PROCESSED STRONG MOTION DATA FROM THE PALM SPRINGS EARTHQUAKE OF 8 JULY 1986

PART I

GROUND-RESPONSE RECORDS

CALIFORNIA DEPARTMENT OF CONSERVATION DIVISION OF MINES AND GEOLOGY OFFICE OF STRONG MOTION STUDIES REPORT OSMS 87-01

GORDON K. VAN VECK, Secretary THE RESOURCES AGENCY

GEORGE DEUKMEJIAN, Governor STATE OF CALIFORNIA

RANDALL M. WARD, Director DEPARTMENT OF CONSERVATION
PROCESSED STRONG MOTION DATA FROM THE PALM SPRINGS EARTHQUAKE OF 8 JULY 1986

PART I. GROUND-RESPONSE RECORDS

M.J. Huang
D.L. Parke
R.W. Sherburne
A.F. Shakal

Report No. OSMS 87-01
California Strong Motion Instrumentation Program

California Department of Conservation
Division of Mines and Geology
Office of Strong Motion Studies
630 Berclay Drive, Sacramento, California 95814

June 1987
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INTRODUCTION

Strong motion records were recovered from nearly thirty stations of the California Strong Motion Instrumentation Program (CSMIP) following the Palm Springs earthquake of July 8, 1986 (also known as North Palm Springs earthquake). Twenty-one of those stations were ground-response stations. This report presents results of the digitization and processing performed on the records obtained from eighteen of these stations. The unprocessed records for the remaining stations typically had maximum accelerations of 5% g or less, as shown in the data report by Huang et al. (1986), and were not digitized. The results for the digitization of strong-motion records obtained at CSMIP structural-response stations are presented in an accompanying Part II report (Huang et al., 1987). Strong-motion records obtained by other agencies such as the U.S. Geological Survey (USGS) are described in the report by Porcella et al. (1987).

EARTHQUAKE CHARACTERISTICS

The Palm Springs earthquake occurred on July 8, 1986 within the San Andreas fault system in the northern part of the Coachella Valley. The epicenter of the mainshock has been located between the Mission Creek and Banning Faults of the San Andreas fault system (Hutton, 1986). Surface faulting was observed in the epicentral region (Hart, 1986). A total of about 7 cm of predominantly right-lateral strike-slip displacement was observed on the Banning Fault, a southern branch fault of the San Andreas Fault. The displacement observed was distributed over several parallel fault strands crossing Highway 62. Minor rupture was also observed on the
Mission Creek Fault and along a branch fault at the mouth of Whitewater Canyon.

Serious damage occurred at an electric power substation near Devers Hill, and at the Whitewater Interstate 10 overpass west of North Palm Springs. Specific reports on the earthquake damage and other aspects of the event are included in the EERI newsletter (August & September, 1986).

The earthquake location and magnitude are (K. Hutton, Caltech Seismological Lab., personal communication):

- **Origin Time:** 09:20:45 GMT, 8 July 1986 (02:20:45 PDT)
- **Epicenter:** 33.999 N, 116.606 W
- **Focal Depth:** 12 km
- **Magnitude:** ML = 5.6

### CSMIP STATIONS AND INSTRUMENTATION

The locations of the earthquake epicenter and of the 18 SMIP ground-response stations for which data are included in this report are shown on the map in Figure 1. The locations of the five instrumented buildings for which data are included in the Part II report are also shown. The 18 ground-response stations are within the distance range of 10 to 90 km from the epicenter. For reference, the stations are listed in order of code number (three-digit code on the map) in Table 1A and are listed in alphabetical order in Table 1B. For each station, coordinates, site characteristics and maximum values of ground motion are given in Table 2. Table 2 also lists the distance of the station from the epicenter.

The Hemet array is a northeast-southwest alignment of stations which transects the San Jacinto Fault south of San Bernardino. This
earthquake is the first which triggered all stations of the array since it was installed in 1975. All the records from the 8 stations of the array are digitized and processed. For completeness, the free-field record from the San Bernardino County Law and Justice Center at Rancho Cucamonga (base-isolated building) is included in this report as well as the Part II report.

ACCELEROMETER DIGITIZATION AND PROCESSING

The digitization results presented in this report were obtained using a computer-driven optical scanning system. This facility is patterned after the system developed at the University of Southern California (Trifunac and Lee, 1979). In this system, a direct photographic negative copy of the film accelerogram is mounted on a rotating drum, which is scanned by a photodensitometer. The photodensitometer is mounted on a carriage moving perpendicular to the rotational direction of the drum. The resulting x-y array of optical density values is converted to raw time series through several trace-reconstruction steps. Baseline and other corrections are then applied to this raw data to obtain the acceleration data for further processing and spectral analysis. The subsequent post-digitization processing is similar to that first developed at the California Institute of Technology (Trifunac and Lee, 1973). As discussed in greater detail below, a change of operators was made to improve the instrument correction procedure at high frequencies. In addition, the results of system noise analyses are used to guide the selection of filter corner frequencies in CSMIP processing.

The accelerograms digitized for this report are from SMA-1 accelerographs having 3 channels of data recorded on a 70 mm
Fig. 1. Location of the epicenter and major faults in the vicinity of the 8 July 1986 earthquake near Palm Springs. Solid circles indicate the location of CSMIF ground-response stations for which digitized records are presented in this report. The stations are identified by 3-digit codes which are referenced to station names in Table 1A. The solid squares indicate the location of structural-response stations in the Part II report.
**Table 1A**

<table>
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<tr>
<th>Station No.</th>
<th>Station Name</th>
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<td>Hesperia</td>
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<td>Station Name</td>
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<td>12194</td>
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<td>12302</td>
<td>Windemere Hidden Valley Farms Newport B.</td>
</tr>
</tbody>
</table>

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**Notes:**
- The types of instrumental shakers in this table are: Inst. shlr = small prefabricated metal building
- Shallow V = shallow V = 1100g/sec
- Inst. shlr = small metal box
- Inst. shlr = large building shaker
- Inst. shlr = large building shaker
- Adapted from Boulton et al., 1985

**Notes:** Distance given relative to the epicenter at 33.399N, 116.608W.
### the 1966 Palm Springs Earthquake

<table>
<thead>
<tr>
<th>Station</th>
<th>Trigger Time</th>
<th>Peak Acceleration (g)</th>
<th>Peak Velocity (cm/s)</th>
<th>Peak Displacement (cm)</th>
<th>Long-Period Length (sec)</th>
<th>Filter Time (sec)</th>
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<td>20:47:5</td>
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<td>12025</td>
<td>20:48:8</td>
<td>0.199</td>
<td>11.5</td>
<td>0.2</td>
<td>60</td>
<td>6.20 sec</td>
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<td>0.2</td>
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<td>0.0</td>
<td>60</td>
<td>1.67 sec</td>
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<td>1.3</td>
<td>0.1</td>
<td>60</td>
<td>1.25 sec</td>
</tr>
<tr>
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<td>20:51:9</td>
<td>0.103</td>
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<td>0.5</td>
<td>60</td>
<td>1.67 sec</td>
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<td>20:57:8</td>
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<td>1.1</td>
<td>0.1</td>
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<td>0.6</td>
<td>0.1</td>
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<td>1.25 sec</td>
</tr>
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</table>

**Note:** Accelerograph trigger times, when known, in minutes after 09:00 GMT on 6 July 1966.

**#** Values in peak acceleration values; absolute values are given for peak acceleration, velocity and displacement.
(2.75 in) wide film. For each accelerogram, the 70 mm film contains
three acceleration traces, two straight-line reference traces, and
two time-mark traces. For all the accelerograms presented in this
report, one of the time-mark traces contains a WWVB time code. The
accelerograph trigger times are listed in Table 2.

The sequence of steps in processing these records is summarized
in the following:

1. The film record, 70 mm wide and about 60 cm (60 seconds)
long, is contact-copied onto a 25 cm by 25 cm high-contrast
photographic negative; three sections of the record, each
approximately 22 cm (22 seconds) in length, are copied onto a single
negative. To facilitate subsequent reconstruction of the original
record, adjacent sections are copied so that they have an overlap of
approximately 2 seconds. For further details, refer to the report
by Trifunac and Lee (1979).

2. The negative containing the three sections of the
accelerogram is digitized into x and y coordinates by the optical
scanner. The scanner sampling rate used for these records is 200
samples per centimeter in x and y. This is nominally equal to a
time step of 0.005 second (200 samples/sec) and an acceleration
increment of 0.003 g.

3. The raw x,y data from the individual sections are
concatenated to form continuous acceleration traces, straight-line
reference traces and timing traces.

4. Vol. I Processing. The reference traces are subtracted
from the acceleration traces to remove any spurious film-movement
effects. The axis of zero acceleration is determined. The
time-mark traces are used to obtain an accurate time scale. The
starting times of the acceleration channels are adjusted so any time
phasing error from one channel to another is less than 0.02 sec
(i.e., less than one time increment in the Vol. II data). The
instrument sensitivities are used to scale ordinate values to
accelerations. The length of the record processed in this report is
40 or 60 seconds depending on the duration of motion.

5. Vol. II Processing. The Vol. I acceleration data are
interpolated to obtain exactly 200 pts/sec sampling (100 Hz Nyquist
frequency). The instrumental data are corrected to true
acceleration using a simple finite-difference based instrument
correction operator. A high-frequency Ormsby filter with a corner
frequency of 23 Hz and a roll-off termination frequency of 25 Hz is
applied. The data are then decimated to 50 pts/sec (25 Hz Nyquist).
As discussed in Shakal and Ragsdale (1984), this order (instrument
correction prior decimation) improves the accuracy of the instrument
correction procedure at high frequencies while still using the same
simple operator used in the original Caltech code (Trifunac and Lee,
1973). The acceleration data are initially corrected for
long-period errors by using a low-frequency Ormsby filter with a
ramp from 0.05 to 0.07 Hz. Velocity and displacement are integrated
from acceleration and filtered using the same low-frequency Ormsby
filter as for the acceleration. To prevent the introduction of
spurious long-period energy through aliasing, an Ormsby filter
rather than a running mean filter is used prior to the decimation
associated with the long period filtering (Shakal, 1982; Shakal and
Ragsdale, 1984).

6. Vol. III Processing. The response spectra for periods from
0.04 to 15 seconds and damping values of 0, 2, 5, 10 and 20 per cent
of critical are calculated from the accelerations obtained in step 5. The Fourier amplitude spectral values are also computed for these periods. A preliminary plot of the pseudo-velocity (PSV) response spectrum is generated for use in filter selection.

7. The Vol. II Processing of Step 5 is repeated, but with a new low-frequency Ormsby filter to remove long-period noise in the record. The corner frequency of the filter used depends on the signal-to-noise ratio in the record and the noise level of the digitizing system. The long-period intersection of the PSV spectrum obtained in Step 6 and the CSMIP system average noise spectrum shown in Fig. 2 (from Shakal and Ragadale, 1984) indicates the long-period limit of useful information. An iterative procedure is used, with the filter corner being set at progressively shorter periods in order to remove the long period noise while preserving as much of the signal as possible. The final value of the filter corner used is shown on the titles of the plots. The acceleration, velocity and displacement time histories obtained using this filter are the final Vol. II data written on a magnetic tape and presented in this report.

8. The final relative velocity response spectrum (SV), relative displacement response spectrum (SD), absolute acceleration response spectrum (SA), and Fourier amplitude spectrum (FS) are computed using the final filter settings. The pseudo-velocity response spectra (PSV) computed from SD are plotted on tripartite logarithmic paper and presented in this report. In addition, the SA spectra are plotted versus period with a linear scale.

Note that the optimal filter corner is obtained for each accelerogram; all accelerograms from a single earthquake are not
Fig. 2. Noise-level spectra (PSV, 20% damping) for the CSMIP digitization system (from Shakal and Ragsdale, 1984).
restricted to have a single filter corner frequency. However, the same filter corner is used for all channels from a single accelerogram to make channel-to-channel comparisons convenient.

As discussed above, Fig. 2 shows the average noise spectrum for the CSMIP digitization system. It is also useful to consider the noise characteristics in terms of actual time-domain amplitudes. Fig. 3 shows typical noise amplitudes present in acceleration, in velocity, and in displacement time histories obtained for different long-period filter cutoff settings. For example, Fig. 3 indicates that for a filter cutoff near 10 seconds, the expected noise level is near 0.002 g in acceleration, 1 cm/sec in velocity, and 1 cm in displacement.
REFERENCES

Earthquake Engineering Research Institute Newsletter, Vol. 20, No. 8 & 9, August and September, 1986.

Hart, E., 1986, personal communication, California Division of Mines and Geology.


DATA AVAILABILITY

The processed data for the CSMIP ground-response records presented in this report are available on two magnetic tapes, one containing Vol. I data (named PALMSPRINGS86-IG) and the other Vol. II and III data (PalmSprings86-G). They are written in a standard CSMIP format similar to that of the Caltech tapes, documented in Shakal and Huang (1985). These tapes are available in standard ASCII or EBCDIC blocked (unlabeled) coding, and can be obtained at nominal cost from this office:

Office of Strong Motion Studies
Division of Mines and Geology
California Department of Conservation
630 Bercut Drive, Sacramento, California 95814

Phone: (916) 322-3105
APPENDIX

PLOTS OF PROCESSED DATA

Organization and Order of Plots

In this appendix, the processed data plots and related information for each station are presented in the following order:


2. Uncorrected accelerograms (Vol. I data). The three components of the acceleration for the first 12 seconds are plotted with a common scaling factor and a common 22-second time axis length (which corresponds to a time scale of approximately 1 second per centimeter, like an SMA film record). This plot is followed by another plot of the full processed length (40 or 60 seconds) with each component individually scaled.

3. Instrument and baseline-corrected acceleration, velocity and displacement (Vol. II data). The filter frequencies used are indicated on the plots. One 22-second plot per component, plotted with equal scaling for all three components. For some stations with longer-duration signal, this is augmented by a 40- or 60-second plot.

4. Absolute acceleration response spectra (Vol. III data). The absolute acceleration (Sa) spectra for 0%, 2%, 5%, 10%, and 20% dampings are plotted against period for periods from 0 to 2 seconds, all three components on a single page, with linear-linear scaling.

5. Response and Fourier amplitude spectra (Vol. III data). One spectral plot per component. The spectra are plotted for periods from 0.04 second (25 Hz) to the period used in the final long-period filters used in the Vol. II processing.
DESERET HOT SPRINGS
Palm Springs Earthquake  July 8, 1986  02:20 PDT  
Desert Hot Springs

Uncorrected Accelerogram  12149-51832-86189.01  101786.1437-QP86A149

CHN 1: 90 Deg  MAX = 0.274 G

CHN 2: Up  MAX = 0.563 G

CHN 3: 0 Deg  MAX = 0.330 G

Time (Sec)  Acceleration (G)
Palm Springs Earthquake July 8, 1986 02:20 PDT
Desert Hot Springs CHN 1: 90 Deg
Instrument-corrected and Bandpass-filtered Acceleration, Velocity and Displacement
Filter Band: 0.016 to 23.0 to 25.0 Hz
12149-51832-86189.01 101786.1611-QF86A149

Max = 283.8

Max = -18.5

Max = 4.34
Palm Springs Earthquake, July 8, 1986 02:20 PDT
Desert Hot Springs
CHN 1: 90 deg
Accelerogram Bandpass-Filtered with Ramps at 0.08-0.16 to 13.0-25.0 Hz.
12149-51832-8686.01 101786.1634-QP86A149

Response spectra: PSV, PSA & SD
Fourier amplitude spectrum: FS
Damping values: 0.2, 5, 10, 20%
Palm Springs Earthquake July 8, 1986 02:20 PDT
Desert Hot Springs
CHN 2: UP
Accelerogram bandpass-filtered with ramps at 0.08-16 to 23.0-25.0 Hz.
12145-51832-86189.01 101786.1634-OPB6A149

Response Spectra: 
PSV, PSA & SD
Fourier Amplitude Spectrum: FS
Damping Values: 0.2, 5.10, 20%
PALM SPRINGS - AIRPORT
RESPONSE SPECTRA: PSV, PSA & SD
FOURIER AMPLITUDE SPECTRUM: FS

RESPONSE SPECTRA:

PSA (G)
SD (IN)
SD (CM)

PSV/FS (IN/SEC)
PSV/FS (CM/SEC)

PERIOD (SEC)
FREQUENCY (HZ)
SILENT VALLEY - POPPET FLAT
Palm Springs Earthquake  July 5, 1986  02:20 PDT
Silent Valley - Poppet Flat
Uncorrected Accelerogram  1Z206-51866-86192.01  082886.1218-QP86A206

CHN 1: 90 DEG  MAX = 0.119 G

CHN 2: UP  MAX = -0.099 G

CHN 3: 0 DEG  MAX = -0.145 G

ACCELERATION (G)

TIME (SEC)
Palm Springs Earthquake
July 8, 1986
00:20 PDT
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity, and Displacement
Filter Band: 0.05 to 20.0 Hz
12206-5165-6192-01 09386-1821-5199-01
MAX = 107.1

TIME (SEC)
0 5 10
ACCELERATION (g)
0 -5 -10

VELOCITY (cm/sec)
0 -5 -10

DISPLACEMENT (cm)
0 -5 -10
PALM SPRINGS EARTHQUAKE JULY 8, 1986 02:20 PDT
SILENT VALLEY - POPPET FLAT CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 20-40 TO 23.0-25.0 HZ 12206-S1868-B6191.01 090386.1821-QP86A206

ACCELERATION (cm/sec/sec)
MAX = -102.6

VELOCITY (cm/sec)
MAX = 3.02

DISPLACEMENT (cm)
MAX = 0.23

TIME (SEC)
0 5 10 15 20
RESPONSE SPECTRA: PSV, PSA & SD
FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0, 2, 5, 10, 20%
SAN JACINTO - SOBOBA
PALM SPRINGS EARTHQUAKE  JULY 6, 1986  02:20 PDT
SAN JACINTO - SOBOBA  CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 15-30 TO 23.0-25.0 HZ.  12204-51863-86191.01  102086.1623-QPB6A204

ACCELERATION (CM/SEC/SEC)

MAX = -237.8

VELOCITY (CM/SEC)

MAX = -9.27

DISPLACEMENT (CM)

MAX = -1.06

TIME (SEC)
Palm Springs Earthquake July 8, 1986 02:20 PDT
San Jacinto - Soboba CHN 2: UP
Instrument-corrected and bandpass-filtered acceleration, velocity and displacement
Filter band: 15.30 to 23.0 -25.0 Hz. 12284-S1863-86191:01 102086.1623-EP862A04

Max = 185.1
Max = 6.41
Max = -0.76
PALM SPRINGS EARTHQUAKE JULY 8, 1986 02:20 PDT
SAN JACINTO - SOBOA CHN 3: 0 DEC
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 15-30 TO 23.0-25.0 HZ. 12204-51863-86191.01 102086.1623-QP86A204

ACCELERATION (CM/SEC/SEC)

MAX = -237.5

VELOCITY (CM/SEC)

MAX = -9.46

DISPLACEMENT (CM)

MAX = 1.10

TIME (SEC)
Palm Springs Earthquake July 8, 1986 02:20 PDT
San Jacinto - Soboba
CYN 1: 90 DEG

Accelerogram bandpass-filtered with ramps at 15-30 to 23.0-25.0 Hz.
12204-S1863-8619101 110386.1604-QP6A204

Response spectra: PSV, PSA & SD  —  Fourier amplitude spectrum: FS
Damping values: 0, 2, 5, 10, 20%
Palm Springs Earthquake July 8, 1986 02:20 PDT
San Jacinto - Soboba
CHN 2: UP
Accelerogram bandpass-filtered with ramps at 0.15-0.30 to 23.0-25.0 Hz.
12204-51863-86191.01 110386.1604-QF6A204

Response Spectra: PSV, PSA & SD
Fourier Amplitude Spectrum: FS
Damping Values: 0.2 5 10 20%

Frequency (Hz)

PSV, FS (in/sec)

Period (Sec)
RESPONSE SPECTRA: PSA, PSA & SD
FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0, 2.5, 10, 20%
SAN JACINTO - VALLEY CEMETERY
PALM SPRINGS EARTHQUAKE JULY 8, 1986 02:20 PDT
SAN JACINTO - VALLEY CEMETERY CHN 1: J60 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 15 - 30 TO 23.0 - 25.0 HZ.
12202-S1864-86190 01 090286 2158-DF86A202

ACCELERATION (CPS/SEC²)

VELOCITY (CPS/SEC)

DISPLACEMENT (CM)

MAX = 62.1

MAX = 4.02

MAX = 0.71

TIME (SEC)
Palm Springs Earthquake  July 8, 1986  02:20 PDT
San Jacinto - Valley Cemetery  CHN 3: 270 Deg
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity and Displacement
Filter Band: 15.0-30 to 23.0-25.0 Hz.  12202-51664-86190.01  090286.2158-QP86A202

Max = 63.9

Max = -3.01

Max = -0.56
Palm Springs Earthquake: July 8, 1986 02:20 PDT
San Jacinto - Valley Cemetery
CHN 3: 270 Deg
Accelerogram Bandpass-Filtered with Ramps at 0.15-30 to 0.0-25.0 Hz.
122202-51864-86190.01 092286.1756-GP86A202

Response Spectra: PSV, PSA & SD
Fourier Amplitude Spectrum: FS
Damping Values: 0.2, 5, 10, 20%
HEMET - STETSON AVE FIRE STATION
PALM SPRINGS EARTHQUAKE JULY 8, 1986 02:20 PDT
HEMET - STETSON AVE FIRE STATION CHN 1: 360 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 20-40 TO 23.0-25.0 HZ  12331-S2572-B6191.01  060187.1213-QP86A331

-1000
0
1000

200
0
-200

6
0
-6

6
0
-6

0
1
-1

0 10 20 30 40 50 60
TIME (SEC)
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Hemei - Stetson Ave Fire Station  CHN 3  270 Deg
Instrument-corrected and Bandpass-filtered Acceleration, Velocity, and Displacement
Filter Band:  20.0–40.0 to 23.0–25.0 Hz  12331-52572-86191.01  060187.1213-0P6A3J1

MAX = -129.7

MAX = 4.80

MAX = 0.83
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Hemet - Stetson Ave Fire Station
CHN 1: 360 Deg
Accelerogram Bandpass-Filtered with Ramps at .20-.40 10 23.0-25.0 Hz
12331-52572-86191.01  060187-1233-QP86A331

Response spectra: PSA, PSA & SC — Fourier Amplitude spectrum: FS
Damping values: 0, 2, 5, 10, 20%
RESPONSE SPECTRA: PSV, PSA & SD

FOURIER AMPLITUDE SPECTRUM: FS

DAMPING VALUES: 0.2, 5, 10, 20%

FREQUENCY (HZ)

PSA (G)

PSV (IN/SEC)

SD (IN)

SD (OM)

PERIOD (SEC)
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Winchester - Page Bros. Ranch  CHN 1: 90 DEG
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity and Displacement
Filter Band: 20-0.40 to 23.0-25.0 Hz.  13201-S1859-86190.01  0903B6.1926-0P86A201

Acceleration (cm/sec/sec)
Velocity (cm/sec)
Displacement (cm)

Time (sec)
PALM SPRINGS EARTHQUAKE  JULY 8, 1986  02:20 PDT
WINCHESTER - PAGE BROS. RANCH
ACCELEROMETER BANDPASS-FILTERED WITH ROLLS AT 2.0-40 TO 23.0-25.7 HZ.
13201-51859-86190.01  D40887.0820-01A, M5844G

CHN 1: 90 DEG
DAMPING VALUES: 0.2, 0.2%

CHN 2: UP
DAMPING VALUES: 0.2, 0.19%

CHN 3: 0 DEG
DAMPING VALUES: 0.2, 0.19%
RESPONSE SPECTRA: PSV, PSA & SD
- FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0, 2.5, 10, 20%

FREQUENCY (HZ)

PSV (IN/SEC)

PSA (G)

SD (IN)

SD (CM)

PERIOD (SEC)

10^{-3}

10^{-2}

10^{-1}

10^{0}

10^{1}

10^{2}

10^{3}

10^{4}

10^{5}

10^{6}

10^{7}

10^{8}

10^{9}

10^{10}

10^{11}

10^{12}
WINCHESTER - HIDDEN VALLEY FARMS
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Winchester - Hidden Valley Farms
Uncorrected Accelerogram 13200-S1871-86191.01  052987.1407-QP86A200

Channel 1: 360 Deg  Max = 0.079 G
Channel 2: Up  Max = 0.043 G
Channel 3: 270 Deg  Max = 0.089 G

Time (Sec)
Palm Springs Earthquake July 8, 1986 02:20 PDT
Winchester - Hidden Valley Farms CHN 2: UP
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity and Displacement
Filter Band: 0.5- to 2.0-25.0 Hz 13200-51871-06191.01 052987.1429-QP86A200

Max = 36.3

Max = -0.81

Max = -0.06

Time (Sec)
Palm Springs Earthquake
July 6, 1986 02:20 PDT
Winchester - Hidden Valley Farms
CHN 1: 360 Deg
Accelerogram bandpass-filtered with ramps at 0.3-60 to 23.0-25.0 Hz.
13200-51871-86191.01 052987.1443-QP64200

Response spectra: PSV, PSA & SD
Fourier amplitude spectrum: FS
Damping values: 0.2, 5, 10, 10%
WINCHESTER - BERGMAN RANCH
PALM SPRINGS EARTHQUAKE  JULY 8, 1986  02:20 PDT
WINCHESTER - BERGMAN RANCH  CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 30-60 TO 23.0-25.0 HZ  13199-S1862-86191.01  040887.1806-QP86A199
RESPONSE SPECTRA: PSV, PSA & SD

FOURIER AMPLITUDE SPECTRUM: FS

DAMPING VALUES: 0.2, 5, 10, 20%
RESPONSE SPECTRA: PSV, PSA & SD

FOURIER AMPLITUDE SPECTRUM: FS

DAMPING VALUES: 0, 2, 5, 10, 20%
MURRIETA HOT SPRINGS - COLLINS RANCH
Palm Springs Earthquake  July 8, 1986  02:20 PDT
MURRIETA HOT SPRINGS – COLLINS RANCH  CHN 1: 90 DEG
Instrument-corrected and Bandpass-Filtered Acceleration, Velocity and Displacement
Filter Band: 1.0-80 TO 23.0-25.0 Hz  13198-51873-86191.01  041387.1644-QP86A198

Acceleration

Velocity

Displacement

Max = 49.4

Max = 1.30

Max = -0.11

Time (sec)

0  5  10  15  20
LANDERS - FIRE STATION
Palm Springs Earthquake July 8, 1986 02:20 PDT
Landers
CHN 1: 90 Deg
Accelerogram Bandpass-filtered with ramps at .30-.60 to 23.0-25.0 Hz.
22113-52587-86190.01 043087.1551-0P66A113

--- Response Spectra: PSA, PSA & SD --- Fourier Amplitude Spectrum: TS
Damping Values: 0, 2.5, 10, 20%

--- Graph ---
Palm Springs Earthquake July 8, 1986 22:20 PDT
Landers
CHN 2: Up
Accelerogram Bandpass-Filtered with Ramps at 0.30-60 to 23.0-25.0 Hz.
22713-52687-86100 01 043087.1551-QP84AT13

Response spectra: PSV, PSA, & SD
Fourier Amplitude Spectrum: FS
Damping Values: 0, 2.5, 10, 20%

Frequency (Hz)

PSA (g)
SD (in)
SD (cm)

Period (sec)
ACCELEROMETER BANDPASS-FILTERED WITH RAMPS AT 30-60 TO 23.0-25.0 HZ.

RESPONSE SPECTRA: PSV, PSA & SD

FOURIER AMPLITUDE SPECTRUM: FS

DAMPING VALUES: 0.2. 5. 10. 20%
JOSHUA TREE - FIRE STATION
PALM SPRINGS EARTHQUAKE  JULY 8, 1986  02:20 PDT
JOSHUA TREE  CHN 1:  90 DEG

INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND:  20-40 TO 23.0-25.0 HZ.  Z2170-S1612-B6190.01 041467.1036-DF86A170

MAX = 63.6

MAX = -3.95

MAX = -0.59
Palm Springs Earthquake - July 8, 1986 02:20 PDT
Joshua Tree CHN 1: 90 deg
Instrument-corrected and bandpass-filtered acceleration, velocity, and displacement.
Filter band: 20.40 to 23.0-25.0 Hz. 22170-51612-86190.01 041487.1036-0886A170

Max = 63.6
Max = -3.95
Max = -0.59

Time (sec)
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Joshua Tree  CHN 2: UP
Instrument-corrected and bandpass-filtered acceleration, velocity and displacement
Filter band: 20-40 to 23.0-25.0 Hz
22170-51612-86190.01 041487.1036-QPB6A170

MAX = -0.6

MAX = 3.82

MAX = 0.59
RESPONSE SPECTRA: PSV, PSA & SD
FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0.2, 5, 10, 20%
RESPONSE SPECTRA: PSV, PSA & SD
FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0.2, 5, 10, 20%
INDIO - COACHELLA CANAL
Palm Springs Earthquake July 8, 1986 02:20 PDT
Indio - Coachella Canal CHN 1: 90 Deg
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity, and Displacement
Filter Band: 15-30 Hz to 23.0-25.0 Hz. 12026-51839-86189.01 041787.1939-QP86A026

Max = -40.3

Max = 3.74

Max = -0.97

Time (sec)
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Indio - Coachella Canal  CHN 2: UP
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity and Displacement
Filter Band: 15-30 to 23.0-25.0 Hz
12026-51839-86189.01  041787.1939-QP66A026

Max = 48.7
Max = -2.13
Max = -0.53

Time (Sec)
RESPONSE SPECTRA: PSA, PSV, & SD
- FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0, 2, 5, 10, 20%
TEMECULA - CDF FIRE STATION
PALM SPRINGS EARTHQUAKE  JULY 8, 1986  02:20 PDT
TEMECULA - CDF FIRE STATION  CHN 1:  90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND:  20.4 - 40.0 TO 23.0 - 25.0 HZ.  13172-55090-86195.01  041587.1854-QP86A172

ACCELERATION (CM/SEC/SEC)

VELOCITY (CM/SEC)

DISPLACEMENT (CM)

MAX = 96.2

MAX = -5.36

MAX = 0.73

TIME (SEC)
Palm Springs Earthquake July 8, 1986 02:20 PDT
Temecula - CDF Fire Station CHN 1: 90 Deg
Instrument-corrected and Bandpass-filtered Acceleration, Velocity and Displacement
Filter Band: 20-40 to 23.0-25.0 Hz
13172 SS090-86195.01 041587.1854-DP86A172

MAX = 96.2

MAX = -5.36

MAX = 0.73
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Temecula - COF Fire Station
Accelerogram Bandpass-Filtered with Ramps at 20-40 to 23.0-25.0 Hz.
13172-55090-BE195.01  050185  D010-OPALMSPREG

Chn 1: 90 Deg
Damping Values: 6.25, 10.20%

Chn 2: Up
Damping Values: 6.25, 10.20%

Chn 3: 0 Deg
Damping Values: 6.25, 10.20%
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Temecula - CDF Fire Station
CHN 1: 90 deg
Accelerogram bandpass-filtered with ramps at .20-.40 to 23.0-35.0 Hz.
13172-S5090-87195.01 050187.0910-QF86A172

Response spectra: PSA, PSA & SD
- - - Fourier amplitude spectrum: FS
Damping values: 0, 2.5, 10, 20%
RESPONSE SPECTRA: PSS, PSA & SD  —— FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0, 2, 5, 10, 20%
RESPONSE SPECTRA: PSA, PSV & SD

FORIER AMPLITUDE SPECTRUM: FS

DAMPING VALUES: 0.2, 5, 10, 20%
PUERTA LA CRUZ
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Puerta La Cruz
Uncorrected Accelerogram  12168-S1843-86191.01  041587.1334-QP86A168

CHN 1: 348 Deg
MAX = -0.061 G

CHN 2: Up
MAX = -0.044 G

CHN 3: 258 Deg
MAX = -0.077 G

Acceleration (g)

Time (Sec)
Palm Springs Earthquake
July 8, 1986 02:20 PDT
Puerta La Cruz
Channel 1: 348 Deg
Instrument-corrected and bandpass-filtered acceleration, velocity and displacement
Filter Band: 0.40-80 to 23.0-25.0 Hz
12168-S1843-86191.01 052087.1351-QB86A168

Max = 0.36

Max = 1.67

Max = 0.13

0 5 10 15 20
Time (sec)

0 0.4
Displacement (cm)

0 0.4
Velocity (cm/sec)

0 0.4
Acceleration (cm/sec^2)
Palm Springs Earthquake | July 8, 1986 | 02:10 PDT
Puerta La Cruz | CHN 2: UP
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity and Displacement
Filter Band: 40.80 to 23.0-25.0 HZ | 12168-51843-86191.01 | 052087.1351-0PB6A16B

Max = 39.4
Max = 1.78
Max = 0.16

Graphs showing acceleration, velocity, and displacement over time.
RESPONSE SPECTRA: PSV, PSA & SD
FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0.2, 5, 10, 20%
112

Palm Springs Earthquake, July 8, 1986, 02:20 PDT

Uncorrected Accelerogram, 1313-0135-56/7890.01, 02:18:37, 018-0896123

Max = -0.041 G

Max = -0.025 G

Max = -0.003 G

CHN 1: 270 Deg

CHN 2: Up

CHN 3: 180 Deg

Acceleration (g)

Time (sec)
Palm Springs Earthquake  July 8, 1986  02:20 PDT
Riverside - Airport  CHN 1: 270 Deg
Instrument-corrected and Bandpass-filtered Acceleration, Velocity and Displacement
Filter band: 40-80 to 23.0-25.0 Hz  13123-S1593-86190.01  041787.1114-QP86A123
RESPONSE SPECTRA: PSA, PSV, PSA & ID
FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0.2, 5, 10, 20%
PALM SPRINGS EARTHQUAKE    JULY 8, 1986    02:20 PDT
HESPERIA    CHN 1: 92 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 20–40 TO 23.0–25.0 HZ.  23321-52562-86190:01  041587.2330-GP86A321

ACCELERATION
(OM/SEC/SEC)

VELOCITY
(OM/SEC)

DISPLACEMENT
(OM)

TIME [SEC]

MAX = 34.4

MAX = -1.34

MAX = 0.19
PALMSpringsEarthquake    JULY 8, 1986 02:20 PDT
HESPERIA CHN 2: UP
INSTRUMENT-Corrected AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 20-40 TO 23.0-25.0 HZ.  23321-52562-86190.01  041587.2330-QP86A321

MAX = 33.4

MAX = -1.19

MAX = 0.28
Palm Springs Earthquake
July 8, 1986 02:10 PDT
Hesperia
CHN 1: 92 DEG
Accelerogram bandpass-filtered with ramps at 0.2 to 0.4 Hz to 23.0-25.0 Hz.
2321-52562-86190.01 060287.117-QP86A321

Response spectra: PSD, PSA & SD
Fourier amplitude spectrum: FS
Damping values: 0.2, 5, 10, 20%

Frequency (Hz)

PSA (g)
SD (in)
SD (cm)

Period (sec)

PSV/FS (in/sec)
PSV/FS (cm/sec)
RESPONSE SPECTRA: PSA, PSA & SD
FOURIER AMPLITUDE SPECTRUM: FS
DAMPING VALUES: 0.2, 5, 10, 20%
Note: The vertical sensor malfunctioned during the earthquake.
PALM SPRINGS EARTHQUAKE    JULY 8, 1986 02:20 PDT
RANCHO CUCAMONGA - LAW & JUSTICE BLDG.  CHN 4 (STA CHN 17): 90 DEG (FREE FIELD)
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: 40–80 TO 23.0–25.0 HZ.  23497-C0118-86189.01  082786.2220-QPALMSP86G

MAX = 19.6

MAX = 0.78

MAX = 0.11
Palm Springs Earthquake
JULY 8, 1986 02:20 PDT
Rancho Cucamonga — Law & Justice Bldg
CHN 6 (STA CHN 19): 0 DEG (FREE FIELD)
Instrument-Corrected and Bandpass-Filtered Acceleration, Velocity and Displacement
Filter Band: 40-80 Hz
23497-C0118-86189.01 082786.2220-DPALWSP86G

Max = 20.4
Max = 0.91
Max = 0.10

Time (sec)
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Catalog of Strong Motion Accelerograph Records Recovered by Office of Strong Motion Studies During 1982

Catalog of Strong Motion Accelerograph Records Recovered by Office of Strong Motion Studies before January 1, 1982

II. Processed Data Reports:

Processed Strong Motion Data from the San Salvador Earthquake of October 10, 1986

Processed Data from the Strong-Motion Record Obtained at a Base-Isolated Building in Rancho Cucamonga, California during the Redlands Earthquake of 2 October 1985

Processed Data from Strong-Motion Records of the Morgan Hill Earthquake of 24 April 1984: Part I Ground-Response Records

Processed Data from Strong-Motion Records of the Morgan Hill Earthquake of 24 April 1984: Part II Structural-Response Records

Processed Data from the Strong-Motion Records of the Imperial Valley Earthquake of 15 October 1979. Final Results

Processed Data from the San Juan Bautista 101/156 Separation Bridge and the San Juan Bautista Freefield Records from the Coyote Lake Earthquake 6 August 1979

Processed Data from the Gilroy Array and Coyote Creek Records, Coyote Lake, California, Earthquake 6 August 1979 (Note: Does not include San Juan Bautista records)

Processed Data from the Strong-Motion Records of the Santa Barbara Earthquake of 13 August 1976. Final Results (in three volumes)

III. Other Reports:

Standard Tape Format of CSMP Strong-Motion Data Tape

California Strong-Motion Instrumentation Program: Construction and Installation Notes for a Ground-Response Station.

There is a nominal charge for these reports.
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<td>Santa Barbara earthquake of 13 August 1978; Vol. 1, 2, and 3 data.</td>
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<td>IMPERIAL79</td>
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<td>(County Services Bldg. and other CSIMF stations); Vol. 1, 2, and 3 data.</td>
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<td>COYOTE79A</td>
<td>Coyote Lake earthquake of 6 August 1979, Gilroy</td>
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<td>Array stations; Vol. 1, 2, and 3 data.</td>
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<td>Bautista overpass and nearest free-field station; Vol. 1, 2, and 3 data.</td>
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<td>Valley station; Vol. 1, 2, and 3 data.</td>
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<td>Mammoth Lakes earthquakes of 25 May 1980 at 09:34 and 09:49 PDT</td>
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<td>Mammoth Lakes earthquakes of 25 May 1980 at 12:45 and 13:36 PDT</td>
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<td>COALINGA83</td>
<td>Coalinga earthquake of 2 May 1983, 10:43 PDT;</td>
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<td>Vol. 2 and 3 data for 47 records.</td>
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<td>COALINGA83AS</td>
<td>Vol. 2 and 3 data for eight aftershocks of the</td>
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<td>Coalinga 2 May 1983 earthquake. The aftershocks</td>
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<td>occurred between 8 May and 11 September 1983,</td>
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<td>and were of magnitude (ML) 4.3 - 6.0.</td>
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<td>COALINGA83AS-I</td>
<td>Uncorrected acceleration data (Vol. 1) for the</td>
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<td>Coalinga aftershock records included on the tape</td>
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<td>COALINGA83AS.</td>
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<td>RIOBEL803</td>
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<td>8 Nov 1980 (6.5ML Trinidad-Offshore); 16 Dec 1982 (4.9ML</td>
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<td>Offshore); Vol. 1, 2, and 3 data.</td>
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<td>MAMMOTH83</td>
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<td>01:38 and 03:24 GMT; Vol. 1, 2, and 3 data.</td>
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MORGANHILL84-JG  Morgan Hill earthquake of 24 April 1984; Vol. 1 data for 19 ground-response records.
MORGANHILL84-G  Morgan Hill earthquake of 24 April 1984; Vol. 2 and 3 data for 19 ground-response records.
MORGANHILL84-S  Morgan Hill earthquake of 24 April 1984; Vol. 2 and 3 data for 9 structural-response records.
REDLANDS85  Redlands earthquake of 2 October 1985; Vol. 1, 2 and 3 data for the Law & Justice Building at Rancho Cucamonga.
HOLLISTER86  Hollister earthquake of 26 January 1986; Vol. 1, 2 and 3 data.
MTLEWIS86  Mt. Lewis earthquake of 31 March 1986; Vol. 1, 2 and 3 data.
SANALVADOR86  San Salvador earthquake of October 10, 1986; Vol. 1, 2 and 3 data.

Footnotes:
Vol. 1 data - uncorrected accelerations.
Vol. 2 data - instrument and baseline-corrected acceleration, velocity, and displacement.
Vol. 3 data - response and Fourier amplitude spectra.

The magnetic tapes are provided at cost. Included with each tape is a copy of either the processed data report (if available) or the plots of the data.

Requests for the reports and data tapes and/or for additional information should be addressed to:
Office of Strong Motion Studies
California Division of Mines and Geology
630 Barron Drive
Sacramento, CA 95814
Phone: (916) 322-3105

12/86
Tape: SANTIBARR78
Santa Barbara Earthquake of 13 Aug 1978, 15:54 PDT, ML=5.1(CIT)
UCSB Goleta Free Field, 3 channels
Santa Barbara - UCSB North Hall, 9 channels
Santa Barbara - Freitas Building, 9 channels
Ventura - Holiday Inn, 15 channels

Tape: IMPERIAL79
Imperial Valley Earthquake of 15 Oct 1979, 16:17 PDT, ML=6.6(CIT)
Niland, 3 channels
Westmorland, 3 channels
Westmorland, aftershock record, 3 channels
El Centro - Imperial County Services Bldg. Free Field, 3 channels
El Centro - Imperial County Services Building, 13 channels
El Centro - Highway 8/Eastland Road Overpass, 13 channels

Tape: COYOTE79A
Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BBK)
Gilroy #1, 3 channels
Gilroy #2, 3 channels
Gilroy #3, 3 channels
Gilroy #4, 3 channels
Gilroy #6, 3 channels
Coyote Lake Dam (San Martin), 3 channels

Tape: COYOTE79B
Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BBK)
San Juan Bautista - Fire Station, 3 channels
San Juan Bautista - Highway 101/156 Overpass, 12 channels

Tape: COYOTE79C
Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BBK)
Halls Valley, 3 channels

12/86
- Convict Creek, 3 channels
- Long Valley Dam, 22 channels
- Mammoth Lakes - High School Gym, 10 channels

Aftershock at 25 May 1980, 09:36 PDT, ML=unknown
- Mammoth Lakes - High School Gym, 10 channels

Mammoth lakes Earthquake of 25 May 1980, 09:49 PDT, ML=6.0(BRK), 5.8(CIT)
- Convict Creek, 3 channels
- Long Valley Dam, 3 channels
- Mammoth Lakes - High School Gym, 4 channels

 Tape: MAMMOTH80B

Mammoth Lakes Earthquake of 25 May 1980, 12:45 PDT, ML=6.1(BRK), 6.5(CIT)
- Convict Creek, 3 channels
- Long Valley Dam, 19 channels

Mammoth Lakes Earthquake of 25 May 1980, 13:36 PDT, ML=5.7(BRK), 5.5(CIT)
- Convict Creek, 3 channels
- Long Valley Dam, 19 channels

Aftershock approx 58 seconds after 25 May 1980, 13:36 Event, ML=unknown
- Convict Creek, 3 channels

 Tape: MAMMOTH80C

Mammoth Lakes Earthquake of 26 May 1980, 11:58 PDT, ML=5.7(BRK), 4.0(CIT)
- Convict Creek, 3 channels
- Long Valley Dam, 5 channels

Mammoth Lakes Earthquake of 27 May 1980, 07:51 PDT, ML=6.2(BRK), 6.3(CIT)
- Convict Creek, 3 channels
- Long Valley Dam, 22 channels
- Bishop - Paradise Lodge, 3 channels
- Benton, 3 channels

 Tape: WESTM0R81

Westmorland Earthquake of 26 Apr 1981, 05:09 PDT, ML=5.7(CIT), 6.3(BRK)
- Westmorland, 3 channels
- Niland, 3 channels

12/86
Coalinga Creek School, 3 channels
Slack Canyon, 3 channels
Parkfield - Vineyard Canyon 2E, 3 channels
Parkfield - Vineyard Canyon 1E, 3 channels
Parkfield - Vineyard Canyon 1W, 3 channels
Parkfield - Vineyard Canyon 2W, 3 channels
Parkfield - Vineyard Canyon 3W, 3 channels
Parkfield - Vineyard Canyon 4W, 3 channels
Parkfield - Vineyard Canyon 5W, 3 channels
Parkfield - Vineyard Canyon 6W, 3 channels
Parkfield - Gold Hill 3E, 3 channels
Parkfield - Gold Hill 2E, 3 channels
Parkfield - Gold Hill 1W, 3 channels
Parkfield - Gold Hill 2W, 3 channels
Parkfield - Gold Hill 3W, 3 channels
Parkfield - Gold Hill 4W, 3 channels
Parkfield - Gold Hill 5W, 3 channels
Parkfield - Gold Hill 6W, 3 channels
Parkfield - Stone Corral 4E, 3 channels
Parkfield - Stone Corral 3E, 3 channels
Parkfield - Stone Corral 2E, 3 channels
Parkfield - Stone Corral 1E, 3 channels
Parkfield - Cholame 3E, 3 channels
Parkfield - Cholame 2E, 3 channels
Parkfield - Cholame 1E, 3 channels
Parkfield - Cholame 2A, 3 channels
Parkfield - Cholame 3W, 3 channels
Parkfield - Cholame 4W, 3 channels
Parkfield - Cholame 4A, 3 channels
Parkfield - Cholame 5W, 3 channels
Parkfield - Cholame 6W, 3 channels
Parkfield - Cholame 8W, 3 channels
Parkfield - Cholame 12W, 3 channels
Parkfield - Fault Zone 16, 3 channels
Parkfield - Fault Zone 15, 3 channels
Parkfield - Fault Zone 14, 3 channels
Parkfield - Fault Zone 13, 3 channels
Parkfield - Fault Zone 12, 3 channels
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Parkfield - Fault Zone 8, 3 channels
Parkfield - Fault Zone 7, 3 channels
Parkfield - Fault Zone 6, 3 channels
Parkfield - Fault Zone 4, 3 channels
Parkfield - Fault Zone 3, 3 channels
Parkfield - Fault Zone 2, 3 channels
Parkfield - Fault Zone 1, 3 channels

* Tape COALINGA83 contains the Vol. 2 and 3 data for the listed accelerograms; the corresponding Vol. 1 data are on tapes COALINGA83-IA and COALINGA83-IB.
Records from 8 aftershocks of the Coalinga Earthquake of 2 May 1983

Event #2: 8 May 1983, 19:49 PDT, ML=5.1(BRB)

Coalinga - Sulphur Baths, 3 channels
Coalinga - CHF, 3 channels
Anticline Ridge - Palmer Ave., 3 channels
Oil Field - Skunk Hollow, 3 channels
Harris Ranch, 3 channels

Event #3: 10 June 1983, 20:10 PDT, ML=5.1(BRB)
Event #4: 9 July 1983, 00:41 PDT, ML=5.1(BRB)
Event #5: 21 July 1983, 19:40 PDT, ML=6.0(BRB)
Event #6: 21 July 1983, 20:43 PDT, ML=5.0(BRB)
Event #7: 25 July 1983, 15:31 PDT, ML=5.1(BRB)
Event #8: 9 Sept 1983, 02:16 PDT, ML=5.3(BRB)
Event #9: 11 Sept 1983, 04:48 PDT, ML=4.3(BRB)

For each of events #3 through #9:

Coalinga - Sulphur Baths, 3 channels
Coalinga - CHF, 3 channels

Vol. 1 data are on tape COALINGA83AS-I; Vol. 2 and 3 data are on tape COALINGA83AS.

Tape: RIODNL8083

Trinidad Offshore Earthquake of 8 Nov 1980, 02:27 PST, ML=6.9(BRB)

Rio Dell - Highway 101/Painter Street Overpass, 18 channels
Rio Dell - Highway 101/Painter Street Overpass, 15 channels
Cape Mendocino Offshore Earthquake of 24 Aug 1983, 06:36 PDT, ML=5.5(BRB)
Rio Dell - Highway 101/Painter Street Overpass, 15 channels

Tape: MAMMOTH83

Mammoth Lakes Earthquake of 6 Jan 1983, 17:38 PST, ML=5.2(BRB)

Convict Creek, 3 channels
Mammoth Lakes Earthquake of 6 Jan 1983, 19:24 PST, ML=5.4(BRB)

Convict Creek, 3 channels

12/86
Ground-response records from the Morgan Hill Earthquake of
24 Apr 1984, 13:15 PT, ML=6.2(BHK)

Walnut Creek, 3 channels
Concord, 3 channels
Gilroy #7 - Manteil Ranch, 3 channels
Gilroy #6, 3 channels
Gilroy #4, 3 channels
Gilroy #3, 3 channels
Gilroy #2, 3 channels
Gilroy #1, 3 channels
Gilroy - Gavilan College, 3 channels
Corralitos, 3 channels
Capitola, 3 channels
Santa Cruz, 3 channels
San Juan Bautista - Fire Station, 3 channels
Los Banos, 3 channels
Agnew - State Hospital, 3 channels
Redwood City - APEEL #1, 3 channels
San Francisco - International Airport, 3 channels
Fremont - Mission San Jose, 3 channels
Hayward - APEEL #16, 3 channels

Tapes: MORGANHILL84-G, MORGANHILL84-JG

Structural-response records from the Morgan Hill Earthquake of
24 Apr 1984, 13:15 PST, ML=6.2(BHK)

San Jose - Town Park Apartment Towers, 13 channels
San Jose - Great Western Savings Bldg., 13 channels
San Jose - Santa Clara County Bldg., 22 channels
Saratoga - West Valley College Gym, 11 channels
Waterville - Telephone Bldg., 13 channels
Rollins - Glorieta Warehouse, 13 channels
South San Francisco - Kaiser Medical Center, 11 channels
San Juan Bautista - Highway 101/156 Overpass, 10 channels

Tapes: MORGANHILL84-S, MORGANHILL84-IS

Redlands Earthquake of 2 Oct 1985, 16:44 PDT, ML=4.8(CIT)

Rancho Cucamonga - Law & Justice Building (base-isolated),
16 channels plus 3 free field channels

12/86
Tape: HOLLISTER86
Hollister Earthquake of 26 January 1986, 11:21 PST, ML=5.5(BBK)
SAG0 South - Tunnel, 3 channels
SAG0 South - Surface, 3 channels
Hollister - Glorieta Warehouse, 13 channels

Tape: MTLEWIS86
Mt. Lewis Earthquake of 31 March 1986, 03:56 PST, ML=5.0(BBK)
Halls Valley, 3 channels
San Jose - Santa Clara County Bldg., 22 channels
San Jose - Great Western Savings Bldg., 13 channels
San Jose - Town Park Apartment Tower, 13 channels

Tape: SANSALTA86
San Salvador Earthquake of 10 October 1986, 17:47 GMT, MS=5.4(CIG)
National Geographical Institute (IGN), 3 channels
Geotechnical Investigation Center (CIG), 3 channels
Institute Urban Construction (IVU), 2 channels
Hotel Casino Real (HCR) - Basement, 3 channels
Hotel Casino Real (HCR) - 2nd Floor, 3 channels
Hotel Casino Real (HCR) - Roof, 1 channel
Gastro Americas University (UCA), 3 channels
Hotel Sheraton (HSB), 3 channels

12/86