

# Catalogue of U.S. Geological Survey Strong-Motion Records, 1991

Compiled by JOSEPHINE C. SWITZER and RONALD L. PORCELLA

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## **PREFACE**

The first seismic engineering program in the United States was administered by the Seismological Field Survey (SFS) of the Coast and Geodetic Survey. This program was begun in 1931 and essentially remained the responsibility of the SFS until 1973, when the U.S. Geological Survey (USGS) assimilated the program into its Earthquake Hazards Reduction Program. Currently, the National Strong-Motion Program (NSMP) operates a cooperative network containing nearly 1000 accelerographs in 39 states and Puerto Rico. This network is administered by the USGS in cooperation with both private industry and numerous Federal, State, and local agencies and organizations. Major contributors include the Army Corps of Engineers, the Veterans Administration, and the Metropolitan Water District of Southern California. Primary objectives of the program are to record strong ground motions and the response of representative engineered structures during moderate to large earthquakes, and to disseminate the resultant data and information about the records, sites, and structures to the earthquake engineering research and design community.

This catalogue continues in a revised format the yearly publication "Strong-Motion Program Report, January-December [year]"; it is a continuation of the table 1 summary of accelerograms recovered at NSMP stations that had been published in that format since 1974. This report includes all accelerograms recovered during 1991. Unless otherwise noted, event data are from the "Preliminary Determination of Epicenters," published weekly by the U.S. Geological Survey.



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*Compiled by Josephine C. Switzer and Ronald L. Porcella*

## INTRODUCTION

Ninety-one accelerograph records were recovered from the National Strong-Motion Program's cooperative network during January to December 1991; this compares with an annual average of nearly 280 records for the period 1974 through 1990. Sixty-nine records are from 47 stations that triggered during the ML=5.4 Sierra Madre, California, earthquake of June 28. Maximum horizontal ground accelerations of 0.29 *g* (on an SMA recorder) and 0.30 *g* (on an SSA recorder) were recorded at the Monterey Park Corporate Building.

A magnitude 6.0 (ML) earthquake on August 17 triggered eight accelerographs at USGS stations in northern California; a peak horizontal ground acceleration of 0.11 *g* was recorded at Ferndale fire station.

One record was recovered from the Gideon City Hall in southeast Missouri after a magnitude 4.6 (mblg) earthquake on May 4. The vertical acceleration was 0.11 *g*. Two magnitude 5.2 (ML) earthquakes on the Big Island of Hawaii triggered four accelerographs on May 8, and five accelerographs on December 9; maximum horizontal accelerations of 0.08 *g* and 0.07 *g*, respectively, were recorded at Honomalino, in the southwestern part of the island.

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Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991

[Station owners: ACOE, U.S. Army Corps of Engineers; BECH, Bechtel Power Corporation; JCG, JCG Finance Corporation of America; MWD, Metropolitan Water District of Southern Calif.; OWNR, Owner of building; USGS, U.S. Geological Survey. Instrument trigger time in seconds after the minute (or the following minute) listed in earthquake column. S-minus trigger denotes  $\underline{S}$ -wave-arrival-minus-trigger-time ( $\underline{S-t}$ ) interval. Direction is of case acceleration for upward trace deflection on accelerogram; horizontal components are listed as azimuth, and vertical components as "up" or "down." Maximum amplitude is peak acceleration recorded at ground level on one vertical and two horizontal orthogonal components unless otherwise noted. Duration is interval between first and last peaks of acceleration greater than 0.10 g. Numbers in parentheses refer to footnotes at end of table.]

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
18 October 1990 1721:56.0 G.m.t. Southern Calif. 33.640N, 117.880W Magnitude 3.0 ML	Costa Mesa John Wayne Airport (USGS)	33.677 117.869	(3)	1.4	360 Up 270	.09 .03 .10	--- --- 1 peak
7 March 1991 1413:21.4 G.m.t. Hawaii 20.003N, 155.685W Magnitude 4.1 ML	Waimea, Hawaii Fire Station (USGS)	20.026 155.664	(4)	3.4		(1)	
4 May 1991 0118:54.9 G.m.t. New Madrid, MO 36.564N, 89.823W Magnitude 4.6 mblg	Gideon City Hall (USGS)	36.454 89.919	(3)	0.5	180 Up 090	.04 .11 .06	--- 1 peak ---
8 May 1991 1821:11.0 G.m.t. Hawaii 19.373N, 156.267W Magnitude 5.2 ML	Honomalino, Hawaii (USGS)	19.169 155.868	(4)	1.7	360 Up 270	.06 .02 .08	--- --- ---
	Kealakekua, Hawaii Kona Hospital (USGS)	19.523 155.879	(4)	5.7	360 Up 270	.05 .03 .07	--- --- ---
	Kailua-Kona, Hawaii Fire Station (USGS)	19.649 155.996	(4)	(2)		(1)	
	Waimea, Hawaii Fire Station (USGS)	20.026 155.664	(4)	8.7		(1)	
28 June 1991 1443:54.5 G.m.t. Southern Calif. 34.262N, 118.002W Magnitude 5.4 ML (Sierra Madre earthquake)	Carbon Canyon Dam Brea (ACOE)  Crest	33.914 117.839	(3)	4.5		(1)	

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)	
28 June 1991 ( <i>Sierra Madre earthquake, continued</i> )	Alhambra 900 S. Fremont (USGS)	34.085 118.149	44:00.0	3.3				
	Structure Array:							
		Ch. 1- 12th Floor, Center				360	.12	1 peak
		Ch. 2- 12th Floor, Center				090	.14	0.1
		Ch. 3- 12th Floor, North End				090	.13	0.1
		Ch. 4- 6th Floor, Center				090	.17	0.7
		Ch. 5- 6th Floor, Center				360	.12	0.5
		Ch. 6- 6th Floor, North End			090	.13	0.3	
		Ch. 7- 2nd Floor, Center				090	.26	3.0
		Ch. 8- 2nd Floor, Center				360	.22	2.2
		Ch. 9- 2nd Floor, North End			090	.25	0.9	
		Ch. 10- Basement, Center				360	.11	1 peak
		Ch. 11- Basement, Center				Up	.04	---
		Ch. 12- Basement, Center				090	.13	0.2
	Garvey Reservoir Monterey Park (MWD)	34.048 118.111	(3)	3.2				
	Abutment Bldg.				114 Up 024	.09 .04 .08	--- --- ---	
	Crest				114 Up 024	.13 .06 .08	1.4 --- ---	
	Jensen Filter Plant Balboa Ave. (MWD)	34.312 118.496	(3)	3.3				
	Administration Bldg. Basement				022 Up 292	.07 .03 .06	--- --- ---	
	Generator Bldg.				022 Up 292	.06 .04 .04	--- --- ---	
	Reservoir Roof				022 Up 292	.07 .04 .07	--- --- ---	
	Leona Valley Fire Station (USGS)	34.62 118.29	44:03.5	5.4		(1)		



Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)						
28 June 1991 ( <i>Sierra Madre earthquake, continued</i> )	Littlerock Post office (USGS)	34.52 117.99	(3)	3.8	300	.10	1 peak						
					Up	.06	---						
						210	.12	1 peak					
	Live Oak Reservoir La Verne (MWD)	Abutment	34.140 117.749	(3)	2.5								
							180	.06	---				
							Up	.02	---				
							090	.06	---				
						Structure Array:							
							Ch. 1- Center Crest				155	.05	---
							Ch. 2- Center Crest				Up	.05	---
							Ch. 3- Center Crest				245	.16	1.1
							Ch. 4- Left Crest				155	.06	---
							Ch. 5- Left Crest				245	.16	1.2
							Ch. 6- Left Slope				245	.11	1 peak
							Ch. 7- Center Slope				155	.05	---
							Ch. 8- Center Slope				Up	.02	---
		Ch. 9- Center Slope				245	.11	1 peak					
		Ch. 10- Center Toe				155	.05	---					
		Ch. 11- Center Toe				Up	.02	---					
		Ch. 12- Center Toe				245	.05	---					
	Lone Pine Canyon (USGS)	34.32 117.57	??:07.3	(2)		(1)							
	Los Angeles 333 S. Hope (OWNR) 55th floor	34.053 118.252	(3)	4.7	083 Up 353	.03 .10 .07	---						
	Los Angeles 444 S. San Vicente (OWNR) Roof (12)	34.071 118.374	(3)	1.5	335 Up 245	.06 .03 .05	---						
	Los Angeles 600 S. Commonwealth Ave. (OWNR) 19th floor	34.063 118.284	(3)	4.8	028 Up 298	.04 .06 .04	---						
	Los Angeles 695 S. Vermont Blvd. (OWNR) 18th floor	34.060 118.290	(3)	4.7		(1)							
	Los Angeles 1526 N. Edgemont Ave. (OWNR) Roof (8)	34.098 118.294	(3)	4.1	090 Up 360	.21 .06 .13	5.0 ---						
							3.7						

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
28 June 1991 ( <i>Sierra Madre earthquake, continued</i> )	Los Angeles 1111 Sunset Blvd. (MWD)	34.067 118.248	(3)	(2)			
	Basement				348 Up 258	.05 .03 .04	--- --- ---
	4th Floor				348 Up 258	.06 .04 .04	--- --- ---
	Roof (8th)				348 Up 258	.05 .10 .07	--- 1 peak ---
	Los Angeles 1100 Wilshire Blvd. (JCG/USGS)	34.052 118.263	(3)	4.4			
	Basement 3 NE				298 Up 208	.07 .04 .05	--- --- ---
	Basement 3 SE				298 Up 208	.05 .03 .05	--- --- ---
	Basement 4 NW				298 Up 208	.04 .02 .05	--- --- ---
	Structure Array:						
	Ch. 1- 12th Floor, North				298	.07	---
	Ch. 2- 12th Floor, North				208	.12	1 peak
	Ch. 3- 12th Floor, South				208	.05	---
	Ch. 4- 13th Floor, North				298	.08	---
	Ch. 5- 13th Floor, North				208	.13	0.8
	Ch. 6- 13th Floor, South				208	.05	---
	Ch. 7- 32nd Floor, North				298	.07	---
	Ch. 8- 32nd Floor, North				208	.11	5.4
	Ch. 9- 32nd Floor, South				208	.04	---
Ch. 10- Ground Floor, North				298	.06	---	
Ch. 11- Ground Floor, North				208	.06	---	
Ch. 12- Ground Floor, South				208	.07	---	
Los Angeles 2055 Avenue of the Stars (OWNR) 31st floor	34.056 118.413	(3)	4.6			(1)	

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
28 June 1991 ( <i>Sierra Madre earthquake, continued</i> )	Los Angeles 2029 Century Park East (OWNR) 43rd floor	34.059 118.413	(3)	(2)		(1)	
	Los Angeles 2049 Century Park East (OWNR) 43rd floor	34.058 118.412	(3)	1.7		(1)	
	Los Angeles 5250 Century Blvd. (OWNR) Roof (8)	33.945 118.372	(3)	3.2		(1)	
	Los Angeles 10550 Wilshire Blvd. (OWNR) 14th floor	34.063 118.431	(3)	(2)		(1)	
	Los Angeles 10601 Wilshire Blvd. (OWNR) 21st floor	34.062 118.433	(3)	(2)		(1)	
	Los Angeles 10660 Wilshire Blvd. (OWNR) 19th floor	34.061 118.434	(3)	0.7	160 Up 070	.06 .04 .10	--- --- 1 peak
	Los Angeles 12121 Wilshire Blvd. (OWNR) 15th floor	34.044 118.467	(3)	(2)		(1)	
	Los Angeles 19191 S. Vermont (OWNR) Roof (11)	33.855 118.291	(3)	4.5		(1)	
	Los Angeles Bulk Mail Facility (USGS)	33.996 118.162	(3)	4.8	360 Up 270	.09 .04 .09	--- --- ---
	Los Angeles Griffith Park (USGS)	34.118 118.299	(3)	(2)	360 Up 270	.04 .04 .06	--- --- ---
	Los Angeles Sepulveda Canyon (MWD)	34.097 118.478	(3)	(2)		(1)	
	Los Angeles 1955 Purdue Avenue (USGS)	34.040 118.445	(3)	(2)	235 Up 145	.06 .01 .05	--- --- ---
	Los Angeles 4929 Wilshire Blvd. (OWNR) Roof (11)	34.063 118.337	(3)	5.4	180 Up 090	.13 .10 .13	6.3 0.2 0.7

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
28 June 1991 ( <i>Sierra Madre earthquake, continued</i> )	Monterey Park 2580 Corporate Place (USGS)	34.044 118.163	(3)	(2)			
	SMA-1 Accelerograph (Analog)				180 Up 090	.15 .13 .29	0.7 0.4 1.2
	SSA-1 Accelerograph (Digital)				360 Up 090	.13 .12 .30	--- --- ---
	Morris Dam (MWD)	34.173 117.879	(3)	1.9			
	Left Abutment				245 Up 155	.07 .08 .06	--- --- ---
	Newport Beach 840 Newport Center Dr. (USGS)	33.618 117.878	(3)	7.1			
	Structure Array:						
	Ch. 1- Tower 2, Level 1, Center				360	.05	---
	Ch. 2- Tower 2, Level 1, Center				Up	.01	---
	Ch. 3- Tower 2, Level 1, Center				090	.04	---
	Ch. 4- Tower 2, Level 2, West					Inoperative	
	Ch. 5- Tower 2, Level 2, Center				360	.07	---
	Ch. 6- Tower 2, Level 2, Center				090	.08	---
	Ch. 7- Tower 2, Level 9, South				090	.03	---
	Ch. 8- Tower 2, Level 10, Center					Inoperative	
	Ch. 9- Tower 2, Level 10, Center					Inoperative	
	Ch. 10- Tower 1, Level 9, East				360	.02	---
	Ch. 11- Tower 1, Level 10, Center				270	.05	---
	Ch. 12- Tower 1, Level 10, Center				360	.05	---
	Norwalk 12400 Imperial Highway (USGS/BECH)	33.916 118.067	(3)	(2)			
North Ground Site						(1)	
South Ground Site						(1)	
Norwalk 12440 Imperial Highway (USGS/BECH)	33.917 118.066	(4)	(2)				
North Site						(1)	

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)	
28 June 1991 (Sierra Madre earthquake, continued)	South Site					(1)		
	Basement					(1)		
	Structure Array 1:							
	Ch. 1- 9th Level (Roof) Bldg. Center				090	.08	---	
	Ch. 2- 6th Level, Bldg. Center				090	.04	---	
	Ch. 3- 3rd Level, Bldg. Center				090	.03	---	
	Ch. 4- 2nd Level, Bldg. Center				090	.02	---	
	Ch. 5- 1st Level (Basement), East End				180	.02	---	
	Ch. 6- 6th Level, Bldg. West-Center				180	.05	---	
	Ch. 7- 1st Level (Basement), Bldg. Center				Up	.01	---	
	Ch. 8- 1st Level (Basement), Bldg. Center					Inoperative		
	Ch. 9- 1st level (Basement), Bldg. Center				180	.01	---	
	Ch. 10- Downhole (30'), Bldg. Center					Inoperative		
	Ch. 11- Downhole (30'), Bldg. Center				090	.01	---	
	Ch. 12- Downhole (30'), Bldg. Center				180	.01	---	
	Structure Array 2:							
	Ch. 13- 9th Level (Roof), East End					180	.07	---
	Ch. 14- 6th Level, East End					180	.05	---
	Ch. 15- 3rd Level, East End					180	.02	---
	Ch. 16- 2nd Level, East End					180	.01	---
	Ch. 17- 9th Level (Roof), Bldg. Center					180	.07	---
	Ch. 18- 6th Level, Bldg. Center					180	.05	---
	Ch. 19- 3rd Level, Bldg. Center					180	.03	---
	Ch. 20- 2nd Level, Bldg. Center					180	.02	---
Ch. 21- 9th Level (Roof), West End					180	.06	---	
Ch. 22- 6th Level, West End					180	.04	---	
Ch. 23- 3rd Level, West End					180	.02	---	
Ch. 24- 2nd Level, West End					180	.02	---	
	Palmdale Fire Station (USGS)	34.58 118.10	(3)	(2)		(1)		
	Paradise Springs Camp (USGS)	34.40 117.80	(3)	(2)		(1)		
	Prado Dam Corona (ACOE)	33.888 117.640	(3)	5.5				
	Downstream					(1)		
	Riverside Santa Ana River Bridge (MWD/USGS)	33.968 117.447	(3)	(2)				
	North Abutment Recorder Building					(1)		

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
28 June 1991 (Sierra Madre earthquake, continued)	Structure Array: Ch. 1- 12					(1)	
	San Antonio Dam Upland (ACOE)	34.157 117.676	(3)	3.2			
	Crest				090 Up 360	.11 .07 .23	1 peak --- 2.2
	Downstream				090 Up 360	.04 .04 .06	--- --- ---
	San Bernardino Array Valley College (USGS)	34.086 117.309	(3)	(2)		(1)	
	San Joaquin Reservoir (MWD)	33.620 117.842	(3)	(2)			
	Left Abutment					(1)	
	Crest				087 Up 357	.05 .02 .05	--- --- ---
	Valyermo Forest Station Ground Level (USGS)	34.44 117.85	(3)	2.3	300 Up 210	.05 .05 .05	--- --- ---
	Weymouth Filter Plant La Verne (MWD)	34.114 117.778	(3)	3.3			
	Bldg., Ground Level				015 Up 285	.05 .04 .04	--- --- ---
	Water Tank, Top				015 Up 285	.11 .09 .12	1 peak --- 3.7
	Whittier 7215 Bright Avenue (USGS)	33.977 118.036	(3)	(2)			
	Basement					(1)	

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)	
28 June 1991 ( <i>Sierra Madre earthquake, continued</i> )	5th Floor					(1)		
	10th Floor				180 Up 090	.05 .03 .04	--- --- ---	
	Los Angeles 2005 N. Highland Ave. (OWNR) Roof (8)	34.106 118.336	(3)	3.8	360 Up 270	.06 .03 .07	--- --- ---	
	Wrightwood Post Office (USGS)	34.360 117.629	(3)	1.3	360 Up 270	.05 .04 .05	--- --- ---	
	Whittier Narrows Dam Pico Rivera (ACOE)	34.020 118.053	(3)	3.7				
	Crest				120 Up 030	.06 .05 .06	--- --- ---	
	Upstream				120 Up 030	.05 .09 .05	--- --- ---	
	17 August 1991 1929:40.0 G.m.t. Northern Calif. 40.235N, 124.348W Magnitude 6.0 ML	Eel River Valley Array Bunker Hill FAA (USGS)	40.498 124.294	29:50.6	(2)	360 Up 270	.05 .02 .05	--- --- ---
		Eel River Valley Array Butler Valley Station 2 (USGS)	40.78 123.88	30:05.6	(2)		(1)	
		Eel River Valley Array Centerville Beach (USGS)	40.563 124.348	(3)	(2)		(1)	
		Eel River Valley Array College of the Redwoods (USGS)	40.699 124.200	(4)	(2)		(1)	
		Eel River Valley Array Ferndale Fire Station (USGS)	40.58 124.26	(4)	(2)	360 Up 270	.11 .03 .08	1 peak --- ---
Eel River Valley Array Fortuna Fire Station (USGS)		40.599 124.154	(4)	5.5	360 Up 270	.07 .03 .07	--- --- ---	

Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
17 August 1991 1929:40.0 G.m.t. Northern Calif. 40.235N, 124.348W Magnitude 6.0 ML (Continued)	Eel River Valley Array Loleta Fire Station (USGS)	40.644 124.219	(4)	6.2	360 Up 270	.06 .04 .05	--- --- ---
	Eel River Valley Array South Bay Union School (USGS)	40.735 124.207	(3)	(2)		(1)	
12 September 1991 0810:02.6 G.m.t. Central Calif. 37.172N, 122.095W Magnitude 3.4 ML	Los Gatos Los Altos Rod and Gun Club (USGS)	37.239 122.106	(4)	2.0		(1)	
11 November 1991 0453:27.0G.m.t. Central Calif. 35.680N, 118.430W Magnitude 4.0 ML	Isabella Dam (ACOE)						
	Main Dam	35.645 118.480	(4)	(2)			
	Right Crest					(1)	
	Left Crest					(1)	
	Mid-dam					(1)	
	Auxiliary Dam	35.642 118.470	(4)	(2)			
	Right Abutment					(1)	
17 November 1991 2200:19.0 G.m.t. Northern Calif. 40.370N, 124.172W Magnitude 3.7 ML	Eel River Valley Array Fortuna Fire Station (USGS)	40.599 124.154	(4)	5.5		(1)	
28 September 1990 6 December 1991 Hawaii Epicenter and magnitude unknown	Pahala, Hawaii Kau Hospital (USGS)	19.20 155.47	(3)	1.2		(1)	
9 December 1991 2314:30.4 G.m.t. Hawaii 18.835N, 155.849W Magnitude 5.2 ML	Honomalino, Hawaii (USGS)	19.169 155.868	(4)	(2)	360 Up 270	.07 .02 .07	--- --- ---
	Mauna Loa, Hawaii Observatory (USGS)	19.539 155.580	(4)	(2)		(1)	



Table 1. National Strong-Motion Program Accelerograph Records Recovered During 1991--*Continued*

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
9 December 1991 2314:30.4 G.m.t. Hawaii 18.835N, 155.849W Magnitude 5.2 ML (Continued)	Waiohinu, Hawaii Kau Baseyard (USGS)	19.070 155.615	(4)	(2)		(1)	
	Waimea, Hawaii Fire Station (USGS)	20.026 155.664	(4)	(2)		(1)	
	Pahala, Hawaii Kau Hospital (USGS)	19.20 155.47	(4)	(2)		(1)	

Note: Two additional records<sup>1</sup> recovered at Pahala Kau Hospital.

<sup>1</sup> Less than 0.05 *g* at ground-level or less than 0.10 *g* at non-ground-level stations.

<sup>2</sup> Questionable or indeterminable.

<sup>3</sup> WWVB time code illegible, or instrument not equipped with a radio receiver; correlation of accelerogram with event may be questionable or identity of event unknown.

<sup>4</sup> Contains internal clock for event correlation only; accuracy is widely variable

Table 2. National Strong-Motion Program Accelerograph Records Recovered During 1991 -- Errata

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
Errata -- Records listed below were not included in the original published version of this report							
23 March 1990- 31 January 1991 Southern Calif. Epicenter and magnitude unknown	Irvine 19900 MacArthur Blvd. (USGS)  Basement	33.656 117.859	(3)	0.2			
					060 Up 330	.05 .05 .03	--- --- ---
	Structure Array						
	Ch. 1 - Roof NE corner				060	.07	---
	Ch. 2 - Roof SW corner				060	.03	---
	Ch. 3 - 7th Floor NE				060	Inoperative	
	Ch. 4 - 7th Floor SW				060	Inoperative	
	Ch. 5 - 1st Floor South side			060	.08	---	
	Ch. 6 - Roof, SW corner				330	.03	---
	Ch. 7 - 7th Floor, SW				330	Inoperative	
	Ch. 8 - 1st Floor West side				330	.04	---
	Ch. 9 - 1st Floor South side			330	.07	---	
	Ch. 10 - 7th Floor SW corner				Down	Inoperative	
	Ch. 11 - 1st Floor West side			Down	Inoperative		
	Ch. 12 - 1st Floor South side			Down	.03	---	
25 June 1990- 27 February 1991 Missouri Epicenter and magnitude unknown	Cape Girardeau (USGS) 89.52	37.31	(3)	(2)		(1)	
5 January 1990- 16 April 1991 Southern Calif. Epicenter and magnitude unknown	Costa Mesa 2300 Placentia (USGS)	33.658 117.931	(3)	1.2	360 Up 270	.09 .07 .10	--- --- ---
16 March 1991 xx29:20.1 G.m.t. Central Calif Epicenter and magnitude unknown	Bear Valley Array #10 Webb Residence (USGS)	36.532 121.143	29:20.2	0.9	310 Up 220	.04 .03 .06	--- --- ---
24 March 1991 0342:08.8 G.m.t. Central Calif. 39.963N, 121.738W Magnitude 4.5 ML	Hollister Airport Differential Array (USGS)	36.888 121.413	42:19.1	0.9		(1)	

Table 2. National Strong-Motion Program Accelerograph Records Recovered During 1991 -- Errata

Earthquake	Station Name (Owner)	Coordinates (Lat. ° N Long. ° W)	Trigger time	S-minus trigger (s)	Direction (az)	Maximum amplitude (g)	Duration (s)
13 April 1991 2051:30.5 G.m.t. Eastern Calif. 37.563N, 118.888W Magnitude 3.3 ML	McGee Creek Crowley Lake (USGS) (Triaxial)	37.550 118.811	(4)	(2)		(1)	
	McGee Creek Crowley Lake (USGS) (Multichannel)	37.550 118.811	(4)	(2)			
	166 m Downhole					(1)	
	35 m Downhole					(1)	
	1 m Downhole					(1)	
	Surface					(1)	
26 April 1991 01xx:09.5 G.m.t. Central Calif. Epicenter and magnitude unknown	Bear Valley Array #10 Webb Residence (USGS)	36.352 121.143	xx:09.5	0.7		(1)	