UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY SUMMARY OF THE U.S. GEOLOGICAL SURVEY STRONG-MOTION RECORDS FROM THE OCTOBER 15, 1979 IMPERIAL VALLEY EARTHQUAKE

Open-File Report 79-1654

U.S. Geological Survey
345 Middlefield Road
Menlo Park, CA 94025

Prepared on behalf of the
National Science Foundation
Grant CA-114

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature

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R. L. Porcella
R. B. Matthiesen

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PRELIMINARY SUMMARY OF THE U.S. GEOLOGICAL SURVEY STRONG-MOTION RECORDS FROM THE OCTOBER 15, 1979 IMPERIAL VALLEY EARTHQUAKE

This report summarizes the data from near-in strong-motion accelerograph stations operated by the U.S. Geological Survey in the Imperial Valley of California at the time of the October 15, 1979 Imperial Valley earthquake. The purpose of this report is to alert others as to the nature of the strong-motion data that is available from this event. In order to provide the information in a timely manner, the report has been limited to a summary of the data. A similar preliminary report of strong-motion data collected by the Office of Strong-Motion Studies of the California Division of Mines and Geology has already been issued.* A more complete report of all of the strong ground motion data is contemplated. This will require the cooperation of all of the agencies in both the U.S. and Mexico that operate strong-motion instruments in the region. A report on the processing of the data from near-in stations is in preparation.

The moderate-size (magnitude 6.4) October 15, 1979 Imperial Valley earthquake was instrumentally located on the Imperial fault approximately 25 km southeast of El Centro, California (figure 1). This location is approximately the same as that of the 1940 Imperial Valley earthquake. The following parameters are for the main shock (CIT/USGS):

Origin time:	23:16:52.4 15OCT79 (UTC)
Epicenter:	32.64 N, 115.33 W
Focal depth:	15 km
Magnitude:	6.4 (M_L)

The 1979 Imperial Valley earthquake triggered all of the accelerographs within about 100 km of the epicenter, and one as far away as 196 km. At this time (28OCT79) information is not available on all of the stations beyond 150 km. The locations of the ground motion instruments relative to the epicenter are shown in figure 1. A list of all of the accelerographs that are known to have been operational at the time of the earthquake and within a radius of about 150 km of the epicenter is given in table A. This list

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* Preliminary Data - Partial film records and file data - Imperial Valley Earthquake of 15 October 1979; CDMG; Sacramento, 1979.

contains the station identification, an indication of the site geology, and the type and size of structure in which the instrument is housed. Most of the instruments are located in small instrument shelters or one-story buildings and are assumed to approximate a "free-field" condition. The instruments are self-contained film-recording accelerographs with a nominal upper limit on range of 1.0 g.

The data from USGS operated accelerographs are summarized in Table B and are presented in order of increasing distance of the stations from the 1940 fault trace. In addition to the distance from the fault and epicenter, the table summarizes the S-wave minus trigger times (when discernable), the peak accelerations, strong durations, and the trigger time as indicated by the WWVB time code on the record. Copies of all main-shock accelerograms from the USGS network are included in Appendix I.

ACKNOWLEDGEMENTS

The USGS acknowledges the cooperation of individuals and organizations that have permitted strong-motion accelerographs to be installed on their property. The authors also extend their special appreciation to John Nielson, Ed Etheredge, Leroy Foote, Dennis Johnson, and Arnie Acosta for their efforts in recovering the records and to Chuck Knudson and Barry Silverstein for their assistance in verifying the information about the stations and in scaling the records.

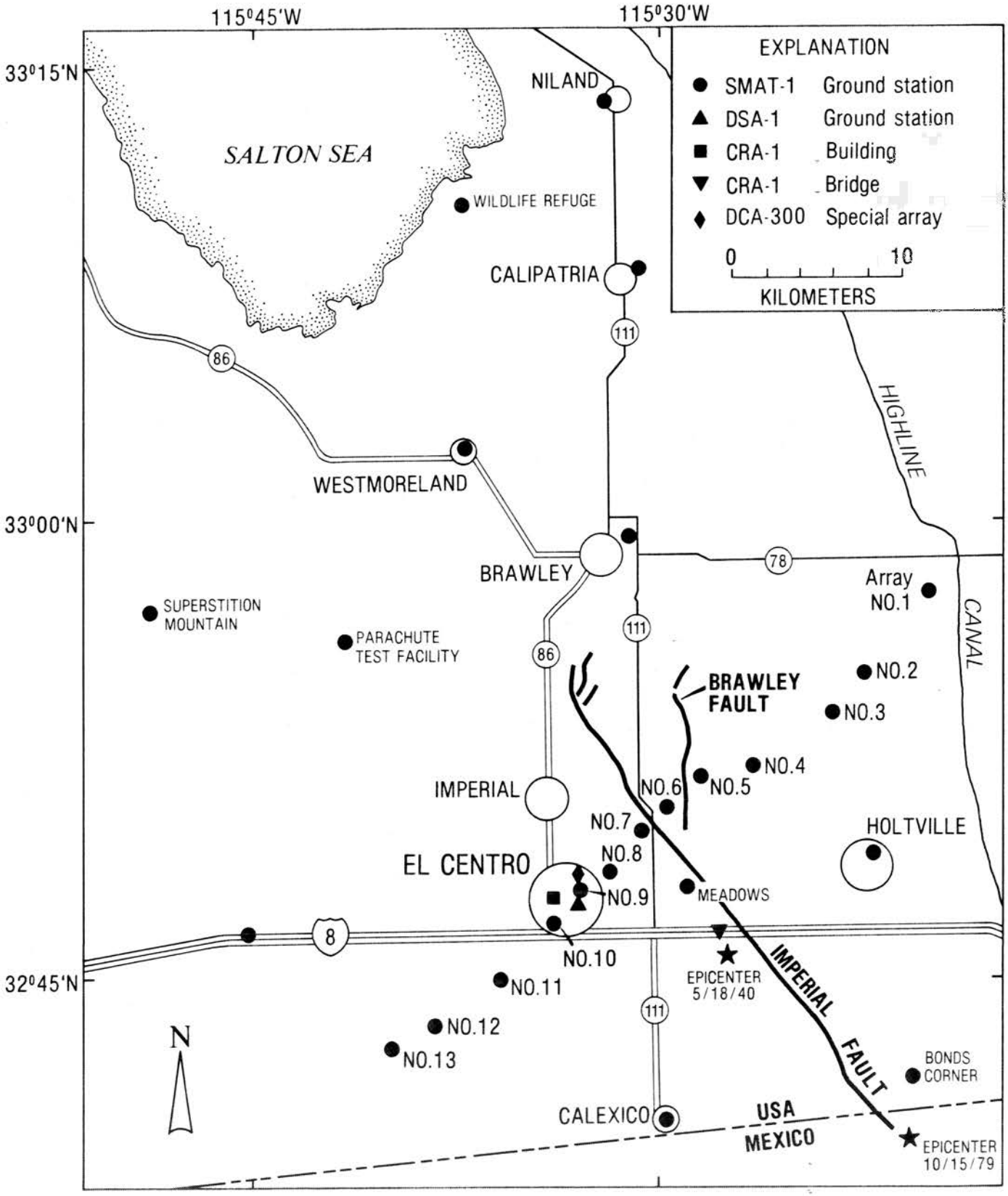


Figure 1.- Strong-motion stations in the Imperial Valley, California.

Table A - STATION LIST

Station Identification[1] No	Name (Data Source)	Coord	Site geology	Structure type/size	Instrument location(s)
5054	Bonds Corner Hwys 98 & 115	32.69 N 115.34 W		1-story bldg	Ground level
5049	Borrego Air Ranch Borrego Springs	33.19 N 116.28 W		1-story bldg	Ground level
5060	Brawley Airport Brawley	32.99 N 115.51 W		Inst shltr	Ground level
5073	Cabazon Post Office	33.92 N 116.78 W		1-story bldg	Ground level
5053	Calexico Fire Station Fifth & Mary	32.67 N 115.49 W		1-story bldg	Ground level
5061	Calipatria Fire Sta	33.13 N 115.52 W		2-story bldg	Ground level
5063	Coachella Canal Sta 1	33.64 N 116.08 W		1-story bldg	Ground level
5064	Coachella Canal Sta 2 Demosser	33.56 N 115.95 W		1-story bldg	Ground level
5065	Coachella Canal Sta 3 Siphon 24	33.51 N 115.77 W		1-story bldg	Ground level
5066	Coachella Canal Sta 4 Siphon 15	33.36 N 115.59 W		1-story bldg	Ground level
5046	Collins Valley	33.42 N 116.47 W		Inst shltr	Ground level
5165	E C Differential Array Dogwood Rd	32.80 N 115.54 W		Inst shltr	Ground level, 6 instruments
464	El Centro Meadows Union School	32.80 N 115.47 W	Alluvium, more than300m	1-story bldg	Ground level
5056	El Centro Sta 1 Borchard Ranches	32.96 N 115.32 W		Inst shltr	Ground level
5115	El Centro Sta 2 Keystone Rd	32.92 N 115.37 W		Inst shltr	Ground level
5057	El Centro Sta 3 Pine Union School	32.89 N 115.38 W		1-story bldg	Ground level

Table A - STATION LIST (cont)

Station Identification[1] No	Name (Data Source)	Coord	Site geology	Structure type/size	Instrument location(s)
955	El Centro Sta 4 2905 Anderson Rd	32.86 N 115.43 W	Alluvium, more than 300m	Inst shltr	Ground level
952	El Centro Sta 5 2801 James Rd	32.86 N 115.47 W	Alluvium, more than 300m	Inst shltr	Ground level
942	El Centro Sta 6 Huston Rd	32.84 N 115.49 W	Alluvium, more than 300m	Inst shltr	Ground level
5028	El Centro Sta 7 Imperial Valley Col	32.83 W 115.50 W		1-story bldg	Ground level
958	El Centro Sta 8 95 E Cruickshank Rd	32.81 N 115.53 W	Alluvium, more than 300m	Inst shltr	Ground level
117*	El Centro Sta 9 302 Commercial Av	32.79 N 115.55 W	Alluvium, more than 300m	2-story bldg	Ground level
412	El Centro Sta 10 Community Hospital	32.78 N 115.57 W	Alluvium, more than 300m	1-story bldg	Ground level
5058	El Centro Sta 11 McCabe School	32.75 N 115.59 W		1-story bldg	Ground level
931	El Centro Sta 12 907 Brockman Rd	32.72 N 115.64 W		Inst shltr	Ground level
5059	El Centro Sta 13 Strobel Residence	32.71 N 115.68 W		1-story bldg	Ground level
817	Hines Pumping Plant	33.71 N 115.63 W		Gatehouse	Mid level
5055	Holtville Post Office	32.81 N 115.38 W		1-story bldg	Ground level
5067	Indio So Calif Gas Co	33.75 N 116.21 W		1-story bldg	Ground level
5050	Ocotillo Wells Burro Bend Cafe	33.14 N 116.13 W		1-story bldg	Ground level
5051	Parachute Test Site	32.93 N 115.70 W		1-story bldg	Ground level
5044	Pinon Flat Observatory	33.61 N 116.46 W		Inst shltr	Tunnel

Table A - STATION LIST (cont)

Station Identification No	Name	Coord	Site geology	Structure type/size	Instrument location(s)
5052	Plaster City Storehouse	32.79 N 115.86 W		1-story bldg	Ground level
5047	Rancho de Anza Anza Borrego Park	33.35 N 116.40 W		Inst shltr	Ground level
5062	Salton Sea Wildlife Refuge	33.18 N 115.62 W		1-story bldg	Ground level
286	Superstition Mtn USAF Camera site	32.95 N 115.82 W	Granite	1-story bldg	Ground level
5045	Terwilliger Valley Snodgrass Residence	33.48 N 116.59 W		Inst shltr	Ground level
2316	Yuma Strand Ave	32.73 N 114.70 W		Inst shltr	Ground level

[1] Ref: Western Hemisphere Accelerograph Station List; USGS, Open-File Rpt. 77-374.

* 1940 Strong-motion accelerogram recorded at this station. Ref: U.S. Eqks, 1940.

Table B - GROUND MOTION DATA

No	Station Identification[1] Name (Data Source)	Coord	Epicentral[2] Distance (km)	S - t[3] Interval (sec)	WWVB[4] trigger time	Acceleration Azimuth (note 5)	Maximum (g)	Duration[6] > 0.1g (sec)
5028	El Centro Sta 7 Imperial Valley Col (USGS)	32.83 W 115.50 W	26 [1]	4.6	**	230 up 140	0.52 0.65 0.36	4.9 5.5 3.7
942	El Centro Sta 6 Huston Rd (USGS)	32.84 N 115.49 W	27 [1]	5*	17:01	230 up 140	0.45 1.74 0.72	7.9 6.2 11.8
5054	Bonds Corner Hwys 98 & 115 (USGS)	32.69 N 115.34 W	6 [3]	2.4	16:57	230 up 140	0.81 0.47 0.66	13.2 12.0 13.3
958	El Centro Sta 8 95 E Cruickshank (USGS)	32.81 N 115.53 W	27 [4]	5*	17:00	230 up 140	0.50 0.55 0.64	6.9 5.8 6.9
952	El Centro Sta 5 2801 James Rd (USGS)	32.86 N 115.47 W	28 [4]	5.1	17:01	230 up 140	0.40 0.71 0.56	7.6 5.6 7.4
5165	E C Differential Array Dogwood Rd (USGS)	32.80 N 115.54 W	26 [5]	5	**	360 up 270	0.51 0.93 0.37	10.2 7.0 7.0
117	El Centro Sta 9 302 Commercial Av (USGS)	32.79 N 115.55 W	26 [6]	-	-	360 dwn 090	0.40 0.38 0.27	7.4 4.7 7.0
955	El Centro Sta 4 2905 Anderson Rd (USGS)	32.86 N 115.43 W	26 [7]	4.8*	17:01	230 up 140	0.38 0.32 0.61	6.5 6.7 6.8
5060	Brawley Airport Brawley (USGS)	32.99 N 115.51 W	42 [7]	6.3	17:03	315 up 225	0.22 0.18 0.17	2.2 5.2 1.8
5055	Holtville Post Office (USGS)	32.81 N 115.38 W	19 [8]	4.1	**	315 up 225	0.22 0.31 0.26	7.5 7.0 6.2
412	El Centro Sta 10 Community Hospital (USGS)	32.78 N 115.57 W	27 [9]	4.9	**	050 up 320	0.20 0.15 0.23	5.2 2.2 5.1
5053	Calexico Fire Station Fifth & Mary (USGS)	32.67 N 115.49 W	15 [11]	3.2	16:59	315 up 225	0.22 0.21 0.28	9.5 8.8 10.8
5058	El Centro Sta 11 McCabe School (USGS)	32.75 N 115.59 W	27 [13]	5.6	17:00	230 up 140	0.38 0.16 0.38	6.5 7.7 7.0

Table B - GROUND MOTION DATA (cont)

Station Identification No	Name (Data Source)	Coord	Epicentral Distance (km)	S - t Interval (sec)	WWVB trigger time	Acceleration Azimuth (note 5)	Maximum (g)	Duration > 0.1g
5057	El Centro Sta 3 Pine Union School (USGS)	32.89 N 115.38 W	28 [13]	5.4	**	230 up 140	0.22 0.15 0.27	6.2 5.6 6.0
5051	Parachute Test Site (USGS)	32.93 N 115.70 W	47 [15]	7.0	**	315 up 225	0.20 0.18 0.11	1.5 5.2 1.4
5115	El Centro Sta 2 Keystone Rd (USGS)	32.92 N 115.37 W	31 [16]	6	17:01	230 up 140	0.43 0.17 0.33	5.7 9.3 9.2
931	El Centro Sta 12 907 Brockman Rd (USGS)	32.72 N 115.64 W	30 [18]	5.2	17:01	230 up 140	0.11 0.08 0.15	4.9 - 3.8
5061	Calipatria Fire Sta (USGS)	33.13 N 115.52 W	57 [21]	7.4	17:06	315 up 225	0.09 0.07 0.13	- - 1 peak
5059	El Centro Sta 13 Strobel Residence (USGS)	32.71 N 115.68 W	34 [22]	5.1	17:02	230 up 140	0.15 0.06 0.12	5.0 - 2.4
5056	El Centro Sta 1 Borchard Ranches (USGS)	32.96 N 115.32 W	37 [22]	6	17:02	230 up 140	0.15 0.10 0.15	3.1 1 peak 4.8
286	Superstition Mtn USAF Camera site (USGS)	32.95 N 115.82 W	57 [26]	7.2*	17:06	135 up 045	0.21 0.09 0.12	1.1 - 0.6
5062	Salton Sea Wildlife Refuge (USGS)	33.18 N 115.62 W	66 [28]	3.5*	17:11	315 up 225	0.10 0.06 0.13	1 peak - 1 peak
5052	Plaster City Storehouse (USGS)	32.79 N 115.86 W	52 [31]	5*	**	135 up 045	0.07 0.03 0.05	- - -
5066	Coachella Canal Sta 4 Siphon 15 (USGS)	33.36 N 115.59 W	84 [47]	8.5	17:11	135 up 045	0.14 0.04 0.11	0.5 - 0.3
5050	Ocotillo Wells Burro Bend Cafe (USGS)	33.14 N 116.13 W	93 [59]	7.5*	17:15	315 up 225	0.05 0.03 0.04	- - -
2316	Yuma Strand Ave (USBR/USGS)	32.73 N 114.70 W	60 [61]	*	17:11	090 up 360	0.03 0.02 0.03	- - -

Table B - GROUND MOTION DATA (cont)

No	Station Identification Name (Data Source)	Coord	Epicentral Distance (km)	S - t Interval (sec)	WWVB trigger time	Acceleration Azimuth (note 5)	Maximum (g)	Duration > 0.1g
5065	Coachella Canal Sta 3 Siphon 24 (USGS)	33.51 N 115.77 W	105 [67]			***		
5049	Borrego Air Ranch Borrego Springs (USGS)	33.19 N 116.28 W	108 [74]	8.2	17:20	315 up 225	0.04 0.02 0.03	- - -
5064	Coachella Canal Sta 2 Demosser (USGS)	33.56 N 115.95 W	117 [79]			***		
5047	Rancho de Anza Anza Borrego Park (USGS)	33.35 N 116.40 W	127 [92]	*	17:27	135 up 045	0.03 0.02 0.02	- - -
5063	Coachella Canal Sta 1 (USGS)	33.64 N 116.08 W	131 [92]	*	17:24	135 up 045	0.02 0.02 0.03	- - -
5067	Indio So Calif Gas Co (USGS)	33.75 N 116.21 W	148 [109]			***		
5073	Cabazon Post Office (USGS)	33.92 N 116.78 W	196 [158]	*	17:55	270 up 180	0.01 0.02 0.02	- - -

1 Ref: Western Hemisphere Strong Motion Accelerograph Station List - 1976; USGS, Open-File Report 77-374.

2 Distance from epicenter at 32.64 N and 115.33 W. Bracketed number is distance to the nearest point on the 1940 Imperial Fault trace. Reference: Sharp, R., 1977; Open File Report 77-815: Misc Field Studies Map MF 838.

3 S-wave minus trigger time.

* S - t is questionable.

4 Trigger time in minutes and seconds after 288dys 23hrs (UTC) as determined from WWVB time time code. Millisecond accuracy is possible.

** WWVB time code not legible.

5 Azimuthal direction of case acceleration for upward trace deflection on accelerogram (degrees clockwise from north).

*** Accelerograph operational but did not trigger.

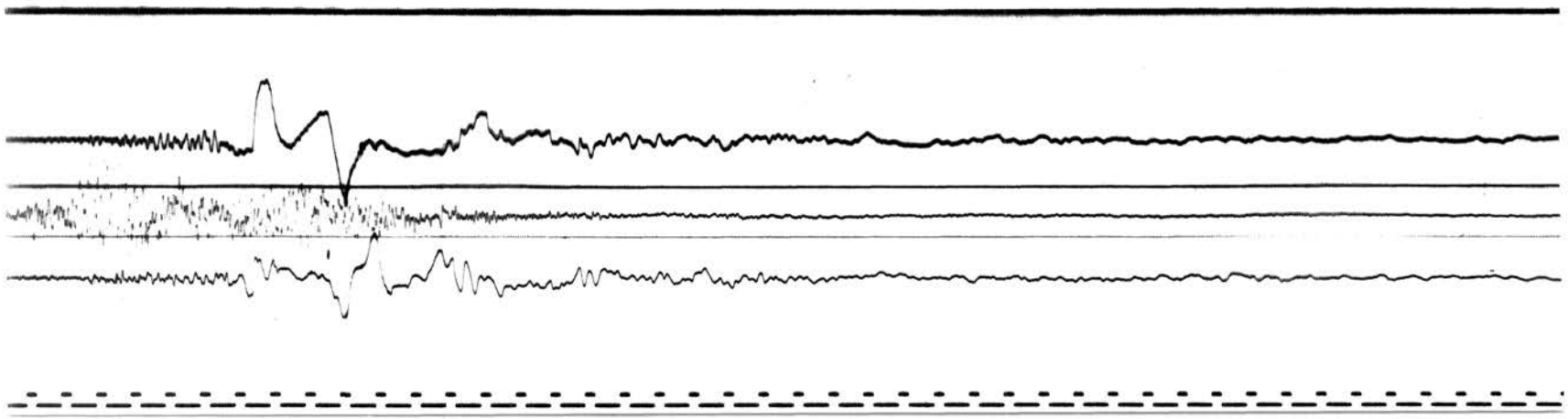
6 Time span between the first and last peak greater than o.10g.

APPENDIX I

Copies of main-shock accelerograms
from the USGS Strong-motion network:
Imperial Valley earthquake of October 15, 1979.

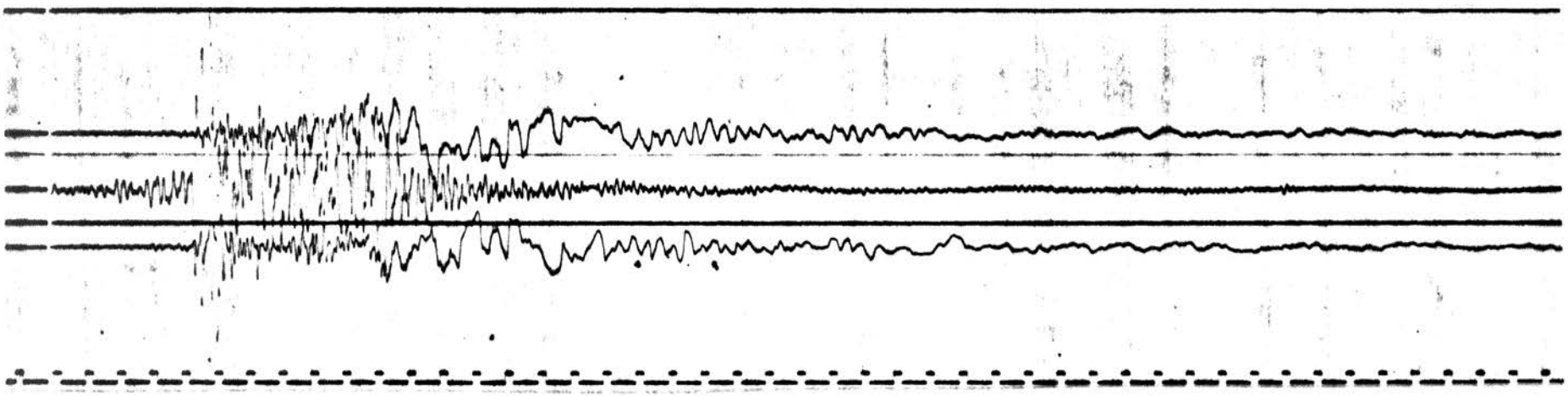
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5028, 32.83N, 115.50W	230°	Sens. = 1.87 cm/g Per. = .039 sec	Film Speed =
El Centro Array #7		Damp. = 0.59 crit	2 time marks/sec
SMA-1T No. 1526 (USGS) Imp. Valley College	Up	Sens. = 1.86 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC plus 12 aftershocks	140°	Damp. = 0.53 crit Sens. = 1.90 cm/g Per. = .039 sec Damp. = 0.55 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



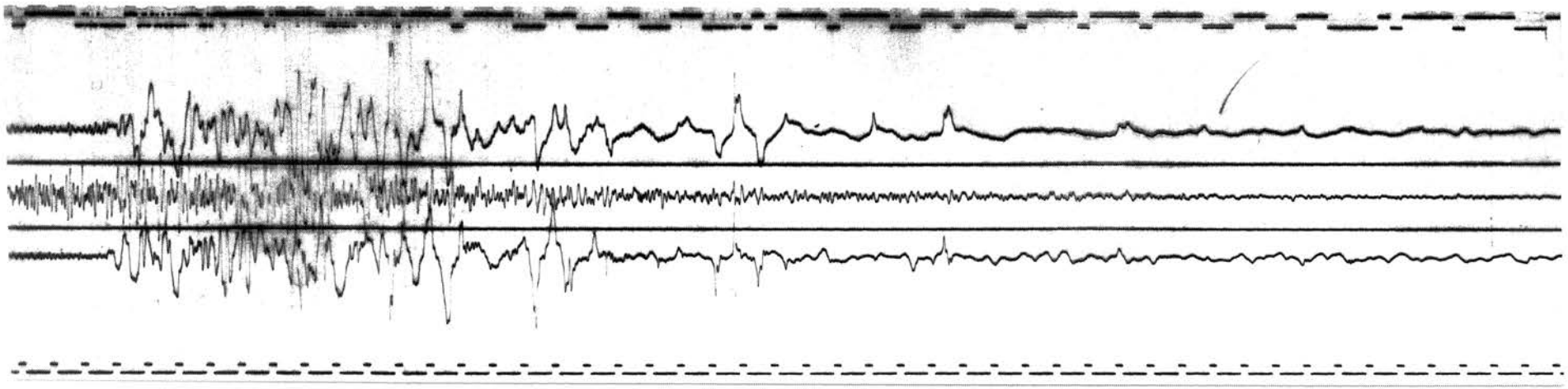
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 942, 32.84N, 115.49W	230°	Sens. = 1.86 cm/g Per. = .039 sec	Film Speed =
El Centro Array #6		Damp. = 0.57 crit	2 time marks/sec
SMA-1T No. 1426 (USGS) Huston Rd.	Up	Sens. = 1.75 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF		Damp. = 0.59 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC plus 35 aftershocks	140°	Sens. = 1.77 cm/g Per. = .039 sec Damp. = 0.59 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



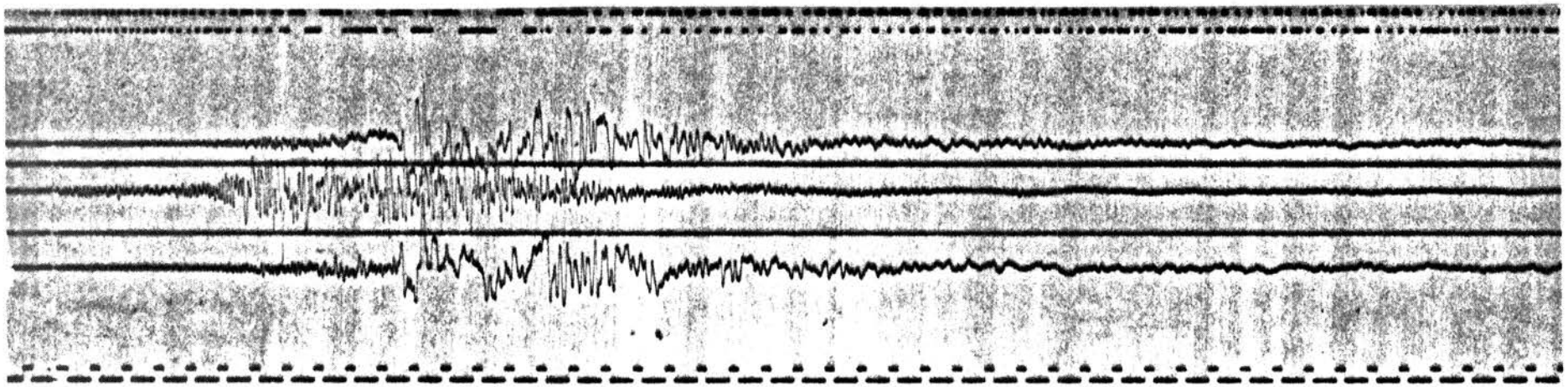
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5054, 32.693N, 115.338W	230°	Sens. = 1.71 cm/g Per. = .039 sec	Film Speed =
Bonds Corner, Hiways 98 & 115		Damp. = 0.59 crit	2 time marks/sec
SMA-1T No. 820 (USGS)	Up	Sens. = 1.72 cm/g Per. = .038 sec	5 cm
EARTHQUAKE OF		Damp. = 0.53 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 4 aftershocks	140°	Sens. = 1.75 cm/g Per. = .038 sec Damp. = 0.59 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



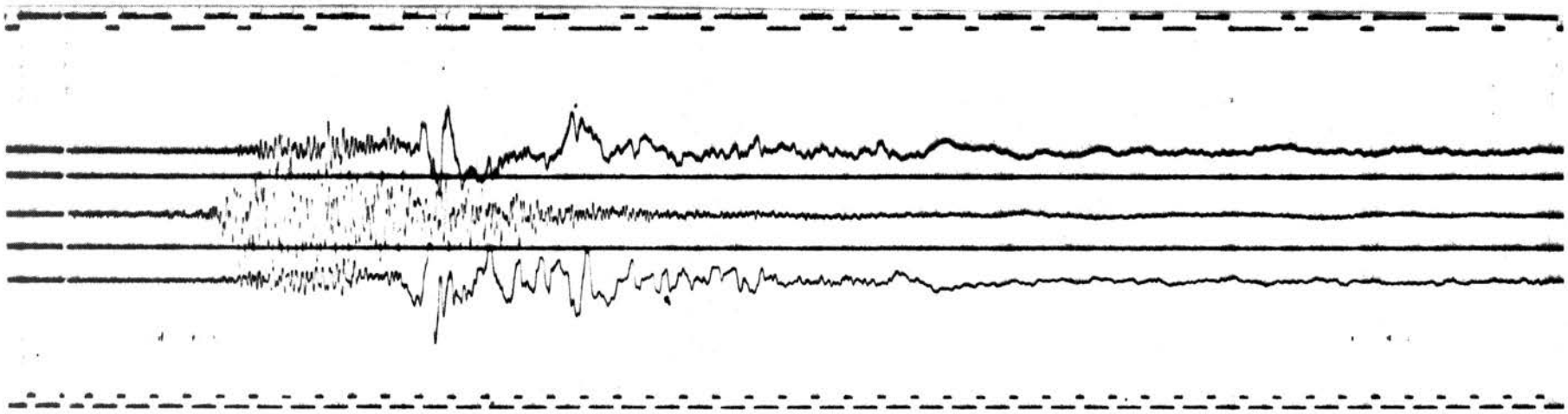
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 958, 32.81N, 115.53W	230°	Sens. = 1.91 cm/g Per. = .038 sec	Film Speed =
El Centro Array #8		Damp. = 0.62 crit	2 time marks/sec
SMA-1T No. 1513 (USGS) Cruickshank Rd	Up	Sens. = 1.95 cm/g Per. = .040 sec	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC plus 14 aftershocks	140°	Damp. = 0.55 crit Sens. = 1.80 cm/g Per. = .038 sec Damp. = 0.62 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 952, 32.855N, 115.466W	230°	Sens. = 1.68 cm/g Per. = .036 sec	Film Speed =
El Centro Array #5		Damp. = 0.65 crit	2 time marks/sec
SMA-1T No. 2339 (USGS) James Rd.	Up	Sens. = 1.71 cm/g Per. = .036 sec	5 cm
EARTHQUAKE OF		Damp. = 0.65 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 20 aftershocks	140°	Sens. = 1.70 cm/g Per. = .036 sec Damp. = 0.64 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK

Station No. 5165 32.796N, 115.535W

El Centro, Diff. Array

SMA-1T No. 826 (USGS) Dogwood Rd.

EARTHQUAKE OF

15 October 1979, 1616 PDT
15 October 1979, 2316 UTC
Plus 19 aftershocks

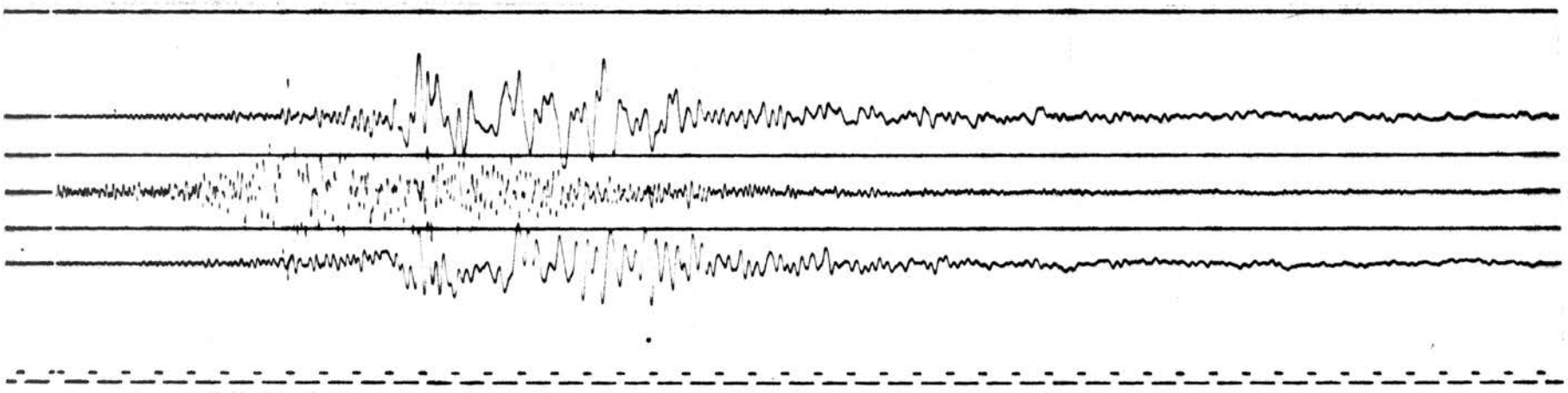
DIRECTION*	CONSTANTS
360°	Sens. = 1.92 cm/g Per. = .040 sec Damp. = 0.57 crit
Up	Sens. = 1.85 cm/g Per. = .039 sec Damp. = 0.59 crit
270°	Sens. = 1.77 cm/g Per. = .039 sec Damp. = 0.59 crit

Film Speed =

2 time marks/sec

5 cm

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



Down
(V)

Sens. = 12.8 cm/g
Per. = .064 sec
Damp. = 0.59 crit

U.S. STRONG-MOTION NETWORK

Station No. 117, 32.79N, 115.55W

El Centro Array #9

S-M, No. 32 w/CDMS (USGS) Commercial Ave

EARTHQUAKE OF
15 October 1979, 1616 PDT
15 October 1979, 2316 UTC
Plus 8 aftershocks

270°
(T)**

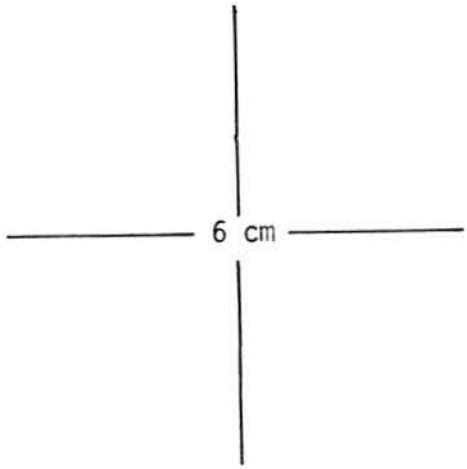
Mag. = 1.0
Per. = 5.50 sec
Damp. = 0.59 crit

360°
(L)

Sens. = 13.4 cm/g
Per. = .065 sec
Damp. = 0.62 crit

360°
(L)**

Mag. = 1.0
Per. = 6.20 sec
Damp. = 0.59 crit



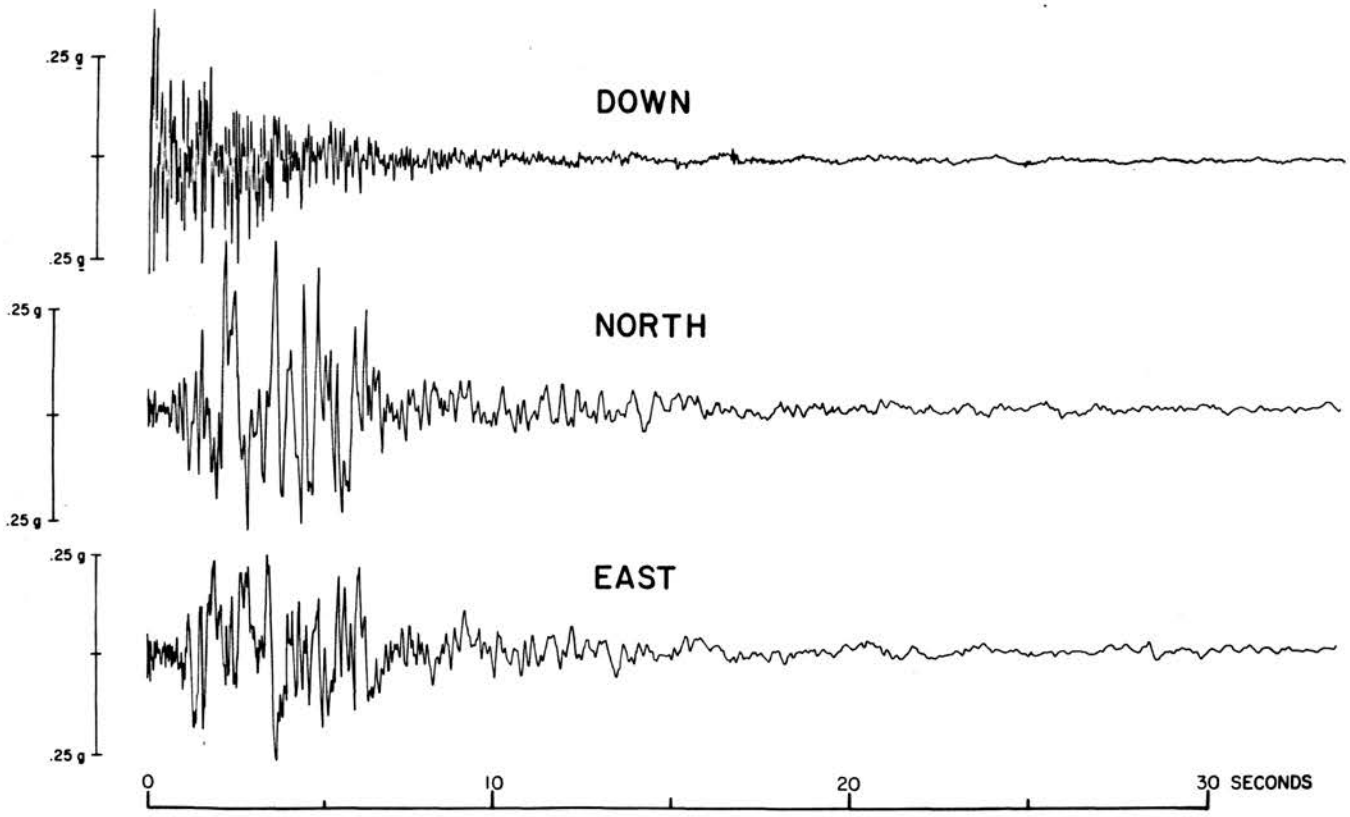
090°
(T)

Sens. = 12.8 cm/g
Per. = .064 sec
Damp. = 0.59 crit

FILM SPEED

2 time marks/sec

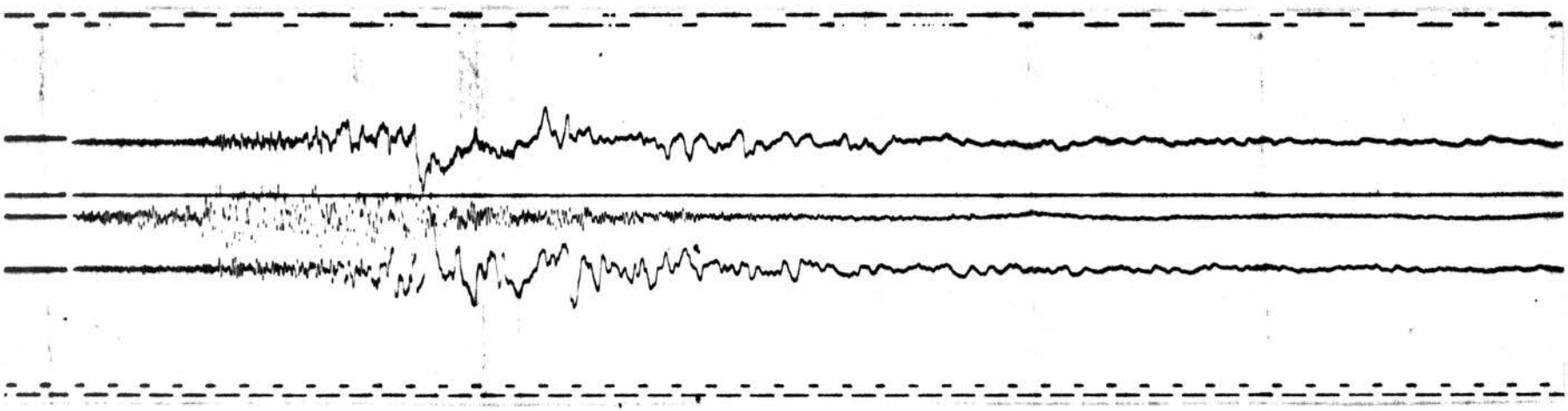
**Carder Displacement Meter



Tracing of the accelerogram from El Centro Array Station 9.

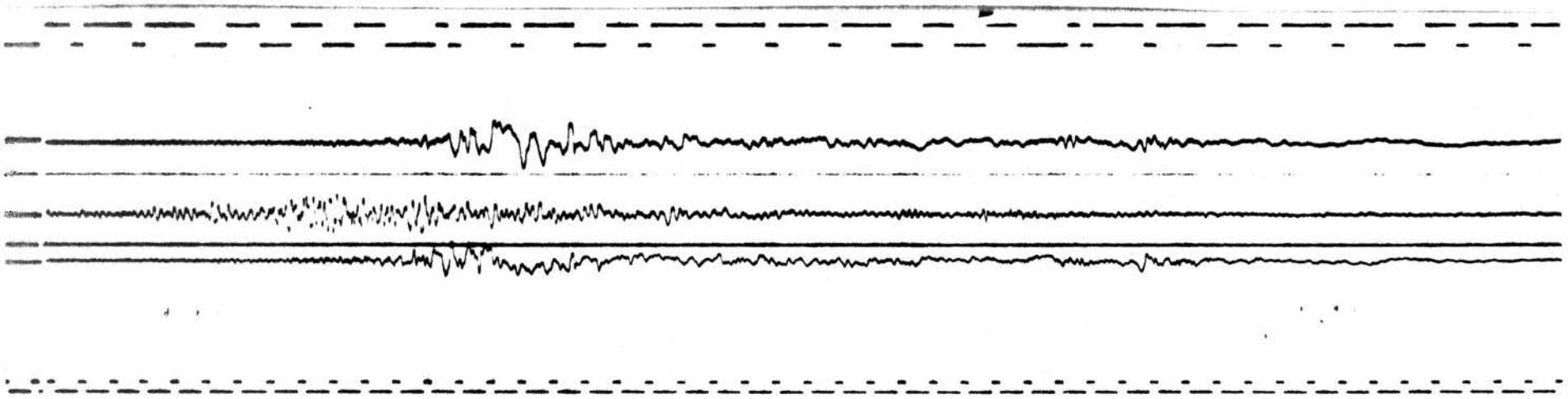
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 955, 32.86N, 115.43W	230°	Sens. = 1.90 cm/g Per. = .039 sec Damp. = 0.62 crit	Film Speed =
El Centro Array #4			2 time marks/sec
SMA-1T No. 1427 (USGS) Anderson Rd.	Up	Sens. = 1.78 cm/g Per. = .038 sec Damp. = 0.62 crit	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 5 aftershocks	140°	Sens. = 1.90 cm/g Per. = .039 sec Damp. = 0.59 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



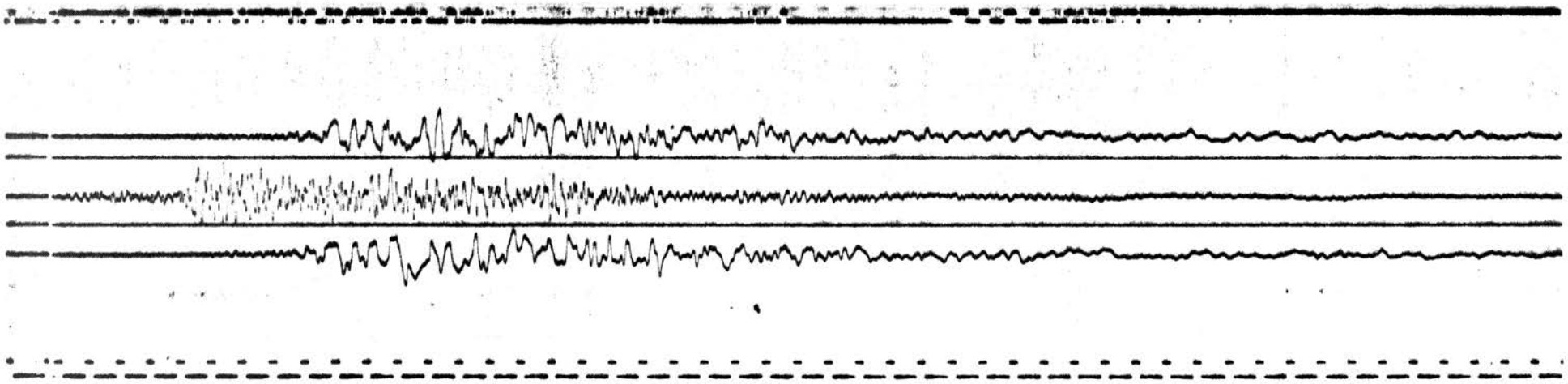
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5060, 32.99N, 115.51W	315°	Sens. = 1.76 cm/g Per. = .033 sec	Film Speed =
Brawley Municipal Airport		Damp. = 0.59 crit	2 time marks/sec
SMA-1T No. 1472 (USGS)	Up	Sens. = 1.88 cm/g Per. = .038 sec	5 cm
EARTHQUAKE OF		Damp. = 0.57 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 35 aftershocks	225°	Sens. = 1.77 cm/g Per. = .039 sec Damp. = 0.62 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



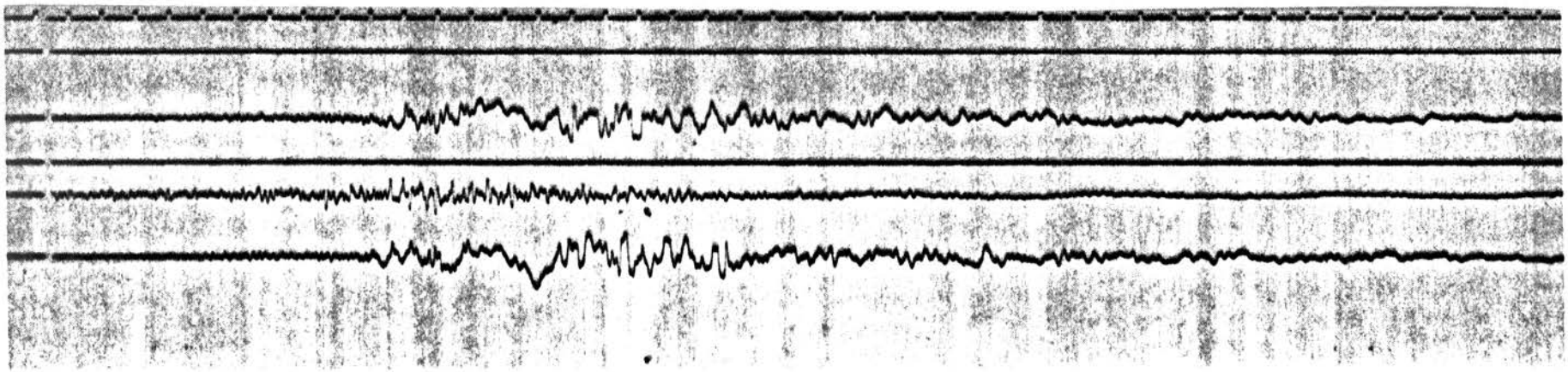
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5055, 32.81N, 115.38W	315°	Sens. = 1.93 cm/g Per. = .040 sec Damp. = 0.57 crit	Film Speed =
Holtville Post Office			2 time marks/sec
SMA-1T No. 1482 (USGS)	Up	Sens. = 1.89 cm/g Per. = .039 sec Damp. = 0.59 crit	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 8 aftershocks	225°	Sens. = 1.89 cm/g Per. = .040 sec Damp. = 0.62 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 412, 32.780N, 115.567W	050°	Sens. = 1.82 cm/g Per. = .046 sec	Film Speed =
El Centro Array #10		Damp. = 0.57 crit	2 time marks/sec
RFT-250 No. 99 (USGS) Commun. Hospital	Up	Sens. = 1.90 cm/g Per. = .046 sec	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC plus 7 aftershocks		Damp. = 0.55 crit	
	320°	Sens. = 1.95 cm/g Per. = .045 sec Damp. = 0.50 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK

Station No. 5053, 32.67N, 115.49W

Calexico Fire Station

SMA-1T No. 1484 (USGS) 5th Street

EARTHQUAKE OF
15 October 1979, 1616 PDT
15 October 1979, 2316 UTC
Plus 5 aftershocks

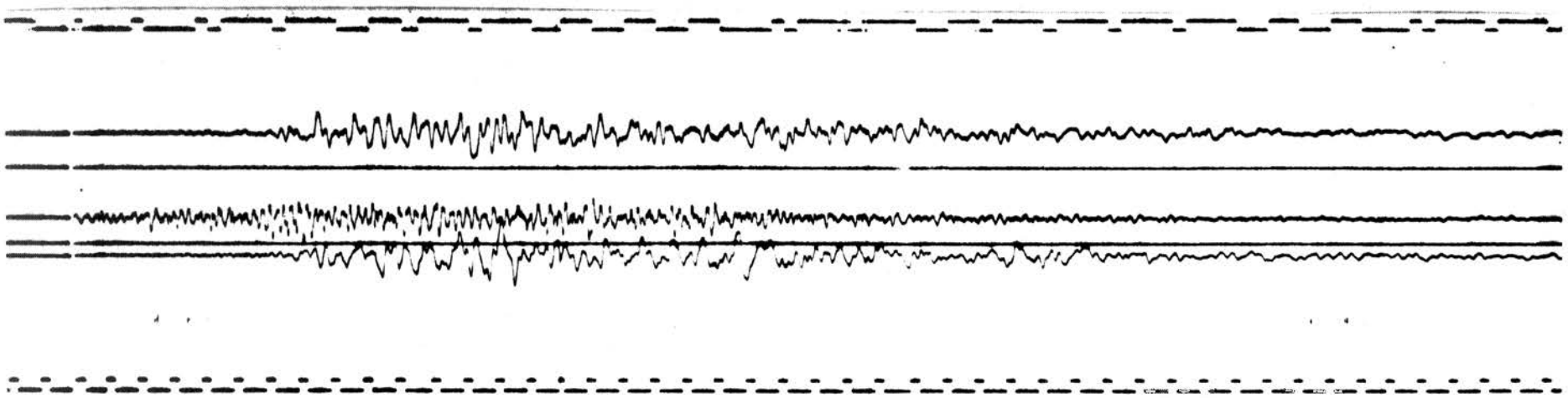
DIRECTION*	CONSTANTS
315°	Sens. = 1.84 cm/g Per. = .038 sec Damp. = 0.59 crit
Up	Sens. = 1.78 cm/g Per. = .038 sec Damp. = 0.55 crit
225°	Sens. = 1.95 cm/g Per. = .039 sec Damp. = 0.59 crit

Film Speed =

2 time marks/sec

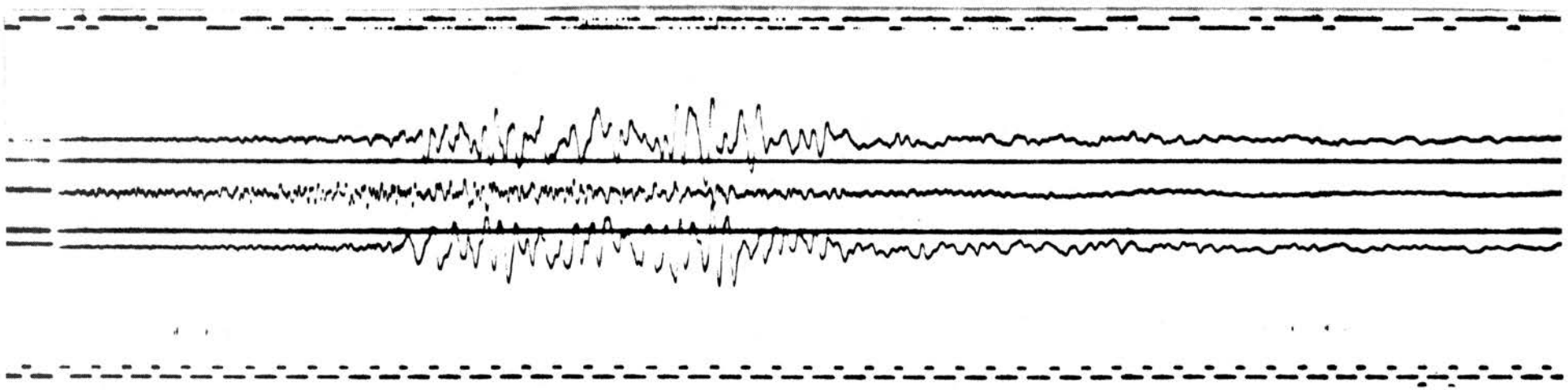
5 cm

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5058, 32.75N, 115.59W	230°	Sens. = 1.93 cm/g Per. = .040 sec	Film Speed =
El Centro Array #11		Damp. = 0.57 crit	2 time marks/sec
SMA-1T No. 1504 (USGS) McCabe School	Up	Sens. = 1.90 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 4 aftershocks		Damp. = 0.57 crit	
	140°	Sens. = 1.84 cm/g Per. = .039 sec Damp. = 0.62 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK

Station No. 5057, 32.89N, 115.38W

El Centro Array #3

SMAl-T No. 1529 (USGS) Pine Union School

EARTHQUAKE OF
15 October 1979, 1616 PDT
15 October 1979, 2316 UTC
Plus 8 aftershocks

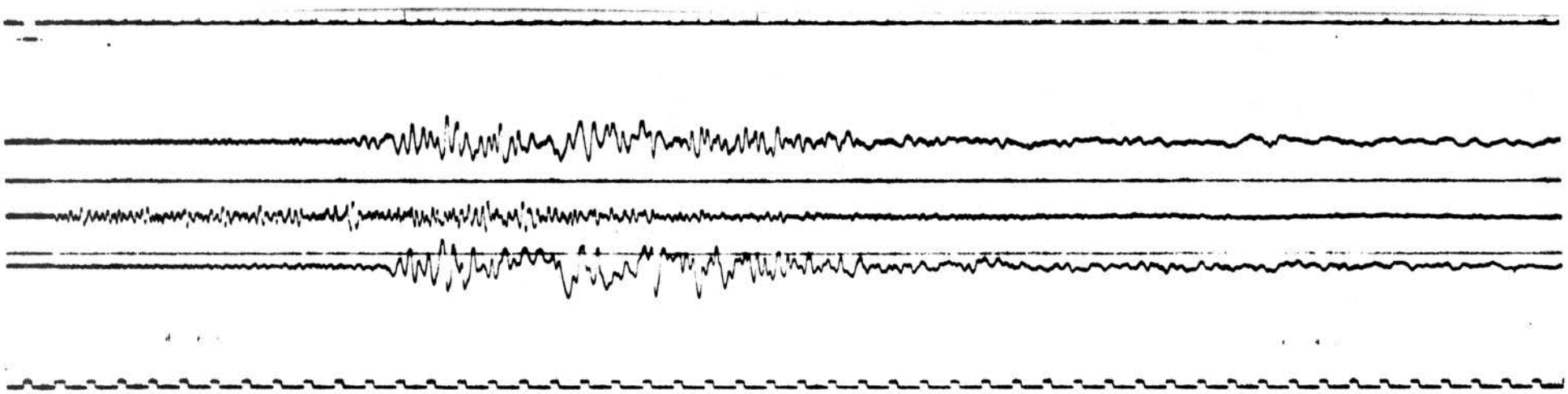
DIRECTION*	CONSTANTS
230°	Sens. = 1.84 cm/g Per. = .038 sec Damp. = 0.57 crit
Up	Sens. = 1.78 cm/g Per. = .038 sec Damp. = 0.59 crit
140°	Sens. = 1.84 cm/g Per. = .039 sec Damp. = 0.62 crit

Film Speed =

2 time marks/sec

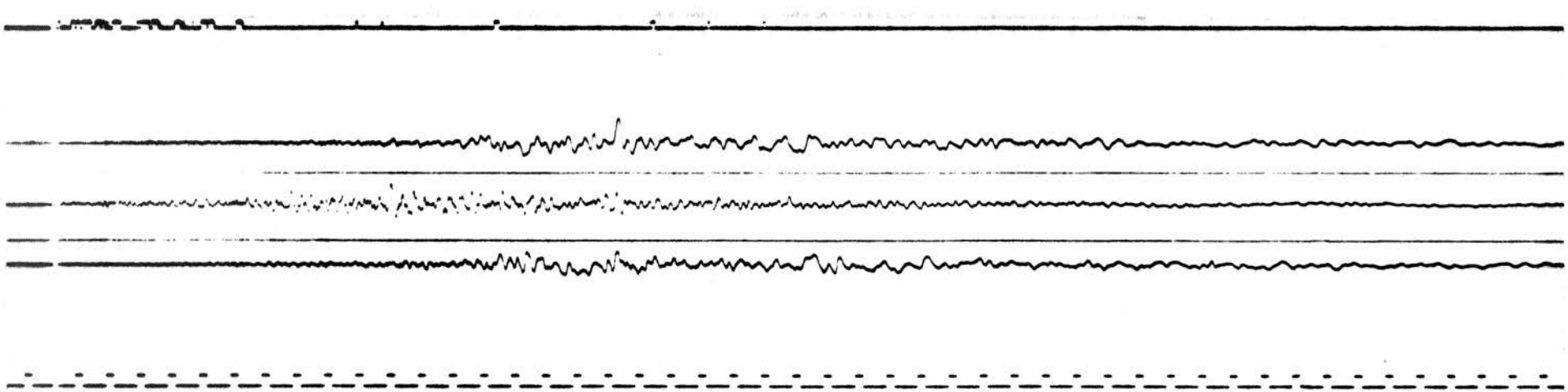
5 cm

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



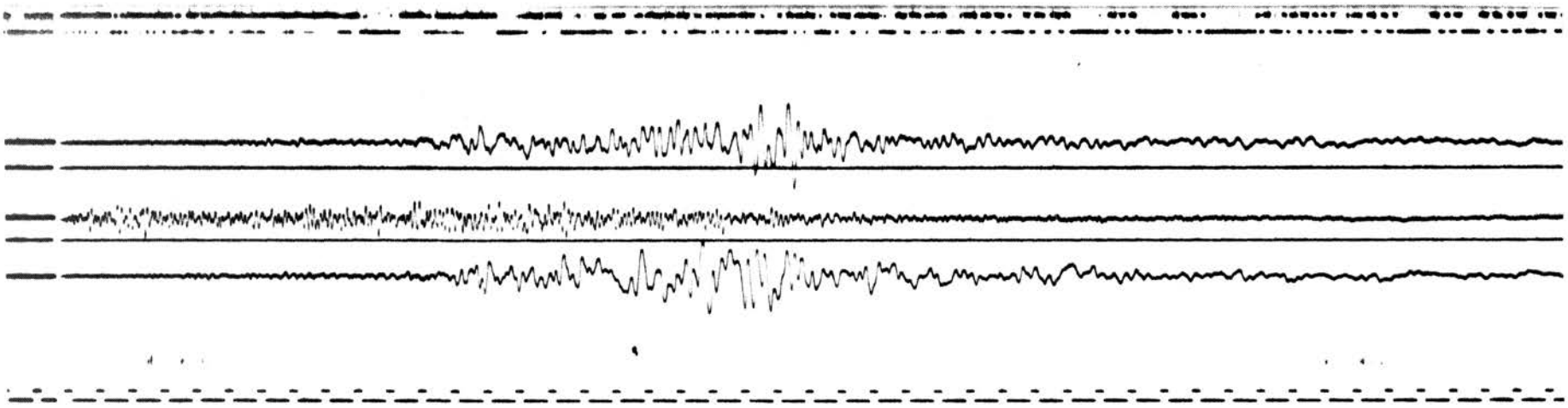
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5051 32.93N, 115.70W	315°	Sens. = 1.90 cm/g Per. = .040 sec Damp. = 0.59 crit	Film Speed =
Parachute Test Facility			2 time marks/sec
SMA-1T No. 1465 (USGS)	Up	Sens. = 1.98 cm/g Per. = .040 sec Damp. = 0.61 crit	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 19 aftershocks	225°	Sens. = 1.89 cm/g Per. = .039 sec Damp. = 0.59 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



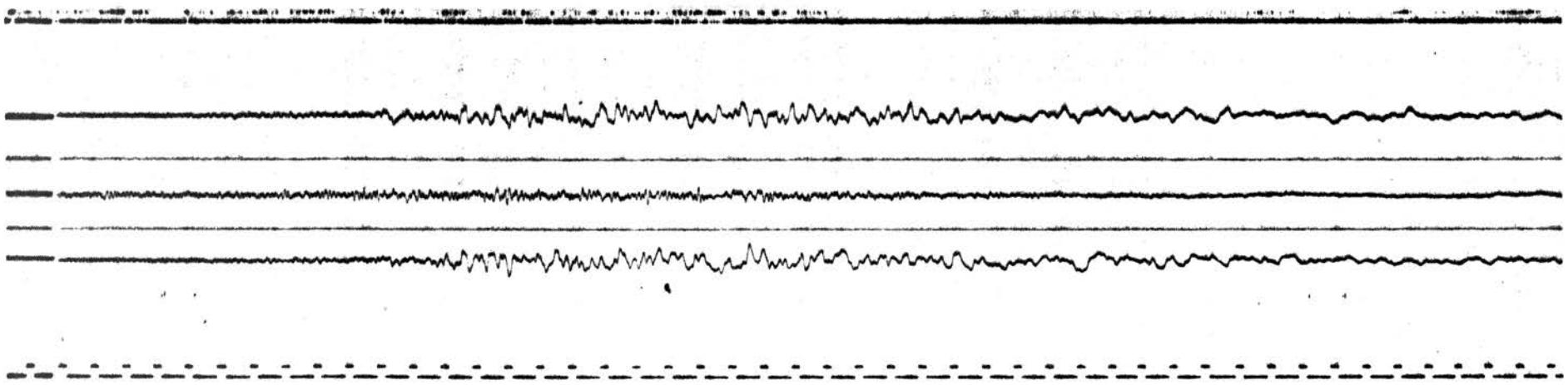
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5115 32.92N, 115.37W	230°	Sens. = 1.68 cm/g Per. = .040 sec	Film Speed =
El Centro Array #2		Damp. = 0.62 crit	2 time marks/sec
SMA-1T No. 587 (USGS) Keystone Rd.	Up	Sens. = 1.86 cm/g Per. = .036 sec	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 9 aftershocks		Damp. = 0.62 crit	
	140°	Sens. = 1.75 cm/g Per. = .035 sec Damp. = 0.61 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



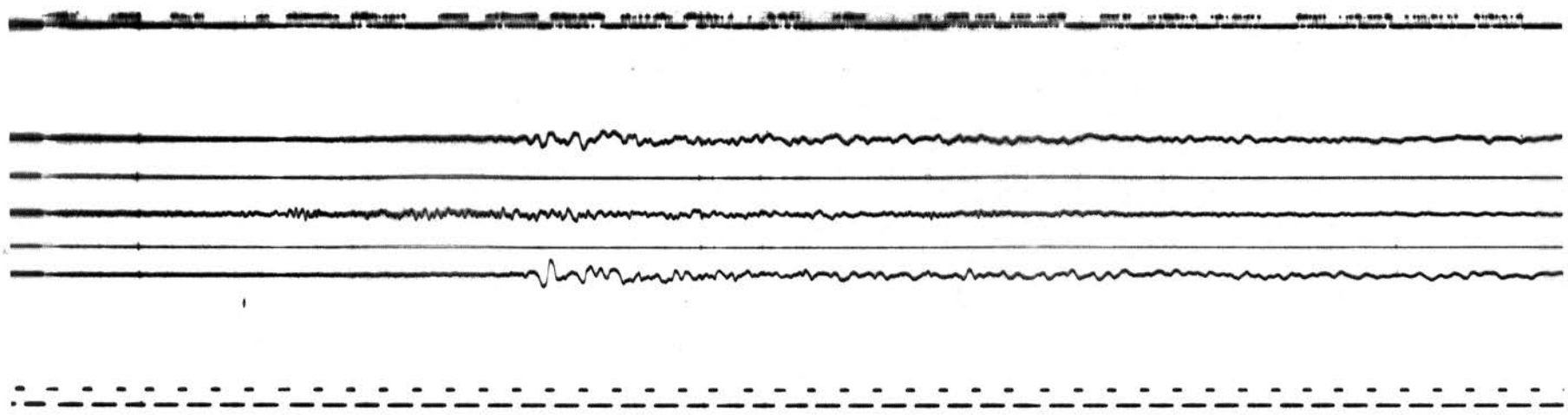
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 931, 32.72N, 115.64W	230°	Sens. = 1.88 cm/g Per. = .039 sec	Film Speed =
El Centro Array #12		Damp. = 0.53 crit	2 time marks/sec
SMA-1T No. 1503 (USGS) Brockman Rd.	Up	Sens. = 1.78 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF		Damp. = 0.55 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	140°	Sens. = 1.84 cm/g Per. = .039 sec Damp. = 0.59 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



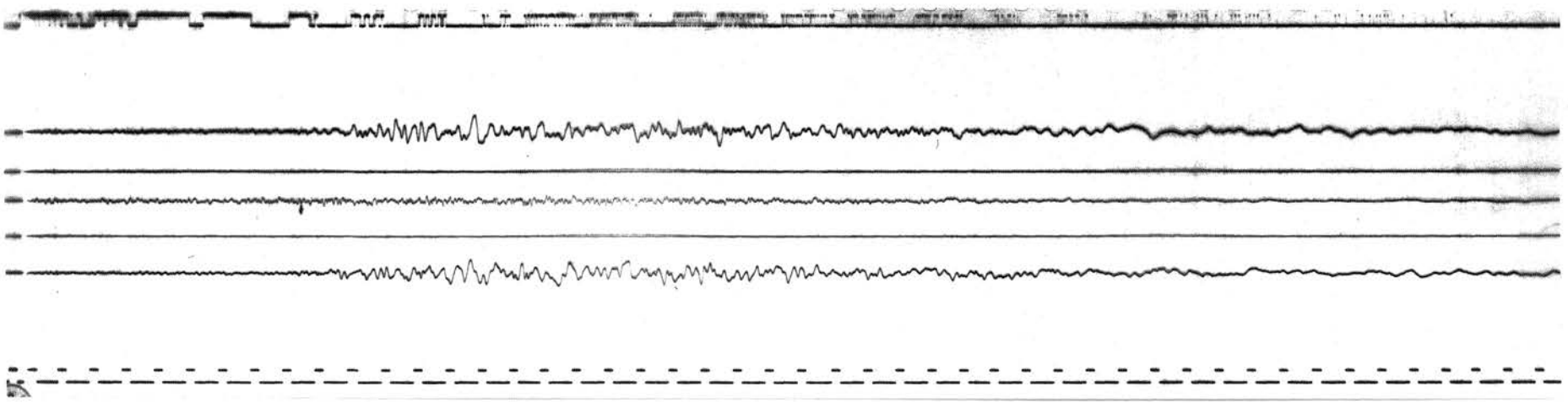
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5061, 33.13N, 115.52W	315°	Sens. = 1.86 cm/g Per. = .038 sec	Film Speed =
Calipatria Fire Station		Damp. = 0.61 crit	2 time marks/sec
SMA-1T No. 1530 (USGS)	Up	Sens. = 1.86 cm/g Per. = .038 sec	5 cm
EARTHQUAKE OF		Damp. = 0.57 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 11 aftershocks	225°	Sens. = 1.79 cm/g Per. = .037 sec Damp. = 0.55 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



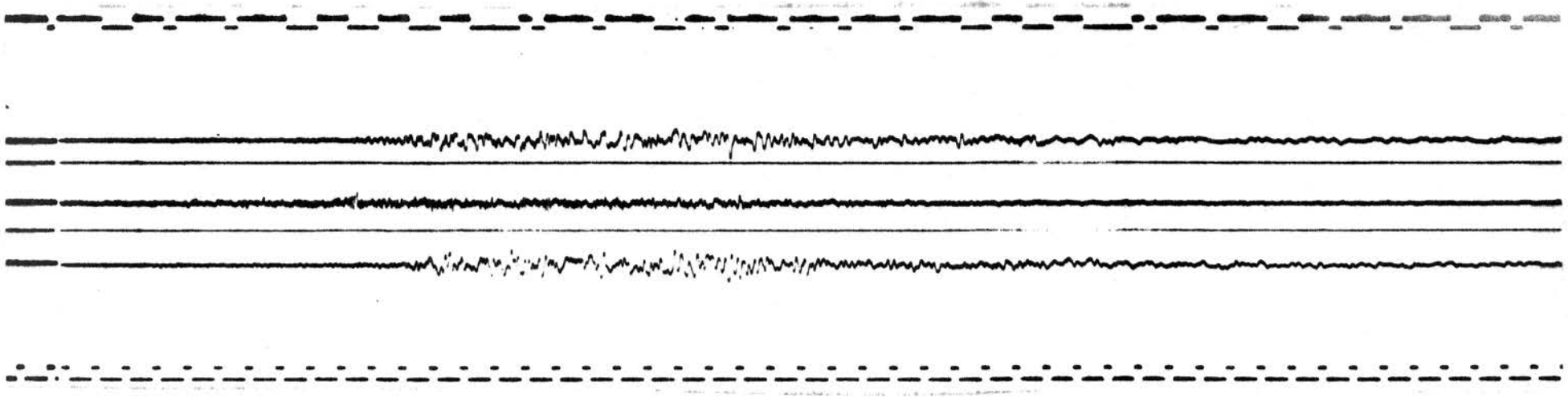
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5059, 32.71N, 115.68W	230°	Sens. = 1.85 cm/g Per. = .039 sec Damp. = 0.61 crit	Film Speed =
El Centro Array #13			2 time marks/sec
SMA-1T No. 1460 (USGS) Strobel Residence	Up	Sens. = 1.81 cm/g Per. = .039 sec Damp. = 0.61 crit	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 1 aftershock	140°	Sens. = 1.81 cm/g Per. = .040 sec Damp. = 0.62 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



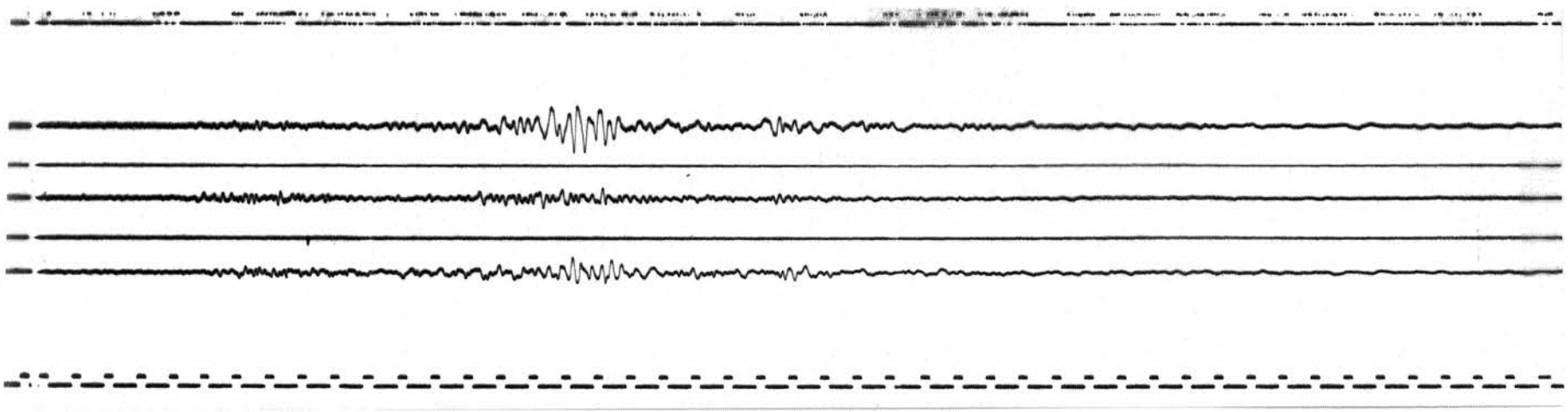
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5056 32.960N, 115.319W	230°	Sens. = 1.84 cm/g Per. = .038 sec	Film Speed =
El Centro Array #1		Damp. = 0.59 crit	2 time marks/sec
SMA-1T No. 1457 (USGS) Borchard Ranch	Up	Sens. = 1.81 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF		Damp. = 0.50 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 7 aftershocks	140°	Sens. = 1.83 cm/g Per. = .040 sec Damp. = 0.59 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to penilulum motion).



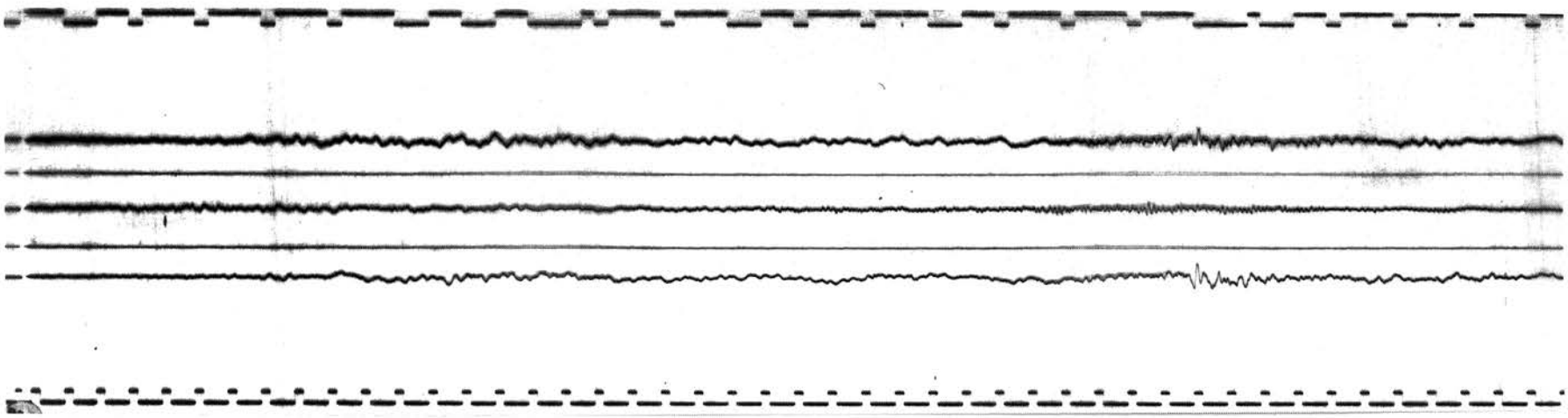
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 286, 32.955N, 115.823W	135°	Sens. = 1.95 cm/g Per. = .040 sec	Film Speed =
Superstition Mountain		Damp. = 0.57 crit	2 time marks/sec
SMA-1T No. 1492 (USGS) Camera Site	Up	Sens. = 1.87 cm/g Per. = .040 sec	5 cm
EARTHQUAKE OF		Damp. = 0.57 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 2 aftershocks	045°	Sens. = 1.98 cm/g Per. = .040 sec Damp. = 0.57 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



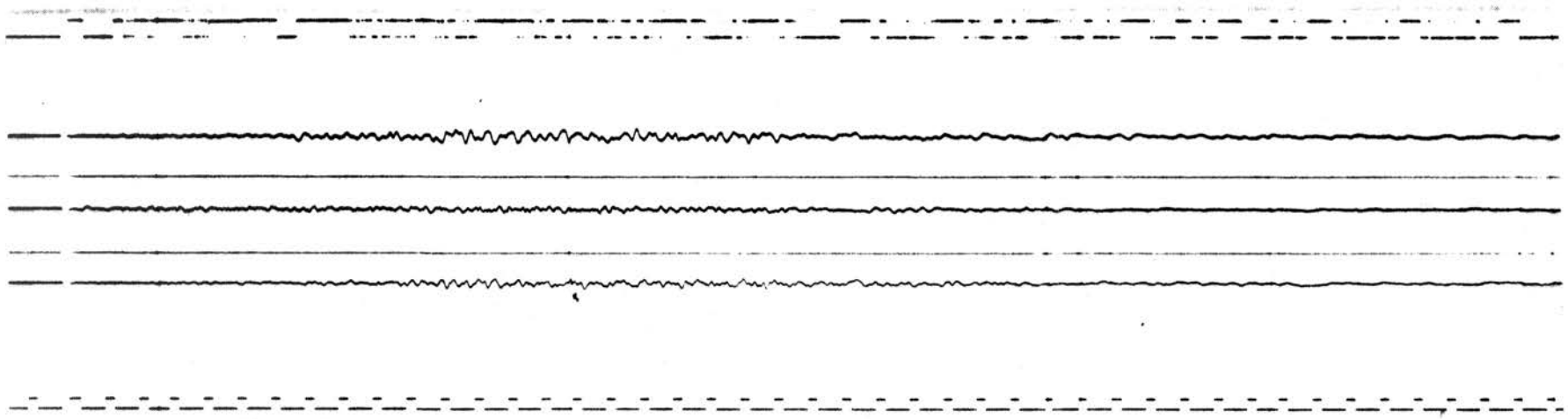
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5062, 33.18N, 115.62W	315°	Sens. = 1.84 cm/g Per. = .039 sec	Film Speed =
Salton Sea Wildlife Refuge		Damp. = 0.61 crit	2 time marks/sec
SMA-1T No. 1471 (USGS)	Up	Sens. = 1.84 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF		Damp. = 0.57 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC Plus 7 aftershocks	225°	Sens. = 1.83 cm/g Per. = .039 sec Damp. = 0.59 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



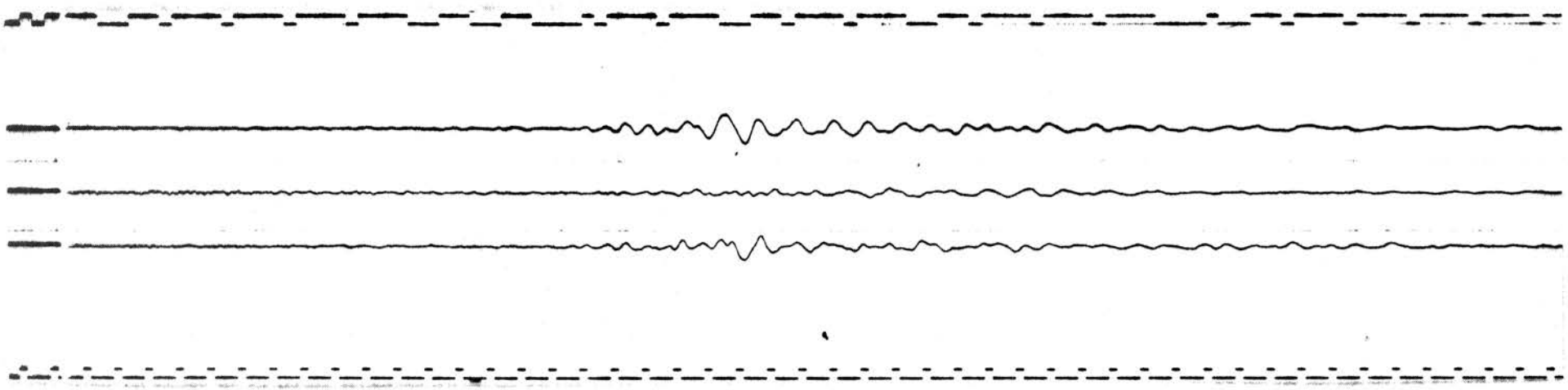
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5052 32.79N, 115.86W	135°	Sens. = 1.97 cm/g Per. = .040 sec	Film Speed =
Plaster City, Storehouse		Damp. = 0.57 crit	2 time marks/sec
SMA-1T No. 1497 (USGS)	Up	Sens. = 1.87 cm/g Per. = .038 sec	5 cm
EARTHQUAKE OF		Damp. = 0.55 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	045°	Sens. = 1.84 cm/g Per. = .038 sec Damp. = 0.55 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



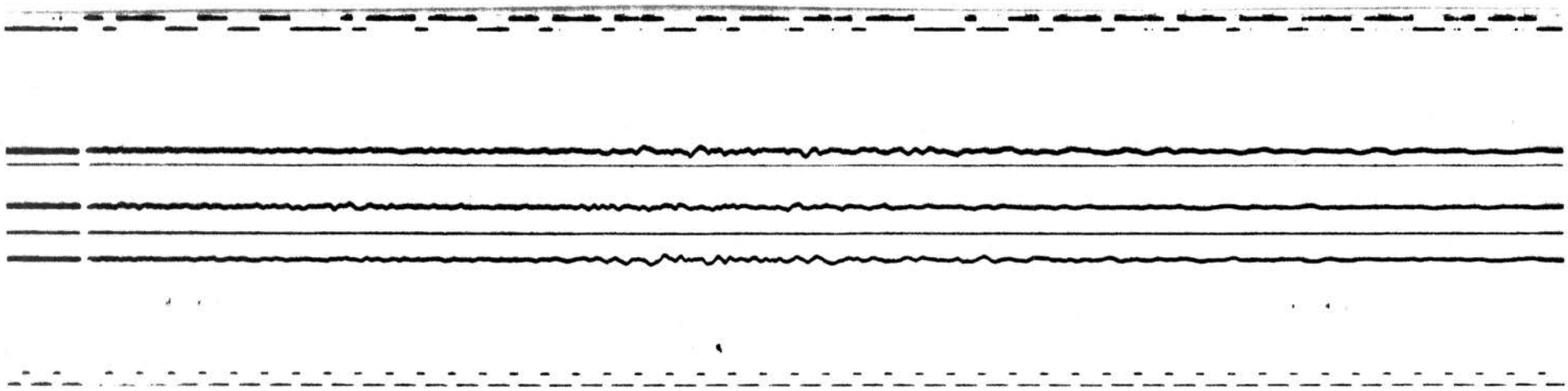
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5066, 33.36N, 115.59W	135°	Sens. = 1.83 cm/g Per. = .038 sec	Film Speed =
Coachella Canal #4		Damp. = 0.62 crit	2 time marks/sec
SMA-1T No. 1477 (USGS) Siphon 15	Up	Sens. = 1.93 cm/g Per. = .040 sec	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	045°	Damp. = 0.57 crit Sens. = 1.79 cm/g Per. = .039 sec Damp. = 0.59 crit	

*Azimutnal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



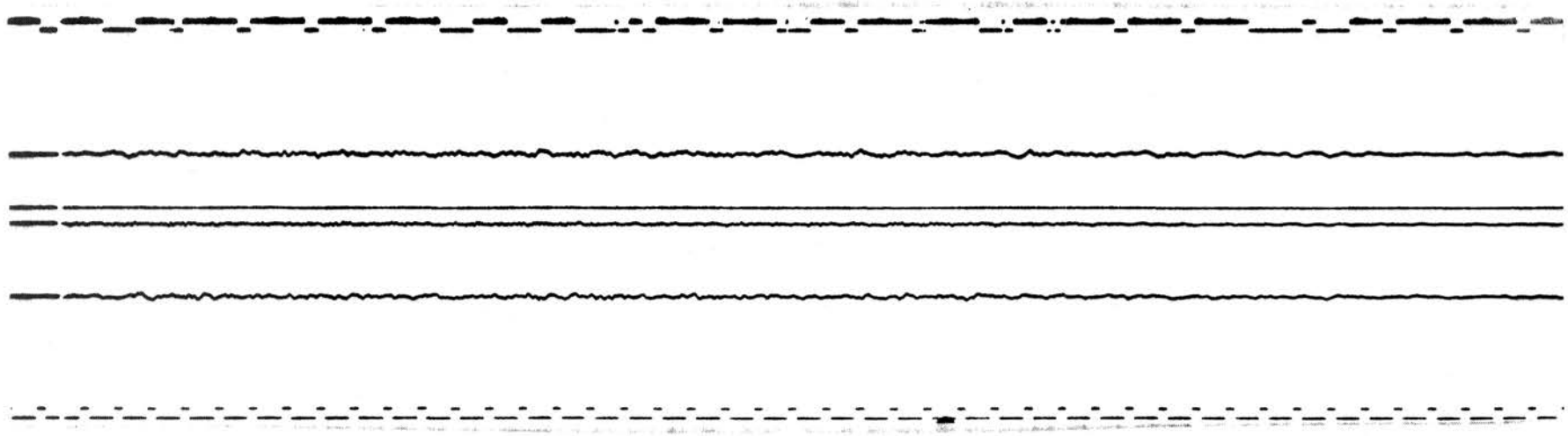
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5050, 33.14N, 116.13W	315°	Sens. = 1.83 cm/g Per. = .035 sec Damp. = 0.62 crit	Film Speed =
Ocotillo Wells			2 time marks/sec
SMA-1T No. 1486 (USGS) Cafe	Up	Sens. = 1.91 cm/g Per. = .035 sec Damp. = 0.61 crit	5 cm
EARTHQUAKE OF			
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	225°	Sens. = 1.85 cm/g Per. = .035 sec Damp. = 0.62 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



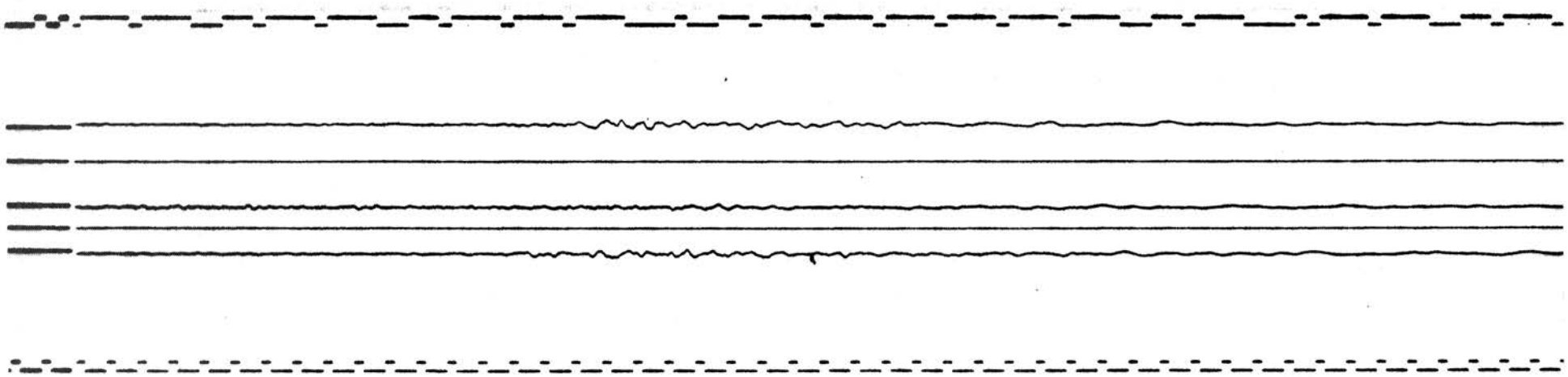
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 948 32.728N, 114.704W	090°	Sens. = 1.77 cm/g Per. = .037 sec	Film Speed =
Yuma, Arizona		Damp. = 0.62 crit	2 time marks/sec
SMA-1T No. 2166 (USGS) Freefield	Up	Sens. = 1.80 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF		Damp. = 0.60 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	360°	Sens. = 1.74 cm/g Per. = .037 sec Damp. = 0.62 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



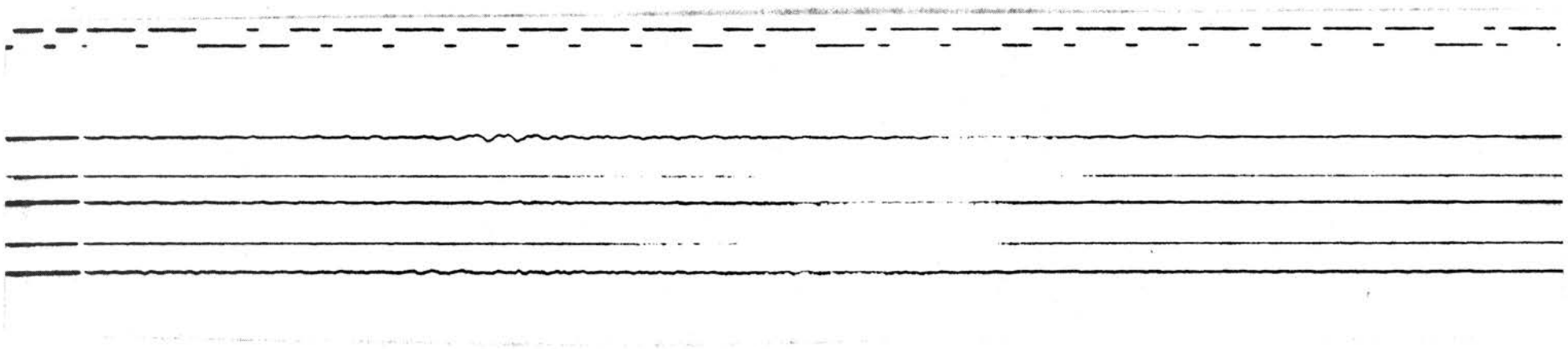
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5049, 33.19N, 116.28W	315°	Sens. = 1.88 cm/g Per. = .040 sec	Film Speed =
Borrego Air Ranch		Damp. = 0.59 crit	2 time marks/sec
SMA-1T No. 1473 (USGS)	Up	Sens. = 1.85 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF 15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	225°	Damp. = 0.57 crit Sens. = 1.75 cm/g Per. = .038 sec Damp. = 0.57 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



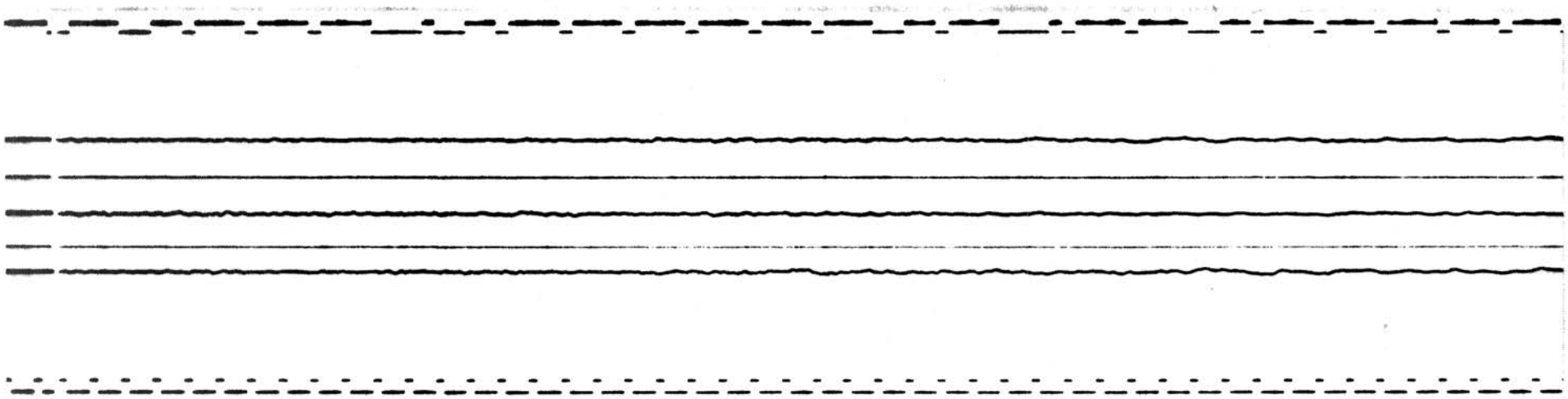
U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5047, 33.35N, 116.40W	135°	Sens. = 1.84 cm/g Per. = .039 sec	Film Speed =
Rancho De Anza		Damp. = 0.60 crit	2 time marks/sec
SMA-1T No. 1522 (USGS) Anza-Borrego Park	Up	Sens. = 1.87 cm/g Per. = .038 sec	5 cm
EARTHQUAKE OF		Damp. = 0.60 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	045°	Sens. = 1.79 cm/g Per. = .039 sec Damp. = 0.60 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5063, 33.64N, 116.08W	135°	Sens. = 1.92 cm/g Per. = .040 sec	Film Speed =
Coachella Canal #1		Damp. = 0.59 crit	2 time marks/sec
SMA-1T No. 1479 (USGS) Mile 97.1	Up	Sens. = 1.91 cm/g Per. = .038 sec	5 cm
EARTHQUAKE OF		Damp. = 0.57 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	045°	Sens. = 2.00 cm/g Per. = .040 sec Damp. = 0.61 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).



U.S. STRONG-MOTION NETWORK	DIRECTION*	CONSTANTS	
Station No. 5073, 33.92N, 116.78W	270°	Sens. = 1.77 cm/g Per. = .038 sec	Film Speed =
Cabezon Post Office		Damp. = 0.57 crit	2 time marks/sec
SMA-1T No. 1495 (USGS)	Up	Sens. = 1.86 cm/g Per. = .039 sec	5 cm
EARTHQUAKE OF		Damp. = 0.57 crit	
15 October 1979, 1616 PDT 15 October 1979, 2316 UTC	180°	Sens. = 1.84 cm/g Per. = .038 sec Damp. = 0.65 crit	

*Azimuthal direction of case acceleration for upward trace deflection (opposite direction to pendulum motion).