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PROCESSED SEISMIC MOTION RECORDS FROM
LANDERS, CALIFORNIA
EARTHQUAKE OF JUNE 28, 1992

RECORDED AT SEISMOGRAPH STATIONS
IN SOUTHERN NEVADA

April 1993

Peter K. Lum

Kenneth K. Honda

Prepared for
The U.S. Department of Energy
Nevada Operations Office
Under Contract DE-AC08-89NV10733

Prepared by
URS/John A. Blume & Associates, Engineers
100 California Street, San Francisco, CA 94111

MASTER

LANDERS, CALIFORNIA EARTHQUAKE OF 28 JUNE 1992

Background

As part of the contract with the U.S. Department of Energy, Nevada Operations Office (DOE/NV), URS/John A. Blume & Associates, Engineers (URS/Blume) maintained a network of seismographs in southern Nevada to monitor the ground motion generated by the underground nuclear explosions (UNEs) at the Nevada Test Site (NTS). The seismographs were located in the communities surrounding the NTS and the Las Vegas valley. When these seismographs were not used for monitoring the UNE generated motions, a limited number of them were maintained for monitoring motion generated by other than UNEs (e.g., motion generated by earthquakes, wind, blast). During the Landers earthquake of June 28, 1992, the systems located at 19 of these ground locations recorded the earthquake motions. Due to the potential benefit of these data for the scientific community, DOE/NV authorized the release of these records.

Earthquake Parameters

The earthquake parameters obtained from various sources were:

Epicenter:	34.217°N, 116.433°W
Depth:	9 Km (Caltech/USGS)
Magnitude:	7.5 M_s (NEIC)
Date:	28 June 1992
Origin time:	Day 180 Hr 11 Min 57 Sec 34 (GMT)
Local time:	4:58 a.m. (PDT)

The earthquake was felt by many of the people in southern Nevada. The motion was most perceptible by the occupants of high-rise buildings in Las Vegas; located approximately 250 km from the epicenter. There were isolated reports of some damage and power failure.

The Landers was followed by the Big Bear earthquake about 3 hours later with magnitude 6.5 and the next day by the magnitude 5.6 Skull Mountain earthquake near the NTS. Separate reports on the records obtained from these earthquakes were issued.

Description of Equipment

Three types of seismographs were used in the monitoring program. They were L-7 velocity meter manufactured by the Precision Instrument Company (L-7B system) and by Develco, Inc. (L-7D system); PDR-1 by Kinometrics; and PDAS-100 by Teledyne Geotech. The FBA-11 accelerometers manufactured by Kinometrics were utilized as sensors for both the PDR-1 and PDAS-100 recorders. The FBA-11 has a flat response from DC to 50 Hz.

L-7 Velocity Meter: It is a continuously recording velocity seismograph which records the motion on an analog magnetic tape. The system has a flat velocity response over a frequency spectrum

from 0.1 Hz to 34 Hz (Reference 1). It has a recording capability of 5 continuous days.

PDR-1: The acceleration signal from the sensors is converted to a digital form and recorded on a digital cassette tape. The selectable sampling rate was set at 200 samples per second per channel. The system is set to trigger on a short-term average (STA) and long-term average (LTA) threshold. It has a pre-event memory of about 5 seconds and has a recording capability of approximately 20 minutes.

PDAS-100: The acceleration signal from the sensors is converted to a digital form and recorded on a random access memory (RAM) within the system. The selectable sampling rate was set at 200 samples per second per channel. The system is set to trigger on a short-term average (STA) and long-term average (LTA) threshold. It has a selectable pre-event memory of up to 20 seconds and has a recording capability of approximately 20 minutes.

Seismic Recordings

The subject earthquake was recorded at 19 ground station sites in southern Nevada as shown on Figure 1. Those in the Las Vegas valley are detailed in Figure 2. Table 1 tabulates the system type, location, geodetic coordinates and distance from epicenter for each station. At several selected sites, the station was monitored by a secondary system. When both systems recorded the motion, the systems are designated A and B on the tables.

Conversion and Processing

The records obtained from the earthquake were retrieved and converted from field data to a computer compatible format for processing. The processing was performed using URS/Blume's standard signal processing as described in Reference 2.

Briefly, the processing was performed in three phases:

- In Phase 1 processing, the seismic signal was converted from field data to a computer compatible format using a special interface equipment. The data were scaled to an engineering unit (cm/sec^2 or cm/sec). The resulting plots were checked for any error and reviewed for additional processing requirements.
- In Phase 2 processing, the records were processed using the noise reduction techniques. The techniques include baseline correction, cosine tapering and application of low-pass and high-pass filtering using the Butterworth filter, Order 4.

For the UNE generated ground motion records, they are generally band-pass filtered from 0.1 to 33Hz. The pseudo relative velocity spectrum (PSRV) of 49 periods and 5 percent of critical damping is computed. The 49 periods are equally spaced on a logarithmic scale from 0.05 to 6.072 seconds. Fourier amplitude spectra are generated before and after the Phase 2 processing. The corrected acceleration, velocity and displacement time histories are generated using numerical differentiation and integration.

During the preliminary processing of records from distant earthquakes, it was observed that these records appeared to contain motion of longer period than those observed from the UNE generated ground motion. Thus the processing procedure using the standard filter cut-offs would partially filter-out this long period motion. In order to examine the characteristics of the long-period motion, the lower cut-off frequency was extended to 0.05 Hz and the PSRV was extended to a period of 30.11 seconds. Of course, the PSRV values for periods greater than the cut-off frequency or the beyond the recording system response are not the optimum values.

- In the final phase, the records were arranged for the long-term preservation and for report preparation. The final product contains data plots in chronological order of data processing; original recording, uncorrected and corrected Fourier amplitude spectra, corrected acceleration, velocity, displacement and PSRVs.

Results

Table 2 tabulates the uncorrected peak acceleration or velocity, corrected peak acceleration, velocity and displacement values and any data processing comments. The data are written in a format which are compatible with the standard format for the California Strong-Motion Instrumentation Program (CSMIP) tapes [Reference 3]. Table A summarizes the standard data format.

The data were copied on to a 8MM tape using ASCII format (record length=80, blocksize=2000). Table B gives examples of VAX/VMS commands used to create the data tape and an instruction for retrieval of the data files.

Acknowledgment

The network of seismographs in southern Nevada to monitor the seismic motion generated by the UNEs at the NTS was maintained by the staff of electronic technicians consisting of Ray Bradley, Don Morgan, Robert Stewart, Lori Forrester and Jim Graham. The seismic records conversion and processing staff included Vickie Ross, Stephanie Miller, Rosemarie Musso, Ben Gacula and Cory Lieber.

References

1. Navarro, R., and G.M. Wuollet, "The L-7 Velocity Seismograph Shaking-Table Results", NOAA Technical Report ERL 254-ESL 26, Boulder, Colorado, July 1972.
2. Lum, P. K., "Overview of Seismic Signal Conversion and Processing Operations", URS/John A. Blume & Associates, Engineers, San Francisco, JAB-10733-TM3, March 1991.
3. Shakal, A. F. and Huang, M. J., "Standard Tape Format for CSMIP Strong-Motion Data Tapes", California Department of Conservation, Division of Mines and Geology, Office of Strong Motion Studies, Report OSMS 85-03, December 1985.

0 Kilometers 10

○ See Table #1 for station information

URS/BLUME
100 CALIFORNIA STREET
SAN FRANCISCO, CA 94111

FIGURE 2: STATIONS RECORDING THE LANDERS, CALIFORNIA
EARTHQUAKE MAINSHOCK OF 6/28/92
IN LAS VEGAS VALLEY

TABLE 1: LOCATIONS OF THE RECORDING STATIONS

<u>Station No.</u>	<u>System Type</u>	<u>Location</u>	<u>Coordinates</u>	<u>Distance from Epicenter (Km)</u>
1	PDR-1	Pahrump	115.98W 36.21N	225
2	PDR-1	Las Vegas	115.41W 36.15N	234
3	PDR-1	Las Vegas	115.07W 36.06N	239
4	PDR-1	Las Vegas	115.14W 36.11N	241
5	PDR-1	Las Vegas	115.19W 36.17N	245
6	PDR-1	Las Vegas	115.14W 36.17N	247
7	PDR-1	Las Vegas	115.14W 36.17N	247
8	PDR-1	Las Vegas	115.22W 36.22N	249
9	PDR-1	Las Vegas	115.31W 36.26N	249
10	PDR-1	Las Vegas	115.16W 36.21N	250
11	PDR-1	Las Vegas	115.02W 36.18N	253
12	PDAS-100	Las Vegas	115.02W 36.24N	259
13A 13B	PDR-1 PDAS-100	Lathrop Wells	116.40W 36.64N	270
14	PDR-1	Beatty	116.76W 36.91N	301
15A 15B	PDR-1 PDAS-100	Nevada Test Site	116.06W 36.93N	304
16	PDR-1	Death Valley	117.34W 37.03N	323
17A 17B	PDR-1 PDAS-100	Alamo	115.12W 37.27N	359
18	PDR-1	Tempiute	115.63W 37.65N	388
19	PDR-1	Goldfield	117.23W 37.71N	395

TABLE 2: PEAK AMPLITUDES FROM LANDERS EARTHQUAKE OF 6/28/92

Station No.	Comp	<-- Uncorrected -->		<----- Corrected ----->			Comments
		Accel. (cm/sec ²)	Velocity (cm/sec)	Accel. (cm/sec ²)	Velocity (cm/sec)	Disp (cm)	
1	DOWN	6.601	0.000	6.538	-2.451	-3.336	
1	NORTH	-14.414	0.000	-14.438	-4.277	4.362	
1	WEST	-14.373	0.000	-14.459	-5.960	7.201	
2	DOWN	-11.015	0.000	-9.262	2.173	-3.765	
2	NORTH	-15.001	0.000	12.767	-1.875	-2.977	
2	WEST	10.513	0.000	10.916	4.492	6.144	
3	DOWN	11.856	0.000	11.877	1.923	-1.713	
3	NORTH	17.178	0.000	17.129	-3.122	2.599	
3	WEST	17.603	0.000	17.708	6.273	-3.888	
4	DOWN	8.452	0.000	8.497	2.418	-2.297	
4	NORTH	20.690	0.000	20.640	4.319	-3.202	
4	WEST	13.245	0.000	13.347	5.397	-4.294	
5	DOWN	-10.469	0.000	-10.449	3.826	-2.678	
5	NORTH	27.442	0.000	27.357	4.660	3.282	
5	WEST	-21.626	0.000	-21.555	7.574	5.269	
6	DOWN	11.183	0.000	11.129	3.462	-2.329	
6	NORTH	19.875	0.000	19.938	-7.280	3.311	
6	WEST	-24.478	0.000	-24.261	9.219	6.445	
7	DOWN	9.198	0.000	9.158	2.874	-2.320	
7	NORTH	-20.241	0.000	-20.163	-6.761	3.745	
7	WEST	-22.702	0.000	-22.605	8.899	6.707	
8	DOWN	-7.352	0.000	-7.393	3.193	-3.052	
8	NORTH	18.683	0.000	18.580	-3.204	2.471	
8	WEST	-21.134	0.000	-20.756	5.538	4.651	
9	DOWN	-6.688	0.000	-6.677	2.615	-3.022	
9	NORTH	10.959	0.000	10.924	2.593	-2.819	
9	WEST	-12.589	0.000	-12.673	3.810	4.800	
10	DOWN	10.107	0.000	10.055	3.349	-3.215	
10	NORTH	25.868	0.000	25.950	5.099	3.513	
10	WEST	-21.492	0.000	-21.561	-6.611	4.924	
11	DOWN	3.824	0.000	3.799	1.431	-1.894	
11	NORTH	6.423	0.000	6.297	1.911	-2.315	
11	WEST	-7.320	0.000	-7.461	-2.823	3.204	
12	DOWN	-11.635	0.000	-11.618	2.690	-1.890	
12	NORTH	14.763	0.000	14.748	4.116	-2.358	
12	WEST	20.470	0.000	20.448	-5.278	3.828	
13A	DOWN	-8.168	0.000	-8.223	-3.705	-4.060	
13A	NORTH	14.805	0.000	14.722	5.498	-5.316	
13A	WEST	15.097	0.000	14.937	8.987	8.988	
13B	DOWN	-8.446	0.000	-8.469	3.620	-4.146	
13B	NORTH	14.814	0.000	14.769	5.537	-5.212	
13B	WEST	15.370	0.000	15.179	9.131	9.356	

TABLE 2: PEAK AMPLITUDES FROM LANDERS EARTHQUAKE OF 6/28/92

Station No.	Comp	<-- Uncorrected -->		<----- Corrected ----->			Comments
		Accel. (cm/sec ²)	Velocity (cm/sec)	Accel. (cm/sec ²)	Velocity (cm/sec)	Disp (cm)	
14	DOWN	7.511	0.000	7.284	1.776	-2.580	
14	NORTH	15.914	0.000	15.859	1.920	-2.661	
14	WEST	-15.647	0.000	-15.728	4.297	5.486	
15A	DOWN	-3.585	0.000	-3.602	2.477	-3.097	
15A	NORTH	6.130	0.000	6.133	-3.665	-4.611	
15A	WEST	5.928	0.000	5.945	-3.343	4.884	
15B	DOWN	-3.558	0.000	-3.522	2.391	-2.926	
15B	NORTH	6.199	0.000	6.172	-3.699	-4.698	
15B	WEST	6.035	0.000	6.016	-3.442	4.946	
16	DOWN	-3.170	0.000	-3.115	1.773	1.754	
16	NORTH	-5.902	0.000	-5.840	-2.494	-3.647	
16	WEST	6.104	0.000	6.198	6.759	9.431	
17A	DOWN	3.685	0.000	3.695	1.345	1.579	
17A	NORTH	6.003	0.000	5.940	-2.488	-1.869	
17A	WEST	6.917	0.000	6.653	-3.803	-3.805	
17B	DOWN	3.632	0.000	3.667	1.283	1.624	
17B	NORTH	-5.513	0.000	-5.479	-1.996	-1.526	
17B	WEST	7.070	0.000	7.084	-3.915	-4.043	
18	DOWN	1.678	0.000	1.458	-1.399	-1.866	LATE TRIGGERED
18	NORTH	1.508	0.000	1.484	1.653	2.006	
18	WEST	-2.181	0.000	-2.173	-2.638	4.001	
19	DOWN	-1.460	0.000	-1.427	1.562	2.020	
19	NORTH	-3.708	0.000	-3.586	-4.479	-6.627	
19	WEST	3.062	0.000	3.034	-2.074	2.456	

TABLE 3: DATA FORMAT

Each station contains 3 data channels and contains the following 4 files:

	Units
Vol 1 Uncorrected acceleration	1000/g
Vol 2 Corrected acceleration	cm*100/sec ²
Corrected velocity	cm*100/sec
Corrected displacement	cm*100
Vol 3 Pseudo Response Velocity	cm/sec
Vol 4 Fourier Amplitude Spectra	cm/sec

A typical station contains the following data:

<u>Vol Ch.</u>	<u>Line No. of</u>	<u>No. Lines</u>	<u>Format</u>	<u>Description</u>
1 1	1-13	13	a80	Header of alphanumeric data.
	14-20	7	16i5	Header of 100 integer parameters.
	21-27	7	8f10.3	Header of 50 real-value parameters.
	28-..	many	8f10.0	.. points of t(i),a(i) pairs of acc. data.
	...	1	a80	/& --- End of data for Channel 1.
2	(Repeat header, data and end-of-file mark for Channel 2)			
3	(Repeat header, data and end-of-file mark for Channel 3)			
2 1	1-25	25	a80	Header of alphanumeric data.
	26-32	7	16i5	Header of 100 integer parameters.
	33-45	13	8f10.3	Header of 100 real-value parameters.
	46	1	a80	Acceleration header information.
	47-..	many	8f10.0	... points of a(i) of dt= .005 second.
	..	1	a80	Velocity header information.
	..	many	8f10.0	... points of v(i) of dt= .005 second.
	..	1	a80	Displacement header information.
	..	many	8f10.0	... points of d(i) of dt= .005 second.
	..	1	a80	/& --- End of data for Channel 1
2	(Repeat header, data and end-of-file mark for Channel 2)			
3	(Repeat header, data and end-of-file mark for Channel 3)			
3 1	1-30	30	a80	Header of alphanumeric data.
	31-37	7	16i5	Header of 100 integer parameters.
	38-50	13	8f10.3	Header of 100 real-value parameters.
	51	1	f10.3	Damping values (.05 pct of critical).
	52-64	13	8f10.3	49 periods at which PSRV are computed (65 periods for the Landers earthquake).
	65	1	a80	PSRV header information
	66-72	7	8e10.3	49 points of PSRV or
	66-74	9	8e10.3	65 points of PSRV for the Landers earthquake.
	..	1	a80	/& --- End of data for Channel 1
2	(Repeat header, data and end-of-file mark for Channel 2)			
3	(Repeat header, data and end-of-file mark for Channel 3)			
4 1	1-30	30	a80	Header of alphanumeric data.
	31-37	7	16i5	Header of 100 integer parameters.
	38-50	13	8f10.3	Header of 100 real-value parameters.
	51	1	a80	Fourier amplitude header information.
	52-..	7	8e10.3	.. points of Fourier amplitude data.
	..	1	a80	/& --- End of data for Channel 1
2	(Repeat header, data and end-of-file mark for Channel 2)			
3	(Repeat header, data and end-of-file mark for Channel 3)			

TABLE 4: READ / WRITE DATA ON 8MM ASCII FORMATTED TAPE

WRITE DATA ON ASCII FORMATTED 8MM TAPE

Below is an example to save files on 8MM ASCII formatted tape with record length=80, block size = 2000 using the VAX/VMS operating system utilities TWRITE:

```
$ INIT MUB0: 0705B
$ MOUNT/NOASSIST/FOR/RECORD=80/BLOCK=2000 MUB0:
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN1.V1
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN1.V2
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN1.V3
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN1.V4
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN2.V1
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN2.V2
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN2.V3
$ TWRITE/ASCII/RECORD=80/BLOCK=2000/OUTPUT=MUB0:  STATN2.V4

... etc.. (for all stations, each with v1,v2,v3 and v4 data)

$ EXIT
```

READ/RETRIEVE DATA FROM ASCII FORMATTED 8MM TAPE

Below is an example to read/retrieve files from an 8MM ASCII formatted tape with record length=80, block size = 2000 using the VAX/VMS operating system utilities TREAD:

```
$ MOUNT/NOASSIST/FOR/RECORD=80/BLOCK=2000 MUB0:
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN1.V1
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN1.V2
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN1.V3
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN1.V4
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN2.V1
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN2.V2
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN2.V3
$ TREAD/ASCII/RECORD=80/BLOCK=2000/INPUT=MUB0:  STATN2.V4

... etc.. (for all stations, each with v1,v2,v3 and v4 data)

$ EXIT
```

STATION NO. 1

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 1

UNCORRECTED ACCELERATION TIME HISTORIES

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 1

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 1

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 1 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 1 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 1 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

EVENT: LANDERS STATION: NO. 1
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF(BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 3 WEST

CH 2 NORTH

CH 1 DOWN

STATION NO. 2

1602 25-FEB-1993 09:05

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 2

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

1030 25-FEB-1993 09:06

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 2

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 2

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.03-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 2 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.03-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 2 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.03-33HZ)

1672 25-FTB-1993 09:29

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 2 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER-4, 0.03-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 2
DAMPING: 5 PERCENT OF CRITICAL
SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.03-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 3

1682 25-FEB-1993 11:55

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 3

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 3

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

1030 25-FEB-1993 12:04

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 3

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92

STATION NO. 3 CH 1 DOWN

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER-4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 3 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

1682 25-FEB-1993 12:20

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 3 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 3
DAMPING: 5 PERCENT OF CRITICAL
SYSTEM:

BPF(BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 4

2006 25-FEB-1993 13:37

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 4

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

1030 25-FEB-1993 13:38

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 4

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

URS/Blume

1030 25-FEB-1993 13:45

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 4

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER-4, 0.05-33HZ)

URS/Blume

2006 25-FEB-1993 13:58

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 4 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

2006 FEB-1993 13:59

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 4 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

2006 25-FEB-1993 14:00

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 4 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

EVENT: LANDERS STATION: NO. 4
DAMPING: 5 PERCENT OF CRITICAL
SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 5

1998 25-FEB-1993 10:43

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 5

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 5

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

1030 25-FEB-1993 10:51

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 5

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

1998 25-FEB-1993 11:01

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 5 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

1998 25-FEB-1993 11:02

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 5 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

1998 25-FEB-1993 11:03

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 5 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

EVENT: LANDERS STATION: NO. 5
DAMPING: 5 PERCENT OF CRITICAL
SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 6

2010 26-FEB-1993 10:39

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 6

UNCORRECTED ACCELERATION TIME HISTORIES

TIME (SEC)

URS/Blume

1030 26-FEB-1993 10:40

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 6

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 6

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

2010 26-FEB-1993 10:58

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 6 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 6 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

2010 26-FEB-1993 11:00

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 6 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER-4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 6
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 3 WEST

CH 2 NORTH

CH 1 DOWN

STATION NO. 7

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92 STATION NO. 7

UNCORRECTED ACCELERATION TIME HISTORIES

1030 25-FEB-1993 14:30

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 7

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

URS/Blume

1030 25-FEB-1993 14:40

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 7

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

1966 25-FEB-1993 14:57

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 7 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

1966 25-FEB-1993 14:58

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 7 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

1966 25-FEB-1993 14:58

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 7 CH 3 WEST

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 7
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF(BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 3 WEST

CH 2 NORTH

CH 1 DOWN

STATION NO. 8

2002 25-FEB-1993 11:07

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92 STATION NO. 8

UNCORRECTED ACCELERATION TIME HISTORIES

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 8

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

1030 25-FEB-1993 11:16

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 8

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

2002 25-FEB-1993 11:25

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 8 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 8 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

2002 25-FEB-1993 11:27

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 8 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

EVENT: LANDERS STATION: NO. 8
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 9

2006 24-FEB-1993 16:55

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 9

UNCORRECTED ACCELERATION TIME HISTORIES

TIME (SEC)

URS/Blume

1030 24-FEB-1993 16:57

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 9

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 9

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 9 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

2006 24-FEB-1993 17:23

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 9 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

2006 24-FEB-1993 17:25

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 9 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

EVENT: LANDERS STATION: NO. 9
DAMPING: 5 PERCENT OF CRITICAL
SYSTEM:

BPF(BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 10

2006 25-FEB-1993 12:26

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 10

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 10

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

URS/Blume

1030 25-FEB-1993 12:37

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 10

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

2006 25-FEB-1993 12:48

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 10 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

2006 25-FEB-1993 12:49

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 10 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 10 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

EVENT: LANDERS STATION: NO. 10
DAMPING: 5 PERCENT OF CRITICAL
SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 3 WEST

CH 2 NORTH

CH 1 DOWN

STATION NO. 11

2018 25-FEB-1993 14:05

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 11

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

1030 25-FEB-1993 14:06

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 11

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 11

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER-4, 0.05-33HZ)

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LANDERS, CALIFORNIA EARTHQUAKE 6/28/92

STATION NO. 11 CH 1 DOWN

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

2018 25-FEB-1993 14:24

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 11 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 11 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

EVENT: LANDERS STATION: NO. 11
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF(BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 12

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 12

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 12

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 12

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 12 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

AMPLITUDE

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 12 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 12 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

EVENT: LANDERS STATION: NO. 12
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 13 SYSTEM A

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM A
UNCORRECTED ACCELERATION TIME HISTORIES

TIME (SEC)

URS/Blume

1030 25-FEB-1993 10:14

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM A
UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM A
CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM A CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER-4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM A CH 2 NORTH

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM A CH 3 WEST

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER-4, 0.05-33HZ)

EVENT: LANDERS STATION: NO. 13
 SYSTEM: A DAMPING: 5 PERCENT OF CRITICAL

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 13 SYSTEM B

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM B
UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM B

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM B
CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM B CH 1 DOWN

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
 STATION NO. 13 SYSTEM B CH 2 NORTH
 CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
 BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 13 SYSTEM B CH 3 WEST

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 13
SYSTEM: B DAMPING: 5 PERCENT OF CRITICAL

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 14

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 14

UNCORRECTED ACCELERATION TIME HISTORIES

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 14

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 14

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 14 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 14 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

AMPLITUDE

TIME (SEC)

URS/Blume

1050 25-FEB-1993 09:00

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 14 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 14
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 15 SYSTEM A

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM A
UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM A

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM A
CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
 STATION NO. 15 SYSTEM A CH 1 DOWN
 CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
 BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM A CH 2 NORTH

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM A CH 3 WEST

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 15
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM: A

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 15 SYSTEM B

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM B
UNCORRECTED ACCELERATION TIME HISTORIES

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM B
UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM B
CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM B CH 1 DOWN

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM B CH 2 NORTH

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 15 SYSTEM B CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

EVENT: LANDERS STATION: NO. 15
 SYSTEM: B DAMPING: 5 PERCENT OF CRITICAL

BPF(BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 16

1822 25-FEB-1993 12:54

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 16

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

1030 25-FEB-1993 12:55

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 16

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 16

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 16 CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 16 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 16 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 16
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 17 SYSTEM A

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM A
UNCORRECTED ACCELERATION TIME HISTORIES

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM A
UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM A
CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM A CH 1 DOWN
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM A CH 2 NORTH

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM A CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

10 24-FEB-1993 16:25

EVENT: LANDERS STATION: NO. 17
SYSTEM: A DAMPING: 5 PERCENT OF CRITICAL

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

URS/Blume

STATION NO. 17 SYSTEM B

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM B
UNCORRECTED ACCELERATION TIME HISTORIES

1030 25-FEB-1993 15:03

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM B
UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

1030 25-FEB-1993 15:07

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM B
CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
 STATION NO. 17 SYSTEM B CH 1 DOWN
 CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
 BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM B CH 2 NORTH

CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 17 SYSTEM B CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERNORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 17
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM: B

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 18

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 18

UNCORRECTED ACCELERATION TIME HISTORIES

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 18

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 18

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 18 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
 STATION NO. 18 CH 1 DOWN
 CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
 BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

AMPLITUDE

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 18 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

EVENT: LANDERS STATION: NO. 18
 DAMPING: 5 PERCENT OF CRITICAL
 SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

STATION NO. 19

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 19

UNCORRECTED ACCELERATION TIME HISTORIES

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 19

UNCORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 19

CORRECTED FOURIER AMPLITUDE SPECTRA OF ACCELERATION
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

FREQUENCY (HZ)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
 STATION NO. 19 CH 1 DOWN
 CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
 BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 19 CH 2 NORTH
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

TIME (SEC)

URS/Blume

LANDERS, CALIFORNIA EARTHQUAKE 6/28/92
STATION NO. 19 CH 3 WEST
CORRECTED ACCELERATION, VELOCITY & DISPLACEMENT
BPF (BUTTERWORTH, ORDER-4, 0.05-33HZ)

EVENT: LANDERS STATION: NO. 19
DAMPING: 5 PERCENT OF CRITICAL
SYSTEM:

BPF (BUTTERWORTH, ORDER=4, 0.05-33HZ)

CH 1 DOWN

CH 2 NORTH

CH 3 WEST

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