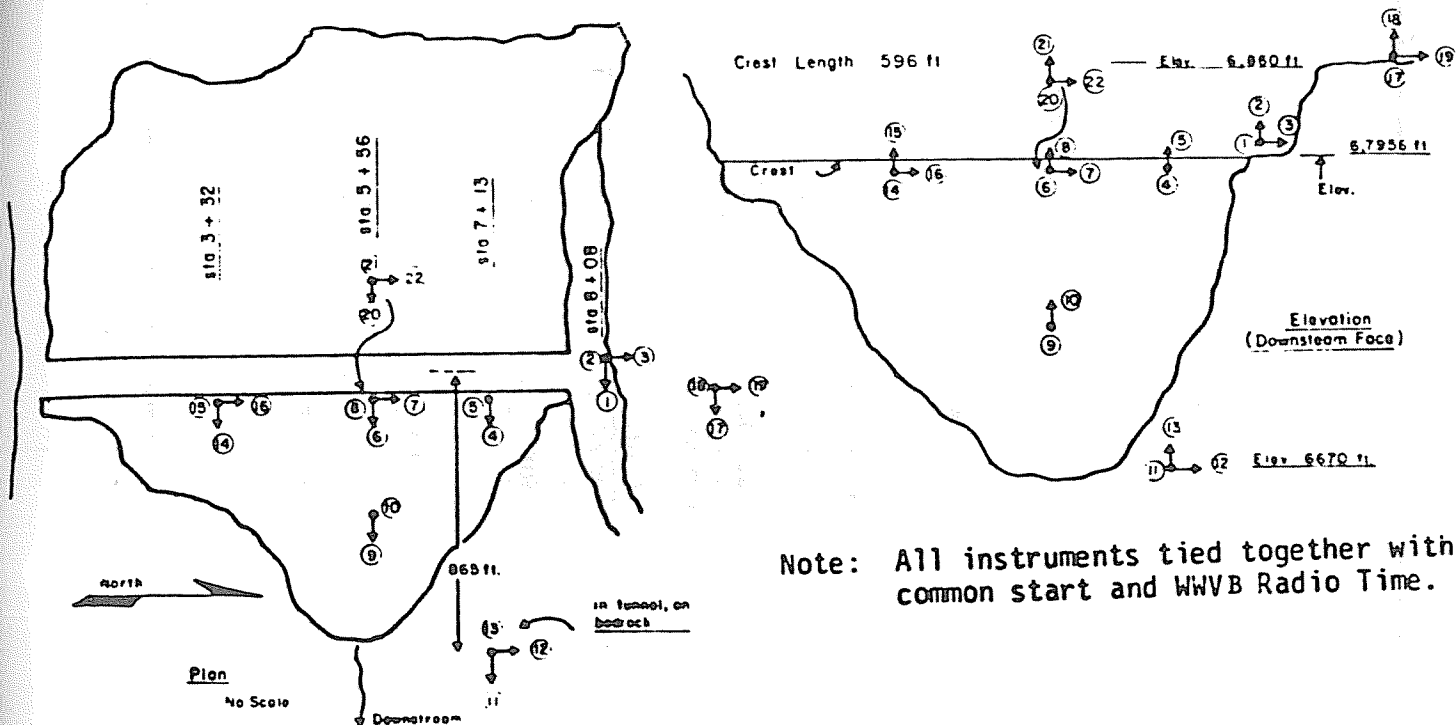


Figure 3 - Long Valley Dam, strong-motion instrumentation scheme. (Note that for dams, left and right are defined relative to an observer on the crest facing downstream.) Reference orientations for structure are  $N=360^\circ$ ,  $E=90^\circ$ .

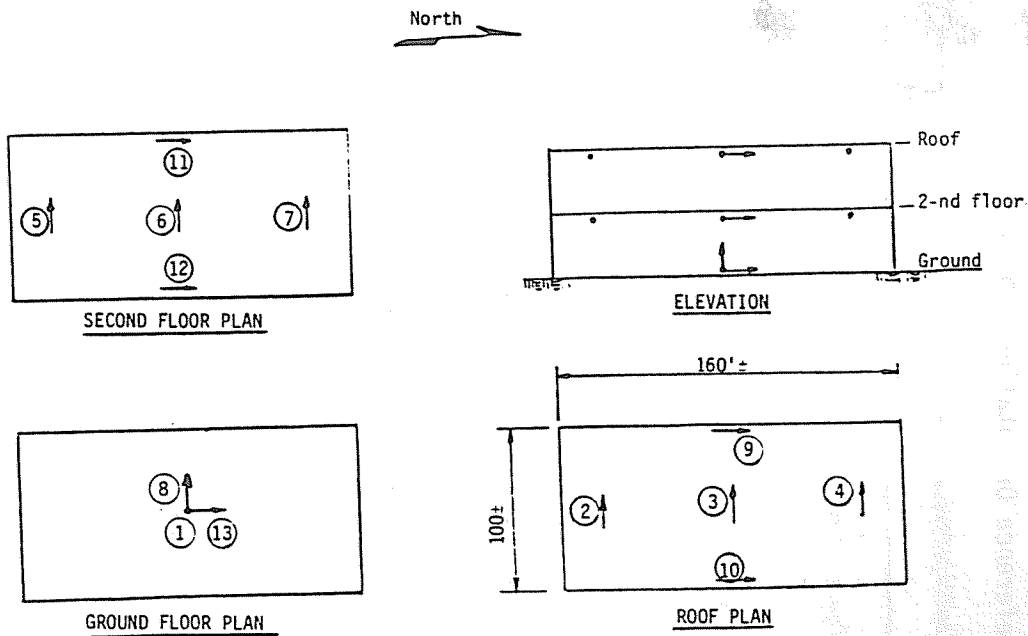


Figure 4. Office bldg, 873 No. Main St., Bishop - Strong-motion instrumentation scheme. Reference orientations for structure are  $N=360^\circ$ ,  $W=270^\circ$ .

Mammoth Lakes Earthquake of  
6 Jan 83-17:38 (PST)

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Structure Reference Orientation: N=344°

1)	W	Ground Floor-Center	0.20 g
2)	UP	" " "	0.17 g
3)	N	" " "	0.17 g
4)	N	" " -West Wall	0.26 g
5)	N	Roof-West Wall	0.34 g
6)	N	" -East Wall	0.26 g
7)	N	" -Center	0.49 g
8)	W	" -North Wall	0.24 g
9)	W	" -Center	0.46 g
10)	W	" -South Wall	0.19 g

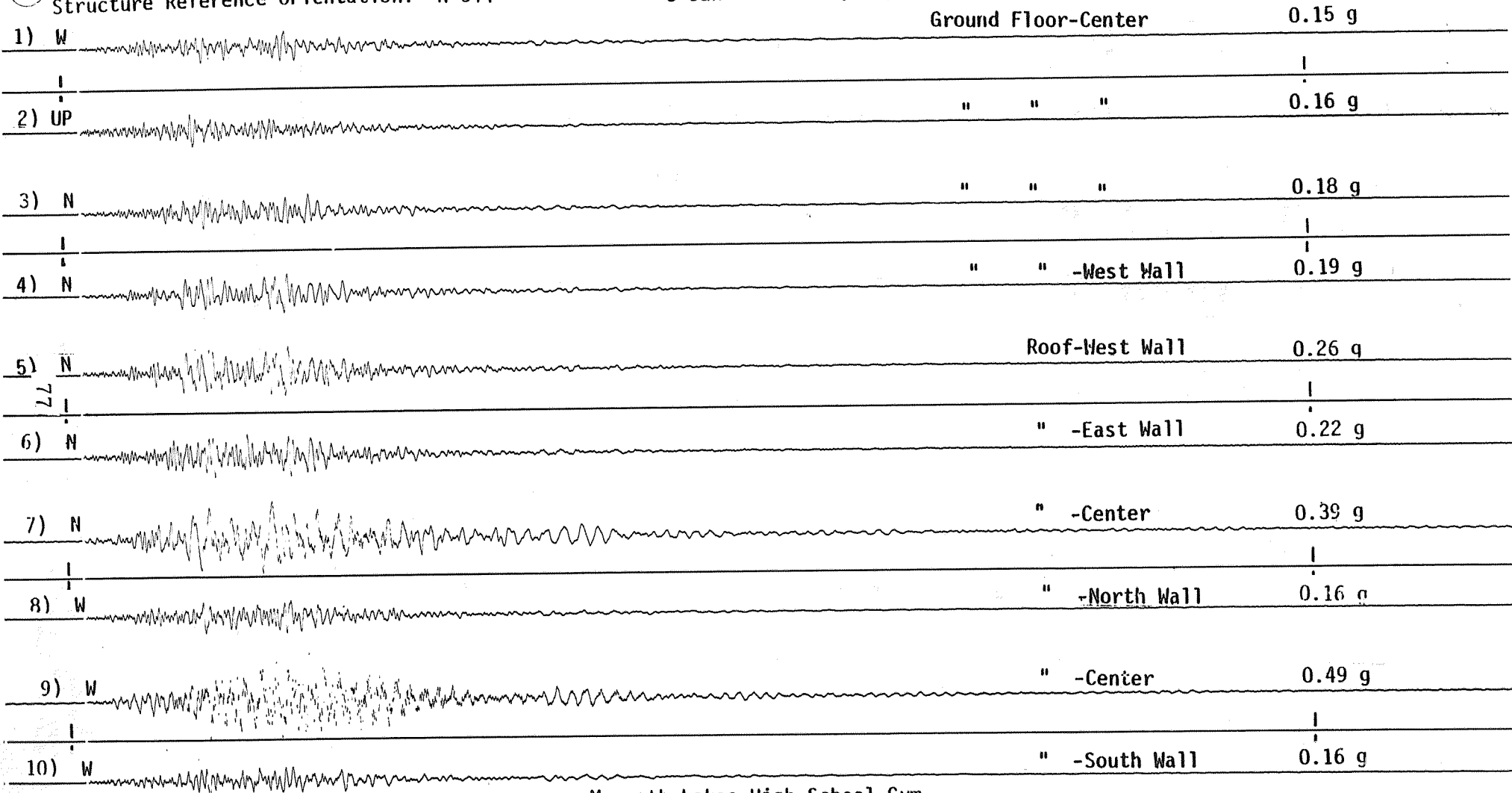
Mammoth Lakes-High School Gym  
CDMG Station #54301  
Record #54301-C0135-83007.04

[ Timer malfunction. ]  
Timing: 1 cm/sec (approx)

5

Structure Reference Orientation: N=344°

Mammoth Lakes Earthquake of  
6 Jan 83-19:24 (PST)



Mammoth Lakes-High School Gym

CDMG Station #54301

Record #54301-C0135-83007.05

Timing: 2 marks/sec

TABLE 3

Strong-motion data from CDMG accelerograph stations located within 60 km of the 19:24 (PST) 6 January 1983 Mammoth Lakes earthquake. Stations are arranged in order of increasing epicentral distance.

Number	Station Name	Coordinates (degrees)	Epicentral Distance (km)	S-t <sup>1</sup> Interval (sec)	WWVB <sup>2</sup> Trigger Time	Maximum Acceleration		
						Azimuth <sup>3</sup>	Ground (g)	Structure (g)
54301	Mammoth Lakes High School Gym	37.641 N 118.963 W	2.3	0.9(?)	radio inoperative	344	0.19	0.39
						UP	0.16	-
						254	0.15	0.49
54099	Convict Creek U.C. Research Station	37.614 N 118.831 W	10.1	0.9	24:22.4	180	0.09	-
						UP	0.07	-
						90	0.16	-
Temp	Crowley Lake Shehorn Res	37.561 N 118.743 W	19	-	-	Inoperative		
55429	June Lake Fire Station	37.783 N 119.075 W	21	2.6	24:24.4	360	< 0.05	-
						UP	"	-
						270	"	-
54214	Long Valley Dam	37.588 N 118.705 W	22	2.0	radio inoperative	90	0.08	0.09
						UP	0.06	< 0.05
						360	0.11	0.13
54362	Vermilion Dam	37.370 N 118.987 W	29	-	-	Station not accessible		
54384	Vermilion Dam Downstream	37.356 N 118.988 W	30	-	-	Station not accessible		
54424	Bishop Paradise Lodge	37.481 N 118.602 W	34	*	24:31.2	160	< 0.05	-
						UP	"	-
						70	"	-
55098	Mono Lake	37.940 N 119.065 W	36	-	-	Station not accessible		
55031	Tioga Pass	37.940 N 119.190 W	41	-	-	Not	Triggered	
54100	Benton	37.818 N 118.475 W	46	*	radio inoperative	-	#	-
54428	Chalfant	37.662 N 118.393 W	48	-	-	Not	Triggered	
54388	Bishop Office Bldg	37.370 N 118.396 W	56	*	no radio	360	< 0.05	< 0.05
						UP	"	"
						270	"	0.05
54171	Bishop	37.360 N 118.396 W	57	-	-	Not	Triggered	

<sup>1</sup>S-wave arrival minus trigger time.

\* S-t is not recognizable.

<sup>2</sup>Trigger time in minutes and seconds after 19:00 hours (PST) on 6 January 1983 as determined from WWVB time code.

<sup>3</sup>Azimuthal direction of ground or structure acceleration for upward trace deflection on accelerogram (degrees clockwise from north).

# Benton record cannot with certainty be associated with first or second earthquake (maximum acceleration < 0.05g).