A SELECTION OF IMPORTANT STRONG MOTION EARTHQUAKE RECORDS

David M. Lee
Paul C. Jennings
George W. Housner

REPORT NO. EERL 80-01

A REPORT ON RESEARCH CONDUCTED UNDER A GRANT FROM THE NATIONAL SCIENCE FOUNDATION

PASADENA, CALIFORNIA
JANUARY, 1980
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ABSTRACT

This report is a condensed collection of 45 strong and/or historically important earthquake-generated ground and building motions. These data are presented as accelerogram and integrated velocity and displacement time histories. Linear, absolute acceleration, relative velocity and relative displacement response spectra are given for all the ground motions presented. As a major aim of this report was to allow comparisons of different ground motions, the time history and response spectra plots were plotted, wherever possible, to fixed vertical and horizontal scales.

A short introduction is given to earthquake recording instruments and recording networks using these devices. The sources from which the data in this report were drawn are identified and information given to enable one to obtain printed copies or magnetic tape copies of these data or any of the other earthquake data recorded in the U.S.
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A SELECTION OF IMPORTANT STRONG-MOTION EARTHQUAKE RECORDS

by

David M. Lee
Paul C. Jennings
George W. Housner

INTRODUCTION

In the field of earthquake engineering the real dynamic test of structures occurs when they are subjected to strong ground shaking from a major earthquake. An earthquake provides a full-scale test which may cause damage, or even collapse. Ideally, when a strong earthquake occurs it would be desirable to have many structures instrumented to record the base motions and the resulting structural vibrations. However, not knowing where and when earthquakes will occur and having limited finances for installation and maintenance of instruments, it is only occasionally possible to obtain such recordings in the region of strongest ground shaking. Many more records have been obtained in regions where moderately strong ground shaking has occurred. A study of strong-motion records can be very helpful to engineers in developing an understanding of the nature of earthquake ground shaking and the nature of building response. These records comprise the basic data of earthquake engineering. The accelerograms of strong ground shaking define the forces that would be applied to structures, and the records of structural response define the earthquake behavior of real structures. Such records enable the performance of structures to be judged and the adequacy of building code requirements to be assessed.
The first strong-motion accelerogram was recorded during the Long Beach earthquake of 1933 and since that time several hundred records have been obtained. These records have provided a greatly increased understanding of the significant characteristics of strong ground motion and structural response. The objective of this report is to collect together, from a variety of sources, a set of the more important and commonly used strong-motion records and to present them in a single volume in a form suitable for comparison and study.

The records were selected to include most of the stronger motions obtained in the United States from ground sites and from the basements of buildings, along with other records which illustrate important characteristics of strong ground motion. A representative sample of recorded building responses was also included to illustrate the nature of the responses of structures to strong ground motion.

The data presented are the corrected accelerogram records and the derived velocity and displacement records. Acceleration, velocity and displacement response spectra are given for those accelerograms which were recorded on the ground or in the basements of buildings. The intent of this presentation is to provide engineers and geo-scientists with an informative and useful selection of strong-motion data.

The Strong-Motion Accelerometer

The basic strong-motion recording instrument is the accelerometer of which there are several varieties in use. The most common form records the three mutually perpendicular components of acceleration; such as N-S, E-W and vertical; onto 70 mm photographic film. Also
recorded are reference baseline traces and internally-generated timing marks. The recording sensitivity is most commonly set to record ±1g maximum and the instrument is self starting, triggered by accelerations of about ±0.01g. The transducers in modern accelerometers typically have a natural frequency near 25 Hz and damping of the order of 60 percent of critical. These characteristics enable the instrument to record, without distortion, accelerations whose frequencies range from the very low, up to 25 Hz. Some of the pre-1967 accelerographs had natural frequencies of about 10 Hz and hence could not record the higher frequency ground motions. The electric power for the accelerometers is usually provided by batteries which are kept at peak charge by slow acting chargers connected to standard power outlets. In a reasonably well-maintained network of accelerometers, experience has shown that 90 percent or more of the instruments can be expected to function satisfactorily.

Figure 1 shows typical accelerograms from a strong-motion array.

Instrument Networks

The agency principally responsible for the deployment and maintenance of strong-motion instruments and the processing of the records obtained, is the Seismic Engineering Branch of the U.S. Geological Survey which is funded by the National Science Foundation. This agency installs and maintains its own instruments and performs similar services for instruments owned by other organizations. Another agency which operates a program of similar size and scope is the Office of Strong-Motion Studies, California Division of Mines and Geology. Other smaller networks are operated by the City of Los Angeles, university research groups and public utilities.
Figure 1 Photocopies of accelerograms recorded during the San Fernando earthquake of 9 February 1971. Corrected accelerograms for these motions are contained in the report.
In addition, many buildings and dams have been instrumented by their owners. Accelerometer networks exist in several foreign countries including Japan, Mexico, Yugoslavia, Iran, Italy, New Zealand, Peru, Chile, People's Republic of China and Soviet Russia among others.

The Seismic Engineering Branch maintains approximately 600 strong-motion installations. A little over 200 of these installations belong to the Seismic Engineering Branch, with the remainder being owned by other agencies but maintained by the Seismic Engineering Branch on a contract basis.

The State of California's strong-motion recording program was established in 1972 and the Office of Strong-Motion Studies now operates a network of over 300 installations. In the last year this office has also developed the capability for processing the data from its network and for disseminating the results.

The largest of these other networks is that run by the City of Los Angeles which maintains instruments in approximately 160 tall buildings within its jurisdiction.

Strong-Motion Records

The Seismic Engineering Branch of the U.S. Geological Survey has the primary responsibility for collecting and cataloging strong-motion records. They do this not only for their own network but also for the other networks as well. In addition, the Seismic Engineering Branch tries to obtain copies of important records obtained in foreign countries.

The Seismic Engineering Branch has in its archives approximately 3,000 records recorded from about 750 separate events. With a few
exceptions, each record contains three components of ground acceleration. Of these records about 800 are from upper stories of buildings, crests of dams, etc., leaving over 2,000 records of basement or free-field motion. Approximately 100 of the records are from foreign stations. As might be expected, most of these records are of small motions and of the over 2,000 ground-level accelerograms only about 250 are classified as being significant on the basis of having a peak acceleration of 10 percent g or more, or of being of special interest. On the same basis, some 200 of the approximately 800 records of structural response are classified as significant.

On this basis there are about 450 significant records, with about half of these coming from the San Fernando earthquake of February 9, 1971. Most of the records, including the San Fernando data and nearly all of the records prior to 1971, were digitized and processed at the California Institute of Technology. About 420 digitized and processed records are stored on computer tapes which can be obtained from the Environmental Data Service (EDS-NOAA) at Boulder, Colorado. Tape files also exist at the Seismic Engineering Branch and at the National Information Service for Earthquake Engineering (NISEE) which has facilities at the University of California, Berkeley, and at the California Institute of Technology.

Developments in the strong-motion network and additions to the strong-motion data set are published in the program reports of the Seismic Engineering Branch¹ and in the publications of the California Office of Strong-Motion Studies.²


2. Office of Strong-Motion Studies, California Division of Mines and Geology, 2811 Q Street, Sacramento, California 95816.
The Caltech Data Reports

Nearly all of the significant records obtained up to and including 1971 have been published in report form in a project directed by Professor Donald E. Hudson. This extensive series of reports consists of 77 individual reports, including an index volume, and occupies about four linear feet of shelf space. These data reports contain accelerograms, integrated velocities and displacements, and response and Fourier spectra of 381 strong-motion records obtained in the United States up to and including the San Fernando earthquake of February 9, 1971. One of the main objectives of the project was to produce integrated velocity and displacement curves, response spectra and Fourier spectra, all evaluated and presented in a standardized manner. It was hoped that this set of data would allow all investigators to begin with the same basic information thereby aiding comparisons of research results. A chronological list of the earthquakes which produced the records in the reports, together with other information is given in Table A1, which is adapted from Table I given by Hudson in the Index Volume to the data reports.

The information presented in the reports was organized into four volumes, each with 25 parts.

Volume I: Uncorrected Digitized Accelerograms - Listing of data and plots of the digitized records.

Volume II: Corrected Accelerograms - Plots and listings of accelerograms and integrated velocities and displacements.

Volume III: Response Spectrum Curves - Listing of data and linear and tripartite logarithmic plots of response spectra.

Volume IV: Fourier Amplitude Spectra - Linear and logarithmic plots of Fourier spectra.

The sites at which the records were obtained are given in Table A2, also taken from the Index Volume. In Tables A1 and A2 the letters A, B, C, ... refer to the individual parts of each volume. For example, if one were interested in data from the El Centro earthquake of 1934, which from Table A1 has a reference number of B024, one would look under this number in volumes IB, IIB, IIIB and IVB.

It should be noted that part A of each volume contains introductory and background information, including details of methods used, applications of the data, references, etc. Volume II, Part G, contains additional information on the calculation of long-period errors, and Volume IV, Parts Q, R and S contain further studies of high frequency errors.

All of these data reports are available in either book form or on microfiche from the National Technical Information Service (NTIS). Table A3 lists the NTIS numbers, which will facilitate ordering from this source. The same basic data set is also available in digitized form on magnetic tapes supplied by the Environmental Data Service. 5


5. EDS/NOAA, National Geophysical and Solar-Terrestrial Data Center (1062), Boulder, Colorado, 80302.
FORMAT OF THIS REPORT

In the Caltech data reports and in most subsequent publications, the time histories and response spectra of ground motions were plotted to varying vertical and horizontal scales, both chosen so that the resulting plot would fully occupy the available page space. While this method was virtually required for a large project like the production of the data reports, it tends to make all the plots of a given type appear the same. The reader cannot, from a visual comparison of a number of plots, easily appreciate what is a large, medium or small earthquake, or determine how the dominant periods of one earthquake record compare to those of another. Such information tends to be obscured by the plotting process. The wide and very real variability of amplitude, duration and general appearance of different accelerograms can be clearly seen in Figure 2. In order to preserve the variability of ground motion and structural response within this report, nearly all the diagrams within a given section have been plotted to fixed vertical and horizontal scales. For the rare case where the diagrams were very large, the chosen scales were increased. Whenever this was necessary, a statement indicating a change of scale has been printed on the diagram itself.

The report is divided into four sections of which the first three contain ground motion data while the fourth contains building response data. Specifically, these sections are:

FIGURE 2

EARTHQUAKE GROUND ACCELERATIONS IN EPICENTRAL REGIONS.
The strong-motion ground and basement records selected for inclusion in this report are listed in Table 1 at the beginning of Section 1 and the selected building motion records are listed in Table 2 at the beginning of Section 4.

ACKNOWLEDGMENTS

The authors wish to thank Dr. A. G. Brady of the U.S. Geological Survey at Menlo Park for providing accelerograms for inclusion in this report and for other information. Recently recorded building motions were kindly provided by Mr. L. D. Porter of the Office of Strong-Motion Studies, California Division of Mines and Geology. Finally, thanks are extended to Mr. Moh-jiann Huang for his aid in preparing plots for the report.

Financial support for this project was provided by the National Science Foundation under grant AEN77-07472 and by the Earthquake Research Affiliates of the California Institute of Technology. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the National Science Foundation.
SECTION 1
FREE-FIELD AND BUILDING BASEMENT ACCELEROGRAMS

In this section the accelerograms of selected free-field and building basement records are presented. The maximum accelerations, velocities and displacements of these records are listed in order in Table 1. In all but three cases the records are plotted on acceleration-time axes which have maximum values of 0.5g and 40 seconds, respectively. The exceptions to this rule are the Cholame-Shandon Array No. 2 records from the Parkfield earthquake for which the acceleration axes have a maximum value of 0.8g, the Pacoima Dam records from the San Fernando earthquake for which the acceleration axes have a maximum of 1.2g and the Inpres, San Juan record from the Argentina earthquake for which the time axis has a maximum value of 60 seconds.

It should be noted that due to an instrument malfunction the N25W component of motion was not recorded at Cholame-Shandon Array No. 2 during the Parkfield earthquake.

The final records in this section were obtained from the basement of the North Hall building at the University of California, Santa Barbara. This building was instrumented by the Office of Strong-Motion Studies of the California Division of Mines and Geology. The instrumentation includes nine single-axis accelerometers, four of which were located at ground level. These four transducers are arranged so that instruments 2, 3 and 1 provide accelerograms of the vertical, east-west and north-south motion of the center of the building's ground floor slab, while instrument 4 provides an
accelerogram of the north-south motion of the west end of this slab. Details of the installation and other information are available from the above office on request.  

<table>
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<th>Date</th>
<th>Earthquake</th>
<th>Recording Site</th>
<th>Component</th>
<th>Max. Accel. (g/\text{s})</th>
<th>Time (sec)</th>
<th>Max. Velocity (\text{cm/s})</th>
<th>Time (sec)</th>
<th>Max. Displ. (\text{cm})</th>
<th>Time (sec)</th>
</tr>
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<td>1933 Mar 10</td>
<td>Long Beach</td>
<td>Vernon Ord. Bldg.</td>
<td>Dow</td>
<td>149.5</td>
<td>1.00</td>
<td>12.0</td>
<td>1.44</td>
<td>7.4</td>
<td>2.18</td>
</tr>
<tr>
<td>1934 Dec 30</td>
<td>Lower California</td>
<td>El Centro, Imperial Valley</td>
<td>Dow</td>
<td>190.4</td>
<td>1.08</td>
<td>12.5</td>
<td>7.8</td>
<td>5.5</td>
<td>2.36</td>
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<td>1935 Oct 21</td>
<td>Helena, Montana</td>
<td>Carroll College</td>
<td>Dow</td>
<td>-161.5</td>
<td>1.04</td>
<td>12.8</td>
<td>9.0</td>
<td>6.4</td>
<td>2.78</td>
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<tr>
<td>1940 May 18</td>
<td>Imperial Valley</td>
<td>El Centro</td>
<td>Dow</td>
<td>321.7</td>
<td>1.58</td>
<td>12.5</td>
<td>9.2</td>
<td>6.6</td>
<td>2.98</td>
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<td>1949 Apr 13</td>
<td>Western Washington</td>
<td>Seattle, Distr. Engrs. Office</td>
<td>Dow</td>
<td>66.5</td>
<td>1.04</td>
<td>12.5</td>
<td>11.0</td>
<td>5.2</td>
<td>2.18</td>
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<tr>
<td>1949 Apr 13</td>
<td>Western Washington</td>
<td>Olympia, Wash. Test Lab</td>
<td>Dow</td>
<td>-65.0</td>
<td>1.04</td>
<td>12.5</td>
<td>11.0</td>
<td>5.2</td>
<td>2.18</td>
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<td>1957 Jul 21</td>
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<td>Pasadena, Caltech Aerospace</td>
<td>Dow</td>
<td>-274.6</td>
<td>1.58</td>
<td>12.5</td>
<td>9.2</td>
<td>6.6</td>
<td>2.98</td>
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<td>1958 Aug 27</td>
<td>Kern County</td>
<td>Taft, Lincoln School Tunnel</td>
<td>Dow</td>
<td>92.8</td>
<td>1.58</td>
<td>12.5</td>
<td>9.2</td>
<td>6.6</td>
<td>2.98</td>
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<td>1958 Jul 21</td>
<td>Kern County</td>
<td>Santa Barbara Court House</td>
<td>Dow</td>
<td>36.8</td>
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<td>12.5</td>
<td>9.2</td>
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<td>1959 Aug 17</td>
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<td>12.5</td>
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<td>1957 Mar 22</td>
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<td>Golden Gate Park</td>
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<td>116.9</td>
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<td>12.5</td>
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<td>2.00</td>
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<td>1968 Jun 27</td>
<td>Parkfield, California</td>
<td>Cholula, Shandon Array No. 8</td>
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<td>2.00</td>
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<td>1968 Jun 27</td>
<td>Parkfield, California</td>
<td>Cholula, Shandon Array No. 12</td>
<td>Dow</td>
<td>116.9</td>
<td>2.00</td>
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<td>1968 Jun 27</td>
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<td>8244 Orton Blvd., 1st Floor</td>
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<td>250 E. First St., Bldg.</td>
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<td>San Fernando</td>
<td>Hollywood Storage, Bldg.</td>
<td>Dow</td>
<td>302.6</td>
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<td>Caltech Seismological Lab.</td>
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<td>160.2</td>
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<td>12.5</td>
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Table 1
The Free Field and Building Basement Records Presented in Sections 1, 2 and 3, With Their Maximum Accelerations, Velocities and Displacements.
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<td>1971 FEB 9</td>
<td>San Fernando</td>
<td>Palmdale Fire Station</td>
<td>Down</td>
<td>-86.6</td>
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<td>-2.4</td>
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<td>SSE</td>
<td>113.8</td>
<td>5.48</td>
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<td>136.2</td>
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<td>2.5</td>
<td>6.36</td>
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<td>Nicaragua, (SSO Refinery)</td>
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<td>-299.9</td>
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<td>-34.3</td>
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LONG BEACH EARTHQUAKE  MAR 10, 1933 - 1754 PST
EPICENTER  33 35 OON, 117 59 OOW
MAGNITUDE 6.4

VERNON CMD BLDG - STATION NO. 288  34 00 OON, 118 12 OOW

CORRECTED ACCELEROMETER SET L:021, O PEAK VALUES...
  DOWN  149.5 CM/SEC/SEC
  508W  130.6 CM/SEC/SEC
  N82W  -151.5 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS

COMP DOWN
LOWER CALIFORNIA EARTHQUAKE  DEC 30, 1934 - 0552 PST
EPICENTER  32 12 00N, 115 30 00W
MAGNITUDE 7.1

EL CENTRO IMPERIAL VALLEY - STATION NO. 117  32 47 43N, 115 32 55W

CORRECTED ACCELEROMGRAM SET II8024.  ○ PEAK VALUES...
VERT  -68.1 CM/SEC/SEC
SO0W  -156.8 CM/SEC/SEC
SS0W  -179.1 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
HELENA, MONTANA EARTHQUAKE  OCT 31, 1935 - 1138 MST
EPICENTER  46 37 00N, 111 58 00W
MAGNITUDE 5.5

HELENA, MONTANA CARROLL COLLEGE - STATION NO. 323  46 35 00N, 112 02 00W

CORRECTED ACCELEROMGRAM SET I18025.  ○ PEAK VALUES...
   DOWN  87.5 cm/sec/sec
   S00W  143.5 cm/sec/sec
   S90W  142.5 cm/sec/sec

ACCELERATION - G/100

TIME - SECONDS
IMPERIAL VALLEY EARTHQUAKE  MAY 18, 1940 - 2037 PST
EPICENTER  32 44 00N, 115 27 00W
MAGNITUDE 6.5

EL CENTRO VALLEY IRRIGATION DISTRICT  - STATION NO. 117  32 47 43N, 115 32 55W

CORRECTED ACCELEROMETER SET IIAR001,  o PEAK VALUES...
VERT  -206.3 CM/SEC/SEC
S0E  341.7 CM/SEC/SEC
S90W  210.1 CM/SEC/SEC

ACCELERATION - G/100
TIME - SECONDS
WESTERN WASHINGTON EARTHQUAKE  APR 13, 1949 - 1156 PST
EPICENTER  47 06 00N, 122 42 00W
MAGNITUDE 6.5

OLYMPIA, WASHINGTON HWY TEST LAB - STATION NO. 325  47 02 00N, 122 54 00W

CORRECTED ACCELEROMGRAM SET II8029.  ○ PEAK VALUES...
DOWN  90.6 cm/sec/sec
N04W  161.6 cm/sec/sec
N86E  -274.6 cm/sec/sec

ACCELERATION - G/100

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
EPICENTER  35 00 00N, 119 02 00W
MAGNITUDE 7.2

PASADENA - CALTECH ATHENAEUM - STATION NO. 475  34 08 20N, 118 07 17W

CORRECTED ACCELEROMETER SET IIAG03,  0 PEAK VALUES...
  VERT  29.3 CM/SEC/SEC
  S00E -46.5 CM/SEC/SEC
  S90W -52.1 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
EPICENTER 35 00 00N,119 02 00W
MAGNITUDE 7.2

TAFT LINCOLN SCHOOL TUNNEL - STATION NO. 095  35 09 00N,119 27 00W

CORRECTED ACCELEROMETER SET IIAD04. PEAK VALUES...
  VERT 102.9 CM/SEC/SEC
  N21E 152.7 CM/SEC/SEC
  S69E 175.9 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 PDT
EPICENTER 35 00 00N, 119 02 00W
MAGNITUDE 7.2

SANTA BARBARA COURT HOUSE - STATION NO. 283 34 25 28N, 119 42 05W

CORRECTED ACCELEROMETER SET IIADCS. PEAK VALUES...
VERT 43.6 CM/SEC/SEC
N42E -87.8 CM/SEC/SEC
S46E 128.6 CM/SEC/SEC

ACCELERATION - G/100

COMP VERT

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
EPICENTER  35 00 00N,119 02 00W
MAGNITUDE 7.2

HOLLYWOOD STORAGE BASEMENT - STATION NO. 133  34 05 00N,118 20 00W

CORRECTED ACCELEROMGRAM SET II A006,  O PEAK VALUES... VERT  22.5 CM/SEC/SEC
          500W  -54.1 CM/SEC/SEC
          N90E    43.5 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
EPICENTER  35 00 00N,119 02 00W
MAGNITUDE 7.2

HOLLYWOOD STORAGE P.E. LOT - STATION NO. 135  34 05 00N,118 20 00W

CORRECTED ACCELEROMETER SET IIa007, ○ PEAK VALUES...
              VERT  -20.3 CM/SEC/SEC
          S00W  -58.1 CM/SEC/SEC
          N90E   41.2 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
SAN FRANCISCO EARTHQUAKE  MAR 22, 1957 - 1144 PST
EPICENTER  37 40 00N, 122 29 00W
MAGNITUDE 5.3

SAN FRANCISCO GOLDEN GATE PARK - STATION NO. 077  37 46 12N, 122 26 42W

CORRECTED ACCELEROMGRAM SET IIA015.  ○ PEAK VALUES...

VERT  37.2 CM/SEC/SEC
N10E  -81.8 CM/SEC/SEC
S80E  -102.8 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
ENG BLDG, STATE COLL., MONTANA, E/Q OF AUG 17 1959-0639 MST
EPICENTER AT 44.83N 111.01W
MAGNITUDE 6.8

ENG. BLDG., STATE COLLEGE - STATION LOCATION 45.68N, 111.03W

CORRECTED ACCELEROMETER SET I 000, ○ PEAK VALUES...
VERT. 28.4 CM/SEC/SEC
NORTH 52.7 CM/SEC/SEC
EAST -39.1 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS

COMP VERT.
PUGET SOUND, WASHINGTON EARTHQUAKE  APR 29, 1965 - 0728 PST
EPICENTER  47 24 00N, 122 18 00W
MAGNITUDE 5.4
OLYMPIA, WASHINGTON HWY TEST LAB - STATION NO. 325  47 02 00N, 122 54 00W
CORRECTED ACCELEROMGRAM SET IIB032, 0 PEAK VALUES...  VEAT  -59.9 cm/sec/sec
          SO4E   134.2 cm/sec/sec
          S86W  -194.3 cm/sec/sec

ACCELERATION - G/100

TIME - SECONDS
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1966 - 2026 PST
EPICENTER 35 54 00N, 120 54 00W
MAGNITUDE 5.8

CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 2 - STATION NO. 013 35 43 35N, 120 17 13W

CORRECTED ACCELEROGRAPH SET IIB033. ○ PEAK VALUES...
- DOWN -202.2 cm/sec/sec
- N65E -479.6 cm/sec/sec
- N25W NOT RECORDED

ACCELERATION - G/100

TIME - SECONDS

COMP DOWN
(VERTICAL SCALE CHANGED)
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
EPICENTER  35 54 00N, 120 54 00W
MAGNITUDE 5.8

CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 5 - STATION NO. 014  35 42 00N, 120 19 42W

CORRECTED ACCELEROMETER SET II8034, O PEAK VALUES...

- DOWN -116.9 cm/sec/sec
- N05W -347.1 cm/sec/sec
- N85E -425.7 cm/sec/sec

COMP DOWN

ACCELERATION - G/100

TIME - SECONDS
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
EPICENTER  35 54 00N,120 54 00W
MAGNITUDE 5.8

CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 8 - STATION NO. 015  35 40 18N,120 54 00W

CORRECTED ACCELERATOMGRAM SET I1B035. PEAK VALUES...
- DOWN  77.7 CM/SEC/SEC
- N50E -232.6 CM/SEC/SEC
- N40W -269.6 CM/SEC/SEC

ACCELERATION - G/100
TIME - SECONDS

COMP DOWN
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
EPICENTER  35 54 00N, 120 54 00W
MAGNITUDE 5.8

CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 12 - STATION NO. 016  35 38 12N, 120 24 12W

CORRECTED ACCELEROMETER SET 11B036.  ⊙ PEAK VALUES...
DOWN  44.6 CM/SEC/SEC
N50E  -52.1 CM/SEC/SEC
N40W  -63.2 CM/SEC/SEC
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
EPICENTER  35 54 00N, 120 54 00W
MAGNITUDE 5.8

TEMBLOR, CALIFORNIA NO. 2 - STATION NO. 097  35 45 07N, 120 15 52W

CORRECTED ACCELEROMETER SET 118037. O PEAK VALUES... DOWN -129.8 CM/SEC/SEC
N65W -264.3 CM/SEC/SEC
S25W -340.8 CM/SEC/SEC
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER  34 24 00N, 118 23 42W
MAGNITUDE 6.3

PACOIMA DAM, CAL. - STATION NO. 279  34 20 06N, 118 23 48W

CORRECTED ACCELEROMETER SET IICO41, O PEAK VALUES...
DOWN  696.0 CM/SEC/SEC
S16E -1148.1 CM/SEC/SEC
S74W  1054.9 CM/SEC/SEC

COMP DOWN
(VERTICAL SCALE CHANGED)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER 34 24 00N, 118 23 42W
MAGNITUDE 6.3

8244 ORION BLVD. 1ST FLOOR, LOS ANGELES, CAL. - STATION NO. 241 34 13 16N, 118 28 16W

CORRECTED ACCELEROMGRAM SET IIC048.  ○ PEAK VALUES...  DOWN 167.5 cm/sec/sec
North -250.0 cm/sec/sec
South -131.7 cm/sec/sec

ACCELERATION - G/100

TIME - SECONDS

COMP DOWN
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER  34 24 00N, 118 23 42W
MAGNITUDE 6.3

250 E FIRST STREET BASEMENT, LOS ANGELES, CAL. - STATION NO. 151  34 03 01N, 118 14 26W

CORRECTED ACCELEROMETER SET I1C051.  O PEAK VALUES...  DOWN  48.0 CM/SEC/SEC
N36E  97.8 CM/SEC/SEC
N54W  122.7 CM/SEC/SEC

ACCELERATION - g/100

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER  34 24 00N, 118 23 42W
MAGNITUDE 6.3

445 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL. - STATION NO. 157  34 03 12N, 118 15 24W

CORRECTED ACCELEROMETER SET IIC054.  0 PEAK VALUES...  DOWN  51.7 cm/sec/sec
N52W  147.1 cm/sec/sec
S38W  -117.0 cm/sec/sec

ACCELERATION - G/100

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER  34 24 00N, 118 23 42W
MAGNITUDE 5.3

HOLLYWOOD STORAGE BSMT. LOS ANGELES, CAL - STATION NO. 133 34 05 00N, 118 20 00W

CORRECTED ACCELEROMETER SET IID057, ① PEAK VALUES...
   UP   -49.8 CM/SEC/SEC
   S00W 103.8 CM/SEC/SEC
   N90E 148.2 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS

COMP UP
SAN FERNANDO EARTHQUAKE  FEB 9, 1971  -  0600 PST

EPICENTER  34 24 00N, 118 23 42W
MAGNITUDE 6.3

CALTECH SEISMOLOGICAL LAB., PASADENA, CAL.  -  STATION NO. 266  34 08 55N, 118 10 15W

CORRECTED ACCELEROMETER SET IIG06,  » PEAK VALUES...

TIME - SECONDS

ACCELERATION - G/100
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER 34 24 00N, 118 23 42W
MAGNITUDE 6.3

CALTECH ATHENAEUM, PASADENA, CAL. - STATION NO. 475  34 08 20N, 118 07 17W

CORRECTED ACCELEROMGRAM SET IIG107, \( \circ \) PEAK VALUES...

\text{DOW} N -92.9 \text{ cm/sec/sec}
\text{NODE} N 93.5 \text{ cm/sec/sec}
\text{NGOE} -107.3 \text{ cm/sec/sec}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{earthquake_graph.png}
\caption{Accelerogram graph showing the acceleration over time for the San Fernando Earthquake.}
\end{figure}
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER  34 24 00N, 118 23 42W
MAGNITUDE 6.3

CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL. - STATION NO. 264  34 08 12N, 118 07 30W

CORRECTED ACCELEROMGRAM SET IIG108.  ○ PEAK VALUES...  DOWN  -91.2 CM/SEC/SEC
NODE  -198.0 CM/SEC/SEC
NSOE  -181.6 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
SAN FERNANDO EARTHQUAKE    FEB 9, 1971 - 0600 PST
EPICENTER   34 24 00N,118 23 42W
MAGNITUDE 6.3

JET PROPULSION LAB., BASEMENT, PASADENA, CAL. - STATION NO. 267    34 12 01N,118 10 25W

CORRECTED ACCELEROMGRAM SET IIG110.   ○ PEAK VALUES...   DOWN -126.3 CM/SEC/SEC
                                            SD2E  207.8 CM/SEC/SEC
                                            SD8W  139.0 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS

COMP DOWN
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER 34 24 00N, 118 23 42W
MAGNITUDE 6.3

PALMDALE FIRE STATION, STORAGE ROOM, PALMDALE, CAL. - STATION NO. 262  34 34 40N, 118 06 45W

CORRECTED ACCELEROMETER SET IIG114.  ○ PEAK VALUES...
  DOWN -86.6 cm/sec/sec
  S60E 110.8 cm/sec/sec
  S30W 136.2 cm/sec/sec

ACCELERATION - G/100

TIME - SECONDS

COMP DOWN
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
EPICENTER  34 24 00N, 118 23 42W
MAGNITUDE 6.3

15250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL. - STATION NO. 466  34 09 14N, 118 27 50W

CORRECTED ACCELEROMETER SET I 1H115.  0 PEAK VALUES...
  DOWN  94.5 CM/SEC/SEC
  N11E  220.6 CM/SEC/SEC
  N79W  -146.0 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
MANAGUA EARTHQUAKE  DEC 23, 1972 - 0629 GMT
EPICENTER - 12 24 00N, 86 06 00W
MAGNITUDE 6.2

MANAGUA, NICARAGUA - ESSO REFINERY  12 08 42N, 86 19 18W

CORRECTED ACCELEROMETER SET II2001.  O PEAK VALUES...
DOWN -299.9 CM/SEC/SEC
SOGE  318.5 CM/SEC/SEC
EAST  -351.0 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS

COMP DOWN
ARGENTINA EARTHQUAKE NOV 23 1977 - 0927 GMT
EPICENTER 31.13S, 67.98W
MAGNITUDE 7.4

INPRES, SAN JUAN - STATION LOCATION 31.5265, 68.558W

CORRECTED ACCELEROMGRAM SET, 1 PEAK VALUES...

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<td>186.9 cm/sec/sec</td>
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<tr>
<td>SG0E</td>
<td>189.5 cm/sec/sec</td>
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COMP DOWN
(HORIZONTAL SCALE CHANGED)
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
EPICENTER  34.37N , 119.72W
MAGNITUDE 5.1

UCSB NORTH HALL, GROUND FLOOR - STATION LOCATION  34.41N , 119.85W

CORRECTED A/GRAMS TRACES 2.3.1  -- PEAK VALUES...
VERT   105.6 CM/SEC/SEC
N90E  269.0 CM/SEC/SEC
N00E  395.9 CM/SEC/SEC

ACCELERATION - G/100

TIME - SECONDS
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
EPICENTER  34.37N, 119.72W
MAGNITUDE 5.1

UCSB NORTH HALL, GROUND FLOOR - STATION LOCATION  34.41N, 119.85W

CORRECTED ACCELEROMETER TRACE 4,  ○ PEAK VALUE ... NODE  351.3 cm/sec/sec

COMP NODE TR 4

ACCELERATION - G/100

TIME - SECONDS
SECTION 2
FREE-FIELD AND BUILDING BASEMENT RESPONSE SPECTRA

In this section linear absolute acceleration, relative velocity and relative displacement response spectra are presented for the earthquake records of Section 1 (as listed in Table 1). In all cases the spectra are plotted on a (horizontal) period axis which is divided so that oscillator periods from zero to 2.0 seconds occupy three-quarters of the abcissa, with periods from 2.0 seconds to 14.0 seconds occupying the remaining one-quarter. For all the records but two, the vertical axes have maximum values for response acceleration, velocity and displacement of 3.5g, 250 cm/sec and 150 cm, respectively. The exceptional cases are the Pacoima Dam records of the San Fernando earthquake for which the maximum acceleration and velocity were increased to 10.0g and 500 cm/sec, respectively and the Nicaragua-Esso refinery records of the Managua earthquake for which the maximum acceleration was also increased to 10.0g.

The N25W component of the Cholame-Shandon Array No. 2 record of the Parkfield earthquake was not recorded and hence does not appear here.
RESPONSE SPECTRA I I I B 0 2 1 COMP DOWN
LONG BEACH EARTHQUAKE MAR 10, 1933 - 1754 PST
VERNON CMD BLDG
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL.

RESPONSE SPECTRA I I I B 0 2 1 COMP S O B W
LONG BEACH EARTHQUAKE MAR 10, 1933 - 1754 PST
VERNON CMD BLDG
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL.

[Graphs showing seismic response spectra for various periods and damping values.]
RESPONSE SPECTRA III024 COMP 500W
LOW CALIFORNIA EARTHQUAKE DEC 30, 1934 - 0552 PST
EL CENTRO IMPERIAL VALLEY
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL.
RESPONSE SPECTRA IIIB025 COMP DOWN
HELENA, MONTANA EARTHQUAKE OCT 31, 1935 - 1138 MST
HELENA, MONTANA CARROLL COLLEGE
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIB025 COMP SOWN
HELENA, MONTANA EARTHQUAKE OCT 31, 1935 - 1138 MST
HELENA, MONTANA CARROLL COLLEGE
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIb025 COMP S9DN
HELENA, MONTANA EARTHQUAKE OCT 31, 1935 - 1136 PST
HELENA, MONTANA CARROLL COLLEGE
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIa001 COMP VERT
IMPERIAL VALLEY EARTHQUAKE MAY 19, 1940 - 2037 PST
EL CENTRO VALLEY IRRIGATION DISTRICT
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIB028 COMP VERT
WESTERN WASHINGTON EARTHQUAKE APR 13, 1949 - 1156 PST
SEATTLE, WASH, DIST ENGRS OFFC AT ARMY BASE
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIB028 COMP S02W
WESTERN WASHINGTON EARTHQUAKE APR 13, 1949 - 1156 PST
SEATTLE, WASH, DIST ENGRS OFFC AT ARMY BASE
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIB028 COMP NNBW
WESTERN WASHINGTON EARTHQUAKE APR 13, 1969 - 1156 PST SEATTLE, WASH. DIST ENGRS OFFC AT ARMY BASE DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIB029 COMP DOWN
WESTERN WASHINGTON EARTHQUAKE APR 13, 1969 - 1156 PST OLYMPIA, WASHINGTON HAY TEST LAB DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIA003 COMP VERT
KERN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 POT
PASADENA - CALTECH ATHENAEUM
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL.

RESPONSE SPECTRA IIIA003 COMP SODE
KERN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 POT
PASADENA - CALTECH ATHENAEUM
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL.
RESPONSE SPECTRA IIIA003 COMP S90W
KEARN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 PDT
PASADENA - CALTECH ATHENAEUM
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIA004 COMP VERT
KEARN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 PDT
TAFT LINCOLN SCHOOL TUNNEL
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIA005 COMP S48E
KERN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 PDT
SANTA BARBARA COURTHOUSE
DAMPING VALUES ARE 0.2, 5.10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIA006 COMP VERT
KERN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 PDT
HOLLYWOOD STORAGE BASEMENT
DAMPING VALUES ARE 0.2, 5.10 AND 20 PERCENT OF CRITICAL

- Absolute Acceleration - G/10

- Relative Velocity - CM/SEC

- Relative Displacement - CM
RESPONSE SPECTRA IIIA006 COMP SOW
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
HOLLYWOOD STORAGE BASEMENT
DAMPING VALUES ARE 0.2, 5.10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIA006 COMP N90E
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
HOLLYWOOD STORAGE BASEMENT
DAMPING VALUES ARE 0.2, 5.10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA I-1A007 COMP NODE
KERN COUNTY, CALIFORNIA EARTHQUAKE JULY 21, 1952 - 0453 PST
HOLLYWOOD STORAGE P.E. LOT
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA I-1A015 COMP VERT
SAN FRANCISCO EARTHQUAKE MAR 22, 1957 - 1144 PST
SAN FRANCISCO GOLDEN GATE PARK
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIA015 COMP NIOE
SAN FRANCISCO EARTHQUAKE  MAR 22, 1957 - 1114 PST
SAN FRANCISCO GOLDEN GATE PARK
CAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIA015 COMP SBOE
SAN FRANCISCO EARTHQUAKE  MAR 22, 1957 - 1114 PST
SAN FRANCISCO GOLDEN GATE PARK
CAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA II 000 COM. VERT.
ENG BLDG. STATE COLL., MONTANA, E/Q OF AUG 17, 1968-0639 MST
ENG. BLDG., STATE COLLEGE
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL.

RESPONSE SPECTRA II 000 COM. NORTH
ENG BLDG. STATE COLL., MONTANA, E/Q OF AUG 17, 1968-0639 MST
ENG. BLDG., STATE COLLEGE
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL.
RESPONSE SPECTRA IIIb036 COMP DOWN
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1988 - 2026 PST
CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 12
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIb036 COMP NSOE
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1988 - 2026 PST
CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 12
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIB037 COMP N65W
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1966 - 2026 PST
TEMBLOR, CALIFORNIA NO. 2
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIB037 COMP S25W
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1966 - 2026 PST
TEMBLOR, CALIFORNIA NO. 2
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA III041 COMP DOWN
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
PACIMA DAM, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

VERTICAL SCALE CHANGED

ABSOLUTE ACCELERATION - G/10

PERIOD - SECONDS

500

VERTICAL SCALE CHANGED

RELATIVE VELOCITY - CM/SEC

PERIOD - SECONDS

150

VERTICAL SCALE CHANGED

RELATIVE DISPLACEMENT - CM

PERIOD - SECONDS

RESPONSE SPECTRA III041 COMP SIGH
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
PACIMA DAM, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

VERTICAL SCALE CHANGED

ABSOLUTE ACCELERATION - G/10

PERIOD - SECONDS

500

VERTICAL SCALE CHANGED

RELATIVE VELOCITY - CM/SEC

PERIOD - SECONDS

150

VERTICAL SCALE CHANGED

RELATIVE DISPLACEMENT - CM

PERIOD - SECONDS
RESPONSE SPECTRA IIICO4B COMP NOW
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
8244 ORION BLVD. 1ST FLOOR. LOS ANGELES, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA III CO51 COMP DOWN
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
250 E FIRST STREET BASEMENT, LOS ANGELES, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA III CO51 COMP N36E
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
250 E FIRST STREET BASEMENT, LOS ANGELES, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IICOS1 COMP N54W
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
250 E FIRST STREET BASEMENT, LOS ANGELES, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IICOS4 COMP DOWN
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
415 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIG108 COMP N80E
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL.
DRAPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

ABSOLUTE ACCELERATION - g/10

PERIOD - SECONDS

250

RELATIVE VELOCITY - CM/SEC

PERIOD - SECONDS

150

RELATIVE DISPLACEMENT - CM

PERIOD - SECONDS
RESPONSE SPECTRA IIIG110 COMP DOWN
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
JPL PROPULSION LAB., BASEMENT, PASADENA, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIG110 COMP S82E
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
JPL PROPULSION LAB., BASEMENT, PASADENA, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA IIIH115 COMP N79W
SANTA BARBARA EARTHQUAKE  FEB 9, 1971 - 0600 PST
13250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL.
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA IIIZ001 COMP DOWN
MANAGUA EARTHQUAKE  DEC 23, 1972 - 0629 GMT
MANAGUA, NICARAGUA
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

(VERITCAL SCALE CHANGED)
RESPONSE SPECTRA INPRES COMP DOWN
ARGENTINA EARTHQUAKE NOV 23 1977 - 0927 GMT
INPRES SAN JUAN
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA INPRES COMP SODE
ARGENTINA EARTHQUAKE NOV 23 1977 - 0927 GMT
INPRES SAN JUAN
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

Graphs showing response spectra for different damping values.
RESPONSE SPECTRA INPRES COMP S90E
ARGENTINA EARTHQUAKE NOV 23 1977 - 0827 GMT
INPRES, SAN JUAN
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA TRACE 2 DIRM VERT
SANTA BARBARA EARTHQUAKE AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
RESPONSE SPECTRA TRACE 3 DIAN NOOE
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL.GROUND FLOOR
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

RESPONSE SPECTRA TRACE 1 DIAN NOOE
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL.GROUND FLOOR
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL

- Absolute Acceleration
- Relative Velocity
- Relative Displacement
RESPONSE SPECTRA TRACE 4 DIAM NODE
SANTA BARBARA EARTHQUAKE AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR
DAMPING VALUES ARE 0, 2, 5, 10 AND 20 PERCENT OF CRITICAL
SECTION 3
FREE-FIELD AND BUILDING BASEMENT ACCELEROMETERS,
INTEGRATED VELOCITIES AND DISPLACEMENTS

In this section accelerograms and integrated velocities and displacements are presented for the earthquake records of Section 1 (as listed in Table 1). In all but five records the time histories are plotted on a horizontal axis that extends to 40 seconds and on vertical axes that extend to 0.4g, 40 cm/sec and 20 cm for acceleration, velocity and displacement, respectively. In three of the five exceptional cases it was necessary to increase the time axis to 60 seconds to accommodate fully the strong-motion part of these records. The records so affected are the Seattle District Engineers Office record of the Western Washington earthquake, the Taft, Lincoln School Tunnel record of the Kern County earthquake and the Inpres, San Juan record of the Argentina earthquake. Two records needed increased vertical axes, namely the Cholame-Shandon Array No. 2 record of the Parkfield earthquake (0.8g, 80 cm/sec and 40 cm) and the Pacoima Dam record of the San Fernando earthquake (1.2g, 120 cm/sec and 40 cm). It should again be noted that the N25W component of the Cholame-Shandon Array No. 2 record of the Parkfield earthquake is not included here.
LONG BEACH EARTHQUAKE MAR 10, 1933 - 1754 PST
II8021 33.001.0 VERNON CMD BLDG COMP DOWN
O PEAK VALUES ACCEL = 149.5 CM/SEC/SEC VELOCITY = 12.0 CM/SEC DISPL = 7.4 CM
LONG BEACH EARTHQUAKE MAR 10, 1933 - 1754 PST
I18021 33.001.0 VERNON CMD BLDG COMP SBW

PEAK VALUES
ACCEL = 130.6 cm/sec/sec
VELOCITY = 29.0 cm/sec
DISPL = -15.5 cm
LONG BEACH EARTHQUAKE  MAR 10, 1933 - 1754 PST
IIB021  33.001.0   VERNON CMD BLDG  COMP NB2W
(1) PEAK VALUES : ACCEL = -151.5 CM/SEC/SEC  VELOCITY = 17.3 CM/SEC  DISPL = -17.5 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
LOWER CALIFORNIA EARTHQUAKE  DEC 30, 1934 - 0552 PST
116024  34.002.0  EL CENTRO IMPERIAL VALLEY  COMP VERT
Π PEAK VALUES:  ACCEL = -68.1 CM/SEC/SEC  VELOCITY = -0.8 CM/SEC  DISPL = -5.6 CM
LOWER CALIFORNIA EARTHQUAKE DEC 30, 1934 - 0552 PST
IIB024 34.002.0 EL CENTRO IMPERIAL VALLEY COMP S00W
0 PEAK VALUES: ACCEL = -156.8 CM/SEC/SEC VELOCITY = -20.9 CM/SEC DISPL = -4.2 CM
LOWER CALIFORNIA EARTHQUAKE  DEC 30, 1934 - 0552 PST
IIIB04  34.002.0  EL CENTRO IMPERIAL VALLEY  COMP S90W

○ PEAK VALUES - ACCEL = -179.1 CM/SEC/SEC  VELOCITY = 11.6 CM/SEC  DISPL = -3.7 CM
HELENA, MONTANA EARTHQUAKE  OCT 31, 1935 - 1138 MST
II5025 35.001.0  HELENA, MONTANA CARROLL COLLEGE  COMP DOWN

PEAK VALUES: ACCEL = 87.5 cm/sec/sec  VELOCITY = -9.7 cm/sec  DISPL = 2.8 cm
HELENA, MONTANA EARTHQUAKE  OCT 31, 1935 - 1138 MST
IIB025  35.001.0  HELENA, MONTANA CARROLL COLLEGE  COMP SOW
\( \text{PEAK VALUES: ACCEL} = 143.5 \text{ CM/SEC/SEC} \quad \text{VELOCITY} = 7.3 \text{ CM/SEC} \quad \text{DISPL} = 1.4 \text{ CM} \)
HELENA, MONTANA EARTHQUAKE  OCT 31, 1935 - 1138 MST
I16025  35.001.0  HELENA, MONTANA  CARROLL COLLEGE  COMP 990W
(1) PEAK VALUES: ACCEL = 142.5 CM/SEC/SEC  VELOCITY = -13.3 CM/SEC  DISPL = -3.7 CM
IMPERIAL VALLEY EARTHQUAKE  MAY 18, 1940 - 2037 PST
IID001 40.001.0 EL CENTRO VALLEY IRRIGATION DISTRICT  COMP VERT
O PEAK VALUES: ACCEL = -206.3 CM/SEC/SEC  VELOCITY = -10.8 CM/SEC  DISPL = -5.6 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
IMPERIAL VALLEY EARTHQUAKE  MAY 18, 1940 - 2037 PST
EL CENTRO SITE IMPERIAL VALLEY IRRIGATION DISTRICT  COMP SOOE
O PEAK VALUES  ACCEL = 341.7 cm/sec/sec  VELOCITY = 33.4 cm/sec  DISPL = 10.9 cm
IMPERIAL VALLEY EARTHQUAKE  MAY 18, 1940 - 2037 PST
11A001 40.001.0 EL CENTRO SITE IMPERIAL VALLEY IRRIGATION DISTRICT COMP S90W
PEAK VALUES: ACCEL = 210.1 cm/sec/sec  VELOCITY = -36.9 cm/sec  DISPL = -19.8 cm

ACCELERATION - g/100

VELOCITY - cm/sec

DISPLACEMENT - cm

TIME - SECONDS
WESTERN WASHINGTON EARTHQUAKE  APR 13, 1949 - 1156 PST
IIB028  49.002.0  SEATTLE, WASH.  DIST. ENGRS OFFC AT ARMY BASE  COMP VERT
○ PEAK VALUES:  ACCEL = -22.0 CM/SEC/SEC  VELOCITY = 2.4 CM/SEC  DISPL = -2.3 CM

ACCELERATION - G/100

(HORIZONTAL SCALE CHANGED)

VELOCITY - CM/SEC

(HORIZONTAL SCALE CHANGED)

DISPLACEMENT - CM

(HORIZONTAL SCALE CHANGED)

TIME - SECONDS
WESTERN WASHINGTON EARTHQUAKE  APR 13, 1949 - 1156 PST
118028  49.002.0  SEATTLE, WASH. DIST ENGRS OFFC AT ARMY BASE  COMP S02W
(PEAK VALUES)  ACCEL = 66.5 CM/SEC/SEC  VELOCITY = 8.2 CM/SEC  DISPL = 2.4 CM

(HORIZONTAL SCALE CHANGED)
WESTERN WASHINGTON EARTHQUAKE  APR 13, 1949 - 1156 PST
11B028  49.002.0  SEATTLE, WASH. DIST ENGRS OFFC AT ARMY BASE  COMP N88W
© PEAK VALUES  • ACCEL = -65.9 CM/SEC/SEC  VELOCITY = 7.9 CM/SEC  DISPL = 2.7 CM

(HORIZONTAL SCALE CHANGED)
WESTERN WASHINGTON EARTHQUAKE  APR 13, 1949 – 1156 PST

IIB029  49.003.0  OLYMPIA, WASHINGTON HWY TEST LAB  COMP DOWN

\(\text{PEAK VALUES: ACCEL} = 90.6 \text{ cm/sec/sec} \quad \text{VELOCITY} = 7.0 \text{ cm/sec} \quad \text{DISPL} = 4.0 \text{ cm}\)

\[\text{ACCELERATION} - \text{G/1000}\]
\[\text{VELOCITY} - \text{CM/SEC}\]
\[\text{DISPLACEMENT} - \text{CM}\]

\[0 \quad 5 \quad 10 \quad 15 \quad 20 \quad 25 \quad 30 \quad 35 \quad 40\]

\[\text{TIME - SECONDS}\]
WESTERN WASHINGTON EARTHQUAKE  APR 13, 1949 - 1156 PST
II6029  49.003.D  OLYMPIA, WASHINGTON HWY TEST LAB  COMP N0W
© PEAK VALUES  •  ACCEL = 161.6 CM/SEC/SEC  VELOCITY = 21.4 CM/SEC  DISPL = -8.6 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
WESTERN WASHINGTON EARTHQUAKE
APR 13, 1949 - 1156 PST
IIIB29 49.003.0 OLYMPIA, WASHINGTON HWY TEST LAB COMP N06E
○ PEAK VALUES: ACCEL = -274.6 CM/SEC/SEC VELOCITY = -17.1 CM/SEC DISPL = 10.4 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA003 52.001.0 PASADENA - CALTECH ATHENAEUM COMP VEAT

PEAK VALUES: ACCEL = 29.3 cm/sec/sec  VELOCITY = -4.5 cm/sec  DISPL = -3.0 cm
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA003 52.001.0  PASADENA - CALTECH ATHENAEUM  COMP SODE
- PEAK VALUES - ACCEL = -46.5 cm/sec/sec  VELOCITY = -6.2 cm/sec  DISPL = 2.7 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IHA003 52.001.0 PASADENA - CALTECH ATHENAEUM  COMP S90W
PEAK VALUES: ACCEL = -52.1 cm/sec/sec VELOCITY = 9.1 cm/sec DISPL = -2.9 cm
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT IIAD04  52.002.0  TAFT LINCOLN SCHOOL TUNNEL COMP VERT

○ PEAK VALUES: ACCEL = 102.9 cm/sec/sec  VELOCITY = 6.7 cm/sec  DISPL = -5.0 cm

(HORIZONTAL SCALE CHANGED)
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA004  52.002.0  TAFT LINCOLN SCHOOL TUNNEL  COMP N21E
© PEAK VALUES : ACCEL = 152.7 CM/SEC/SEC  VELOCITY = -15.7 CM/SEC  DISPL = -6.7 CM

ACCELERATION - G/100

( HORIZONTAL SCALE CHANGED )

VELOCITY - CM/SEC

( HORIZONTAL SCALE CHANGED )

DISPLACEMENT - CM

( HORIZONTAL SCALE CHANGED )

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA004  52.002.0  TAFT LINCOLN SCHOOL TUNNEL  COMP 569E
O PEAK VALUES:  ACCEL = 175.9 CM/SEC/SEC  VELOCITY = -17.7 CM/SEC  DISPL = -9.2 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE    JULY 21, 1952 - 0453 PDT
IIA005 52.003.0 SANTA BARBARA COURT HOUSE  COMP VERT
© PEAK VALUES • ACCEL = 43.6 CM/SEC/SEC  VELOCITY = 5.0 CM/SEC  DISPL = 2.2 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952  - 0453 PDT
IIA005  S2.003.0  SANTA BARBARA COURTHOUSE  COMP N42E
O PEAK VALUES  ACCEL = -87.8 CM/SEC/SEC  VELOCITY = -11.6 CM/SEC  DISPL = 4.6 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA005 52.003.0  SANTA BARBARA COURTHOUSE  COMP S46E

* PEAK VALUES:  ACCEL = 128.6 CM/SEC/SEC  VELOCITY = 19.3 CM/SEC  DISPL = -5.8 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT

IIA006 52.005.0 HOLLYWOOD STORAGE BASEMENT  COMP VERT

• PEAK VALUES  • ACCEL = 22.5 CM/SEC/SEC  VELOCITY = -4.2 CM/SEC  DISPL = -2.2 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA006  52.005.0  HOLLYWOOD STORAGE BASEMENT  COMP S00W
○ PEAK VALUES  ACCEL = -54.1 CM/SEC/SEC  VELOCITY = -6.1 CM/SEC  DISPL = -5.1 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA007  52.006.0  HOLLYWOOD STORAGE P.E. LOT  COMP VERT
O PEAK VALUES • ACCEL = -20.3 CM/SEC/SEC  VELOCITY = 3.0 CM/SEC  DISPL = -3.4 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE    JULY 21, 1952 - 0453 PDT
IIA007  52.006.0   HOLLYWOOD STORAGE P.E. LOT   COMP SOON
* PEAK VALUES:  ACCEL = -58.1 CM/SEC/SEC  VELOCITY = -6.6 CM/SEC  DISPL = -4.5 CM
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA007  52.006.0  HOLLYWOOD STORAGE P.E. LOT  COMP N90E
© PEAK VALUES:  ACCEL = 41.2 CM/SEC/SEC  VELOCITY = 8.9 CM/SEC  DISPL = 6.4 CM
SAN FRANCISCO EARTHQUAKE  MAR 22, 1957 - 1144 PST
IIA015 57.006.0 SAN FRANCISCO GOLDEN GATE PARK  COMP VERT
• PEAK VALUES • ACCEL = 37.2 CM/SEC/SEC VELOCITY = -1.2 CM/SEC DISPL = -0.7 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FRANCISCO EARTHQUAKE  MAR 22, 1957 - 1144 PST
IIA015 57.006.0  SAN FRANCISCO GOLDEN GATE PARK  COMP N10E

○ PEAK VALUES : ACCEL = -81.8 CM/SEC/SEC  VELOCITY = -4.9 CM/SEC  DISPL = -2.3 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FRANCISCO EARTHQUAKE  MAR 22, 1957 - 1144 PST
IIA015 57.008.0  SAN FRANCISCO GOLDEN GATE PARK  COMP SB0E

1) PEAK VALUES: ACCEL = -102.8 cm/sec/sec  VELOCITY = -4.6 cm/sec  DISPL = -0.8 cm
ENG BLDG., STATE COLL., MONTANA, E/Q OF AUG 17 1959-0639 MST
ENG. BLDG., STATE COLLEGE COM. VERT.

PEAK VALUES: ACCEL = 28.4 cm/sec/sec  VELOCITY = 5.2 cm/sec  DISPL = 5.9 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
ENG BLDG., STATE COLL., MONTANA, E/Q OF AUG 17 1959-0639 MST
I 000
ENG. BLDG., STATE COLLEGE, COM. NORTH

PEAK VALUES: ACCEL = 52.7 CM/SEC/SEC VELOCITY = -7.7 CM/SEC DISPL = 6.5 CM
ENG BLDG., STATE COLL., MONTANA E/Q OF AUG 17 1959-0639 MST

0.000 ENG. BLDG., STATE COLLEGE COM. EAST

0 PEAK VALUES: ACCEL = -39.1 cm/sec/sec VELOCITY = -4.2 cm/sec DISPL = -3.4 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
PUGET SOUND, WASHINGTON EARTHQUAKE  APR 29, 1965 - 0728 PST
IIB032  65.001.0  OLYMPIA, WASHINGTON HWY TEST LAB  COMP VERT
0 PEAK VALUES  ACCEL = -59.9 CM/SEC/SEC  VELOCITY = -3.0 CM/SEC  DISPL = 1.7 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
PUGET SOUND, WASHINGTON EARTHQUAKE  APR 29, 1965 - 0728 PST
IIB032 65.001.0 OLYMPIA, WASHINGTON HWY TEST LAB  COMP SOWE
O PEAK VALUES : ACCEL = 134.2 cm/sec/sec  VELOCITY = 8.1 cm/sec  DISPL = -2.7 cm
PUGET SOUND, WASHINGTON EARTHQUAKE APR 29, 1965 - 0728 PST
IIB032 65.001.0 OLYMPIA, WASHINGTON HWY TEST LAB COMP S86W

PEAK VALUES: ACCEL = -194.3 CM/SEC/SEC VELOCITY = 13.1 CM/SEC  DISPL = -3.8 CM
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1966 - 2026 PST
I1B033 66.001.0 CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 2 COMP DOWN
○ PEAK VALUES: ACCEL = -202.2 cm/sec/sec VELOCITY = -14.1 cm/sec DISPL = 4.3 cm

(VERTICAL SCALE CHANGED)

(VERTICAL SCALE CHANGED)

(VERTICAL SCALE CHANGED)
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST

II0033  66.001.0  CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 2  COMP N65E

(PEAK VALUES:  ACCEL = -479.6 cm/sec/sec  VELOCITY = -78.1 cm/sec  DISPL = 26.5 cm)

(VERTICAL SCALE CHANGED)
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
118034  66.002.0  CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 5  COMP DOWN
0 PEAK VALUES:  ACCEL = -116.9 CM/SEC/SEC  VELOCITY = 7.3 CM/SEC  DISPL = -3.4 CM
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
II8034 66.002.0 CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 5 COMP NOSW

PEAK VALUES: ACCEL = -347.8 cm/sec/sec  VELOCITY = -23.2 cm/sec  DISPL = -5.3 cm

ACCELERATION - g/100

VELOCITY - cm/sec

DISPLACEMENT - cm

TIME - SECONDS
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
11B034 66.002.0 CHOLUM-CHANDON, CALIFORNIA ARRAY NO. 5  COMP N85E
⊙ PEAK VALUES: ACCEL = -425.7 cm/sec/sec  VELOCITY = -25.4 cm/sec  DISPL = -7.1 cm

![Graphs of acceleration, velocity, and displacement over time.](attachment:image.png)
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
II035  66.003.0  CHOLUMA-SHANDON, CALIFORNIA ARRAY NO. 8  CMP DOWN
PEAK VALUES:  ACCEL = 77.7 cm/sec/sec  VELOCITY = 4.5 cm/sec  DISPL = 2.1 cm

ACCELERATION - g/100

VELOCITY - cm/sec

DISPLACEMENT - cm

TIME - SECONDS
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PSI
II8035  66.003.0  CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 8  COMP N50E

PEAK VALUES : ACCEL = -232.6 cm/sec/sec  VELOCITY = 10.8 cm/sec  DISPL = 4.4 cm
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST

Instrumentation:
- Site: 66.003.0 CHOLAME, SHANDON, CALIFORNIA
- Array No.: 8
- Measurement: COMP N40W

Peak Values:
- ACCEL = -269.6 cm/sec/sec
- VELOCITY = 11.8 cm/sec
- DISPL = -3.9 cm

Graphs:
1. Acceleration vs. Time
2. Velocity vs. Time
3. Displacement vs. Time

Time - Seconds: 0 to 40
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
JIB036 66.004.0 CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 12 COMP DOWN
O PEAK VALUES: ACCEL = 44.6 CM/SEC/SEC VELOCITY = 5.0 CM/SEC DISPL = -2.6 CM
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1966 - 2026 PST
11B036 66.004.0 CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 12 COMP N50E
O PEAK VALUES: ACCEL = -52.1 CM/SEC/SEC VELOCITY = 7.0 CM/SEC DISPL = 4.1 CM

![Graphs showing acceleration, velocity, and displacement over time.](image-url)
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1966 - 2026 PST
IIB036 66.004.0 CHOLAME, SHANDON, CALIFORNIA ARRAY NO. 12 COMP NW
O PEAK VALUES: ACCEL = -63.2 CM/SEC/SEC VELOCITY = -8.0 CM/SEC DISPL = 5.7 CM

ACCELERATION - C/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
PARKFIELD, CALIFORNIA EARTHQUAKE JUNE 27, 1966 - 2026 PST
11037 66.005.0 TEMBLOR, CALIFORNIA NO. 2 COMP DOWN

PEAK VALUES
ACCEL = -129.8 cm/sec/sec VELOCITY = 4.4 cm/sec DISPL = 1.4 cm
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
IIB037  66.005.0  TEMBLOR, CALIFORNIA NO. 2  COMP N-SW
○ PEAK VALUES  :  ACCEL = -264.3 CM/SEC/SEC  VELOCITY = -14.5 CM/SEC  DISPL = 4.7 CM
PARKFIELD, CALIFORNIA EARTHQUAKE  JUNE 27, 1966 - 2026 PST
N1B037 66.005.0 TEMBLOR, CALIFORNIA NO. 2 COMP S25W
º PEAK VALUES: ACCEL = -340.8 cm/sec/sec  VELOCITY = 22.5 cm/sec  DISPL = -5.5 cm
SAN FERNANDO EARTHQUAKE   FEB 9, 1971 - 0600 PST
                  IIC041 71.001.0 PACOIMA DAM, CAL. COMP DOWN
                  O PEAK VALUES: ACCEL = 696.0 CM/SEC/SEC  VELOCITY = 58.3 CM/SEC  DISPL = -19.3 CM

(VERSICAL SCALE CHANGED)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IICOI  71.001.0  PACOIMA DAM, CAL.  COMPS1GE

© PEAK VALUES  ACCEL = -1148.1 CM/SEC/SEC  VELOCITY = -113.2 CM/SEC  DISPL = 37.7 CM

ACCELERATION - G/100

(VERTICAL SCALE CHANGED)

VELOCITY - CM/SEC

(VERTICAL SCALE CHANGED)

DISPLACEMENT - CM

(VERTICAL SCALE CHANGED)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIC041 71.001.0 PACOIMA DAM, CAL.  COMP S74W

PEAK VALUES:  ACCEL = 1054.9 cm/sec/sec  VELOCITY = -57.7 cm/sec  DISPL = -10.8 cm

ACCELERATION - g/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

(TIME - SECONDS)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICO48  71.008.0  8244 ORION BLVD. 1ST FLOOR, LOS ANGELES, CAL.  COMP DOWN
O PEAK VALUES:  ACCEL = 167.5 CM/SEC/SEC  VELOCITY = -32.0 CM/SEC  DISPL = -14.6 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IUC048  71.008.0  8244 ORION BLVD. 1ST FLOOR, LOS ANGELES, CAL.  COMP NOON
1 PEAK VALUES : ACCEL = -250.0 CM/SEC/SEC  VELOCITY = -30.0 CM/SEC  DISPL = -14.9 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICO48  71.008.0  8244 ORION BLVD. 1ST FLOOR. LOS ANGELES, CAL.  COMP 590W
○ PEAK VALUES:  ACCEL = -131.7 CM/SEC/SEC  VELOCITY = 23.9 CM/SEC  DISPL = 13.8 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST

ICOSI 71.005.0 250 E FIRST STREET BASEMENT, LOS ANGELES, CAL. COMP DOWN

○ PEAK VALUES • ACCEL = 48.0 CM/SEC/SEC VELOCITY = -7.8 CM/SEC DISPL = 5.8 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIC051  71.005.0  250 E FIRST STREET BASEMENT, LOS ANGELES, CAL.  COMP N36E

PEAK VALUES:  ACCEL = 97.8 cm/sec/sec  VELOCITY = 17.1 cm/sec  DISPL = -9.2 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIC051  71.005.0  250 E FIRST STREET BASEMENT, LOS ANGELES, CAL.  COMP N54W
O PEAK VALUES:  ACCEL = 122.7 cm/sec/sec  VELOCITY = 21.9 cm/sec  DISPL = 11.6 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIC054  71.060,0  445 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL.  COMP DOWN

PEAK VALUES  • ACCEL = 51.7 CM/SEC/SEC  VELOCITY = 10.7 CM/SEC  DISPL = 5.1 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIC054  71.060.0  445 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL.  COMP N52W
  PEAK VALUES:  ACCEL = 147.1 CM/SEC/SEC  VELOCITY = 17.4 CM/SEC  DISPL = 11.8 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

ICALS 71.000.0  445 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL.  COMP S38W

@ PEAK VALUES:  ACCEL = -117.0 CM/SEC/SEC  VELOCITY = -17.3 CM/SEC  DISPL = 11.8 CM

\[ \text{ACCELERATION - G/100} \]

\[ \text{VELOCITY - CM/SEC} \]

\[ \text{DISPLACEMENT - CM} \]

TIME - SECONDS

\[
\begin{align*}
&0 \quad 5 \quad 10 \quad 15 \quad 20 \quad 25 \quad 30 \quad 35 \quad 40 \\
\end{align*}
\]
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IID057 71.156.0 HOLLYWOOD STORAGE BSMT. LOS ANGELES, CAL COMP UP

PEAK VALUES: ACCEL = -49.8 CM/SEC/SEC VELOCITY = -5.0 CM/SEC DISPL = -3.8 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IVID 71.156.0  HOLLYWOOD STORAGE BSMT. LOS ANGELES, CAL  COMP SOOW
\(\text{\textbullet PEAK VALUES: ACCEL} = 103.8 \text{ cm/sec/sec} \quad \text{VELOCITY} = -17.0 \text{ cm/sec} \quad \text{DISPL} = 8.6 \text{ cm}\)

\begin{align*}
\text{ACCELERATION} & - \frac{g}{100} \\
\text{VELOCITY} & - \text{cm/sec} \\
\text{DISPLACEMENT} & - \text{cm}
\end{align*}

\begin{align*}
\text{TIME - SECONDS} & \quad 0 \quad 5 \quad 10 \quad 15 \quad 20 \quad 25 \quad 30 \quad 35 \quad 40
\end{align*}
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
II0057  71.156.0  HOLLYWOOD STORAGE BSMT. LOS ANGELES, CAL  COMP NS0E

ARM :  G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG106 71.018.0 CALTECH SEISMOLOGICAL LAB., PASADENA, CAL. COMP DOWN
 PEAK VALUES - ACCEL = 83.5 CM/SEC/SEC  VELOCITY = -5.9 CM/SEC  DISPL = -2.3 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IG06  71.018.0  CALTECH SEISMOLOGICAL LAB., PASADENA, CAL.  COMP SOON
⊙ PEAK VALUES : ACCEL = -87.5 cm/SEC/SEC  VELOCITY = -6.0 cm/SEC  DISPL = 1.7 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
I1G106 71.018.0  CALTECH SEISMOLOGICAL LAB., PASADENA, CAL.  COMP S90W

PEAK VALUES:
ACCEL = -188.6 cm/sec/sec  VELOCITY = -11.6 cm/sec  DISPL = 5.0 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
I1G107  71.019.0  CALTECH ATHENAEUM, PASADENA, CAL.  COMP DOWN
○ PEAK VALUES : ACCEL = -92.9 CM/SEC/SEC  VELOCITY = 6.6 CM/SEC  DISPL = 2.7 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
116107  71.019.0  CALTECH ATHENAUM, PASADENA, CAL.  COMP NODE
O PEAK VALUES : ACCEL = 93.5 CM/SEC/SEC  VELOCITY = -8.0 CM/SEC  DISPL = 3.0 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG107  71.019.0  CALTECH ATHENAEUM, PASADENA, CAL.  COMP N90E

PEAK VALUES: ACCEL = -107.3 cm/sec/sec  VELOCITY = 14.3 cm/sec  DISPL = -7.4 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG108 71.022.0  CALTECH MILIKAN LIBRARY, BASEMENT, PASADENA, CAL.  COMP DOWN
0 PEAK VALUES:  ACCEL = -91.2 CM/SEC/SEC  VELOCITY = 9.0 CM/SEC  DISPL = 2.4 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIG108  71.022.0  CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL.  COMP NODE

PEAK VALUES:  ACCEL = -198.0 CM/SEC/SEC  VELOCITY = -9.8 CM/SEC  DISPL = 2.7 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG108 71.022.0  CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL.  COMP N9OE
0 PEAK VALUES  ACCEL = -181.6 CM/SEC/SEC  VELOCITY = -16.4 CM/SEC  DISPL = -6.9 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG110 71.032.0  JET PROPULSION LAB., BASEMENT, PASADENA, CAL.  COMP DOWN
O PEAK VALUES: ACCEL = -126.3 CM/SEC/SEC  VELOCITY = -5.9 CM/SEC  DISPL = 2.6 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG110 71.032.0 JET PROPULSION LAB., BASEMENT, PASADENA, CAL.  COMP S82E
  PEAK VALUES:  ACCEL = 207.6 CM/SEC/SEC  VELOCITY = 13.9 CM/SEC  DISPL = -5.0 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG110  71.032.0  JET PROPULSION LAB., BASEMENT, PASADENA, CAL.  COMP S08W
 seizures:  ACCEL = 139.0 cm/sec/sec  VELOCITY = 9.2 cm/sec  DISPL = -2.9 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE    FEB 9, 1971 - 0600 PST
IIG114  71.064.0  PALMDALE FIRE STATION, STORAGE ROOM, PALMDALE, CAL.  COMP DOWN
O PEAK VALUES   ACCEL = -86.6 CM/SEC/SEC  VELOCITY = 7.8 CM/SEC  DISPL = -2.4 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG114  71.064.0  PALMDALE FIRE STATION, STORAGE ROOM, PALMDALE, CAL.  COMP SS0E
O PEAK VALUES - ACCEL = 110.8 CM/SEC/SEC VELOCITY = 14.2 CM/SEC DISPL = -3.8 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
I1G114  71.064.0  PALMDALE FIRE STATION, STORAGE ROOM, PALMDALE, CAL.  COMP S3OW
O PEAK VALUES: ACCEL = 136.2 CM/SEC/SEC  VELOCITY = -9.3 CM/SEC  DISPL = 2.6 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIEH115  71.024.0  15250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL.  COMP DOWN
Ο PEAK VALUES:  ACCEL = 94.5 CM/SEC/SEC  VELOCITY = -9.4 CM/SEC  DISPL = 4.3 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
11115 71.024.0  15250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL.  COMP N11E

PEAK VALUES:  ACCEL = 220.6 CM/SEC/SEC  VELOCITY = -28.2 CM/SEC  DISPL = -13.5 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971  -  0600 PST
I1H115  71.024.0  15250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL.  COMP N79W
1) PEAK VALUES:  ACCEL = -146.0 cm/sec/sec  VELOCITY = -23.5 cm/sec  DISPL = -10.3 cm
MANAGUA EARTHQUAKE       DEC 23, 1972 - 0629 GMT
IIZ001 00.000.0 MANAGUA, NICARAGUA COMP DOWN
O PEAK VALUES : ACCEL = -299.9 cm/sec/sec  VELOCITY = 17.5 cm/sec  DISPL = -8.7 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
MANAGUA EARTHQUAKE  DEC 23, 1972 - 0629 GMT
IIZ001 00.0000.0 MANAGUA, NICARAGUA COMP SOUTH
> PEAK VALUES  •  ACCEL = 318.5 CM/SEC/SEC  VELOCITY = -30.0 CM/SEC  DISPL = -6.4 CM
MANAGUA EARTHQUAKE  DEC 23, 1972 - 0629 GMT
IIZ001 00.000.0 MANAGUA, NICARAGUA COMP EAST

- PEAK VALUES - ACCEL = -351.0 CM/SEC/SEC  VELOCITY = 37.7 CM/SEC  DISPL = 14.9 CM
ARGENTINA EARTHQUAKE NOV 23 1977 - 0927 GMT
INPRES, SAN JUAN STATION LOCATION 31 31 34S, 68 33 29W COMP DOWN
○ PEAK VALUES: ACCEL = 150.5 cm/sec/sec VELOCITY = 14.0 cm/sec DISPL = 4.9 cm

(HORIZONTAL SCALE CHANGED)
ARGENTINA EARTHQUAKE NOV 23 1977 - 0927 GMT
INFRAS.SAN JUAN STATION LOCATION 31 31 345.68 33.29W COMP S0DE
○ PEAK VALUES: ACCEL = 186.9 cm/sec/sec VELOCITY = 15.6 cm/sec DISPL = 4.2 cm

ACCELERATION - G/100

(HORIZONTAL SCALE CHANGED)

VELOCITY - CM/SEC

(HORIZONTAL SCALE CHANGED)

DISPLACEMENT - CM

(HORIZONTAL SCALE CHANGED)
ARGENTINA EARTHQUAKE NOV 23 1977 - 0927 GMT
INPRES, SAN JUAN STATION LOCATION 31 31 346.68 33 39W COMP SS0E

PEAK VALUES: ACCEL = 189.5 cm/sec/sec VELOCITY = -20.6 cm/sec DISPL = 5.9 cm
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL.GROUND FLOOR TRACE 2 (DINN. VERT)

PEAK VALUES:  ACCEL = 105.6 CM/SEC/SEC  VELOCITY = 7.1 CM/SEC  DISPL = 1.3 CM
SANTA BARBARA EARTHQUAKE AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR TRACE 3 (DIRN. N90E)

- PEAK VALUES - ACCEL = 269.0 CM/SEC/SEC  VELOCITY = -21.3 CM/SEC  DISPL = -2.6 CM
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR  TRACE 1 (DIAN. NODE)
PEAK VALUES: ACCEL = 395.9 cm/sec/sec  VELOCITY = -34.4 cm/sec  DISPL = 5.6 cm
SANTA BARBARA EARTHQUAKE AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR TRACE 4 (DIAN NODE)

○ PEAK VALUES: ACCEL. = 351.3 cm/sec/sec VELOCITY = -34.3 cm/sec DISPL. = 5.3 cm
SECTION 4
BUILDING BASEMENT AND UPPER FLOOR, ACCELEROMETERS,
INTEGRATED VELOCITIES AND DISPLACEMENTS

This section contains accelerograms and integrated velocities and
displacements of building motions, including their basement motions.
For all except two buildings, the time histories were plotted on a time
(horizontal) axis with a maximum extent of 40 seconds and acceleration,
velocity and displacement (vertical) axes of maximum extent of 0.4g,
60 cm/sec and 30 cm, respectively. The two exceptions were the 15250
Ventura Blvd. records of the San Fernando earthquake for which velocity
and displacement axes of 80 cm/sec and 40 cm respectively were used and
the U.C.S.B. North Hall records of the Santa Barbara earthquake for which
an acceleration axis of maximum value 0.8g was required. In both these
cases the entire set of floor records (usually ground, middle floor and
roof records) were plotted to the enlarged scales, even though the
usual plotting axes were exceeded only by the roof records. This was
done in order to facilitate the examination of how basement motions are
transmitted through multi-story structures.

A list of the records presented in this section is given in Table 2,
together with the maximum values of acceleration, velocity and displace-
ment for these records.

As noted in the introduction to Section 1 the three-story North Hall
building at the University of Santa Barbara is rather unique, in this
report, in regard to its instrumentation. It contains nine accelerometers,
four at ground level, four at the third floor and one attached to a roof
joist. Nine accelerogram traces were therefore produced; traces 2, 3 and
1 record respectively the vertical, east-west and north-south motions of the center of the building base while trace 4 records the north-south motion of the west end of the building base. Trace 6 is the record of the east-west motion of the approximate center of the third floor slab while traces 9, 5 and 8 record the north-south motions of the eastward end, approximate center and far west end of the third floor slab, respectively. Trace 7 records the south-north motion of an approximately central roof joist. For more detailed information on this building the reader is directed to the reference given on page 13.
<table>
<thead>
<tr>
<th>Date</th>
<th>Earthquake</th>
<th>Recording Site</th>
<th>Component</th>
<th>Max. Accel. (g's)</th>
<th>Time (sec)</th>
<th>Max. Velocity (in/sec)</th>
<th>Time (sec)</th>
<th>Max. Disp. (in)</th>
<th>Time (min)</th>
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<tbody>
<tr>
<td>1952 JUL 21</td>
<td>Kern County</td>
<td>Hollywood Storage, Bldg.</td>
<td>Vert</td>
<td>22.5</td>
<td>21.98</td>
<td>-6.2</td>
<td>26.04</td>
<td>-5.1</td>
<td>22.32</td>
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<td></td>
<td>Kern County</td>
<td>Hollywood Storage, Fenchouse</td>
<td>N90E</td>
<td>24.1</td>
<td>13.29</td>
<td>-4.1</td>
<td>13.66</td>
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<td>1957 JUL 21</td>
<td>Kern County</td>
<td>Hollywood Storage, Fenchouse</td>
<td>US</td>
<td>25.8</td>
<td>12.60</td>
<td>-5.1</td>
<td>11.02</td>
<td>-6.6</td>
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<td>South</td>
<td>11.71</td>
<td>18.76</td>
<td>18.6</td>
<td>20.54</td>
<td>-5.6</td>
<td>22.32</td>
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<td>1971 FEB 9</td>
<td>San Fernando</td>
<td>RD44 Orion Blvd., 1st Floor</td>
<td>DOW</td>
<td>-250.0</td>
<td>17.52</td>
<td>-32.0</td>
<td>9.78</td>
<td>-14.9</td>
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<td>SWNW</td>
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KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA006 52.005.0  HOLLYWOOD STORAGE BASEMENT  COMP VERT
Ο PEAK VALUES  • ACCEL = 22.5 cm/sec/sec  VELOCITY = -4.2 cm/sec  DISPL = -2.2 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA006 52.005.0 HOLLYWOOD STORAGE BASEMENT COMP 500W
4 PEAK VALUES: ACCEL = -54.1 cm/sec/sec  VELOCITY = -6.1 cm/sec  DISPL = -5.1 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM
KERN COUNTY, CALIFORNIA EARTHQUAKE  JULY 21, 1952 - 0453 PDT
IIA006  52.005.0  HOLLYWOOD STORAGE BASEMENT  COMP N90E
○ PEAK VALUES • ACCEL = 43.5 CM/SEC/SEC  VELOCITY = 9.4 CM/SEC  DISPL. = -5.9 CM
KERN COUNTY EARTHQUAKE JUL 21, 1952 - 0453 PDT

IV318 52.004.0 HOLLYWOOD STORAGE CO., PENTHOUSE, HOLLYWOOD, CAL. COMP UP

O PEAK VALUES • ACCEL = -52.4 CM/SEC/SEC  VELOCITY = -5.1 CM/SEC  DISPL = -3.6 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
KERN COUNTY EARTHQUAKE  JUL 21, 1952   -  0453 PDT
IIV318  52.004.0  HOLLYWOOD STORAGE CO., PENTHOUSE, HOLLYWOOD, CAL.  COMP SOUTH
(1) PEAK VALUES:  ACCEL = -113.3 cm/sec/sec  VELOCITY = -18.5 cm/sec  DISPL = -5.6 cm

---

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS

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KERN COUNTY EARTHQUAKE  JUL 21, 1952 - 0453 PDT
IIV318  52.004.0  HOLLYWOOD STORAGE CO., PENTHOUSE, HOLLYWOOD, CAL.  COMP WEST
© PEAK VALUES:  ACCEL = -145.6 cm/sec/sec  VELOCITY = -21.7 cm/sec  DISPL = 10.4 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIC048  71.008.0  8244 ORION BLVD. 1ST FLOOR, LOS ANGELES, CAL.  COMP DOWN

PEAK VALUES:  ACCEL = 167.5 cm/sec/sec  VELOCITY = -32.0 cm/sec  DISPL = -14.6 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICO4B  71.008.0  8244 ORION BLVD. 1ST FLOOR, LOS ANGELES, CAL.  COMP NOOW
PXK VALUES: ACCEL = -250.0 CM/SEC/SEC  VELOCITY = -30.0 CM/SEC  DISPL = -14.9 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

PEAK VALUES:  ACCEL = -131.7 cm/sec/sec  VELOCITY = 23.9 cm/sec  DISPL = 13.8 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICO49  71.002.0  8244 ORION BLVD, 4TH FLOOR, LOS ANGELES, CAL.  COMP DOWN
O PEAK VALUES:  ACCEL = -223.1 CM/SEC/SEC  VELOCITY = -31.2 CM/SEC  DISPL = -12.4 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IC049  71.002.0  8244 ORION BLVD, 4TH FLOOR, LOS ANGELES, CAL.  COMP NO.O

- PEAK VALUES -
  - ACCEL = -195.2 cm/sec/sec
  - VELOCITY = 41.8 cm/sec
  - DISPL = -17.3 cm

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IICO49  71.002.0  8244 ORION BLVD. 4TH FLOOR, LOS ANGELES, CAL.  COMP 590W

PEAK VALUES: ACCEL = 231.5 CM/SEC/SEC  VELOCITY = -33.5 CM/SEC  DISPL = 19.3 CM
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST

IIC050 71.014.0 8244 ORION BLVD. 8TH FLOOR, LOS ANGELES, CAL. CMMP DOWN

PERK VALUES: ACCEL = 211.5 CM/SEC/SEC VELOCITY = 31.8 CM/SEC DISPL = 14.0 CM

![Graphs of acceleration, velocity, and displacement over time.](image-url)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

PEAK VALUES: ACCEL = 375.3 cm/sec/sec  VELOCITY = -63.9 cm/sec  DISPL = -24.1 cm

ACCELERATION - g/100

VELOCITY - cm/sec

DISPLACEMENT - cm

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
ICO50  71.014.0  8244 ORION BLVD. 8TH FLOOR, LOS ANGELES, CAL.  COMP S90W

> PEAK VALUES:  ACCEL = 313.5 cm/sec/sec  VELOCITY = -43.2 cm/sec  DISPL = 21.9 cm

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**ACCELERATION - G/100**

**VELOCITY - CM/SEC**

**DISPLACEMENT - CM**

**TIME - SECONDS**
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICOSI  71.005.0  250 E FIRST STREET BASEMENT, LOS ANGELES, CAL.  COMP DOWN
* PEAK VALUES  • ACCEL = 48.0 CM/SEC/SEC  VELOCITY = -7.8 CM/SEC  DISPL = 5.8 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICG51  71.005.0  250 E FIRST STREET BASEMENT, LOS ANGELES, CAL. COMP N36E
PEAK VALUES: ACCEL = 97.8 cm/sec/sec  VELOCITY = 17.1 cm/sec  DISPL = -9.2 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICOSI 71.005.0  250 E FIRST STREET BASEMENT, LOS ANGELES, CAL.  COMP N54W
© PEAK VALUES  •  ACCEL = 122.7 CM/SEC/SEC  VELOCITY = 21.9 CM/SEC  DISPL = 11.6 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
ICO52  71.011.0  250 E FIRST STREET 8TH FLOOR, LOS ANGELES, CAL.  COMP DOWN
PEAK VALUES:  ACCEL = 62.0 CM/SEC/SEC  VELOCITY = -8.6 CM/SEC  DISPL = -5.3 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIC052  71.011.0  250 E FIRST STREET 8TH FLOOR, LOS ANGELES, CAL.  COMP N54W
0 PEAK VALUES:  ACCEL = -167.8 cm/sec/sec  VELOCITY = -37.9 cm/sec  DISPL = 20.0 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

110053  71.016.0  250 E FIRST STREET 17TH FLOOR, LAS ANGELES, CAL.  COMP DOWN

PERK VALUES:  ACCEL = -162.7 CM/SEC/SEC  VELOCITY = -13.7 CM/SEC  DISPL = -7.5 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICO53  71.016.0  250 E FIRST STREET 17TH FLOOR, LAS ANGELES, CAL.  COMP N36E
O PEAK VALUES • ACCEL = -162.5 CM/SEC/SEC  VELOCITY = -45.8 CM/SEC  DISPL = 22.4 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIC053  71.016.0  250 E FIRST STREET 17TH FLOOR, LOS ANGELES, CAL.  COMP N5W

PEAK VALUES:  ACCEL = -159.0 cm/sec/sec  VELOCITY = -41.1 cm/sec  DISPL = 20.1 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIC054 71.060.0  445 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL.
COMP DOWN
PEAK VALUES:  ACCEL = 51.7 CM/SEC/SEC  VELOCITY = 10.7 CM/SEC  DISPL = 5.1 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE    FEB 9, 1971 - 0600 PST
IIC054    71.060.0    445 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL.    COMP N52W
© PEAK VALUES : ACCEL = 147.1 CM/SEC/SEC    VELOCITY = 17.4 CM/SEC    DISPL = 11.8 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIC054  71.060.0  445 FIGUEROA STREET, SUB-BASEMENT, LOS ANGELES, CAL.  COMP S3BW
© PEAK VALUES:  ACCEL = -117.0 cm/sec/sec  VELOCITY = -17.3 cm/sec  DISPL = 11.8 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IICO55  71.091.0  445 FIGUEROA STREET, 19TH FLOOR, LOS ANGELES, CAL.  COMP NS2W
  PEAK VALUES:  ACCEL = -195.5 CM/SEC/SEC  VELOCITY = -35.3 CM/SEC  DISPL = 22.0 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

| PEAK VALUES | ACCEL = -120.8 cm/sec/sec  | VELOCITY = -35.5 cm/sec  | DISPL = -23.4 cm |

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG108  71.022.0  CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL.  COMP DOWN

PEAK VALUES:  ACCEL = -91.2 cm/sec/sec  VELOCITY = 9.0 cm/sec  DISPL = 2.4 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG108 71.022.0  CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL.  COMP NODE
O PEAK VALUES:  ACCEL = -198.0 CM/SEC/SEC  VELOCITY = -9.8 CM/SEC  DISPL = 2.7 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
I1G108 71.022.0  CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL.  COMP N90E
1) PEAK VALUES  :  ACCEL = -181.6 CM/SEC/SEC  VELOCITY = -16.4 CM/SEC  DISPL = -6.9 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
116109  71.023.0  CALTECH MILLIKAN LIBRARY, 10TH FLOOR, PASADENA, CAL.  COMP DOWN
O PEAK VALUES:  ACCEL = -119.4 CM/SEC/SEC  VELOCITY = 7.7 CM/SEC  DISPL = 2.8 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIG109 71.023.0  CALTECH MILLIKAN LIBRARY, 10TH FLOOR, PASADENA, CAL.  COMP NODE

çekirtev değerleri: ACCEL = -305.5 cm/sec/sec  VELOCITY = -24.9 cm/sec  DISPL = 3.8 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIGIO9  71.023.0  CALTECH MILLIKAN LIBRARY, 10TH FLOOR, PASADENA, CAL.  COMP IMGIOE
0 PEAK VALUES:  ACCEL = -340.8 cm/sec/sec  VELOCITY = -49.9 cm/sec  DISPL = -11.7 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIG110 71.032.0  JET PROPULSION LAB., BASEMENT, PASADENA, CAL.  COMP DOWN
○ PEAK VALUES: ACCEL = -126.3 CM/SEC/SEC  VELOCITY = -5.9 CM/SEC  DISPL = 2.6 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

DISPLACEMENT - CM

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIIG110  71.032.0  JET PROPULSION LAB., BASEMENT, PASADENA, CAL.  COMP S82E

P EAK VALUES:  ACCEL = 207.8 cm/sec/sec  VELOCITY = 13.9 cm/sec  DISPL. = -5.0 cm
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIG110 71.032.0 JET PROPULSION LAB., BASEMENT, PASADENA, CAL. COMP S08W

PEAK VALUES: ACCEL = 139.0 CM/SEC/SEC VELOCITY = 9.2 CM/SEC DISPL = -2.9 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

IIG111  71.031.0  JET PROPULSION LAB., 9TH FLOOR, PASADENA, CAL.  COMP DOWN

PEAK VALUES:  ACCEL = 248.0 CM/SEC/SEC  VELOCITY = -12.4 CM/SEC  DISPL = 2.8 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST

PEAK VALUES: ACCEL = -205.6 cm/sec/sec  VELOCITY = -29.5 cm/sec  DISPL = 6.6 cm
SAN FERNANDO EARTHQUAKE    FEB 9, 1971 - 0600 PST
IIH115  71.024.0  15250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL.  COMP DOWN
@ PEAK VALUES:  ACCEL = 94.5 CM/SEC/SEC  VELOCITY = -9.4 CM/SEC  DISPL = 4.3 CM

(VERTICAL SCALE CHANGED)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIH115  71.024.0  15250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL.  COMP N11E
 PEAK VALUES:  ACCEL = 220.6 CM/SEC/SEC  VELOCITY = -28.2 CM/SEC  DISPL = -13.5 CM

(VERTICAL SCALE CHANGED)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIH115 71.024.0  15250 VENTURA BLVD., BASEMENT, LOS ANGELES, CAL. COMP N79W
• PEAK VALUES  • ACCEL = -146.0 CM/SEC/SEC  VELOCITY = -23.5 CM/SEC  DISPL = -10.3 CM

(VERTICAL SCALE CHANGED)
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IH116 71.026.0 15250 VENTURA BLVD., 7TH FLOOR, LOS ANGELES, CAL.  COMP DOWN
@ PEAK VALUES: ACCEL = 152.3 CM/SEC/SEC  VELOCITY = -11.2 CM/SEC  DISPL = 5.2 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

(DIAGRAM VERTICAL SCALE CHANGED)

DISPLACEMENT - CM

(DIAGRAM VERTICAL SCALE CHANGED)

TIME - SECONDS
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIH 116  71.026.0  15250 VENTURA BLVD., 77TH FLOOR, LOS ANGELES, CAL.  COMP N11E
PEAK VALUES:  ACCEL = 255.0 CM/SEC/SEC  VELOCITY = 44.7 CM/SEC  DISPL = 18.6 CM
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IIH116 71.026.0 15250 VENTURA BLVD., 7TH FLOOR, LOS ANGELES, CAL. COMP N79W
PEAK VALUES: ACCEL = -237.6 CM/SEC/SEC VELOCITY = -54.6 CM/SEC DISPL = -29.3 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
41117  71.025.0  15250 VENTURA BLVD., ROOF, LOS ANGELES, CAL.  COMP DOWN
© PEAK VALUES : ACCEL = -140.9 CM/SEC/SEC  VELOCITY = -10.3 CM/SEC  DISPL = 3.8 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

(VERTICAL SCALE CHANGED)

DISPLACEMENT - CM

(VERTICAL SCALE CHANGED)

TIME - SECONDS
SAN FERNANDO EARTHQUAKE    FEB 9, 1971 - 0600 PST
11H117  71.025.0  15250 VENTURA BLVD., ROOF, LOS ANGELES, CAL.  COMP N11E
○ PEAK VALUES:  ACCEL = 282.9 CM/SEC/SEC  VELOCITY = -83.5 CM/SEC  DISPL = -31.0 CM
SAN FERNANDO EARTHQUAKE  FEB 9, 1971 - 0600 PST
IIH117  71.025.0  15250 VENTURA BLVD., ROOF, LOS ANGELES, CAL.  COMP N79W
O PEAK VALUES : ACCEL = 194.9 CM/SEC/SEC  VELOCITY = -82.0 CM/SEC  DISPL = -43.5 CM

ACCELERATION - G/100

VELOCITY - CM/SEC

VERTICAL SCALE CHANGED

DISPLACEMENT - CM

VERTICAL SCALE CHANGED

TIME - SECONDS

0  5  10  15  20  25  30  35  40
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR, TRACE 2 (DIRN. VERT)

PEAK VALUES:
ACCEL = 105.6 CM/SEC/SEC  VELOCITY = 7.1 CM/SEC  DISPL = 1.3 CM

(VERTICAL SCALE CHANGED)
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR  TRACE 3 (DIAN. NSOE)

\( \circ \) PEAK VALUES:  
ACCEL = 269.0 cm/sec/sec  
VELOCITY = -21.3 cm/sec  
DISPL = -2.6 cm

\( \text{(VERTICAL SCALE CHANGED)} \)
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR  TRACE 1 (DIAN. NODE)

- PEAK VALUES - ACCEL = 395.9 CM/SEC/SEC  VELOCITY = -34.4 CM/SEC  DISPL = 5.6 CM

(VERTICAL SCALE CHANGED)
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, GROUND FLOOR TRACE 4 (DIWN.NOOE)
The peak values are:
ACCEL = 351.3 cm/sec/sec  VELOCITY = -34.3 cm/sec  DISPL = 5.3 cm

Vertical scale changed.

ACCELERATION - g/100

VELOCITY - cm/sec

DISPLACEMENT - cm

TIME - SECONDS
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, THIRD FLOOR  TRACE 6 (DIAH. N-SOE)

- PEAK VALUES - ACCEL = 561.0 CM/SEC/SEC  VELOCITY = 25.6 CM/SEC  DISPL = 2.8 CM

(VERTICAL SCALE CHANGED)
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, THIRD FLOOR  TRACE 9 (DIAN. NODE)
PEAK VALUES:  ACCEL = 554.9 cm/sec/sec  VELOCITY = -43.4 cm/sec  DISPL = 6.6 cm
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, THIRD FLOOR  TRACE 5 (DIAM. NODE)

- PEAK VALUES: ACCEL = 676.7 cm/sec/sec  VELOCITY = -45.0 cm/sec  DISPL = 6.7 cm

(VERTICAL SCALE CHANGED)
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, THIRD FLOOR  TRACE B (DIAN. NODE)

1. PEAK VALUES:  ACCEL = -564.5 cm/sec/sec  VELOCITY = -47.4 cm/sec  DISPL = 6.0 cm

(VERTICAL SCALE CHANGED)
SANTA BARBARA EARTHQUAKE  AUG 13 1978 - 2254 GMT
UCSB NORTH HALL, ROOF  TRACE 7 (DIAN. S00W)

PEAK VALUES:  ACCEL = -943.0 cm/sec/sec  VELOCITY = -53.8 cm/sec  DISPL = -7.4 cm

(VERTICAL SCALE CHANGED)
### TABLE A-1
STRONG MOTION EARTHQUAKE ACCELEROMETERS - STANDARD DATA
CRONOCLOGICAL INDEX OF EARTHQUAKES

<table>
<thead>
<tr>
<th>NO.</th>
<th>YEAR</th>
<th>EARTHQUAKE LOCATION</th>
<th>MAG. *</th>
<th>DATE</th>
<th>TIME, PST</th>
<th>DATA REPORT REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1933</td>
<td>Long Beach, Calif.</td>
<td>6.4</td>
<td>3/10</td>
<td>1754</td>
<td>B021, V314, V315</td>
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<tr>
<td>2</td>
<td>1933</td>
<td>Los Angeles, Calif.</td>
<td>5.4</td>
<td>10/2</td>
<td>0110</td>
<td>B022, B023</td>
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<tr>
<td>3</td>
<td>1934</td>
<td>Ferndale, Calif.</td>
<td>5.6</td>
<td>7/5</td>
<td>1449</td>
<td>U294</td>
</tr>
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<td>4</td>
<td>1934</td>
<td>El Centro, Calif.</td>
<td>7.1</td>
<td>12/30</td>
<td>0552</td>
<td>B024</td>
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<tr>
<td>5</td>
<td>1935</td>
<td>Helena, Mont.</td>
<td>5.5</td>
<td>10/11</td>
<td>1138(MST)</td>
<td>B025</td>
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<tr>
<td>6</td>
<td>1935</td>
<td>Helena, Mont.</td>
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<td>10/11</td>
<td>1218(MST)</td>
<td>U295</td>
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<tr>
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<td>1935</td>
<td>Helena, Mont.</td>
<td>3.8</td>
<td>11/21</td>
<td>2058(MST)</td>
<td>U296</td>
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<tr>
<td>8</td>
<td>1935</td>
<td>Helena, Mont.</td>
<td>5.0</td>
<td>11/28</td>
<td>0742(MST)</td>
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<td>1937</td>
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<td>6.7</td>
<td>2/6</td>
<td>2042</td>
<td>U298</td>
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<tr>
<td>10</td>
<td>1938</td>
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<tr>
<td>14</td>
<td>1940</td>
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<td>5/18</td>
<td>2037</td>
<td>A030, T277-T285</td>
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<tr>
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<tr>
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<td>V310, V313</td>
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<td>1942</td>
<td>El Centro, Calif.</td>
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<td>10/21</td>
<td>0822</td>
<td>T286</td>
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<td>20</td>
<td>1942</td>
<td>Hollister, Calif.</td>
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<td>0429</td>
<td>U301</td>
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<tr>
<td>21</td>
<td>1949</td>
<td>Seattle, Wash.</td>
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<td>1150</td>
<td>B028, B029 (Olympia)</td>
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<tr>
<td>22</td>
<td>1951</td>
<td>El Centro, Calif.</td>
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<td>1/25</td>
<td>2317</td>
<td>T287</td>
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<tr>
<td>23</td>
<td>1951</td>
<td>Ferndale, Calif.</td>
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<td>10/7</td>
<td>2011</td>
<td>A002</td>
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<tr>
<td>24</td>
<td>1952</td>
<td>Kern County, Calif.</td>
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<td>7/21</td>
<td>0453</td>
<td>A003-A007, V181</td>
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<td>25</td>
<td>1952</td>
<td>Tehachapi, Calif.</td>
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<td>7/21-31</td>
<td>1546</td>
<td>U302, U303, U304</td>
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<td>26</td>
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<td>9/22</td>
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<td>B030</td>
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<td>2346</td>
<td>V319</td>
</tr>
<tr>
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<td>6/13</td>
<td>2017</td>
<td>T286</td>
</tr>
<tr>
<td>29</td>
<td>1954</td>
<td>Taft, Calif.</td>
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<tr>
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<td>4/25</td>
<td>1233</td>
<td>U305</td>
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<tr>
<td>31</td>
<td>1954</td>
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<td>11/12</td>
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<td>T289</td>
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<tr>
<td>32</td>
<td>1954</td>
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<td>12/21</td>
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<td>A008, A009 (Ferndale)</td>
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<tr>
<td>33</td>
<td>1955</td>
<td>San Jose, Calif.</td>
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<td>9/4</td>
<td>1801</td>
<td>A010, U306</td>
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<td>1955</td>
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<td>12/16</td>
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<td>T290</td>
</tr>
<tr>
<td>35</td>
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<td>12/16</td>
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<td>1955</td>
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<td>12/16</td>
<td>2207</td>
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<td>1956</td>
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<td>2/9</td>
<td>0633</td>
<td>A011</td>
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<tr>
<td>38</td>
<td>1956</td>
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<td>2/9</td>
<td>0725</td>
<td>A012</td>
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<td>39</td>
<td>1957</td>
<td>Port Hueneme, Calif.</td>
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<td>3/18</td>
<td>1056</td>
<td>V320</td>
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<td>40</td>
<td>1957</td>
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<td>3/22</td>
<td>1048</td>
<td>V320</td>
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<tr>
<td>41</td>
<td>1957</td>
<td>San Francisco, Calif.</td>
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<td>3/22</td>
<td>1144</td>
<td>A013-A017, V321</td>
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<td>42</td>
<td>1957</td>
<td>San Francisco, Calif.</td>
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<td>3/22</td>
<td>1515</td>
<td>V322-V327</td>
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<td>43</td>
<td>1957</td>
<td>San Francisco, Calif.</td>
<td>4.0</td>
<td>3/22</td>
<td>1627</td>
<td>V328</td>
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<tr>
<td>44</td>
<td>1958</td>
<td>Hollister, Calif.</td>
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<td>1/19</td>
<td>1926</td>
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<td>45</td>
<td>1960</td>
<td>Ferndale, Calif.</td>
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<td>6/5</td>
<td>1718</td>
<td>U308</td>
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<td>1961</td>
<td>Hollister, Calif.</td>
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<td>4/8</td>
<td>2323</td>
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<tr>
<td>47</td>
<td>1962</td>
<td>Eureka, Calif.</td>
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<td>9/4</td>
<td>0917</td>
<td>V330</td>
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<td>48</td>
<td>1965</td>
<td>Olympia, Wash.</td>
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<td>4/29</td>
<td>0729</td>
<td>B035, U310 (Seattle)</td>
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<td>1965</td>
<td>Castaic, Calif.</td>
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<td>7/15</td>
<td>2346</td>
<td>V331</td>
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<tr>
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<td>1966</td>
<td>Parkfield, Calif.</td>
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<td>6/27</td>
<td>2026</td>
<td>B035-B038, U311</td>
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<td>51</td>
<td>1966</td>
<td>El Centro, Calif.</td>
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<td>8/7</td>
<td>0936</td>
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<td>1966</td>
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<td>9/12</td>
<td>0861</td>
<td>V332</td>
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<tr>
<td>53</td>
<td>1967</td>
<td>Eureka, Calif.</td>
<td>6.3</td>
<td>12/10</td>
<td>0407</td>
<td>B039, U312 (Ferndale)</td>
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<td>1967</td>
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<td>55</td>
<td>1968</td>
<td>Borrego Mtn., Calif.</td>
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<td>4/8</td>
<td>1830</td>
<td>A019, A020, B040,</td>
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<td>56</td>
<td>1970</td>
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<td>9/12</td>
<td>0630</td>
<td>Y370-Y381</td>
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<tr>
<td>57</td>
<td>1971</td>
<td>San Fernando, Calif.</td>
<td>6.3</td>
<td>2/9</td>
<td>0600</td>
<td>W314 through X369</td>
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</table>

*Magnitudes are Local Magnitudes, ML, calculated from strong-motion records by the technique developed by Kanamori and Jennings, "Determination of local magnitude, ML, from strong motion accelerograms," Bull. Seism. Soc. Amer. 68, 2, 471-485 (1978). When such magnitudes were not available, the data were obtained from Hileman, J. A., C. R. Allen and J. N. Nordquist, "Seismicity of the Southern California Region, 1 January 1932 to 31 December 1972," Seism. Lab., California Institute of Technology, Pasadena (1973).
### TABLE A2

STRONG MOTION EARTHQUAKE ACCELEROMETERS - STANDARD DATA

GEOGRAPHICAL INDEX OF ACCELEROGRAPH SITES

#### 1. CALIFORNIA SITES

<table>
<thead>
<tr>
<th>ACCELEROGRAPH SITE</th>
<th>USGS NO.</th>
<th>INST. TYPE</th>
<th>DATA REPORT REF.</th>
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<tbody>
<tr>
<td><strong>ALHAMBRA</strong></td>
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</tr>
<tr>
<td>Fremont Ave., 900 S.; Bsmt.</td>
<td>482</td>
<td>SMA-1</td>
<td>H121</td>
</tr>
<tr>
<td>6th Fl.</td>
<td>483</td>
<td>SMA-1</td>
<td>H122</td>
</tr>
<tr>
<td>12th Fl.</td>
<td>484</td>
<td>SMA-1</td>
<td>H123</td>
</tr>
<tr>
<td><strong>ANZA</strong></td>
<td></td>
<td>RFT-250</td>
<td>N197</td>
</tr>
<tr>
<td>Post Office, Storage Rm.</td>
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<tr>
<td><strong>ARCADIA</strong></td>
<td></td>
<td>AR-240</td>
<td>P221, W341</td>
</tr>
<tr>
<td>Santa Anita Reservoir, Dam Abut.</td>
<td>104</td>
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<tr>
<td><strong>BAKERSFIELD</strong></td>
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<td>USCGS</td>
<td>P224</td>
</tr>
<tr>
<td>Harvey Aud.; Bsmt.</td>
<td>1004</td>
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<tr>
<td><strong>BEVERLY HILLS</strong></td>
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<tr>
<td>Oakhurst Ave., 435 N.; Bsmt.</td>
<td>452</td>
<td>SMA-1</td>
<td>1128</td>
</tr>
<tr>
<td>5th Fl.</td>
<td>453</td>
<td>SMA-1</td>
<td>1129</td>
</tr>
<tr>
<td>Roof, 11th Lvl.</td>
<td>454</td>
<td>SMA-1</td>
<td>1130</td>
</tr>
<tr>
<td>Roxbury Dr., 450 N.; 1st Fl.</td>
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<td>SMA-1</td>
<td>1131</td>
</tr>
<tr>
<td>5th Fl.</td>
<td>456</td>
<td>SMA-1</td>
<td>1132</td>
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<tr>
<td>10th Fl.</td>
<td>457</td>
<td>SMA-1</td>
<td>1133</td>
</tr>
<tr>
<td>Wilshire Blvd., 9100; Bsmt.</td>
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2. Referred to as "SFS Standard" or "S-M" in Open File Report 1975.


4. Later replaced by SMA-1 accelerograph.

5. Station removed.
TABLE A3

The following standardized data reports from the Earthquake Engineering Research Laboratory can be obtained from the National Technical Information Service, Springfield, Virginia, 22121.

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*Part X deleted from Volumes II, III and IV (records too small to process).