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STRONG-MOTION DATA FROM THE PASADENA, CALIFORNIA, EARTHQUAKE OF DECEMBER 3, 1988

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INTRODUCTION

A magnitude (ML) 5.0 earthquake occurred beneath Pasadena, California, at 1138 G.m.t. December 3, 1988. The California Institute of Technology (CIT) located the epicenter in the downtown area near Pasadena City Hall. There were no significant aftershocks.

Although the epicenter of this earthquake is only about 12 kilometers from the epicenter of the M=5.9 Whittier Narrows earthquake of October 1, 1987, there is apparently no direct relationship between the two events. Lucile Jones of the U. S. Geological Survey describes the faulting mechanism of the Pasadena earthquake as strike-slip as distiguished from the dip-slip (thrust) mechanism of the Whittier Narrows earthquake. Strong-motion data from the Whittier Narrows earthquake have been presented in Etheredge and Porcella (1987).

No major damage was reported from the Pasadena earthquake which was felt over a six-county area of southern California. Minor damage to utilities was reported in Pasadena; storefront windows were broken and merchandise was damaged in South Pasadena (Los Angeles Times, Dec. 4, 1988).

The earthquake triggered 45 accelerographs at 22 stations in the National Strong-Motion Instrumentation Network (NSMIN) at epicentral distances of from 8 to 42 kilometers (fig. 1). These accelerographs are located at eight U.S. Geological Survey ground sites, four Army Corps of Engineers dams, four facilities of the Metropolitan Water

District of Southern California, three Veterans Administration hospitals, and eight other buildings (table 1). Two of the buildings have extensive instrumentation: 21 channels at the 32-story JCG building at 1100 Wilshire Boulevard, Los Angeles; and 27 channels at the 7-story Bechtel building at 12440 Imperial Highway, Norwalk.

Peak horizontal ground accelerations were largest (0.12g) at two Los Angeles stations: 4407 Jasper Street (8 kilometers from the epicenter) and 1111 Sunset Boulevard (13 kilometers from the epicenter). A vertical acceleration of 0.19g was recorded at the roof of the seven-story 1111 Sunset Boulevard building. Accelerations of 0.06-0.11g were recorded at the thirteenth floor of 1100 Wilshire Boulevard, Los Angeles (15 kilometers from the epicenter). Copies of all NSMIN accelerograms are presented in figure 2.

ACKNOWLEDGEMENT

The acceleration data presented in this report were recorded by instrumentation owned by the Army Corps of Engineers, Metropolitan Water District of Southern California, Veterans Administration, JCG Finance Corporation of America, Bechtel Power Corporation, and private owners. The U. S. Geological Survey appreciates the assistance of all who have allowed the use of their facilities for the operation of strong-motion instrumentation.

REFERENCE

Etheredge, E., and Porcella, R., 1987, Strong-motion data from the October 1, 1987 Whittier Narrows earthquake, U. S. Geological Survey Open File Report 87-616.

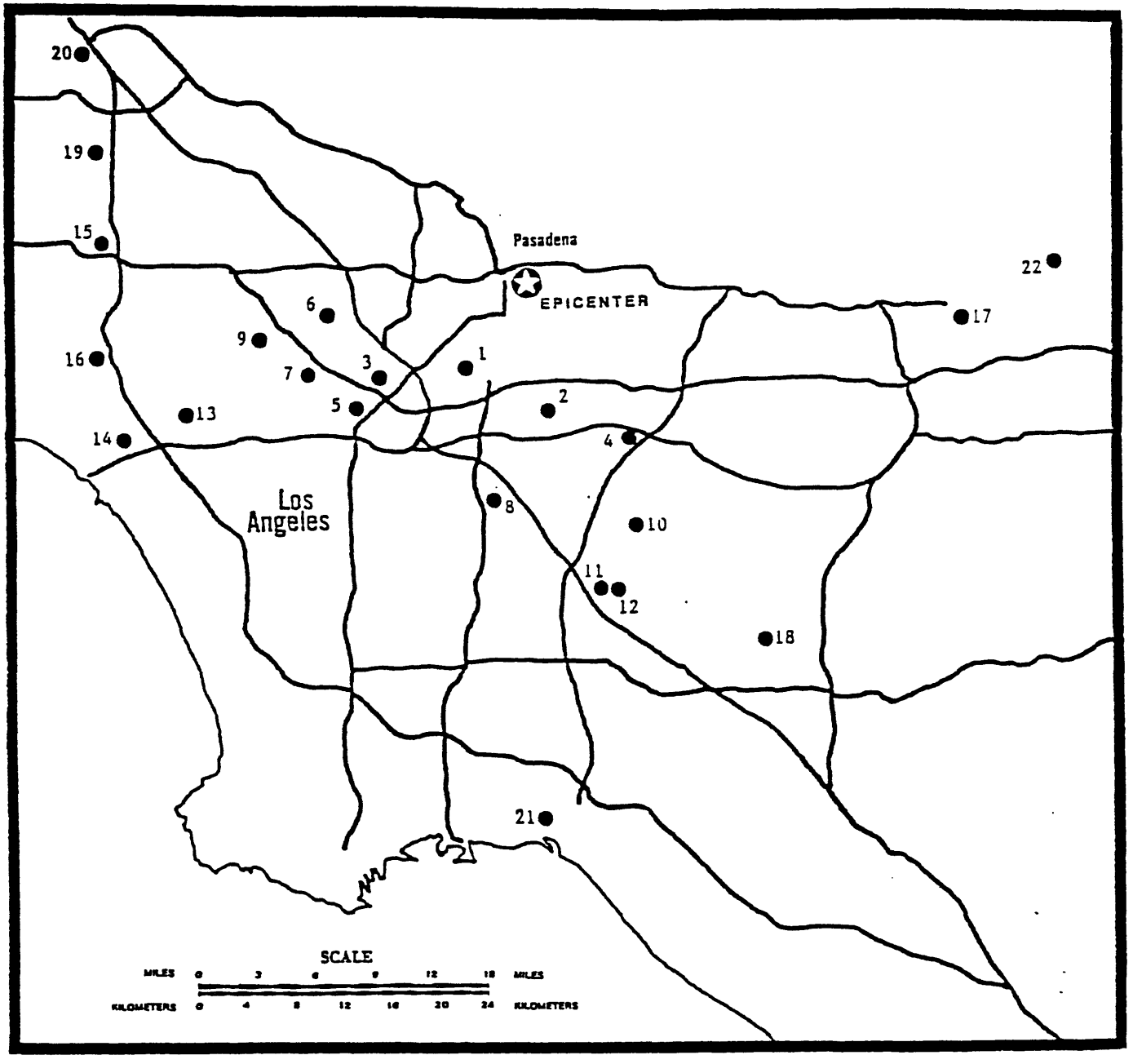

Figure 1. Map showing National Strong-Motion Instrumentation Network stations triggered during the Pasadena earthquake. See table 1 for identification of map numbers.

Table 1. Strong-motion data and peak accelerations from the Pasadena, California, earthquake of December 3, 1988 (1138 G.m.t.)

Station owners are Army Corps of Engineers (ACOE); Bechtel Power Corporation (BECH); JCG Finance Corp. of America (JCG); Metropolitan Water District of Southern California (MWD); U. S. Geological Survey (USGS); the Veterans Administration (VA); and owners of buildings required to have accelerographs by ordinance (Code). Stations are listed in order of increasing epicentral distance. Epicentral distance is measured from station to epicenter at latitude 34.149°N and longitude 118.135°W. Direction of acceleration is for an upward trace deflection on the accelerogram; vertical component directions are all listed as "up."

Station Identification				Acceleration	
USGS Number (map number)	Name (owner)	Coordinates (lat. °N, long. °W)	Epicentral Distance (km)	Direction (degrees)	Maximum (g)
5244	Los Angeles,	34.081	8	130	0.11
(1)	4407 Jasper Street,	118.188		up	0.06
	Ground (USGS)			040	0.12
709	Garvey Reservoir	34.048	10	060	0.10
(2)	Abutment (MWD)	118.111		up	<0.05
				330	0.06
872	Los Angeles,	34.067	13		
(3)	1111 Sunset Blvd.	118.248			
	(MWD)				
	Basement			348	0.08
				up	<0.05
				258	0.12
	4th floor			348	0.08
				up	<0.05
				258	0.09
	Roof (8th)			348	<0.05
				up	0.19
				258	<0.05
289	Whittier Narrows Dam				
(4)	(ACOE)				
	Upstream	34.031	14	152	0.07
		118.054		up	<0.05
				062	0.06
	Crest	34.020	15	033	0.07
		118.053		up	<0.05
				303	0.06

Table 1. Strong-motion data and peak accelerations from the Pasadena, California, earthquake of December 3, 1988 (continued)

Station Identification				Acceleration	
USGS Number (map number)	Name (owner)	Coordinates (lat. °N, long. °W)	Epicentral Distance (km)	Direction (degrees)	Maximum (g)
5233 (5)	Los Angeles, 1100 Wilshire Blvd. (JCG/USGS)	34.052 118.263	15		
	Basement 3, SE			298	0.08
				up	<0.05
				208	0.07
	Basement 3, NE			298	0.09
				up	<0.05
				208	0.05
	Basement 4, NW			298	0.08
				up	<0.05
				208	0.06
	Structure Array:				
	Ch. 1	12th floor. north		298	<0.05
	Ch. 2	12th floor, north		208	0.06
	Ch. 3	12th floor, south		208	0.07
	Ch. 4	13th floor, north		298	0.06
	Ch. 5	13th floor, north		208	0.11
	Ch. 6	13th floor, south		208	0.07
	Ch. 7	32nd floor, north		298	<0.05
	Ch. 8	32nd floor, north		208	0.09
	Ch. 9	32nd floor, south		208	<0.05
	Ch. 10	1st floor, north		298	0.06
	Ch. 11	1st floor, north		208	0.09
	Ch. 12	1st floor, south		208	0.07
141 (6)	Los Angeles, Griffith Park Observatory (USGS)	34.118 118.299	15	360	<0.05
				up	<0.05
				270	0.08
742 (7)	Los Angeles, 1526 N. Edgemont Street, 8th level (Code)	34.098 118.294	15	090	0.09
				up	0.08
				360	0.10
5129 (8)	Los Angeles Bulk Mail Facility, Ground (USGS)	33.996 118.162	16	010	0.09
				up	<0.05
				280	0.10
5259 (9)	Los Angeles, 2005 N. Highland Blvd., 8th level (Code)	34.106 118.336	19	360	<0.05
				up	<0.05
				270	<0.05

Table 1. Strong-motion data and peak accelerations from the Pasadena, California, earthquake of December 3, 1988 (continued)

Station Identification				Acceleration	
USGS Number (map number)	Name (owner)	Coordinates (lat. °N, long. °W)	Epicentral Distance (km)	Direction (degrees)	Maximum (g)
804 (10)	Whittier, 7215 Bright Ave. (Code)	33.977 118.036	20		
	Basement			180	0.08
				up	<0.05
				090	0.06
	5th floor			180	0.10
				up	<0.05
				090	0.06
	10th floor			180	0.06
				up	0.06
				090	0.08
634 (11)	Norwalk, 12400 Imperial Highway (USGS/BECH)				
	4th floor	33.916 118.067	26	090	<0.05
				up	<0.05
				360	<0.05
	North ground site	33.917 118.067	26	090	<0.05
				up	<0.05
				360	<0.05
	South ground site	33.915 118.067	26	090	<0.05
				up	<0.05
				360	<0.05
5239 (12)	Norwalk, 12440 Imperial Highway (USGS/BECH)				
	North ground site	33.917 118.065	26	090	<0.05
				up	<0.05
				360	<0.05
	South ground site	33.915 118.066	26	090	<0.05
				up	<0.05
				360	<0.05
	Basement	33.917 118.066	26	090	<0.05
				up	<0.05
				360	<0.05

Table 1. Strong-motion data and peak accelerations from the Pasadena, California, earthquake of December 3, 1988 (continued)

Station Identification				Acceleration	
USGS Number (map number)	Name (owner)	Coordinates (lat. °N, long. °W)	Epicentral Distance (km)	Direction (degrees)	Maximum (g)
5239 (12)	Norwalk, 12440 Imperial Highway (USGS/BECH)				
	Structure array 1:				
	Ch. 1	7th floor, center		090	<0.05
	Ch. 2	5th floor, center		090	<0.05
	Ch. 3	2nd floor, center		090	<0.05
	Ch. 4	1st floor, center		090	<0.05
	Ch. 5	Basement, east		360	<0.05
	Ch. 6	5th floor, west-center		360	<0.05
	Ch. 7	Basement, center		up	<0.05
	Ch. 8	Basement, center		090	<0.05
	Ch. 9	Basement, center		360	<0.05
	Ch. 10	30′ Downhole, bldg. center		up	<0.05
	Ch. 11	30′ Downhole, bldg. center		090	<0.05
	Ch. 12	30′ Downhole, bldg. center		360	<0.05
	Structure Array 2:				
	Ch. 13	7th floor, east		360	<0.05
	Ch. 14	5th floor, east		360	<0.05
	Ch. 15	2nd floor, east		360	<0.05
	Ch. 16	1st floor, east		360	<0.05
	Ch. 17	7th floor, center		360	<0.05
	Ch. 18	5th floor, center		360	Inop.
	Ch. 19	2nd floor, center		360	<0.05
	Ch. 20	1st floor, center		360	<0.05
	Ch. 21	7th floor, west		360	<0.05
	Ch. 22	5th floor, west		360	<0.05
	Ch. 23	2nd floor, west		360	<0.05
	Ch. 24	1st floor, west		360	<0.05
5256 (13)	Los Angeles, 2055 Avenue of the Stars, 31st level (Code)	34.056 118.413	27	320	<0.05
				up	<0.05
				230	<0.05
5082 (14)	Los Angeles, Wadsworth VA Hospital, North ground site (USGS)	34.054 118.453	31	325	<0.05
				up	<0.05
				235	<0.05

Table 1. Strong-motion data and peak accelerations from the Pasadena, California, earthquake of December 3, 1988 (continued)

Station Identification				Acceleration	
USGS Number (map number)	Name (owner)	Coordinates (lat. °N, long. °W)	Epicentral Distance (km)	Direction (degrees)	Maximum (g)
949 (15)	Sepulveda Dam (ACOE)				
	Crest	34.168	31	054	<0.05
		118.470		up	<0.05
				324	<0.05
	Downstream	34.167	31	054	<0.05
		118.469		up	<0.05
				324	<0.05
757 (16)	Sepulveda Canyon, Spillway roof (MWD)	34.097	32	166	<0.05
		118.478		up	<0.05
				076	0.08
5164 (17)	Weymouth Filter Plant (MWD)				
	Tank top	34.115	33	017	<0.05
		117.779		up	<0.05
				287	<0.05
	Ground level	34.114	33	017	<0.05
		117.778		up	<0.05
				287	<0.05
951 (18)	Brea Dam (ACOE)				
	Crest	33.890	34	130	0.06
		117.925		up	<0.05
				040	0.05
	Left abutment	33.889	34	130	<0.05
		117.924		up	<0.05
				040	<0.05
637 (19)	Sepulveda VA Hospital, Ground (VA)	34.249	34	360	0.07
		118.475		up	<0.05
				270	<0.05
655 (20)	Jensen Filter Plant (MWD)				
	Administration Bldg. Basement	34.312	38	022	<0.05
		118.496		up	<0.05
				292	<0.05

Table 1. Strong-motion data and peak accelerations from the Pasadena, California, earthquake of December 3, 1988 (continued)

Station Identification				Acceleration	
USGS Number (map number)	Name (owner)	Coordinates (lat. °N, long. °W)	Epicentral Distance (km)	Direction (degrees)	Maximum (g)
655 (20)	Jensen Filter Plant (MWD)				
	Generator Bldg., Ground	34.313 118.498	38	022	<0.05
				up	<0.05
				292	<0.05
	Reservoir Roof	34.309 118.499	38	022	<0.05
				up	<0.05
				292	<0.05
5106 (21)	Long Beach VA Hospital (VA)	33.778 118.118	40		
	Basement			360	<0.05
				up	<0.05
				270	<0.05
	6th floor			360	<0.05
				up	<0.05
				270	<0.05
	11th floor			360	<0.05
				up	<0.05
				270	<0.05
287 (22)	San Antonio Dam (ACOE)				
	Crest	34.157 117.676	42	090	0.06
				up	0.05
				360	0.10
	Right Abutment	34.158 117.682	42	090	<0.05
				up	<0.05
				360	<0.05
	Downstream	34.156 117.675	42	090	<0.05
				up	<0.05
				360	<0.05

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5244 34.081°N, 118.188°W Los Angeles, 4407 Jasper St. Ground	L 130°	Sens. = 1.78 cm/g Freq. = 25.8 Hz Damp. = 0.6 crit	0.11g
SMA # 1418 (USGS)	V Up	Sens. = 1.76 cm/g Freq. = 26.0 Hz Damp. = 0.6 crit	0.06g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 040	Sens. = 1.79 Freq. = 26.2 Hz Damp. = 0.6 crit	0.12g

Epicentral distance = 8 km

Film speed = 1 cm/sec

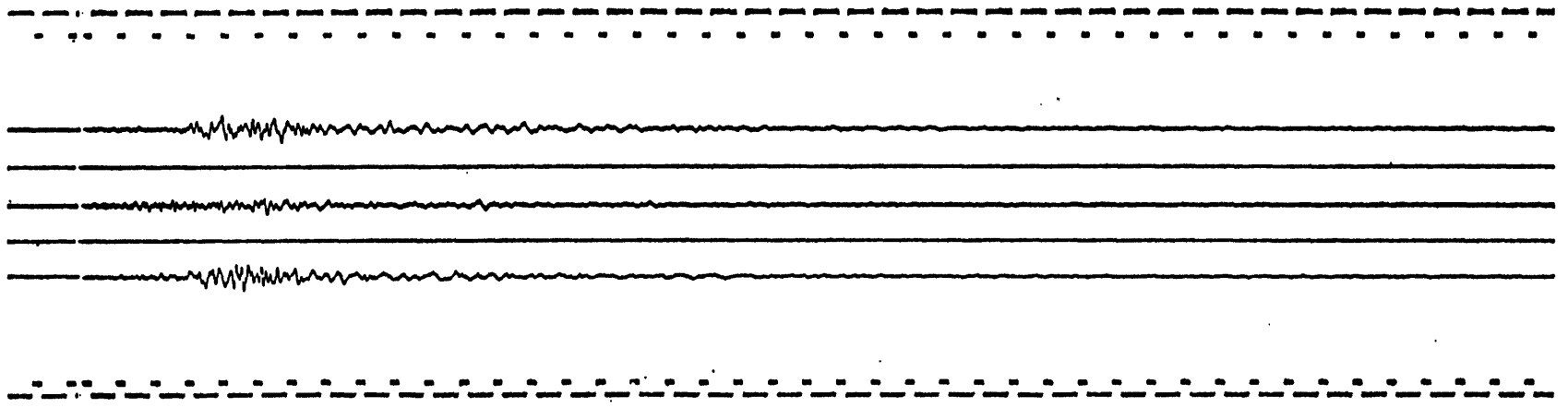

Figure 2. Copies of NSMIN accelerograms.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 709 34.048°N, 118.111°W Garvey Reservoir Abutment SMA # 1055 (MWD)	L 060°	Sens. = 1.84 cm/g Freq. = 26.3 Hz Damp. = 0.55 crit	0.10g
	V Up	Sens. = 1.90 cm/g Freq. = 25.0 Hz Damp. = 0.57 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 330°	Sens. = 1.90 cm/g Freq. = 26.3 Hz Damp. = 0.57 crit	0.06g

Epicentral distance = 10 km

Film speed = 1 cm/sec

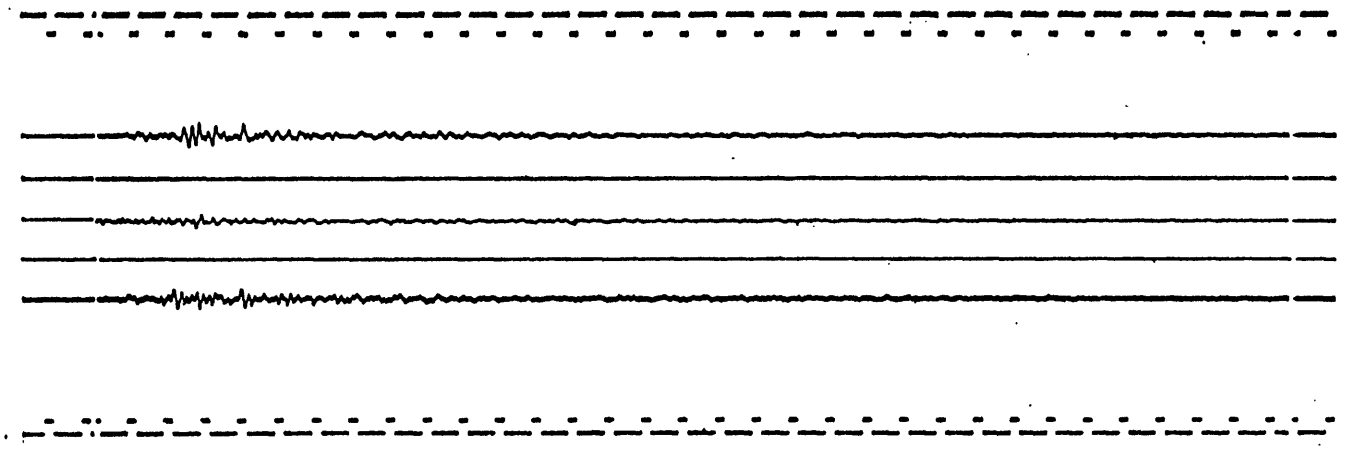

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 872 34.067°N, 118.248°W Los Angeles, 1111 Sunset Blvd. Basement SMA # 1074 (MWD)	L 348°	Sens. = 1.95 cm/g Freq. = 24.3 Hz Damp. = 0.61 crit	0.08g
	V Up	Sens. = 1.87 cm/g Freq. = 25.6 Hz Damp. = 0.59 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 258°	Sens. = 1.90 cm/g Freq. = 25.6 Hz Damp. = 0.61 crit	0.12g
Epicentral distance = 13 km		Film speed = 1 cm/sec	

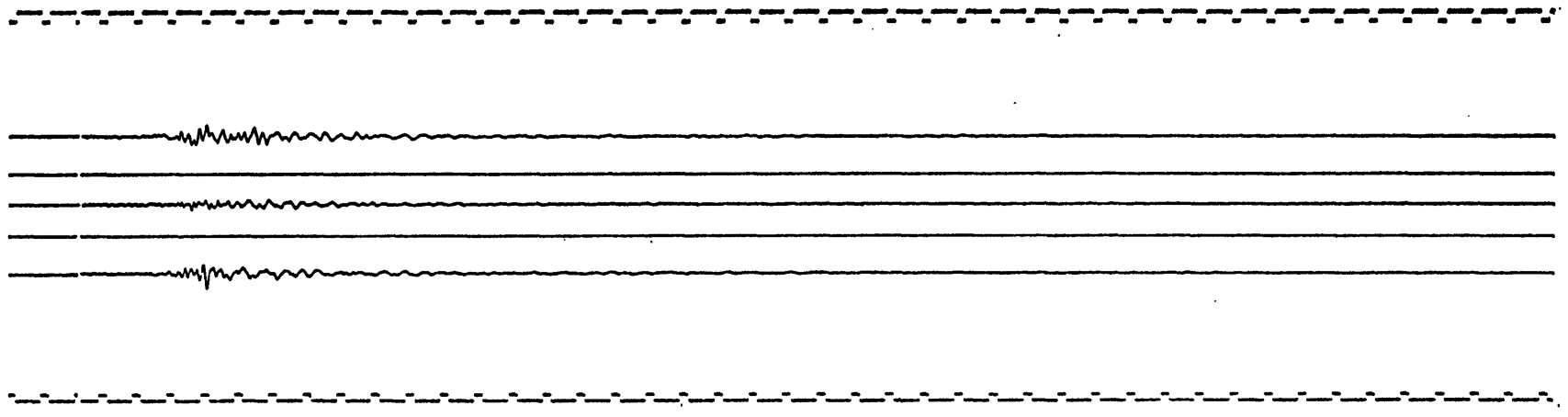

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 872 34.067°N, 118.248°W Los Angeles, 1111 Sunset Blvd. 4th floor SMA # 1075 (MWD)	L 348°	Sens. = 1.80 cm/g Freq. = 25.6 Hz Damp. = 0.59 crit	0.08g
	V Up	Sens. = 1.99 cm/g Freq. = 25.6 Hz Damp. = 0.57 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 258°	Sens. = 1.80 cm/g Freq. = 25.6 Hz Damp. = 0.57 crit	0.09g
Epicentral distance = 13 km		Film speed = 1 cm/sec	

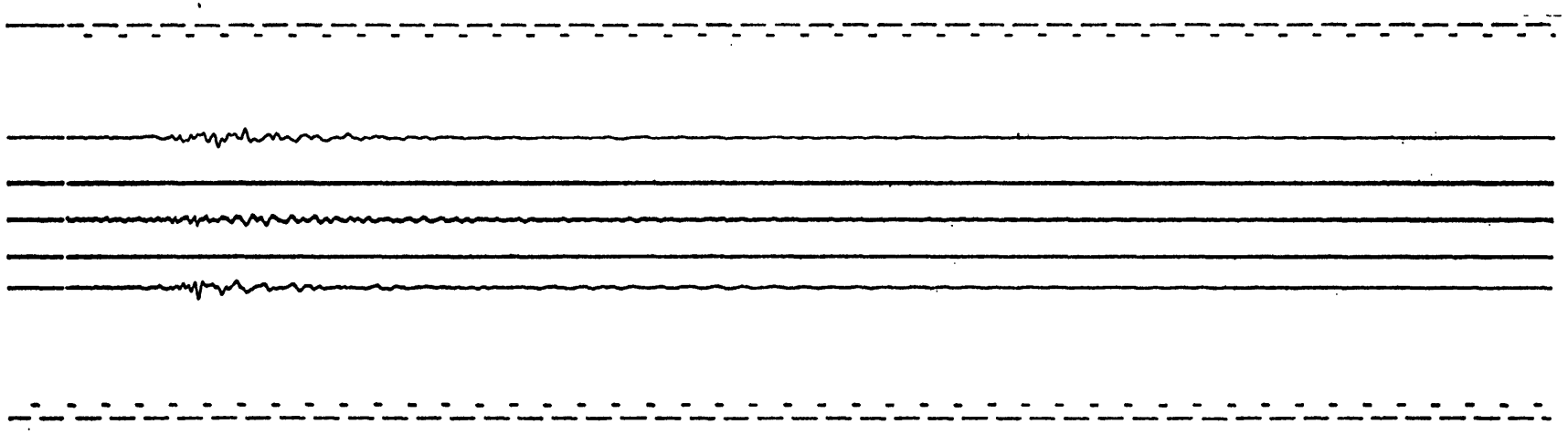

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 872 34.067°N, 118.248°W Los Angeles, 1111 Sunset Blvd. Roof (8)	L 348°	Sens. = 1.90 cm/g Freq. = 25.0 Hz Damp. = 0.59 crit	<0.05g
SMA # 1076 (MWD)	V Up	Sens. = 1.86 cm/g Freq. = 25.6 Hz Damp. = 0.59 crit	0.19g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 258°	Sens. = 1.83 cm/g Freq. = 25.6 Hz Damp. = 0.57 crit	<0.05g

Epicentral distance = 13 km

Film speed = 1 cm/sec

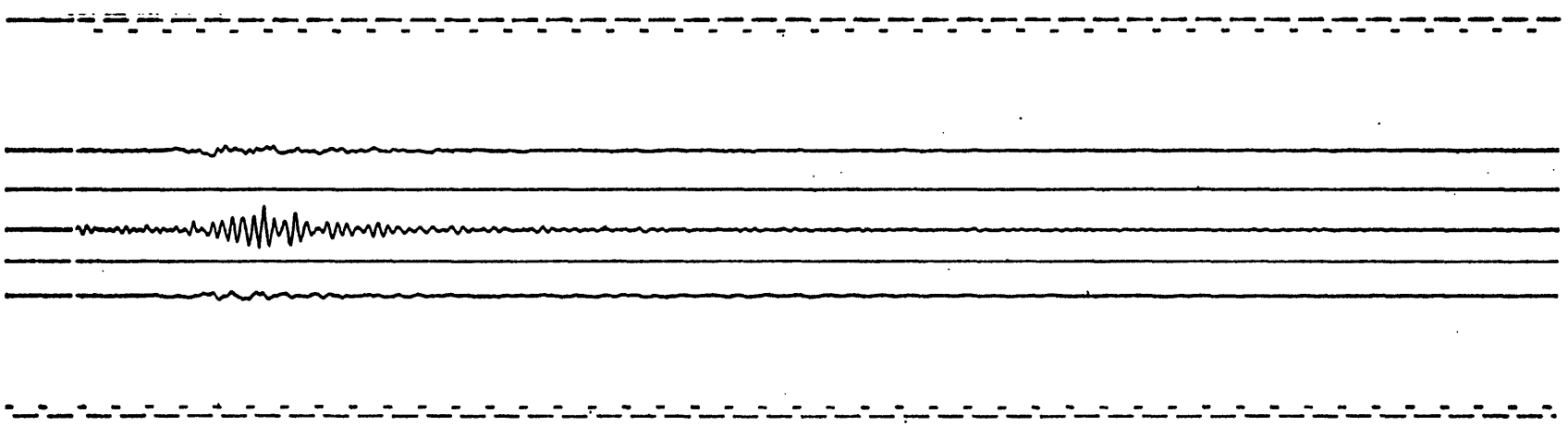

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 289 34.031°N, 118.054°W Whittier Narrows Dam Upstream (baseyard) SMA # 376 (ACOE)	L 152°	Sens. = 1.94 cm/g Freq. = 25.6 Hz Damp. = 0.59 crit	0.07g
	V Up	Sens. = 2.00 cm/g Freq. = 25.6 Hz Damp. = 0.61 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 062°	Sens. = 2.00 cm/g Freq. = 25.0 Hz Damp. = 0.59 crit	0.06g

Epicentral distance = 14 km

Film speed = 1 cm/sec

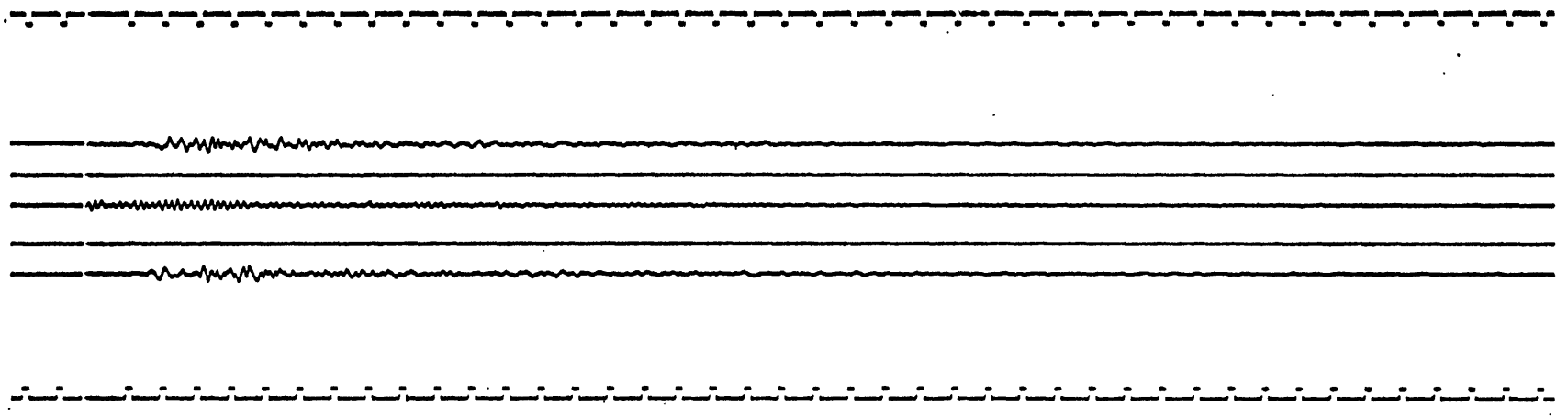

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 289 34.020°N, 118.053°W Whittier Narrows Dam Crest SMA # 478 (ACOE)	L 033°	Sens. = 1.79 cm/g Freq. = 26.3 Hz Damp. = 0.61 crit	0.07g
	V Up	Sens. = 1.80 cm/g Freq. = 26.3 Hz Damp. = 0.57 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 303°	Sens. = 1.85 cm/g Freq. = 25.6 Hz Damp. = 0.59 crit	0.06g

Epicentral distance = 15 km

Film speed = 1 cm/sec

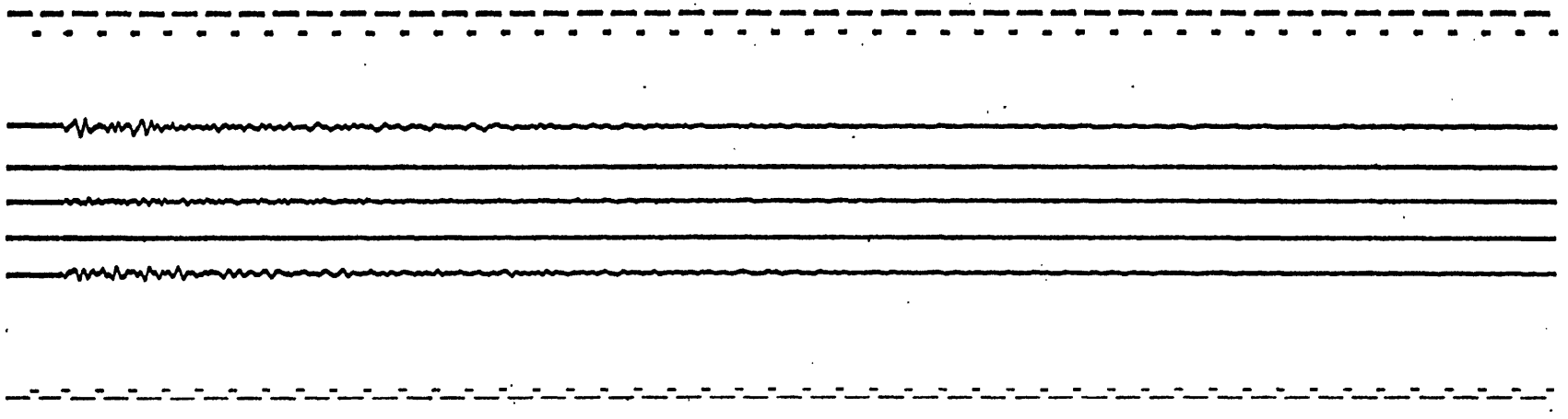

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5233	L 298°	Sens. = 1.90 cm/g	0.08g
34.052°N, 118.263°W		Freq. = 25.3 Hz	
Los Angeles, 1100 Wilshire Blvd.		Damp. = 0.6 crit	
Basement 3 SE			
SMA # 6065 (JCG/USGS)	V Up	Sens. = 1.94 cm/g	<0.05g
		Freq. = 25.8 Hz	
EARTHQUAKE OF		Damp. = 0.6 crit	
3 December 1988	T 208°	Sens. = 1.98 cm/g	0.07g
1138:33.1 G.m.t.		Freq. = 26.2 Hz	
(WWVB trigger time)		Damp. = 0.6 crit	
Epicentral distance = 15 km		Film speed = 1 cm/sec	

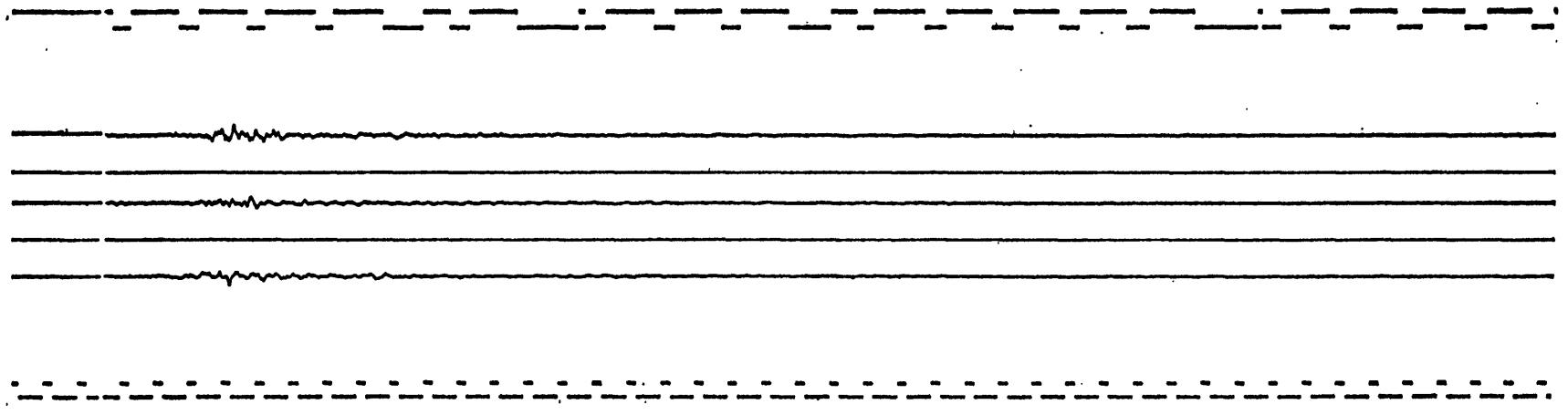

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5233 34.052°N, 118.263°W Los Angeles, 1100 Wilshire Blvd. Basement 3 NE SMA # 6064 (JCG/USGS)	L 298°	Sens. = 1.90 cm/g Freq. = 25.7 Hz Damp. = 0.6 crit	0.09g
	V Up	Sens. = 1.90 cm/g Freq. = 25.8 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138:32.9 G.m.t. (WWVB trigger time)	T 208°	Sens. = 1.90 cm/g Freq. = 25.6 Hz Damp. = 0.6 crit	0.05g
Epicentral distance = 15 km		Film speed = 1 cm/sec	

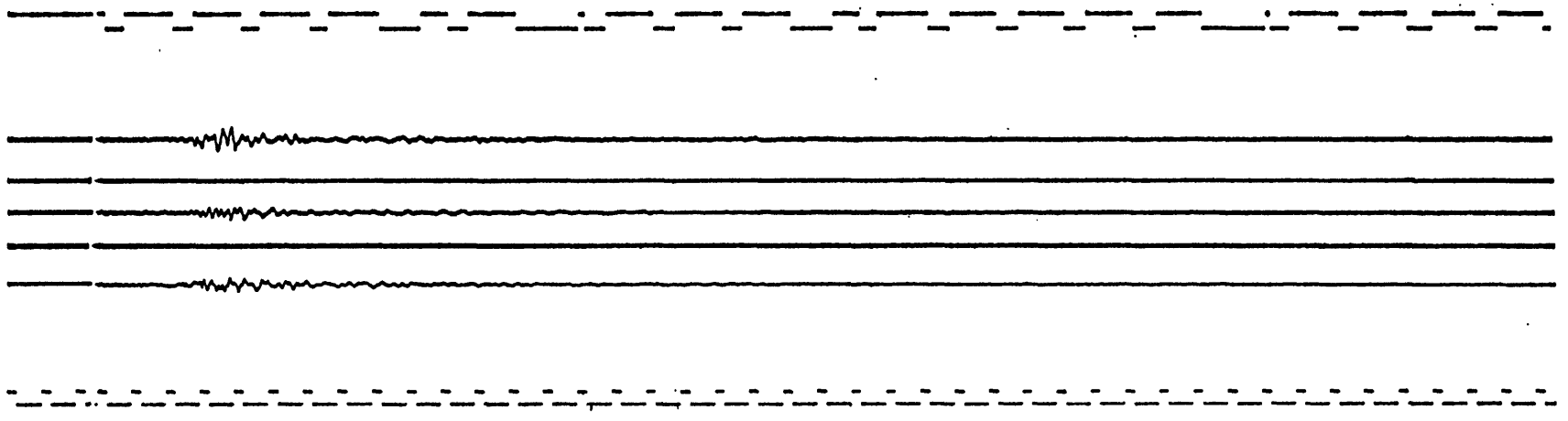

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5233 34.052°N, 118.263°W Los Angeles, 1100 Wilshire Blvd. Basement 4 NW SMA # 6063 (JCG/USGS)	L 298°	Sens. = 1.88 cm/g Freq. = 25.9 Hz Damp. = 0.6 crit	0.08g
	V Up	Sens. = 2.00 cm/g Freq. = 25.4 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138:32.8 G.m.t. (WWVB trigger time)	T 208°	Sens. = 1.89 cm/g Freq. = 25.2 Hz Damp. = 0.6 crit	0.06g
Epicentral distance = 15 km		Film speed = 1 cm/sec	

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	CH.	DIRECTION	LOCATION	SENSITIVITY	MAX. ACCELERATION
Station No. 5233	1	298°	12th floor, north	1.73	<0.05g
34.052°N, 118.263°W	2	208°	12th floor, north	1.70	0.06g
Los Angeles	3	208°	12th floor, south	1.66	0.07g
1100 Wilshire Blvd.	4	298°	13th floor, north	1.83	0.06g
Structure Array	5	208°	13th floor, north	1.80	0.11g
CRA #. 270 (JCGS/USGS)	6	208°	13th floor, south	1.78	0.07g
EARTHQUAKE OF	7	298°	32nd floor, north	1.78	<0.05g
3 December 1988	8	208°	32nd floor, north	1.74	0.09g
1138:32.8 G.m.t.	9	208°	32nd floor, south	1.78	<0.05g
(WWVB trigger time)	10	298°	1st floor. north	1.77	0.06g
	11	208°	1st floor, north	1.74	0.09g
	12	208°	1st floor, south	1.78	0.07g

Epicentral distance = 15 km

Film speed = 1 cm/sec

[See accelerogram on next page]

Figure 2. Continued.

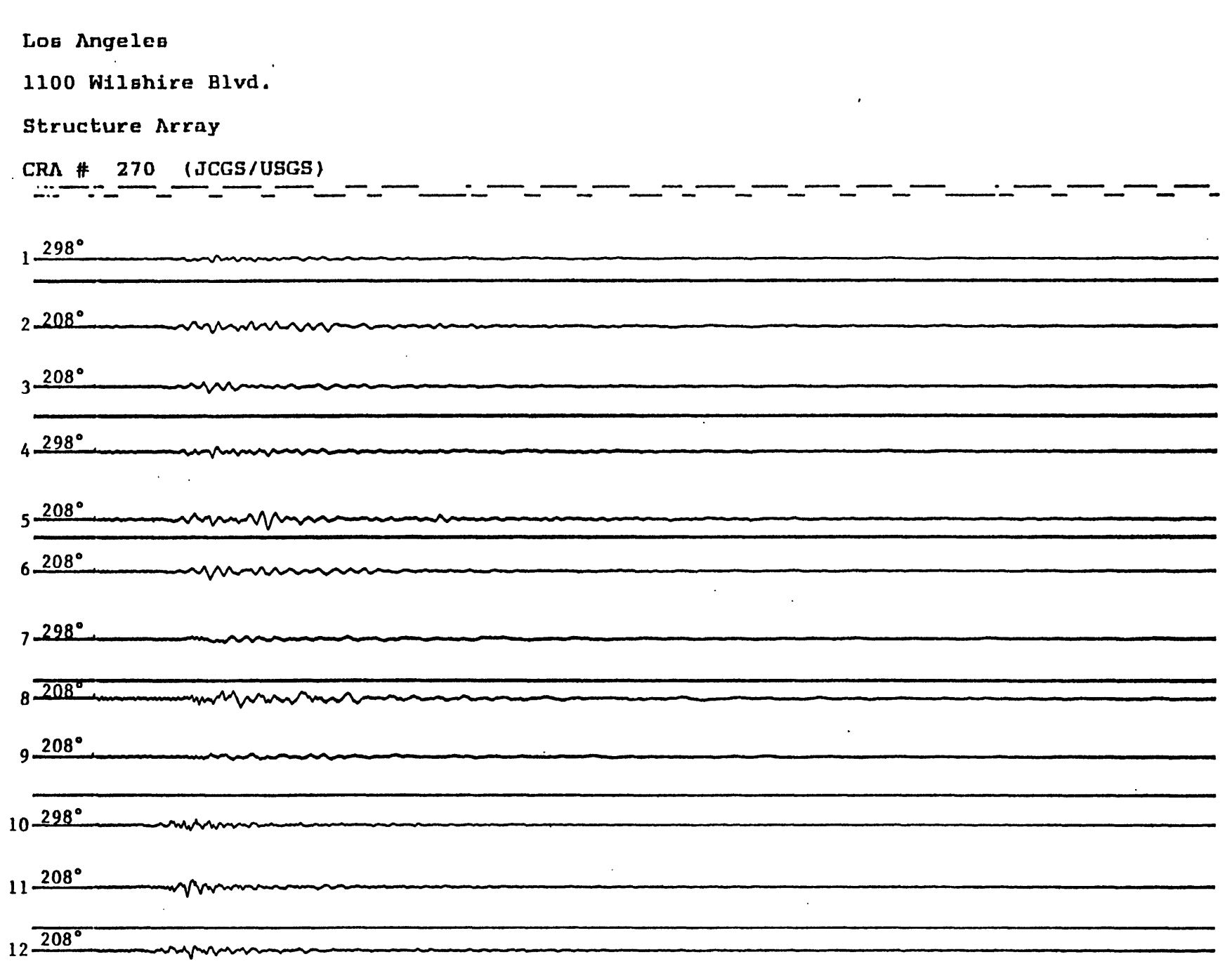

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 141 34.118°N, 118.299°W Los Angeles, Griffith Park Ground RFT-250 s/n 351 (USGS)	L 360°	Sens. = 1.88 cm/g Freq. = 20.6 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.89 cm/g Freq. = 21.5 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF --- 3 December 1988 1138 G.m.t.	T 270°	Sens. = 1.90 cm/g Freq. = 21.7 Hz Damp. = 0.6 crit	0.08g
Epicentral distance = 15 km		Film speed = 1 cm/sec	

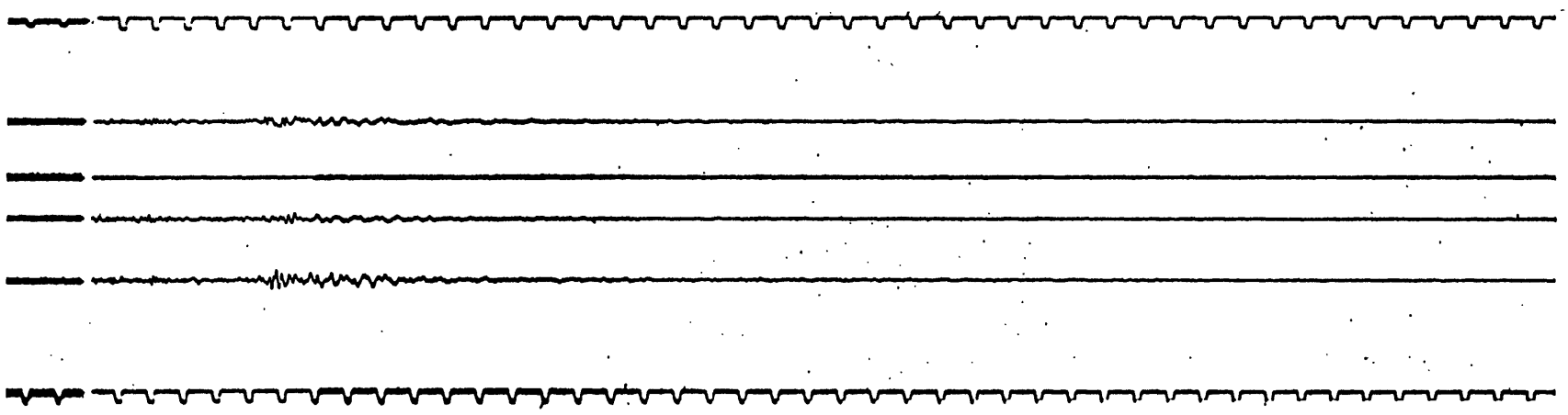

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 742 34.098°N, 118.294°W Los Angeles, 1526 N. Edgemont St. Roof (8) SMA # 923 (Code)	L 090°	Sens. = 1.91 cm/g Freq. = 24.7 Hz Damp. = 0.6 crit	0.09g
	V Up	Sens. = 1.82 cm/g Freq. = 25.8 Hz Damp. = 0.6 crit	0.08g
EARTHQUAKE OF 3 December 1988 1138 G.m.t	T 360°	Sens. = 1.80 cm/g Freq. = 25.5 Hz Damp. = 0.6 crit	0.10g
Epicentral distance = 15 km		Film speed = 1 cm/sec	

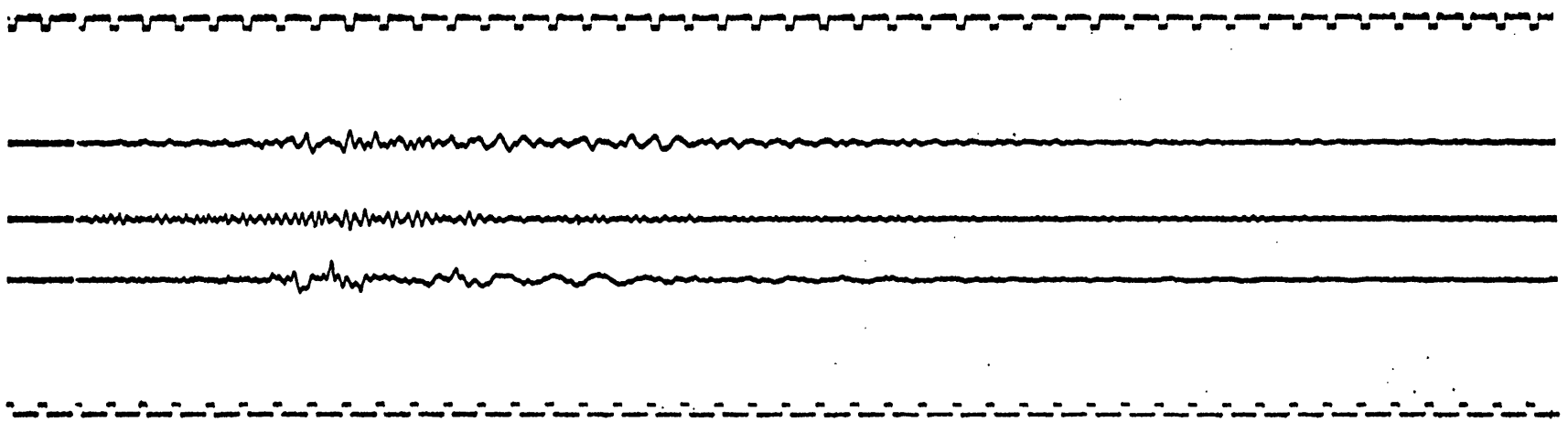

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5129 33.996°N, 118.162°W Los Angeles Bulk Mail Facility Ground SMA # 1295 (USGS)	L 010°	Sens. = 1.80 cm/g Freq. = 25.6 Hz Damp. = 0.6 crit	0.09g
	V Up	Sens. = 1.86 cm/g Freq. = 25.6 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 280°	Sens. = 1.88 cm/g Freq. = 26.3 Hz Damp. = 0.6 crit	0.10g
Epicentral distance = 16 km		Film speed = 1 cm/sec	

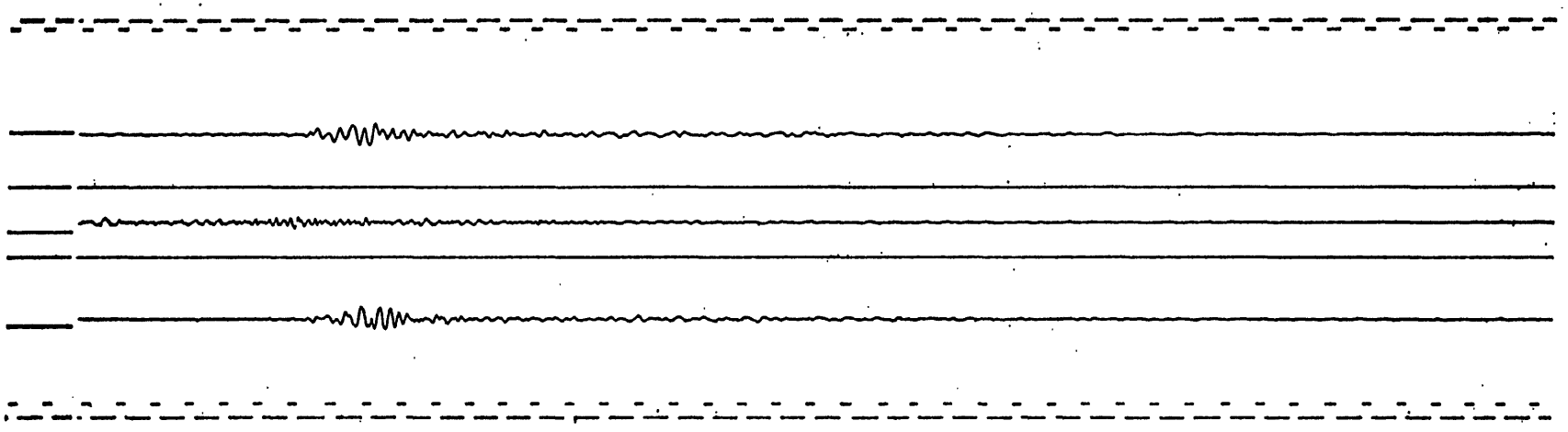

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5259 34.106°N, 118.336°W Los Angeles, 2005 N. Highland Blvd. Roof (8) SMA # 2691 (Code) EARTHQUAKE OF --- 3 December 1989 1138 G.m.t.	L 360°	Sens. = 1.69 cm/g Freq. = 26.4 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.79 cm/g Freq. = 25.7 Hz Damp. = 0.6 crit	<0.05g
	T 270°	Sens. = 1.77 cm/g Freq. = 26.4 Hz Damp. = 0.6 crit	<0.05g

Epicentral distance = 19 km

Film speed = 1 cm/sec

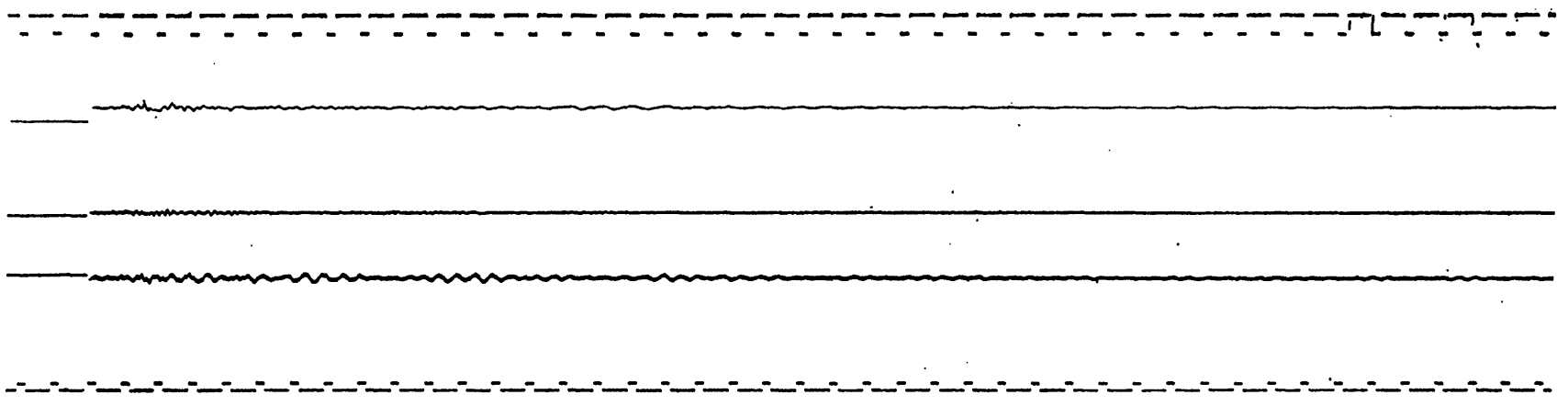

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 804 33.977°N, 118.036°W Whittier, 7215 Bright Ave. Basement SMA # 1069 (Code)	L 180°	Sens. = 1.78 cm/g Freq. = 25.9 Hz Damp. = 0.6 crit	0.08g
	V Up	Sens. = 1.89 cm/g Freq. = 25.1 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 090°	Sens. = 1.90 cm/g Freq. = 25.1 Hz Damp. = 0.6 crit	0.06g
Epicentral distance = 20 km		Film speed = 1 cm/sec	

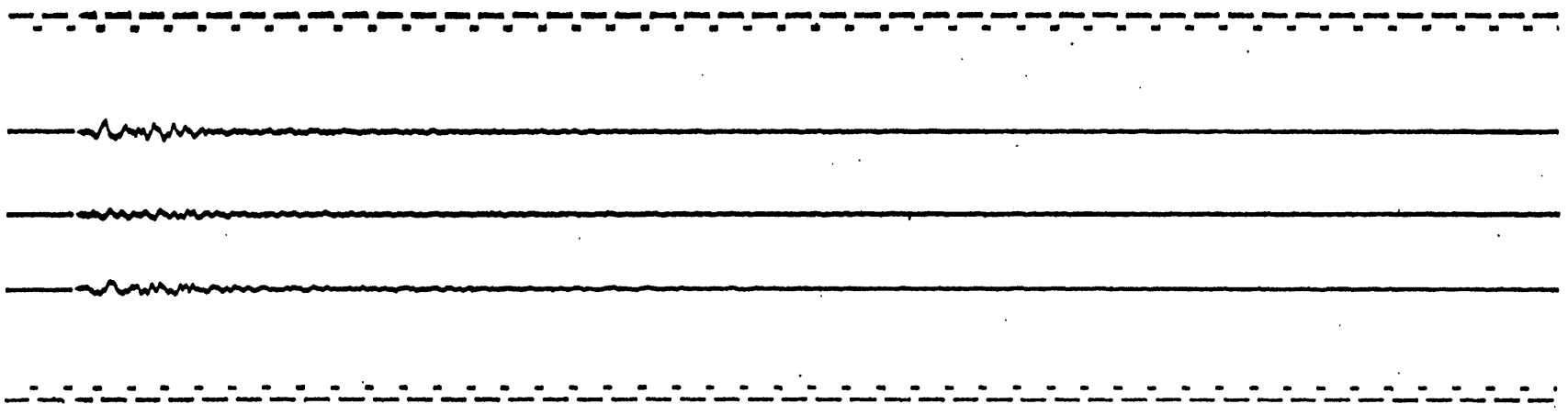

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 804 33.977°N, 118.036°W Whittier, 7215 Bright Ave. 5th floor SMA # 1070 (Code)	L 180°	Sens. = 1.92 cm/g Freq. = 25.4 Hz Damp. = 0.6 crit	0.10g
	V Up	Sens. = 1.91 cm/g Freq. = 25.4 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 090°	Sens. = 1.80 cm/g Freq. = 25.6 Hz Damp. = 0.6 crit	0.06g
Epicentral distance = 20 km		Film speed = 1 cm/sec	

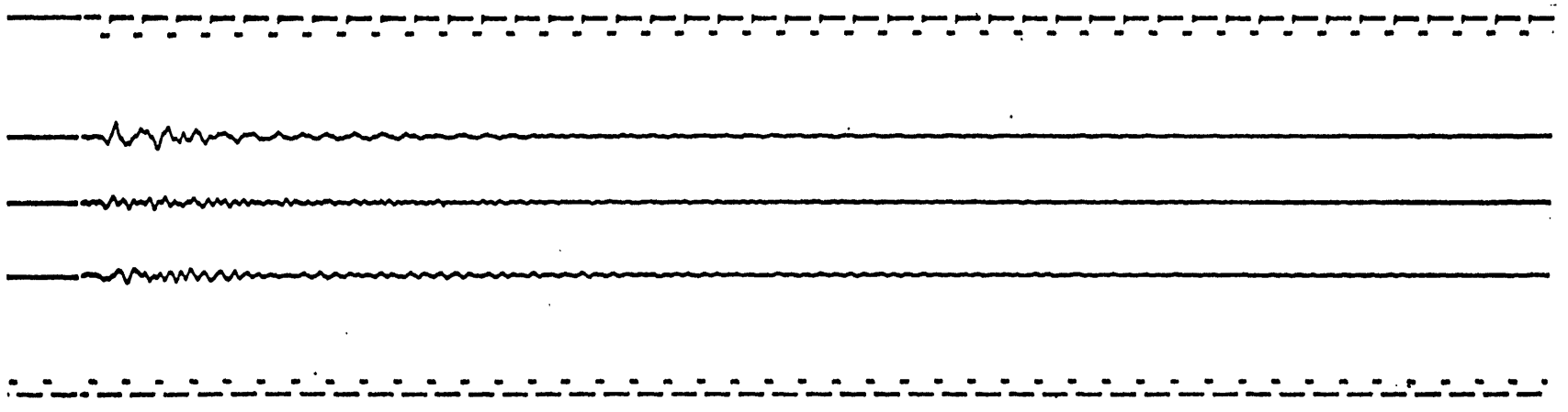

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 804 33.977°N, 118.036°W Whittier, 7215 Bright Ave. 10th floor SMA # 1071 (Code)	L 180°	Sens. = 1.84 cm/g Freq. = 26.1 Hz Damp. = 0.6 crit	0.06g
	V Up	Sens. = 1.85 cm/g Freq. = 25.5 Hz Damp. = 0.6 crit	0.06g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 090°	Sens. = 1.89 cm/g Freq. = 25.1 Hz Damp. = 0.6 crit	0.08g

Epicentral distance = 20 km

Film speed = 1 cm/sec

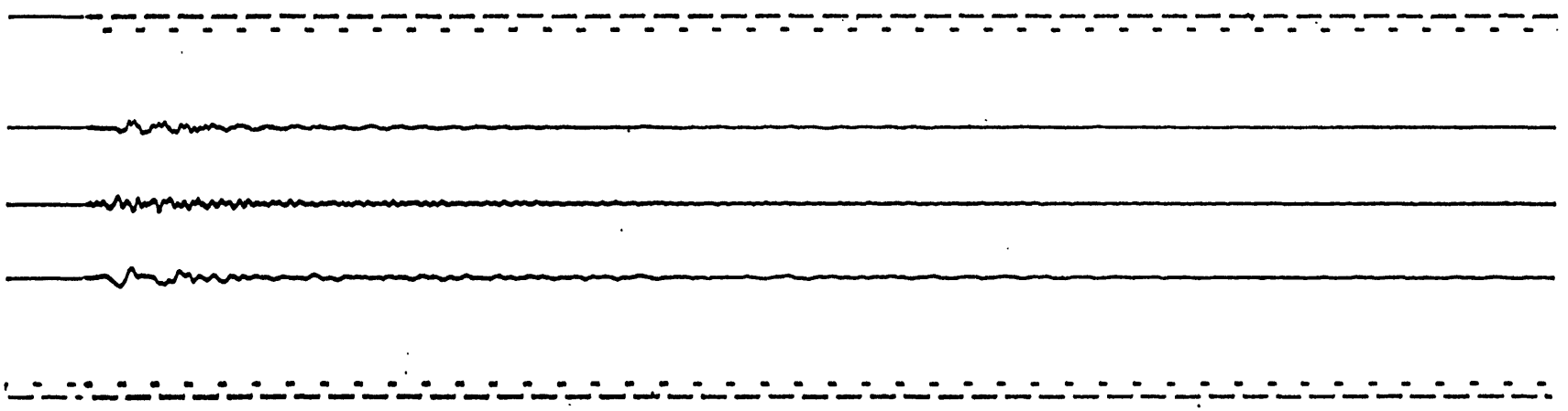

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 634 33.916°N, 118.067°W Norwalk, 12400 Imperial Highway 4th floor	L 090°	Sens. = 1.72 cm/g Freq. = 26.3 Hz Damp. = 0.57 crit	<0.05g
SMA # 425 (USGS/BECH)	V Up	Sens. = 1.99 cm/g Freq. = 24.3 Hz Damp. = 0.55 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 360°	Sens. = 1.67 cm/g Freq. = 26.3 Hz Damp. = 0.57 crit	<0.05g

Epicentral distance = 26 km

Film speed = 1 cm/sec

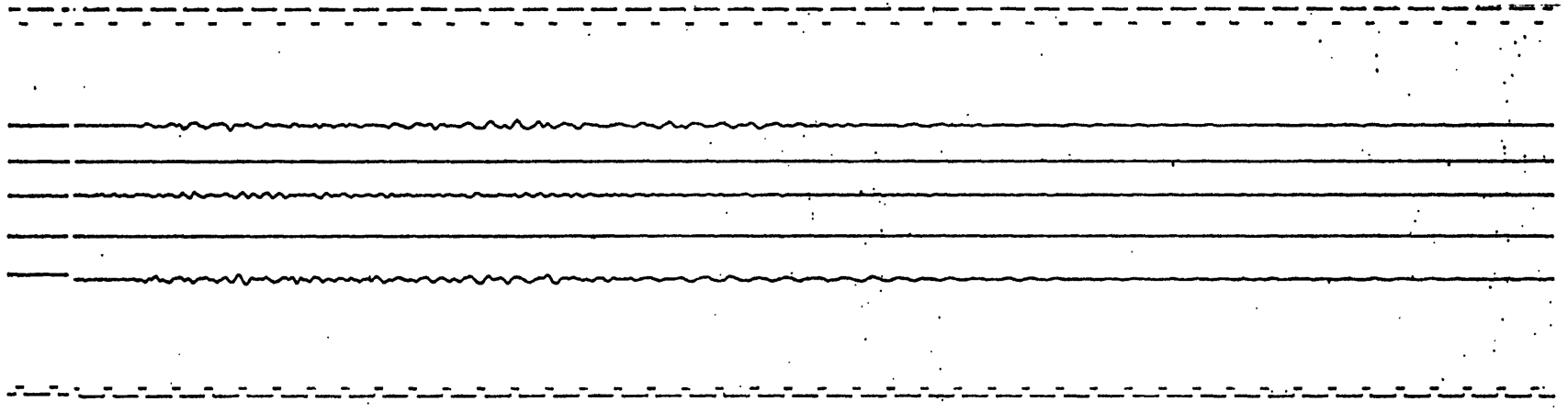

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 634 33.917°N, 118.067°W Norwalk, 12400 Imperial Highway North ground site	L 090°	Sens. = 1.95 cm/g Freq. = 25.0 Hz Damp. = 0.55 crit	<0.05g
SMA # 419 (USGS/BECH)	V Up	Sens. = 1.68 cm/g Freq. = 26.3 Hz Damp. = 0.57 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 360°	Sens. = 1.87 cm/g Freq. = 25.6 Hz Damp. = 0.57 crit	<0.05g

Epicentral distance = 26 km

Film speed = 1 cm/sec

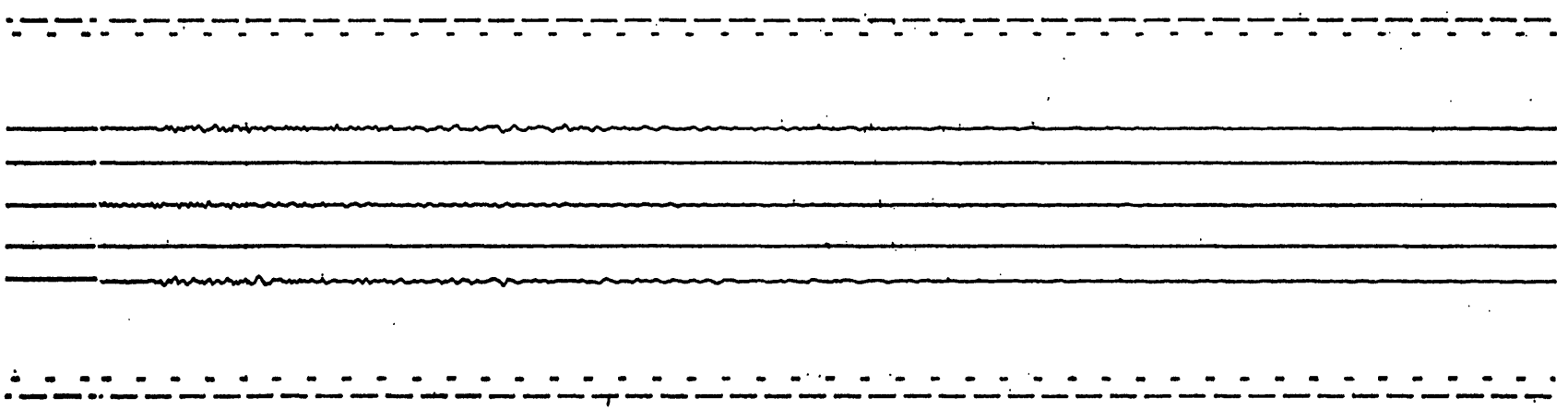

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 634	L 090°	Sens. = 1.83 cm/g	<0.05g
33.915°N, 118.067°W		Freq. = 26.0 Hz	
Norwalk, 12400 Imperial Highway		Damp. = 0.6 crit	
South ground site			
SMA # 823 (USGS/BECH)	V Up	Sens. = 1.76 cm/g	<0.05g
		Freq. = 25.9 Hz	
EARTHQUAKE OF		Damp. = 0.6 crit	
3 December 1988	T 360°	Sens. = 1.88 cm/g	<0.05g
1138 G.m.t.		Freq. = 25.9 Hz	
		Damp. = 0.6 crit	

Epicentral distance = 26 km

Film speed = 1 cm/sec

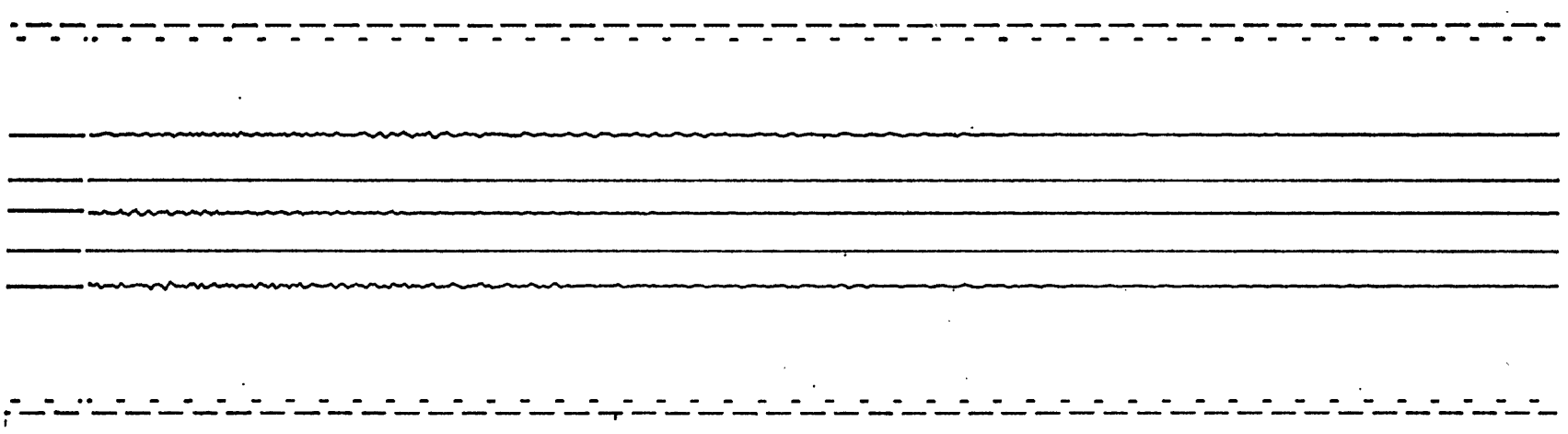

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5239 33.917°N, 118.065°W Norwalk, 12440 Imperial Highway North ground site SMA # 824 (USGS/BECH)	L 090°	Sens. = 1.80 cm/g Freq. = 26.1 Hz Damp. = 0.59 crit	<0.05g
	V Up	Sens. = 1.82 cm/g Freq. = 25.4 Hz Damp. = 0.61 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138:37.4 G.m.t. (Corrected TCG trigger time)	T 360°	Sens. = 1.80 cm/g Freq. = 26.0 Hz Damp. = 0.59 crit	<0.05g
Epicentral distance = 26 km		Film speed = 1 cm/sec	

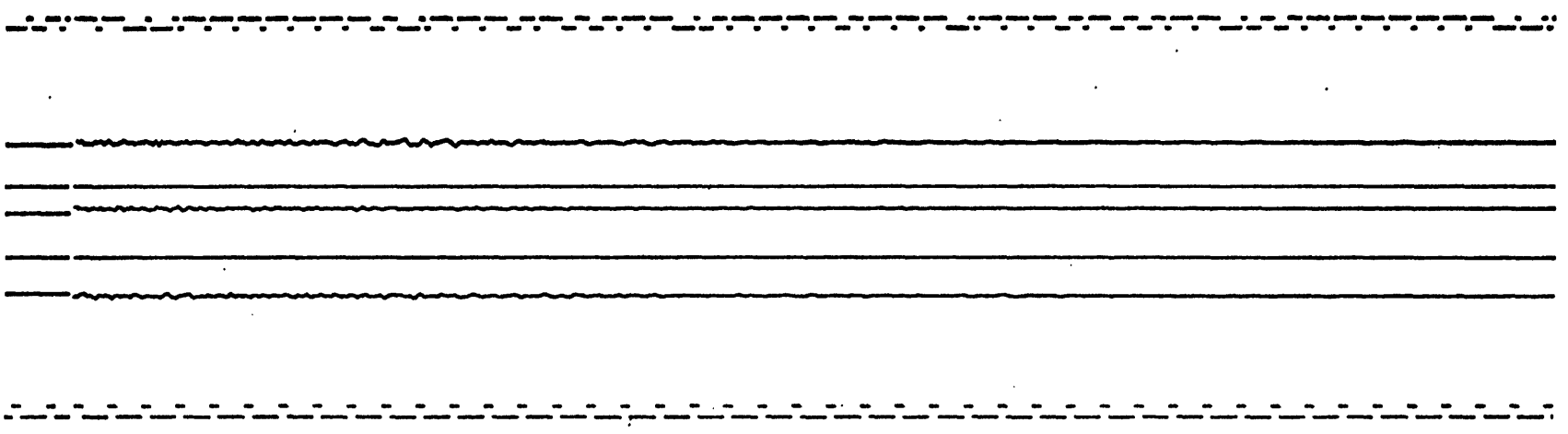

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5239 33.915°N, 118.066°W Norwalk, 12440 Imperial Highway South ground site SMA # 922 (USGS/BECH)	L 090°	Sens. = 1.85 cm/g Freq. = 25.3 Hz Damp. = 0.55 crit	<0.05g
	V Up	Sens. = 1.83 cm/g Freq. = 26.4 Hz Damp. = 0.55 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138:37.4 G.m.t. (Corrected TCG trigger time)	T 360°	Sens. = 1.93 cm/g Freq. = 25.4 Hz Damp. = 0.53 crit	<0.05g
Epicentral distance = 26 km		Film speed = 1 cm/sec	

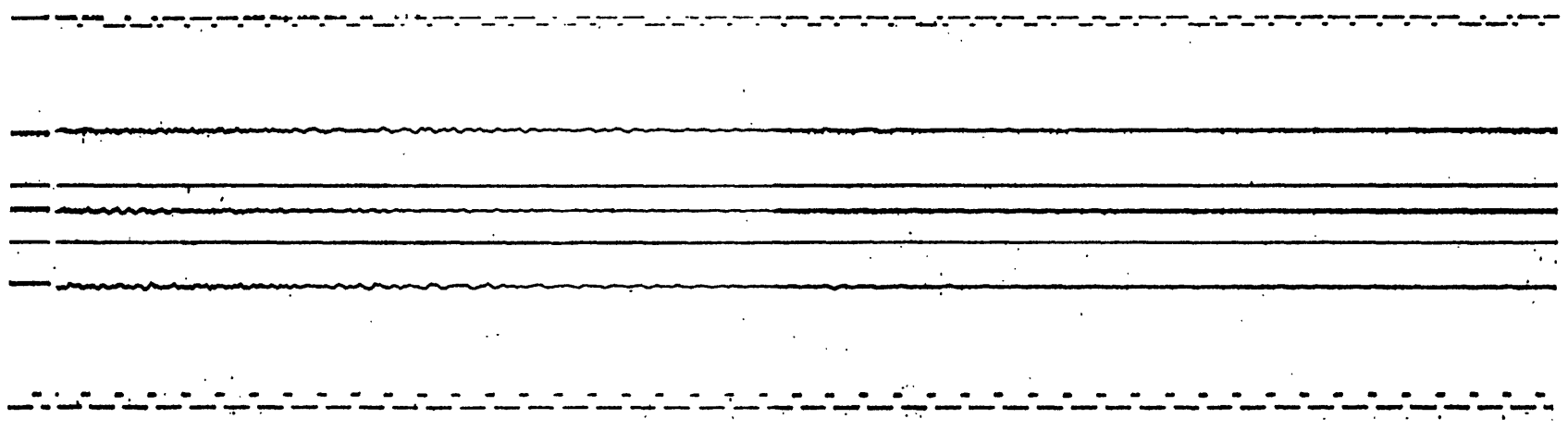

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5239 33.917°N, 118.066°W Norwalk, 12440 Imperial Highway Basement SMA # 2218 (USGS/BECH)	L 090°	Sens. = 1.76 cm/g Freq. = 26.3 Hz Damp. = 0.63 crit	<0.05g
	V Up	Sens. = 1.88 cm/g Freq. = 25.8 Hz Damp. = 0.62 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138:37.4 G.m.t. (Corrected TCG trigger time)	T 360°	Sens. = 1.71 cm/g Freq. = 26.4 Hz Damp. = 0.60 crit	<0.05g
Epicentral distance = 26 km		Film speed = 1 cm/sec	

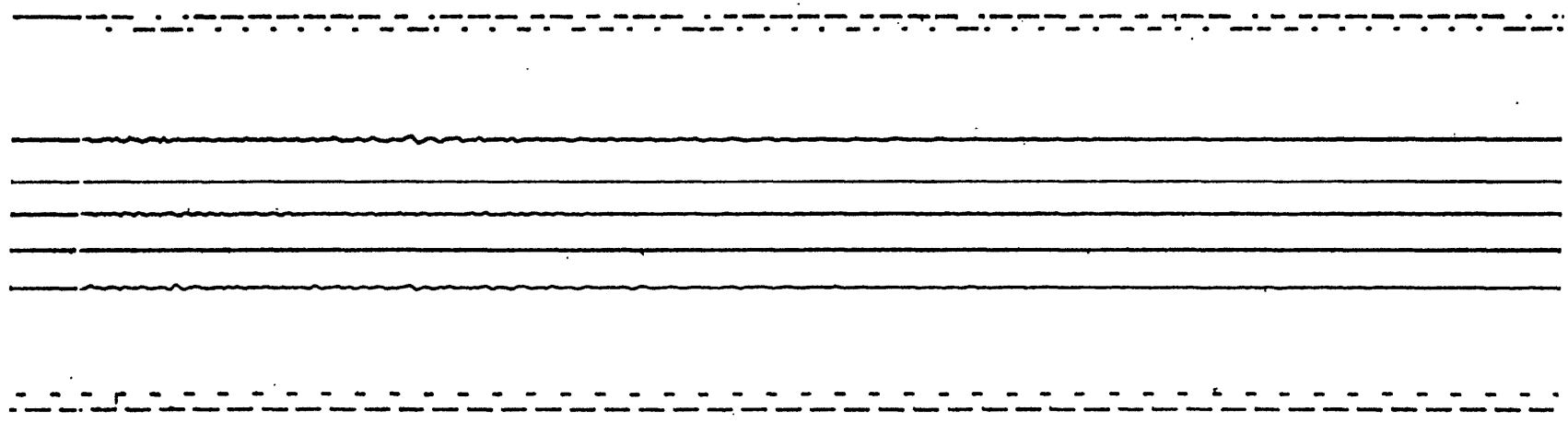

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	CH.	DIRECTION	LOCATION	SENSITIVITY	MAX. ACCELERATION
Station No. 5239	1	090°	7th floor, center	1.75	<0.05g
33.917°N, 118.066°W	2	090°	5th floor, center	1.83	<0.05g
Norwalk	3	090°	2nd floor, center	1.80	<0.05g
12440 Imperial Highway	4	090°	1st floor, center	1.72	<0.05g
Structure Array 1	5	360°	Basement, east	1.94	<0.05g
CRA # 127 (USGS/BECH)	6	360°	5th floor, west-ctr	1.77	<0.05g
EARTHQUAKE OF	7	up	Basement, center	1.92	<0.05g
3 December 1988	8	090°	Basement, center	1.88	<0.05g
1138:37.3 G.m.t.	9	360°	Basement, center	1.93	<0.05g
(WWVB trigger time)	10	up	Downhole (30'), bldg. center	1.85	<0.05g
	11	090°	Downhole (30'), bldg. center	1.91	<0.05g
	12	360°	Downhole (30'), bldg. center	1.90	<0.05g

Epicentral distance = 26 km

Film speed = 1 cm/sec

[See accelerogram on next page]

Figure 2. Continued.

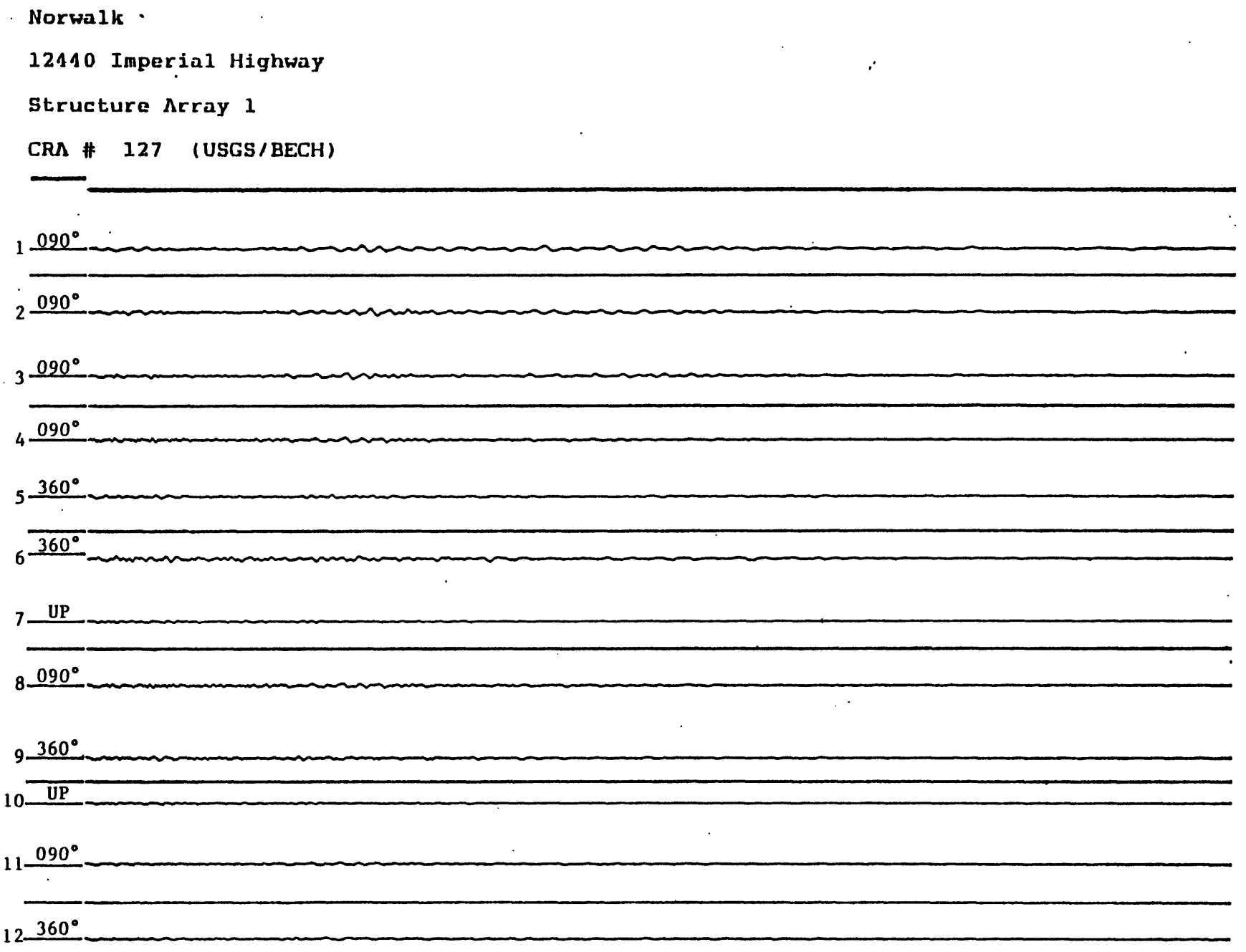

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	CH.	DIRECTION	LOCATION	SENSITIVITY	MAX. ACCELERATION
Station No. 5239	13	360°	7th floor, east	1.95	<0.05g
33.917°N, 118.066°W	14	360°	5th floor, east	1.87	<0.05g
Norwalk	15	360°	2nd floor, east	1.98	<0.05g
12440 Imperial Highway	16	360°	1st floor, east	1.87	<0.05g
Structure Array 2	17	360°	7th floor, center	1.88	<0.05g
CRA # 128 (USGS/BECH)	18	360°	5th floor, center	1.92	Inop.
EARTHQUAKE OF	19	360°	2nd floor, center	1.91	<0.05g
3 December 1988	20	360°	1st floor, center	1.85	<0.05g
1138:37.3 G.m.t.	21	360°	7th floor, west	1.86	<0.05g
(WWVB trigger time)	22	360°	5th floor, west	1.84	<0.05g
	23	360°	2nd floor, west	1.91	<0.05g
	24	360°	1st floor, west	1.85	<0.05g

Epicentral distance = 26 km

Film speed = 1 cm/sec

[See accelerogram on next page]

Figure 2. Continued.

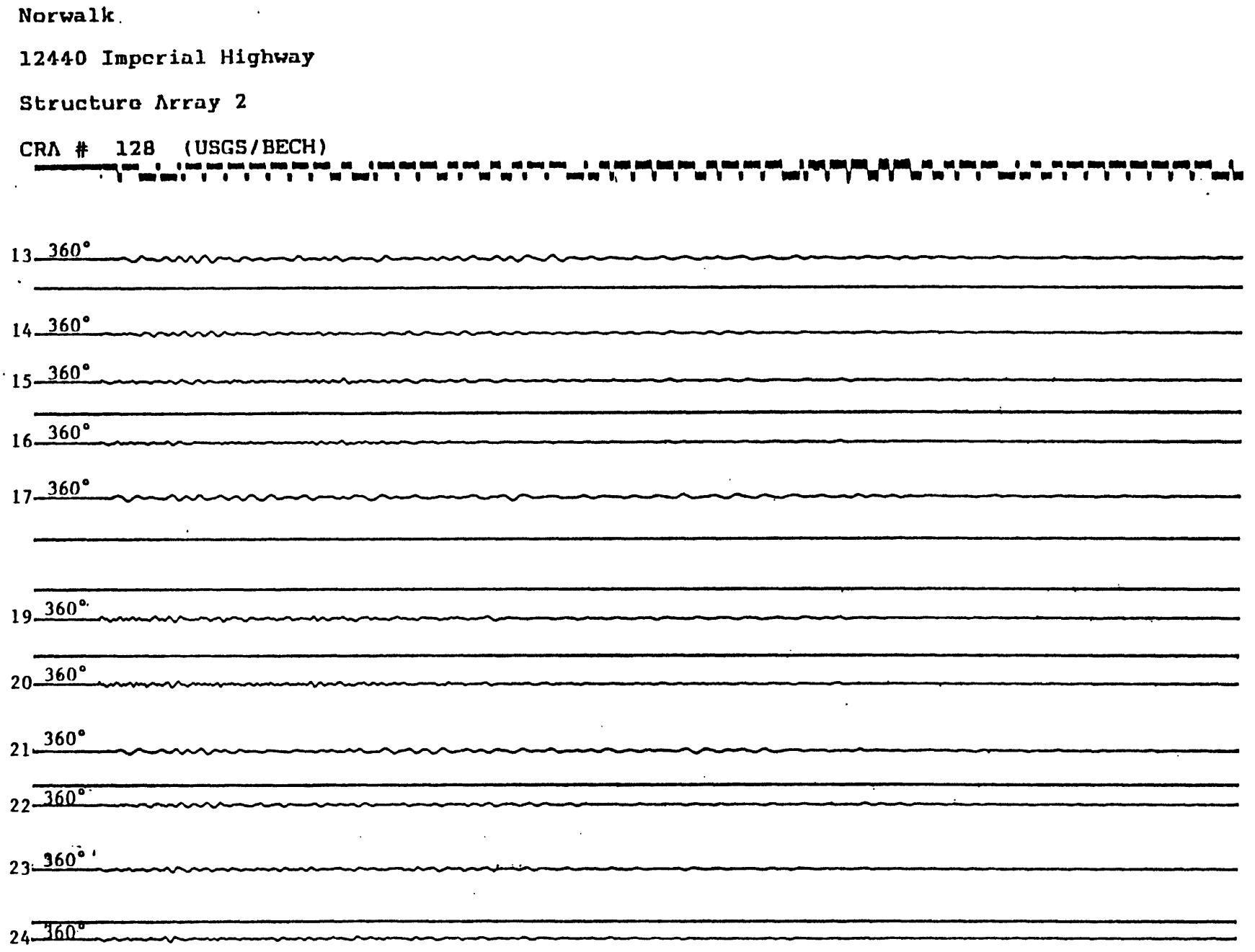

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5256 34.056°N, 118.413°W Los Angeles; 2055 Avenue of the Stars Roof (31) SMA # 5775 (Code) EARTHQUAKE OF --- 3 December 1988 1138 G.m.t.	L 320°	Sens. = 1.66 cm/g Freq. = 27.0 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.89 cm/g Freq. = 25.8 Hz Damp. = 0.6 crit	<0.05g
	T 230°	Sens. = 1.78 cm/g Freq. = 26.0 Hz Damp. = 0.6 crit	<0.05g

Epicentral distance = 27 km

Film speed = 1 cm/sec

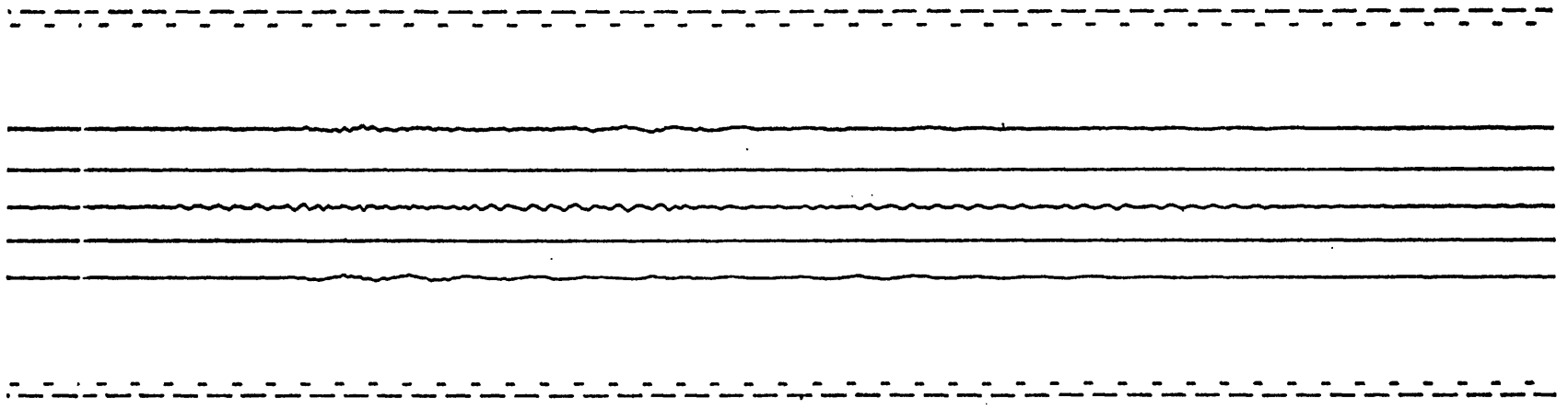

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5082 34.054°N, 118.453°W Los Angeles, Wadsworth VA Hospital Ground site north	L 325°	Sens. = 1.86 cm/g Freq. = 26.0 Hz Damp. = 0.6 crit	<0.05g
SMA # 4980 (USGS)	V Up	Sens. = 1.98 cm/g Freq. = 25.5 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138:38.7 G.m.t. (WWVB trigger time)	T 235°	Sens. = 1.70 cm/g Freq. = 27.0 Hz Damp. = 0.6 crit	<0.05g
Epicentral distance = 31 km		Film speed = 1 cm/sec	

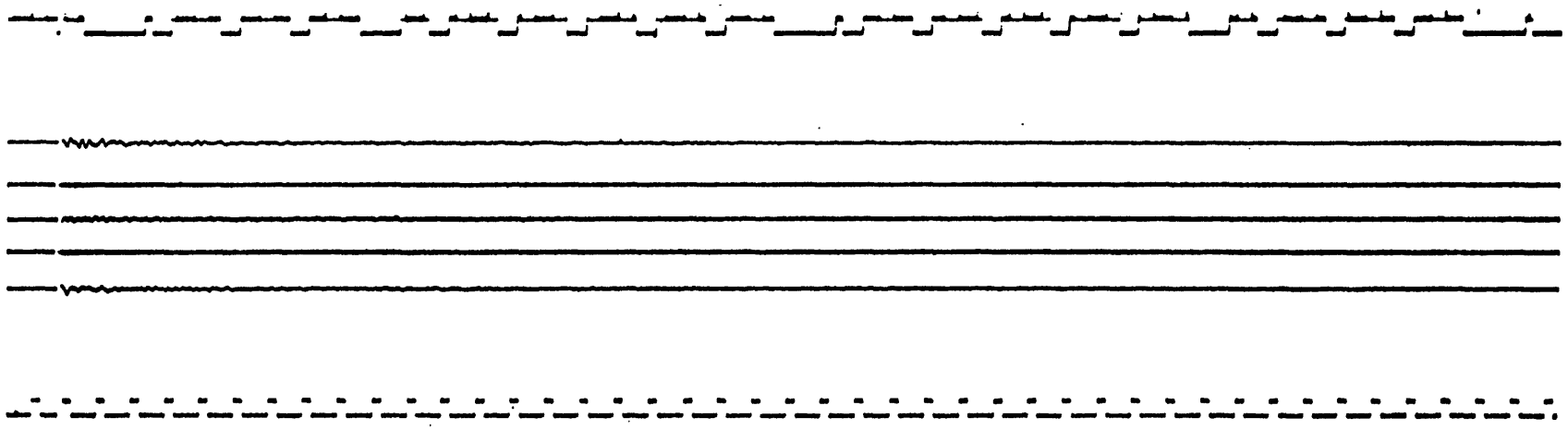

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 949 34.168°N, 118.470°W Sepulveda Dam Crest SMA # 5703 (ACOE)	L 054°	Sens. = 1.90 cm/g Freq. = 25.8 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.99 cm/g Freq. = 25.1 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 324°	Sens. = 1.88 cm/g Freq. = 25.4 Hz Damp. = 0.6 crit	<0.05g
Epicentral distance = 31 km		Film speed = 1 cm/sec	

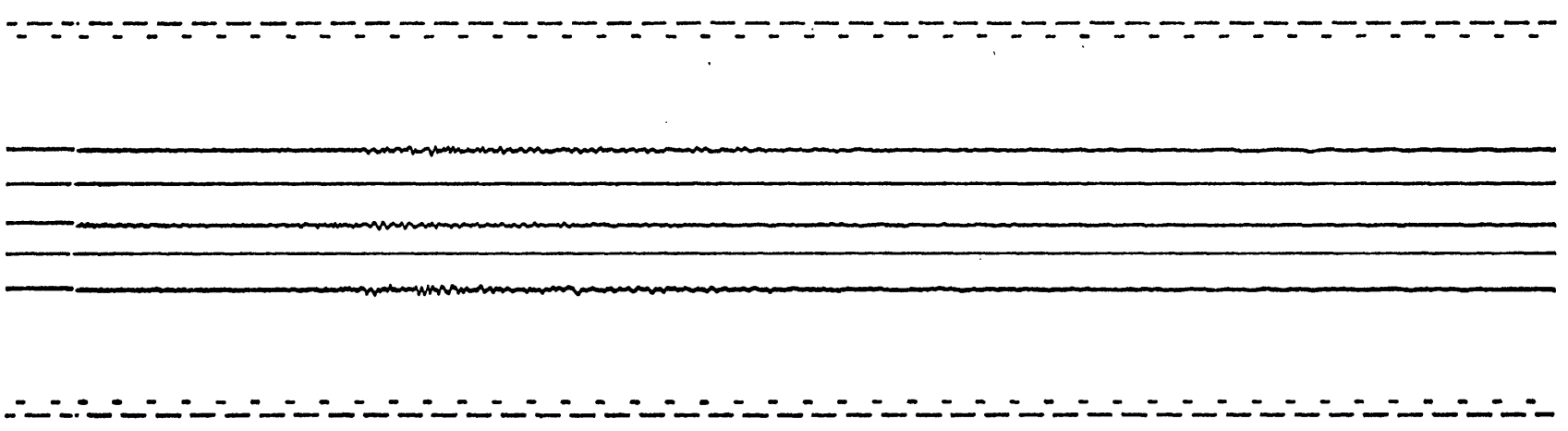

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 949 34.167°N, 118.469°W Sepulveda Dam Downstream SMA # 5702 (ACOE)	L 054°	Sens. = 1.70 cm/g Freq. = 26.6 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.85 cm/g Freq. = 25.6 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 324°	Sens. = 1.84 cm/g Freq. = 26.0 Hz Damp. = 0.6 crit	<0.05g
Epicentral distance = 31 km		Film speed = 1 cm/sec	

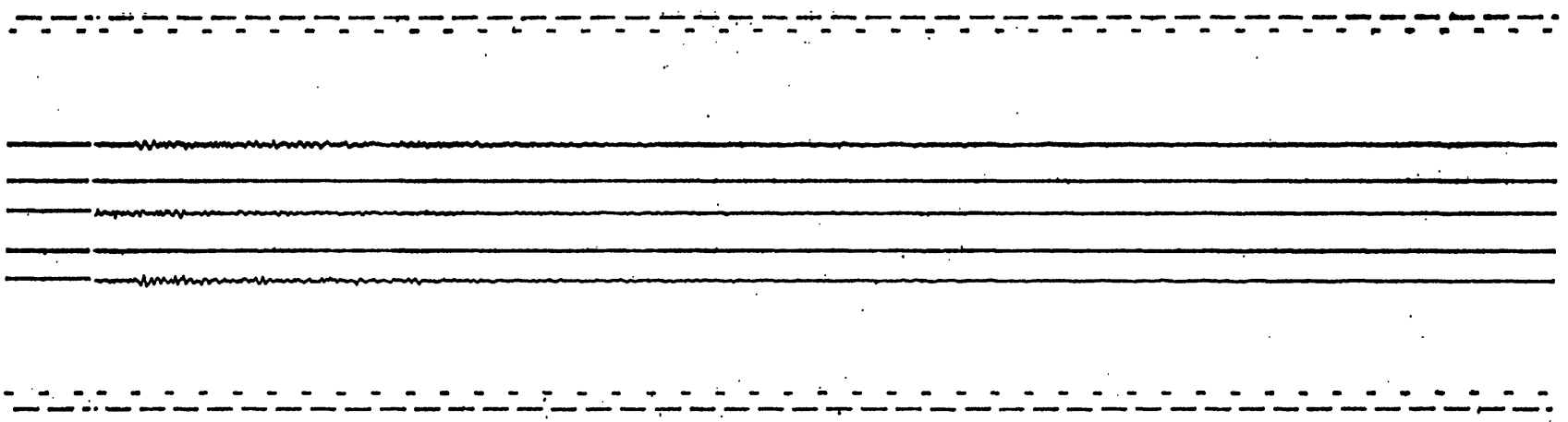

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 757 34.097°N, 118.478°W Sepulveda Canyon Spillway roof SMA # 1054 (MWD)	L 166°	Sens. = 1.84 cm/g Freq. = 26.3 Hz Damp. = 0.59 crit	<0.05g
	V Up	Sens. = 1.93 cm/g Freq. = 25.6 Hz Damp. = 0.59 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 076°	Sens. = 1.92 cm/g Freq. = 25.0 Hz Damp. = 0.59 crit	0.08g
Epicentral distance = 32 km		Film speed = 1 cm/sec	

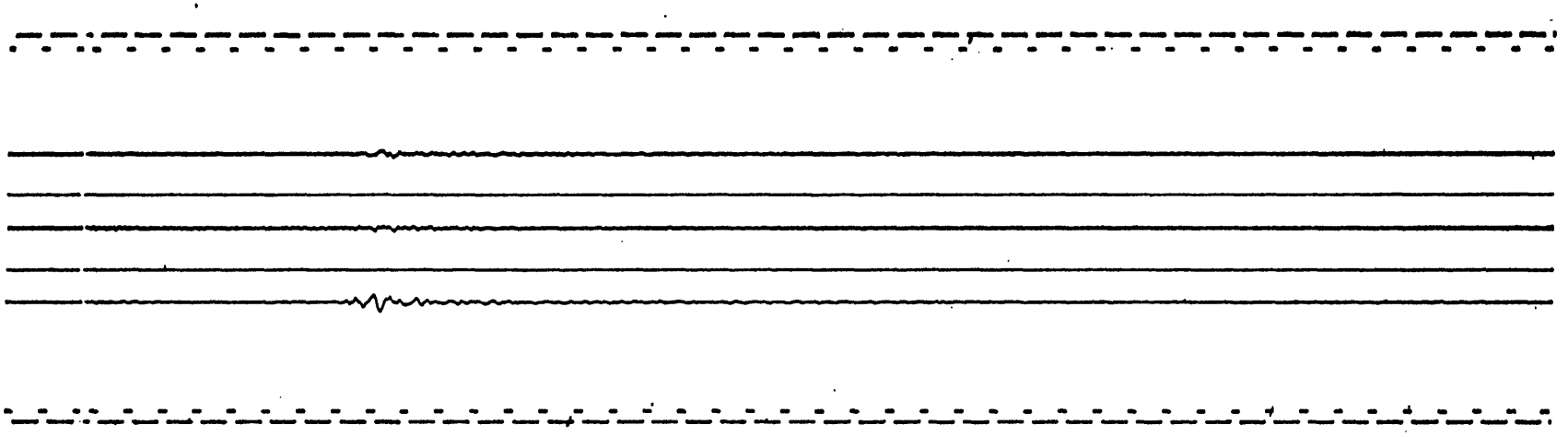

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5164 34.115 N, 117.779°W Weymouth Filter Plant Tank top SMA # 1052 (MWD)	L 017°	Sens. = 1.86 cm/g Freq. = 25.5 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.85 cm/g Freq. = 25.9 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 287°	Sens. = 1.77 cm/g Freq. = 25.8 Hz Damp. = 0.6 crit	<0.05g
Epicentral distance = 33 km		Film speed = 1 cm/sec	

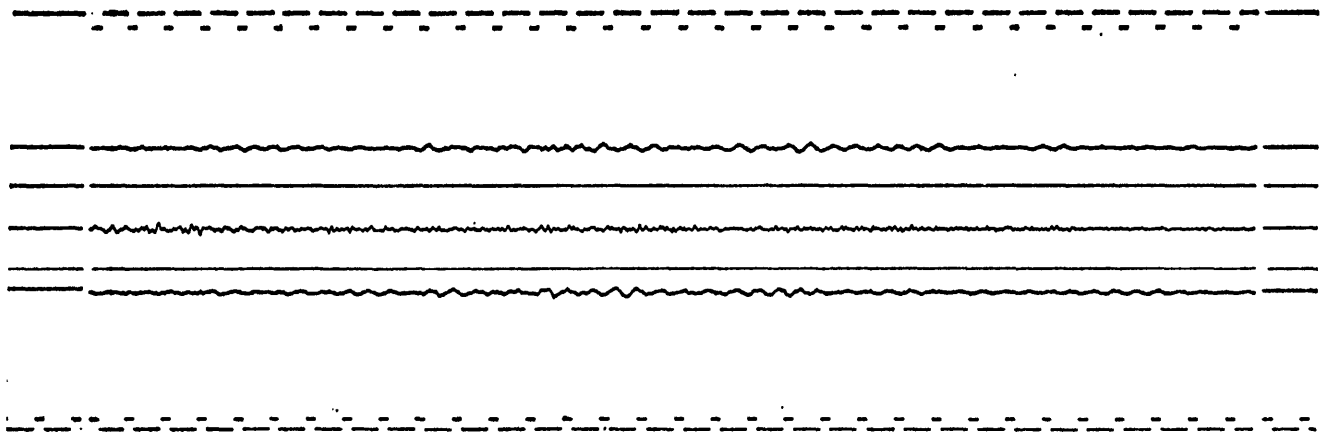

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5164 34.114 N, 117.778°W Weymouth Filter Plant Ground level SMA # 1053 (MWD)	L 017°	Sens. = 2.00 cm/g Freq. = 24.9 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.83 cm/g Freq. = 25.9 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 287°	Sens. = 1.88 cm/g Freq. = 26.3 Hz Damp. = 0.6 crit	<0.05g
Epicentral distance = 33 km		Film speed = 1 cm/sec	

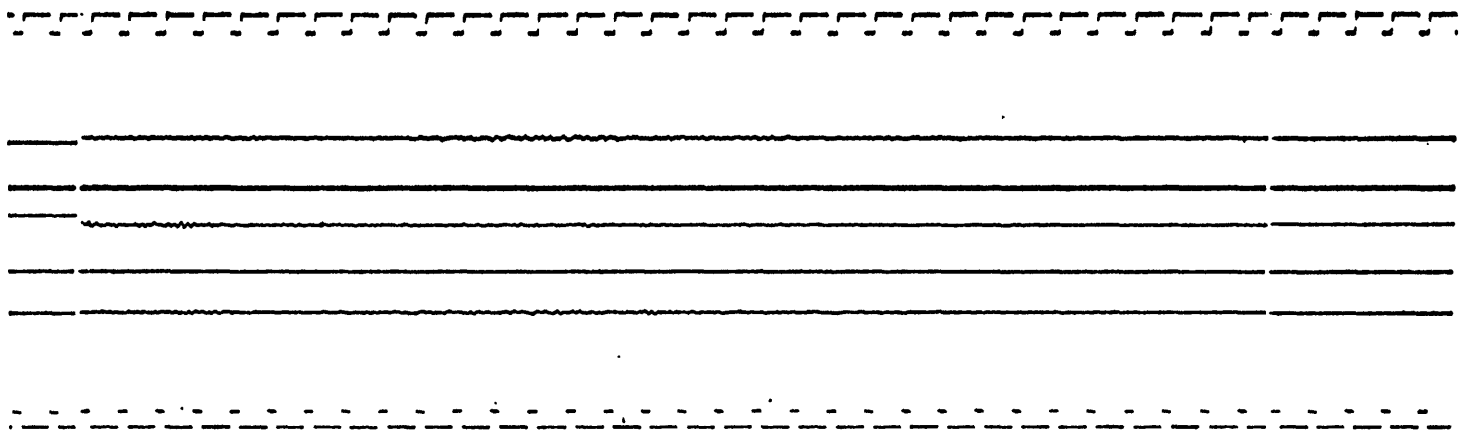

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 951 33.890°N, 117.925°W Brea Dam Crest SMA # 386 (ACOE)	L 130°	Sens. = 1.93 cm/g Freq. = 24.4 Hz Damp. = 0.55 crit	0.06g
	V Up	Sens. = 1.88 cm/g Freq. = 25.0 Hz Damp. = 0.55 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 040°	Sens. = 1.85 cm/g Freq. = 25.6 Hz Damp. = 0.53 crit	0.05g

Epicentral distance = 34 km

Film speed = 1 cm/sec

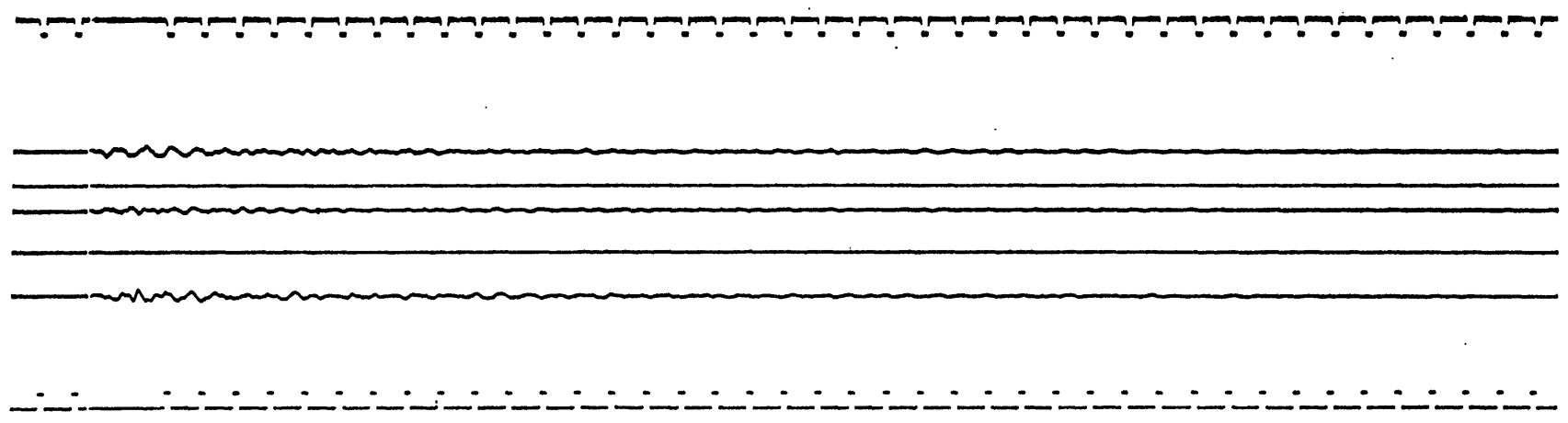

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 951 33.889°N, 117.924°W Brea Dam Left abutment SMA # 385 (ACOE)	L 130°	Sens. = 1.90 cm/g Freq. = 25.9 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 2.02 cm/g Freq. = 24.8 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 040°	Sens. = 1.95 cm/g Freq. = 25.2 Hz Damp. = 0.6 crit	<0.05g

Epicentral distance = 34 km

Film speed = 1 cm/sec

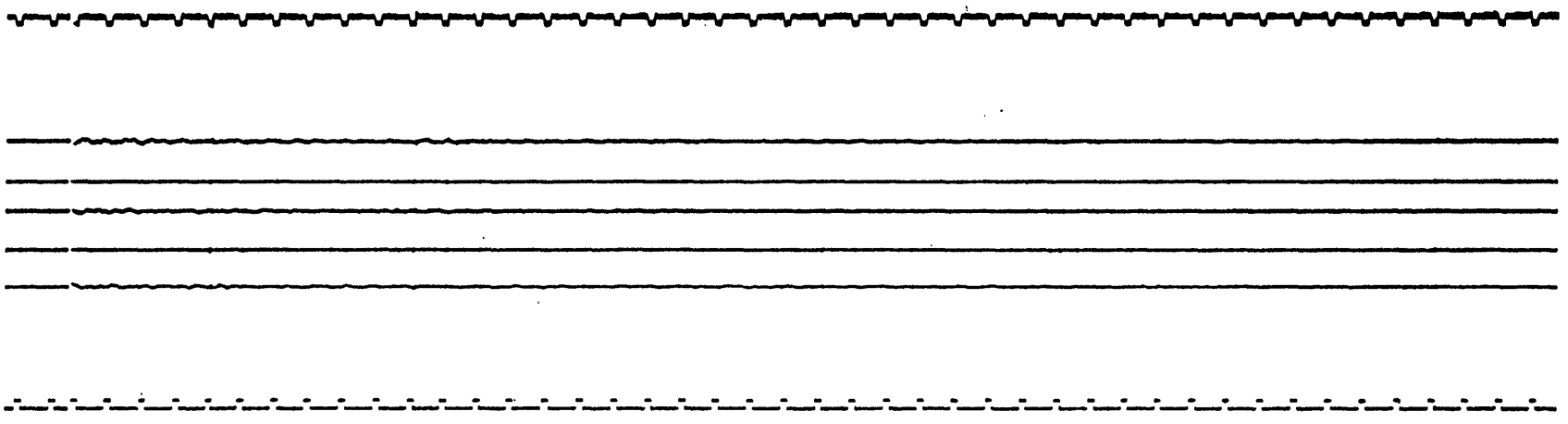

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 637 34.249°N, 118.475°W Sepulveda VA Hospital Ground	L 360°	Sens. = 1.84 cm/g Freq. = 26.3 Hz Damp. = 0.55 crit	0.07g
SMA # 751 (VA)	V Up	Sens. = 1.81 cm/g Freq. = 25.6 Hz Damp. = 0.55 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 270°	Sens. = 1.80 cm/g Freq. = 25.0 Hz Damp. = 0.55 crit	<0.05g
Epicentral distance = 34 km		Film speed = 1 cm/sec	

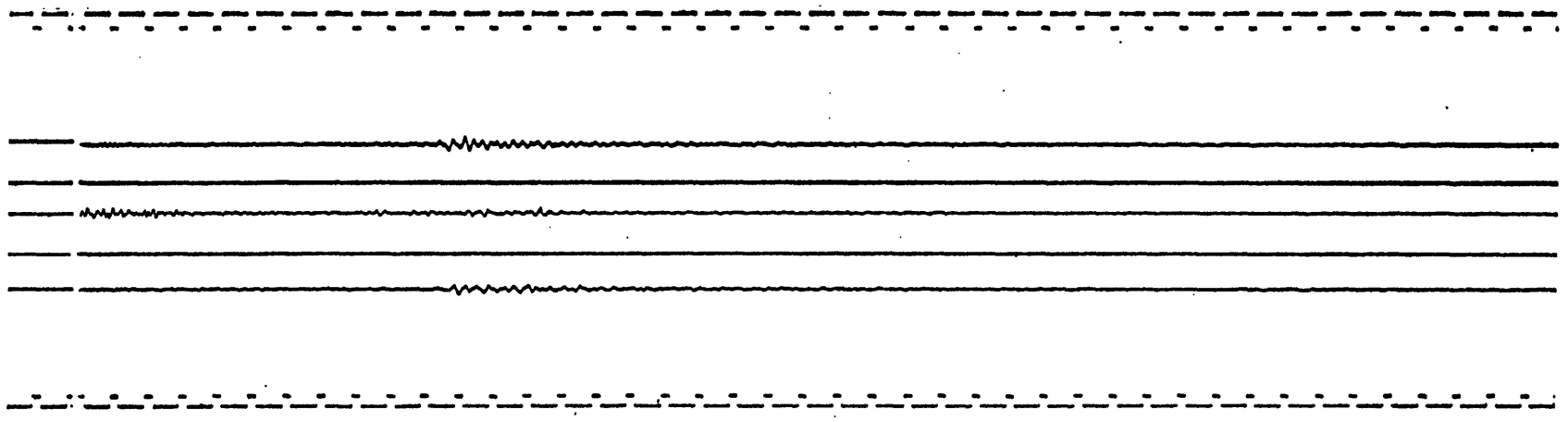

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 655	L 022°	Sens. = 1.78 cm/g	<0.05g
34.312°N, 118.496°W		Freq. = 26.3 Hz	
Jensen Filter Plant		Damp. = 0.57 crit	
Administration Bldg., basement			
SMA # 259 (MWD)	V Up	Sens. = 1.74 cm/g	<0.05g
		Freq. = 27.0 Hz	
EARTHQUAKE OF		Damp. = 0.55 crit	
3 December 1988	T 292°	Sens. = 1.63 cm/g	<0.05g
1138 G.m.t.		Freq. = 27.7 Hz	
		Damp. = 0.50 crit	
Epicentral distance = 38 km		Film speed = 1 cm/sec	

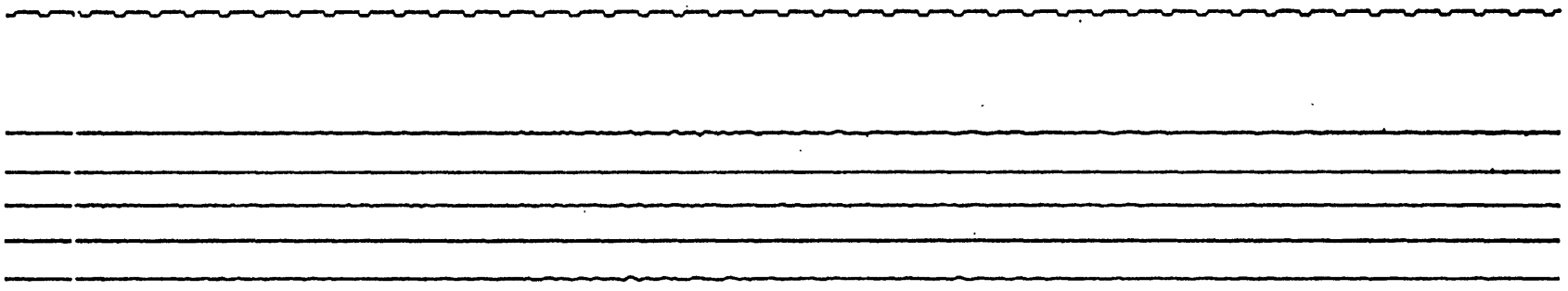

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 655 34.313°N, 118.498°W Jensen Filter Plant Generator building, ground RFT-350 s/n 1002 (MWD)	L 022°	Sens. = 1.85 cm/g Freq. = 20.0 Hz Damp. = 0.60 crit	<0.05g
	V Up	Sens. = 1.85 cm/g Freq. = 20.8 Hz Damp. = 0.55 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 292°	Sens. = 1.76 cm/g Freq. = 20.8 Hz Damp. = 0.55 crit	<0.05g
Epicentral distance = 38 km		Film speed = 1 cm/sec	

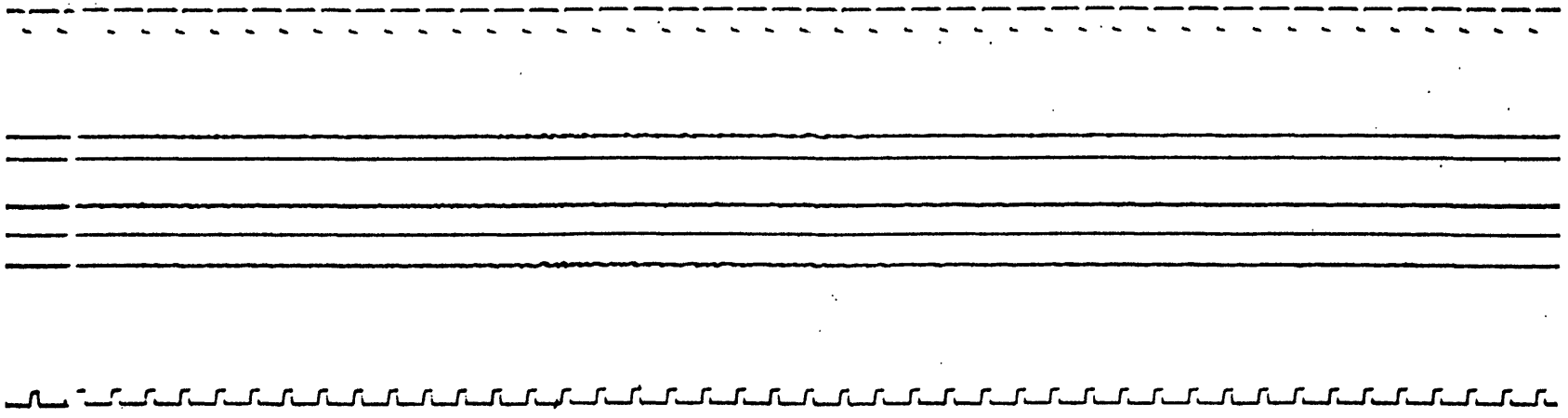

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 655 34.309°N, 118.499°W Jensen Filter Plant Reservoir roof RFT-350 s/n 1003 (MWD)	L 022°	Sens. = 1.75 cm/g Freq. = 20.4 Hz Damp. = 0.57 crit	<0.05g
	V Up	Sens. = 1.72 cm/g Freq. = 21.7 Hz Damp. = 0.57 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 292°	Sens. = 1.74 cm/g Freq. = 20.4 Hz Damp. = 0.57 crit	<0.05g
Epicentral distance = 38 km		Film speed = 1 cm/sec	

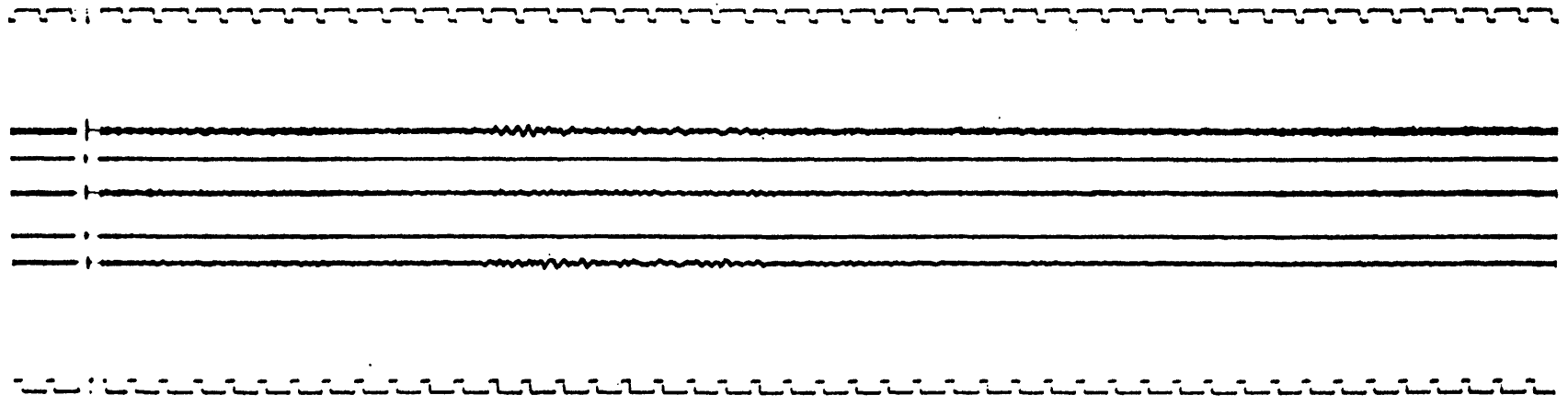

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5106 33.778°N, 118.118°W Long Beach VA Hospital Basement SMA # 845 (VA)	L 360°	Sens. = 1.83 cm/g Freq. = 25.6 Hz Damp. = 0.55 crit	<0.05g
	V Up	Sens. = 1.95 cm/g Freq. = 26.3 Hz Damp. = 0.57 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 270°	Sens. = 2.00 cm/g Freq. = 25.0 Hz Damp. = 0.59 crit	<0.05g
Epicentral distance = 40 km		Film speed = 1 cm/sec	

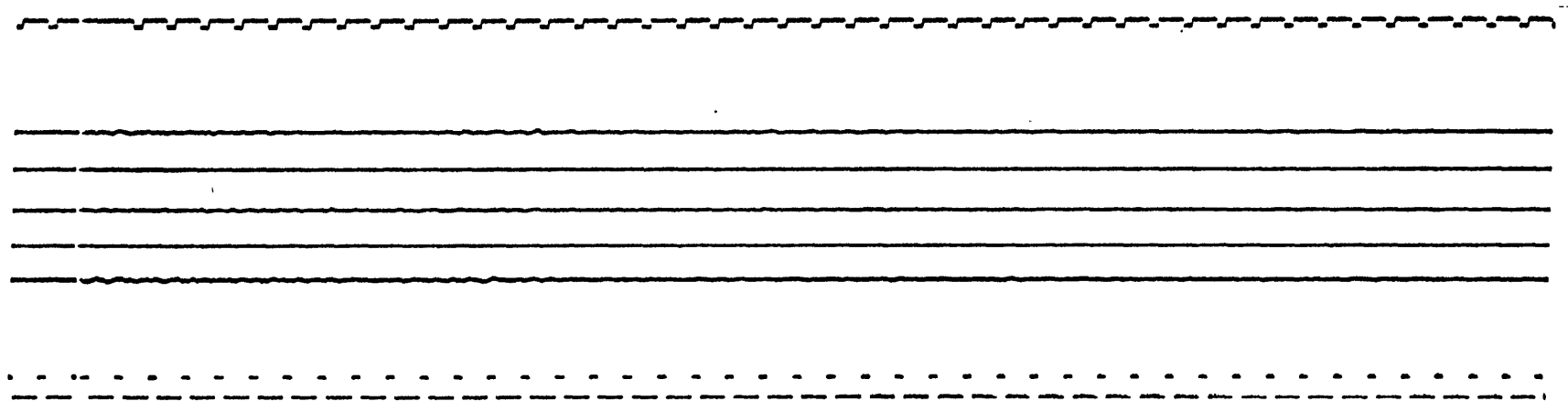

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5106 33.778°N, 118.118°W Long Beach VA Hospital 6th floor SMA # 809 (VA)	L 360°	Sens. = 1.78 cm/g Freq. = 26.3 Hz Damp. = 0.57 crit	<0.05g
	V Up	Sens. = 1.95 cm/g Freq. = 25.6 Hz Damp. = 0.57 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 270°	Sens. = 1.85 cm/g Freq. = 25.6 Hz Damp. = 0.59 crit	<0.05g
Epicentral distance = 40 km		Film speed = 1 cm/sec	

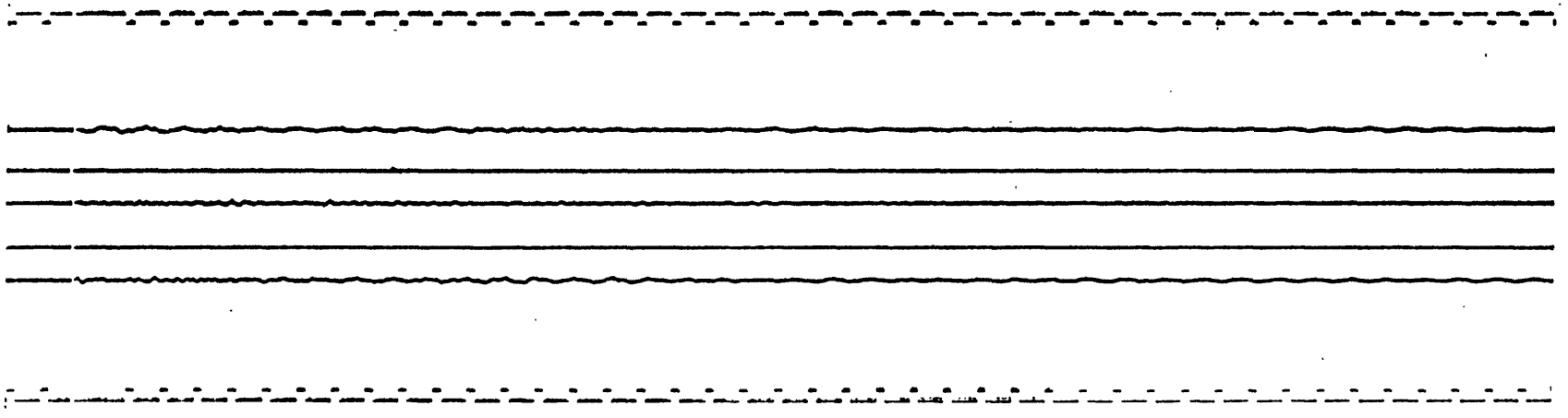

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 5106 33.778°N, 118.118°W Long Beach VA Hospital 11th floor SMA # 749 (VA)	L 360°	Sens. = 1.88 cm/g Freq. = 25.6 Hz Damp. = 0.50 crit	<0.05g
	V Up	Sens. = 1.81 cm/g Freq. = 26.3 Hz Damp. = 0.53 crit	<0.05g
EARTHQUAKE OF --- 3 December 1988 1138 G.m.t.	T 270°	Sens. = 1.77 cm/g Freq. = 27.0 Hz Damp. = 0.50 crit	<0.05g

Epicentral distance = 40 km

Film speed = 1 cm/sec

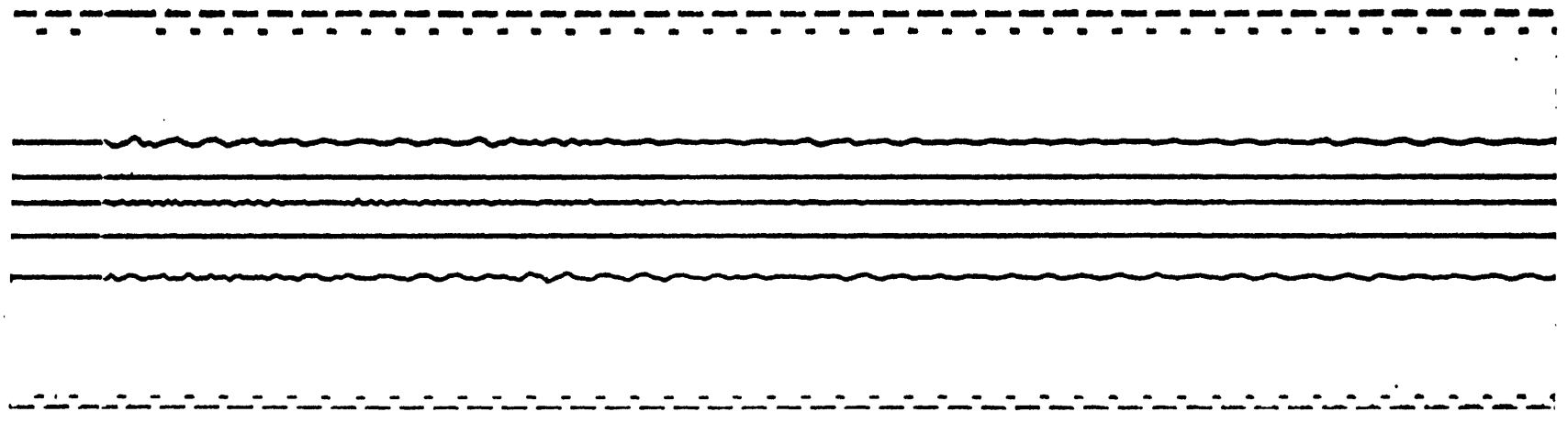

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 287 34.157°N, 117.676°W San Antonio Dam Crest	L 090°	Sens. = 1.80 cm/g Freq. = 25.6 Hz Damp. = 0.6 crit	0.06g
SMA # 476 (ACOE)	V Up	Sens. = 1.80 cm/g Freq. = 25.5 Hz Damp. = 0.6 crit	0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 360°	Sens. = 1.85 cm/g Freq. = 25.3 Hz Damp. = 0.6 crit	0.10g

Epicentral distance = 42 km

Film speed = 1 cm/sec

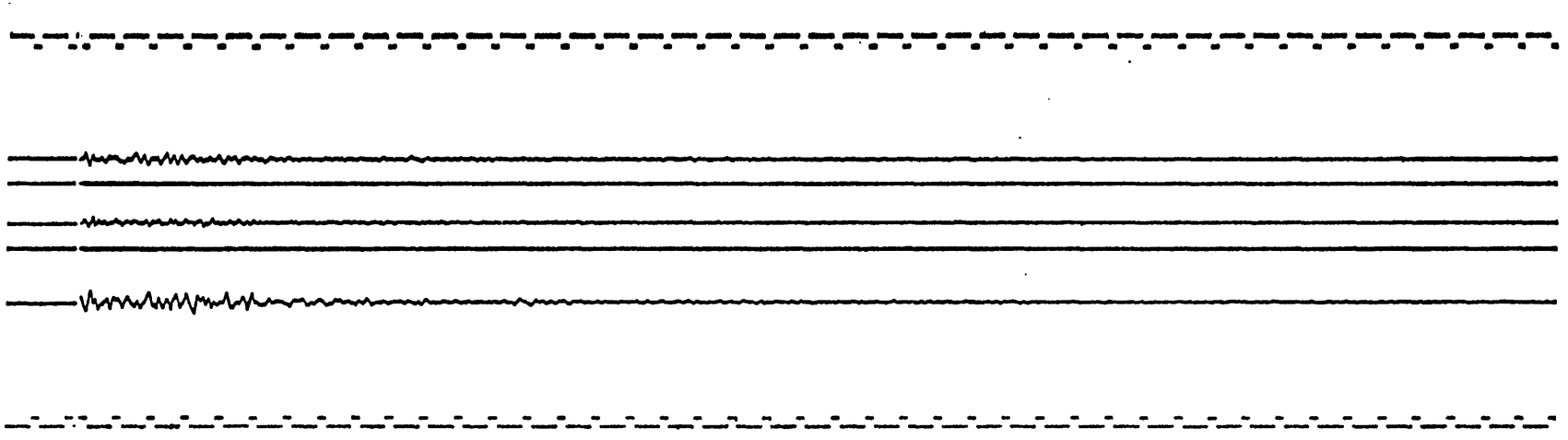

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 287 34.158°N, 117.682°W San Antonio Dam Right abutment SMA # 477 (ACOE)	L 090°	Sens. = 1.87 cm/g Freq. = 25.6 Hz Damp. = 0.6 crit	<0.05g
	V Up	Sens. = 1.75 cm/g Freq. = 26.1 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF --- 3 December 1988 1138 G.m.t.	T 360°	Sens. = 1.85 cm/g Freq. = 25.7 Hz Damp. = 0.6 crit	<0.05g
Epicentral distance = 42 km		Film speed = 1 cm/sec	

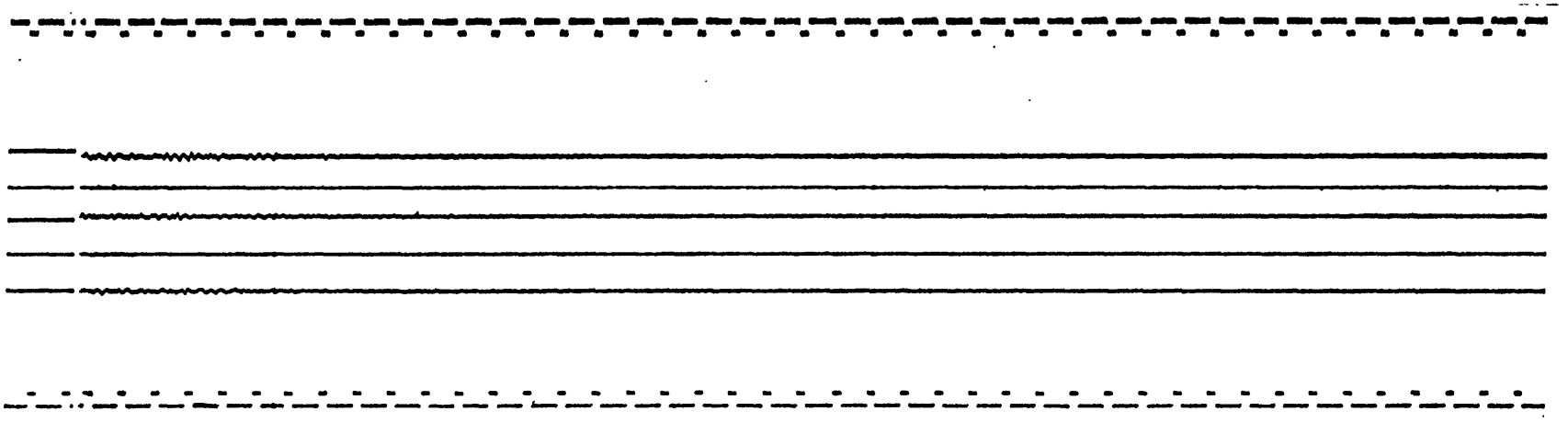

Figure 2. Continued.

U.S. STRONG-MOTION NETWORK	DIRECTION	CONSTANTS	MAX. ACCELERATION
Station No. 287 34.156°N, 117.675°W San Antonio Dam Downstream	L 090°	Sens. = 1.90 cm/g Freq. = 25.4 Hz Damp. = 0.6 crit	<0.05g
SMA # 475 (ACOE)	V Up	Sens. = 1.80 cm/g Freq. = 26.0 Hz Damp. = 0.6 crit	<0.05g
EARTHQUAKE OF 3 December 1988 1138 G.m.t.	T 360°	Sens. = 1.77 cm/g Freq. = 25.5 Hz Damp. = 0.6 crit	<0.05g

Epicentral distance = 42 km

Film speed = 1 cm/sec

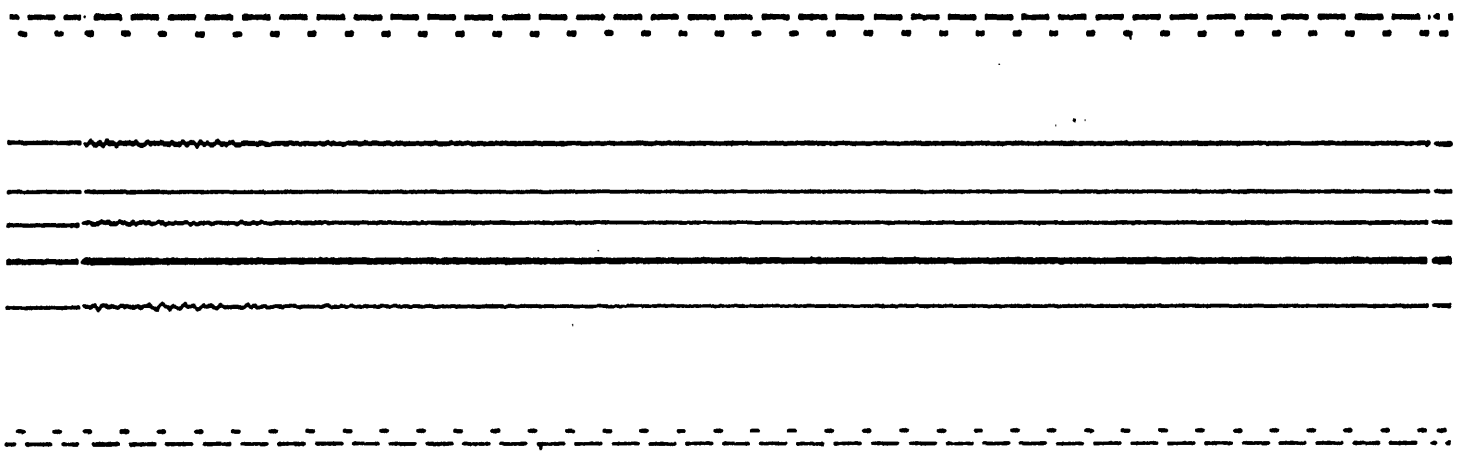

Figure 2. Continued.