UNITED STATES DEPARTMENT OF THE INTERIOR

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CATALOG OF EARTHQUAKES ALONG THE SAN ANDREAS FAULT SYSTEM IN CENTRAL CALIFORNIA, OCTOBER—DECEMBER 1977

OPEN-FILE REPORT 81-1325

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

Menlo Park, California

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United States
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CATALOG OF EARTHQUAKES ALONG THE SAN ANDREAS FAULT SYSTEM IN CENTRAL CALIFORNIA, OCTOBER - DECEMBER 1977

By L. Fluty and S. M. Marks

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INTRODUCTION

Numerous small earthquakes occur each day in the Coast Ranges of central California. The detailed study of these earthquakes provides a tool for gaining insight into the tectonic and physical processes responsible for the generation of damaging earthquakes. This catalog contains the fundamental parameters for earthquakes located within and adjacent to the seismograph network operated by the U.S. Geological Survey(USGS), during the fourth quarter of 1977.

The motivation for these detailed studies has been described by Pakiser and others (1969) and by Eaton and others (1970). Similar catalogs of earthquakes for the years 1969, 1970, and 1971 have been prepared by Lee and others (1972b, c and d). Catalogs for the first, second, third, and fourth quarters of 1972 and the first, second, third and fourth quarters of 1973 have been prepared by Wesson and others (1972a, b, 1973b, and 1974a and b), by Bufe and others (1975), and by Lester and others (1976a and b). Catalogs for the years 1974, 1975 and 1976 and the first, second and third quarters of 1977 have been prepared by Lester and Meagher (1978), by McHugh and Lester (1978 and 1979) by Marks and Lester (1980a and 1980b) and by Marks and Fluty (1981). The basic data contained in these catalogs provide a foundation for further studies.

This catalog contains data on 771 earthquakes in central California. Arrival times at 216 seismograph stations were used to locate the earthquakes listed in this catalog. Of these 205 were telemetered stations operated by USGS. Readings from the remaining 11 stations were obtained through the courtesy of the Seismographic Stations, University of California, Berkeley (UCB), and the California Department of Water Resources, Sacramento.

The Seismographic Station of the University of California, Berkeley, has for many years published a bulletin describing earthquakes in northern California and the surrounding area and listing readings at UCB stations from more distant events. The purpose of the present catalog is not to replace the UCB Bulletin, but rather to supplement it, by describing the seismicity of a portion of central California in much greater detail.

INSTRUMENTATION

The telemetered seismograph system used may be illustrated by block diagram (Figure 1). The equipment at each station includes a vertical component, 1 Hz seismometer (usually Mark Products, Model L-4C), a package containing a preamplifier and voltage-controlled oscillator (U.S.G.S., Model J302), and batteries. The frequency-modulated tone produced at each station is carried by wire (occasionally by radio) to a terminal where it is combined with the tones of up to 7 other stations.

The resulting multiplexed signal is then transmitted by voice-grade telephone circuits or radio to the USGS office in Menlo Park, California. The eight channels of data on each line are separated and demodulated by discriminators and recorded on 16 mm film using a Develocorder (Teledyne, Geotech, Model FR-400). Each Develocorder records seismic signals of up to 17 stations. In addition, 3 timing signals (WWVB on one trace, and a chronometer on the other two) are recorded simultaneously with the seismic signals.

Figure 2 illustrates the overall response of the seismic systems for typical stations. Magnification for individual stations is adjusted according to the background noise level in steps of 6 decibels. As a result, the response for an individual station may differ from that of the typical station by a factor of 2, 4, 8, or 16. Precise calibrations indicate that most stations are operated at magnifications of 25,000 to 100,000 at 1 Hz.

All stations used in the present study are listed in Table 1 and the station locations are plotted on Figure 3.

DATA PROCESSING AND ANALYSIS

The telemetered seismic data recorded on 16 mm film are processed manually to yield information on first P-arrivals, directions of first motions, maximum amplitudes, and signal durations. These data are then processed by computer to give origin time, hypocenter location, magnitude, and pattern of first motions of the earthquakes using the HYPO71 computer program (Lee and Lahr, 1972). Each roll of film contains about 24 hours recording time and is processed in the following steps: (1) scanning, (2) timing using a digitizer which prepares punched cards, (3) batch processing by computer program HYPO71, (4) correcting errors, (5) adding data from other sources, (6) rerunning HYPO71, (7) analyzing poor solutions, and (8) eliminating explosions.

In the routine data processing, local events with signal duration or coda of 10 seconds or more are always timed. This corresponds to a cutoff at about magnitude 1 for events within the USGS network. Some smaller events for which 6 clear first arrivals can be obtained are also timed. The magnitude cutoff for events outside, but near the USGS network, is somewhat larger than 1. The catalog of earthquakes reported here contains all hypocenter solutions obtained. Because the station coverage is not uniform and because some events outside the network are reported, the cutoff for small magnitudes is not uniform over the entire area reported.

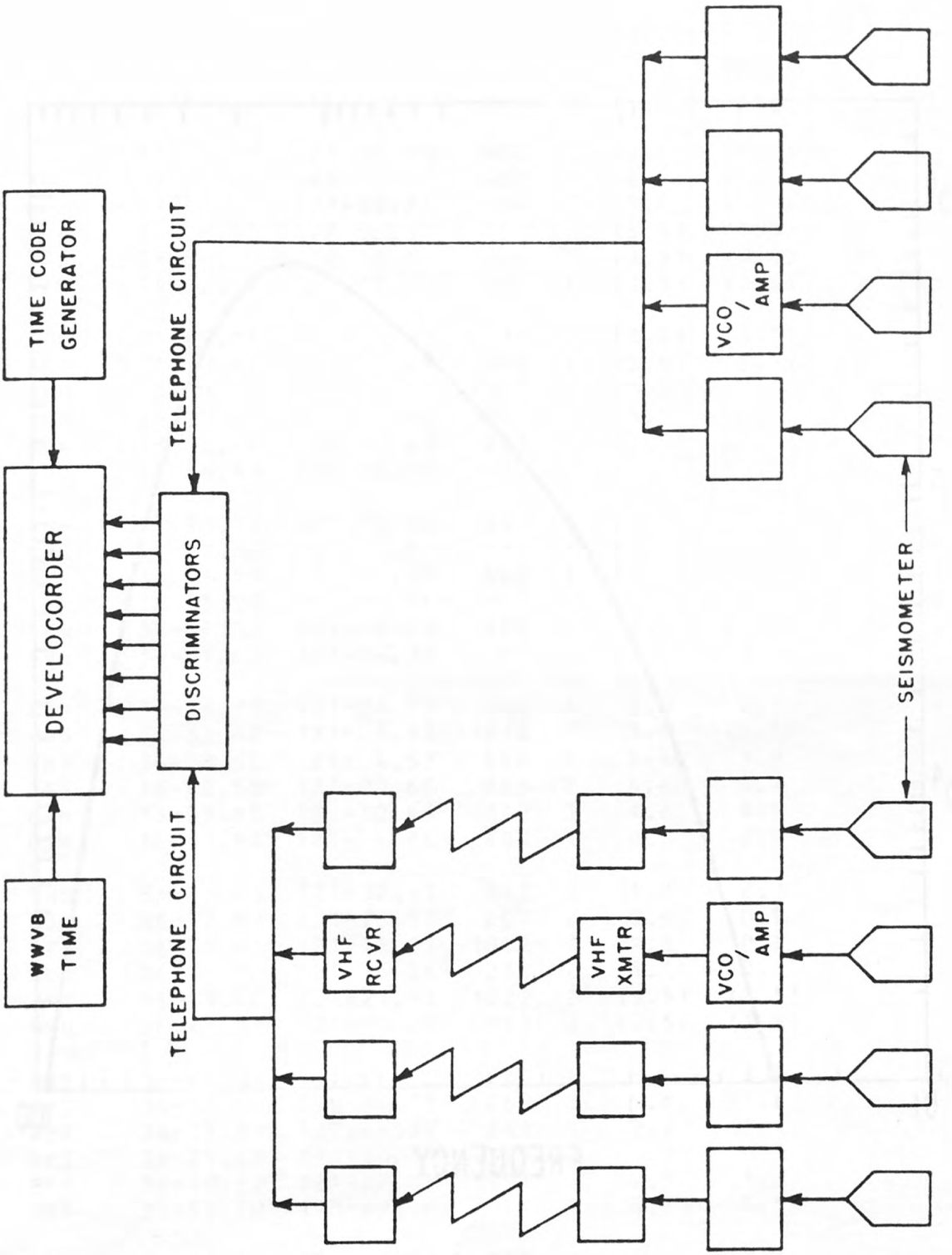

Figure 1. Block diagram of the USGS telemetered seismograph system.

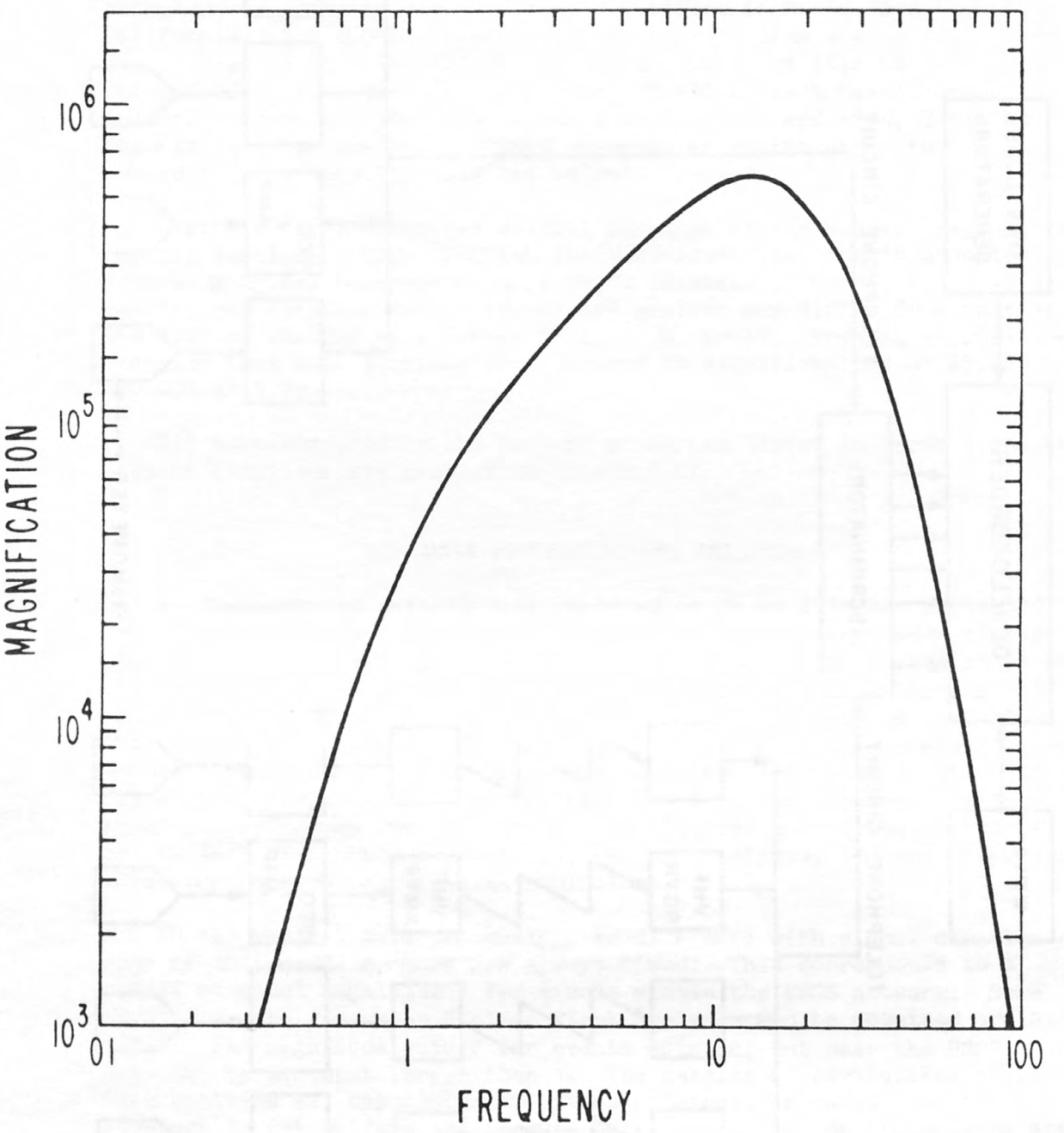

Figure 2. System response of an USGS telemetered seismograph station. This magnification curve is obtained for a system (L-4C seismometer, U.S.G.S. J302M, VCO/Amplifier with attenuation set at 12 db, Develco Discriminator, and Geotech Develocorder).

TABLE 1. STATION DATA *

USGS TELEMETERED STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)	NOTE **
AAR	39 16.57	121 01.53	930	1	(3.5)	(3.5)	
ABJ	39 09.92	121 11.47	457	1	(3.5)	(3.5)	
ABR	39-08.11	121-29.21	24	1	(3.5)	(3.5)	
ADW	38 26.35	120 50.89	251	1	(3.5)	(3.5)	
AFD	38 56.69	120 58.10	524	1	(3.5)	(3.5)	
AFH	39 02.51	120 47.48	1064	1	(3.5)	(3.5)	
AFR	38 47.54	121 20.91	31	1	(3.5)	(3.5)	
AGI	38 50.68	120 58.88	305	1	(3.5)	(3.5)	
AHD	39 02.90	121 04.59	483	1	(3.5)	(3.5)	
AHR	38 51.26	121 04.23	354	1	(3.5)	(3.5)	
ALA	38 52.62	120 57.37	293	1	(3.5)	(3.5)	
AOD	38 36.89	120 43.75	520	1	(3.5)	(3.5)	
AOH	39.22.52	121 15.36	457	1	(3.5)	(3.5)	
APR	38 52.62	121 13.03	133	1	(3.5)	(3.5)	
ARJ	38 41.19	120 57.38	460	1	(3.5)	(3.5)	
ARR	38 45.92	121 10.31	127	1	(3.5)	(3.5)	
ARW	38-57.38	121-09.73	320	1	(3.5)	(3.5)	
AVR	39-01.49	121-16.08	91	1	(3.5)	(3.5)	
BAV	37-38.75	121-01.79	604	1	2.0	2.4	
BBG	36-35.48	121- 1.52	1216	1	3.0	(3.5)	
BBN	36-30.60	121- 4.53	448	2	3.4	3.0	
BCG	36-42.55	121-20.60	305	2	4.8	0.7	
BEH	36-39.88	121-10.45	342	1	1.6	4.0	
BEM	36-39.68	121- 5.76	488	1	0.8	2.2	
BHS	36-21.35	121-32.41	646	2	1.8	2.2	
BJC	36-32.82	121-23.53	207	2	0.9	0.9	
BJO	36-36.65	121-18.81	1052	2	1.5	0.7	
BLR	36-39.96	121-16.36	232	2	5.1	2.4	
BMC	36-39.40	121-21.91	1022	2	(3.5)	(3.5)	
BMH	36-41.18	121-24.80	811	2	(3.5)	(3.5)	
BMS	36-39.48	120-47.62	769	1	3.9	3.8	
BPC	36-33.90	121-38.15	268	2	1.8	1.6	
BPF	36-13.82	121-46.32	349	1	2.2	2.4	
BPI	36-29.40	121-10.11	329	2	1.2	0.3	
BPP	36-10.12	121-22.68	1591	2	2.1	1.3	
BRM	36-50.70	120-49.40	372	1	5.7	5.4	
BRV	36-25.46	121- 1.08	555	2	5.5	2.1	
BSB	36-44.27	121-17.21	398	1	3.8	4.9	
BSC	36-37.98	121-14.05	357	1	5.5	1.9	
BSG	36-24.83	121-15.22	192	2	0.4	0.1	
BSL	36-46.53	121-20.96	155	1	(3.5)	(3.5)	
BSR	36-39.99	121-31.12	395	2	1.4	0.5	

TABLE 1. STATION DATA (CONTINUED)

USGS TELEMETERED STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)	NOTE **
BVL	36-34.51	121-11.34	510	2	3.1	0.6	
BVY	36-44.96	121-24.80	585	2	4.4	(3.5)	
CAC	37-58.57	121-45.62	74	1	7.0	6.2	
CAD	37- 9.77	121-37.45	244	1	3.0	3.2	
CAI	37-51.68	122-25.77	223	1	2.2	2.2	
CAL	37-27.07	121-47.95	265	1	4.4	4.3	
CAO	37-20.96	121-31.96	628	1	3.9	4.2	
CBR	37-48.97	122- 3.72	610	1	4.6	5.0	
CBW	37-55.45	122- 6.40	221	1	5.1	5.1	
CCN	37-47.49	121-56.89	219	1	7.4	(3.5)	
CCO	37-15.46	121-40.35	366	1	5.9	6.8	
CCY	37-33.70	122-05.45	67	1	2.5	3.2	
CDO	37-43.80	121-50.12	198	1	6.8	6.8	
CDS	37-57.98	122-15.17	109	1	(3.5)	(3.5)	
CDU	38- 1.78	122- 0.05	168	1	8.0	5.4	
CLC	37-44.28	122- 3.83	312	1	4.3	4.6	
CMC	37-46.88	122-10.55	90	1	3.1	(3.5)	
CMH	37-21.57	121-45.38	518	1	5.3	6.2	
CMJ	37-31.25	121-52.23	498	1	4.3	4.3	
CMO	37-48.68	121-48.15	792	1	6.6	6.6	
CMR	37-35.68	121-38.22	500	1	4.6	4.6	
CPL	37-37.88	121-57.37	463	1	4.3	4.1	
CRA	37 46.03	121 56.25	171	1	(3.5)	(3.5)	
CRP	37-54.75	121-54.33	331	1	4.8	4.8	
CSC	37-17.11	121-46.35	128	1	5.4	4.8	
CSH	37-38.88	122-02.57	170	1	(3.5)	4.0	
CTL	37 39.44	121 38.63	458	1	(3.5)	(3.5)	
GAF	38-53.59	123-32.28	710	1	5.1	(3.5)	
GAX	38-42.65	122-45.30	379	1	0.8	0.8	
GBG	38-48.84	122-40.76	1125	1	3.0	(3.5)	
GBO	38-49.46	122-50.57	879	1	3.1	(3.5)	
GCM	38-48.35	122-45.31	1286	1	3.8	(3.5)	
GCV	38-46.14	123-00.89	150	1	3.7	(3.5)	
GDC	38-46.03	123-14.31	772	1	4.3	(3.5)	
GDX	38-48.46	122-47.63	931	1	(3.5)	(3.5)	11/17 TO 12/31
GGL	38-53.80	122-46.58	893	1	2.8	(3.5)	
GGP	38-45.88	122-50.65	1054	1	3.4	(3.5)	
GHC	38-36.36	123-11.81	518	1	3.6	(3.5)	
GHG	39-07.70	122-49.47	903	1	2.8	(3.5)	
GHL	39-02.43	123-01.12	956	1	2.8	(3.5)	
GMC	38-47.56	123-07.80	426	1	3.7	(3.5)	
GMK	38-58.17	122-47.22	906	1	3.9	(3.5)	

TABLE 1. STATION DATA (CONTINUED)

USGS TELEMETERED STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)	NOTE **
GMO	38-42.61	123-08.59	802	1	3.0	(3.5)	
GPM	38-50.85	122-56.78	783	1	1.7	1.6	
GRM	39-01.23	122-35.06	469	1	3.2	(3.5)	
GRT	38-56.32	122-40.18	619	1	1.9	(3.5)	
GSG	38-52.03	122-42.58	1080	1	4.1	4.0	
GSM	38-46.15	122-46.87	1017	1	3.0	(3.5)	
GSN	38-56.43	123-11.50	870	1	4.0	(3.5)	
GSS	38-42.12	123-00.81	282	1	3.0	(3.5)	
HAZ	36-53.08	121-35.45	122	2	4.4	1.4	
HBT	36-51.01	121-33.04	98	2	4.5	2.3	
HCA	37- 1.52	121-29.02	332	1	3.6	5.0	
HCB	36-55.88	121-39.63	219	2	4.4	3.2	
HCO	36-53.31	121-42.34	129	2	4.0	3.7	
HCR	36-57.46	121-35.01	241	1	2.1	3.6	
HCZ	36-54.54	121-48.02	30	2	4.0	3.6	
HDL	36-50.12	121-38.64	204	2	3.2	2.2	
HFE	36-59.00	121-24.09	323	1	3.2	4.3	
HFH	36-53.29	121-28.13	101	1	(3.5)	(3.5)	
HFP	36-45.22	121-29.43	705	2	2.2	0.8	
HGS	37- 5.75	121-26.83	778	1	2.3	4.4	
HGW	37-01.02	121-39.20	133	1	2.1	2.5	
HJG	36-47.88	121-34.43	171	2	3.0	1.5	
HJS	36-48.99	121-17.92	215	1	2.6	3.9	
HKR	36-54.10	121-25.56	66	1	4.0	5.6	
HLT	36-53.07	121-18.49	183	1	3.0	4.5	
HMO	36-36.03	121-55.06	192	2	1.1	1.1	
HOR	36-55.03	121-30.46	98	1	3.0	4.4	
HPH	36-51.38	121-24.37	122	1	4.6	6.6	
HPL	37- 3.13	121-17.40	152	1	2.2	3.6	
HPR	36-57.19	121-41.70	94	2	3.7	(3.5)	
HQR	36-50.02	121-12.76	536	1	3.1	4.0	
HSF	36-48.72	121-29.97	340	2	4.5	3.4	
HSL	37-04.81	121-05.65	122	1	(3.5)	(3.5)	
JAL	37- 9.50	121-50.82	244	1	1.6	1.8	
JBC	37- 9.62	122- 1.57	660	2	3.7	4.7	
JBG	37-20.52	122-20.34	158	2	3.8	3.8	
JBL	37-07.69	122-10.08	792	2	1.7	1.7	
JBM	37-19.09	122-09.16	820	1	3.6	3.3	
JBZ	37-01.07	121-49.15	213	2	4.9	5.2	
JCB	37- 6.71	121-41.33	192	1	2.2	2.7	
JEC	37- 3.04	121-48.56	438	2	3.0	3.8	
JEG	37-30.84	120-27.74	202	2	2.5	2.7	

TABLE 1. STATION DATA (CONTINUED)

USGS TELEMETERED STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)	NOTE **
JHL	37-06.56	121-49.95	908	2	2.8	3.1	
JLT	37-21.22	122-12.25	270	2	3.8	3.4	
JLX	37-12.11	121-59.17	244	1	2.9	(3.5)	
JMG	37-38.22	122-28.43	201	2	2.4	2.4	
JPL	36-58.62	121-49.93	158	2	4.9	4.0	
JPP	37-15.87	122-12.78	186	2	4.0	3.7	
JPR	37-47.70	122-28.43	107	1	3.0	3.4	
JPS	37-11.94	122-20.90	84	2	3.2	2.5	
JRG	37-02.22	121-57.87	213	2	(3.5)	(3.5)	
JRR	37-03.27	121-43.61	408	1	(3.5)	(3.5)	
JSA	37-34.95	122-25.03	207	2	2.2	2.2	
JSC	37-17.07	122- 7.42	357	2	3.0	3.0	
JSF	37-24.31	122-10.55	143	1	4.0	4.0	
JSG	37-16.96	122-03.00	198	1	5.5	4.0	
JSJ	37-20.03	122- 5.48	122	1	5.7	4.1	
JSM	37-12.74	122-10.06	262	2	4.6	4.0	
JSS	37-10.17	121-55.84	946	1	2.8	3.4	
JST	37-12.41	121-47.84	149	1	3.2	3.8	
JTG	37-01.71	121-52.58	253	2	4.7	4.1	
JUC	37-00.07	122-02.90	177	2	(3.5)	(3.5)	
JWS	37-25.08	122-16.33	280	2	3.3	2.5	
LCF	40-29.18	121-31.44	840	1	(3.5)	(3.5)	
LHK	40-26.12	121-16.67	2060	1	(3.5)	(3.5)	10/04 TO 12/31
LMZ	40-32.73	121-33.84	1792		(3.5)	(3.5)	
LRD	40-27.78	121-27.85	2292	1	(3.5)	(3.5)	
LSL	40-25.64	121-32.05	2048	1	(3.5)	(3.5)	
MBF	37-40.71	120-20.80	309	1	(3.5)	(3.5)	
MCH	38- 1.12	120-30.57	475	1	(3.5)	(3.5)	
MCU	37-58.36	120-37.02	336	1	(3.5)	(3.5)	
MMW	38-03.83	121-10.89	1411	1	(3.5)	(3.5)	
MNH	38 08.75	120 48.82	219	1	(3.5)	(3.5)	
MOY	37-54.00	120-34.04	176	1	(3.5)	(3.5)	
MRF	38 14.72	120 31.24	799	1	(3.5)	(3.5)	
MST	37-54.27	120-24.29	366	1	(3.5)	(3.5)	
NBP	38-40.07	122-11.60	867	1	3.9	(3.5)	
NBR	38-15.65	122-32.99	137	1	2.8	2.2	
NCD	38-22.19	122-27.70	620	1	2.2	2.2	
NCF	38-19.28	122-47.73	98	1	2.2	2.2	
NFI	37-41.90	123- 0.00	107	2	1.3	1.3	
NFR	38-31.36	123-09.66	528	1	3.9	(3.5)	
NGV	38-16.84	122-12.89	257	1	4.4	5.2	
NHB	38-35.36	122-54.54	165	1	3.8	(3.5)	

TABLE 1. STATION DATA (CONTINUED)

USGS TELEMETERED STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)	NOTE **
NHM	38- 9.28	121-48.02	65	1	6.3	6.3	
NLH	38-07.19	122-08.87	177	1	(3.5)	(3.5)	
NLN	38- 9.15	122-42.75	120	1	1.9	1.9	
NMH	38-40.17	122-37.93	1311	1	1.3	1.6	
NMT	38-48.34	122-26.76	422	1	3.4	(3.5)	
NMW	38-33.03	122-43.37	134	1	3.3	3.3	
NMX	38-24.68	122- 3.44	177	1	5.7	5.7	
NOL	38-02.50	122-47.64	37	2	2.6	2.6	
NSH	38-31.20	122-36.43	328	1	2.0	2.0	
NSP	38-10.96	122-27.20	88	1	3.2	2.2	
NTM	38-23.15	122-40.83	105	1	2.7	2.7	
NWR	38-27.42	122-53.26	50	1	1.6	1.6	
OBH	39-39.10	121-27.70	916	1	(3.5)	(3.5)	
OCH	39 52.55	121 45.93	530	1	(3.5)	(3.5)	
OGO	39-39.22	121-36.72	158	1	(3.5)	(3.5)	
OHC	39 20.18	121 29.05	76	1	(3.5)	(3.5)	
ORA	39-28.13	121-24.80	585	1	(3.5)	(3.5)	
OST	39-22.12	121-35.80	29	1	(3.5)	(3.5)	
OSU	39-16.23	121-51.10	67	1	(3.5)	(3.5)	
OTB	39-32.75	121-33.65	223	1	(3.5)	(3.5)	
OWY	39-27.19	121-29.20	177	1	(3.5)	(3.5)	
PAR	36-14.95	120-20.52	485	1	6.7	5.2	
PBW	36-18.90	120-55.75	381	2	2.1	2.1	
PCA	35-55.90	120-20.22	1189	1	5.2	5.2	
PCR	36-05.65	120-26.08	296	1	(3.5)	(3.5)	
PCZ	36 05.45	121 09.43	277	2	(3.5)	(3.5)	
PGH	35-49.86	120-21.17	433	1	3.3	3.4	
PHC	35-40.93	121-09.15	514	2	4.3	4.3	
PHR	36-22.38	120-49.13	750	1	4.0	1.0	
PIV	35-54.39	120-40.94	497	2	4.2	3.4	
PLO	36-14.79	121- 2.55	308	2	0.1	0.1	
PMP	36-12.91	120-47.69	784	2	1.8	1.9	
PPF	35-52.91	120-24.81	469	1	4.3	5.3	
PPT	36- 6.50	120-43.27	506	2	1.7	1.9	

TABLE 1. STATION DATA (CONTINUED)

USGS TELEMETERED STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)	NOTE **
PSM	36-04.18	120-35.68	988	1	(3.5)	(3.5)	
PTY	35-56.73	120-28.45	552	1	4.3	5.6	
PWK	35-48.87	120-30.67	503	2	4.2	4.4	

** THIS COLUMN INDICATES THE OPERATION PERIOD. IF IT IS BLANK THEN THIS STATION HAS BEEN OPERATED CONTINUOUSLY DURING THE FOURTH QUARTER OF 1977.

UNIVERSITY OF CALIFORNIA STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)
ARC	40-52.60	124-04.50	59	1	(3.5)	(3.5)
BKS	37-52.60	122-14.10	276	1	2.4	2.4
FHC	40-48.10	123-59.10	610	1	(3.5)	(3.5)
FRI	36-59.50	119-42.50	119	1	(3.5)	(3.5)
JAS	37-56.80	120-26.30	457	1	(3.5)	(3.5)
MHC	37-20.50	121-38.50	1282	1	4.5	5.0
MIN	40-20.70	121-36.30	1495	1	(3.5)	(3.5)
PRI	36- 8.50	120-39.90	1187	1	4.0	4.0
PRS	36-19.90	121-22.20	363	2	1.1	1.1
SAO	36-45.90	121-26.70	350	2	2.7	1.0
WDC	40-34.80	122-32.40	300		(3.5)	(3.5)

TABLE 1. STATION DATA (CONTINUED)

CALIFORNIA DEPARTMENT OF WATER RESOURCES STATIONS

CODE	LAT N	LONG W	ELV	K	D(E)	D(W)	NOTE **
KPK	39-35.01	121-18.32	897	1	(3.5)	(3.5)	
MGL	39-48.71	121-33.42	1010	1	(3.5)	(3.5)	
ORV	39-33.33	121-30.00	362	1	(3.5)	(3.5)	
PAM	39-26.94	121-31.19	131	1	(3.5)	(3.5)	
PYR	34-34.07	118-44.50	1247	1	(3.5)	(3.5)	

* LAT AND LONG ARE LATITUDE AND LONGITUDE IN DEGREES AND MINUTES. ELV IS ELEVATION IN METERS. D(E) AND D(W) ARE GIVEN IN KILOMETERS. SEE TEXT (P. 20) FOR EXPLANATION OF K, D(E), AND D(W).

Table 2

New Code	Output Station Name	Old Code	Output* Levels
AAR	Airport Road	AARS	41
ABJ	Bob Jauregui Ranch	ABJS	36
ABR	Brophy Road	ABRS	38
ADW	Drytown Water District	ADWD	40
AFD	Forest Hill Divide	AFHD	44
AFH	Forest Hill Site	AFHS	37
AFR	Fiddyment Road	AFID	36
AGI	Gold Rush Inn	AGRI	44
AHD	Hacienda Drive	AHDR	38
AHR	Harold F. Ross	AHFR	43
ALN	Lincoln	ALIN	38
AOD	Outingdale	AOTD	39
AOH	Oregon House	AOHO	
APR	Poppy Hill Road	APHR	43
ARJ	Robert W. Jensen	ARWJ	31
ARR	Rickey Ranch	ARRA	39
ARW	Richard P. Wilkes	ARPW	40
ASR	Slough House Road	ASHR	
AVR	Valley Road Site	AVRS	36
BAV	Antelope Valley	ANV	35
BBG	Big Mountain	BGM	16
BBN	San Benito	BEN	4
BCG	Cienega Road	CNR	33
BEH	Elkhorn Ranch	EKH	7
BEM	Emmet	EMM	35
BHS	Hastings	HST	17
BJC	Johnson Canyon	JHC	16
BJO	Mt. Johnson	JON	16
BLR	Lewis Ranch	LWR	35
BMC	McPhails Peak	MCP	35
BMH	Mt. Harlan	MTH	32
BMS	Mercey Hot Springs	MRS	33
BPC	Pine Canyon	PNQ	10
BPF	Pfieffer Point	PFP	16
BPI	Pinnacles	PIN	15
BPP	Pinyon Peak	PNP	16
BRM	Rolling Bench Mark	RBM	33
BRV	Little Rabbit Valley	LRV	17
BSB	Swanson Bluff	SWB	33
BSC	Stone Canyon	STQ	17
BSG	Shirt Tail Gulch	SHG	33
BSL	Silva Ranch	SLV	33
BSR	Salinas Radio Site	SRQ	32
BVL	Bear Valley	BVL	16
BVY	Vineyard	VYD	33

Table 2 (continued)

New Code	Output Station Name	Old Code	Output* Levels
CAC	Antioch	ACH	19
CAD	Anderson Dam	AND	35
CAI	Angel Island	ANG	22
CAL	Calaveras	CAL	33
CAO	Arnold Ranch	ARN	35
CBR	Bollinger Road	BOL	23
CBW	Brookwood Reservoir	BWR	22
CCN	Crow Canyon Road	CCQ	34
CCO	Coe Ranch	COE	42
CCY	Coyote Hills	CYO	33
CDO	Doolan Road	DOO	37
CDS	Don Santos Ranch	DSR	20
CDU	Duarte Ranch	DUR	21
CLC	Lake Chabot	LCH	37
CMC	Mills College	MIL	25
CMH	Mt. Hamilton Road	MHR	46
CMJ	Mission San Jose	MSJ	34
CMO	Morgan Territory	MOR	34
CMR	Mines Road	MNR	38
CPL	Palamares	PAL	14
CRA	San Ramon	SRA	
CRP	Russellman Park	RUS	19
CSC	Silver Creek	SVC	25
CSH	Cal. State Hayward	CSH	37
GAF	Pt. Arena A.F.A	AAF	42
GAX	Alexander Valley	ALX	37
GBG	Boggs	BGG	42
GBO	Black Oak	BKO	34
GCM	Cobb Mountain	CMT	36
GCV	Cloverdale	CVD	36
GDC	Dry Creek	DRY	38
GGL	Glenview	GLV	42
GGP	Geyser Peak	GYP	36
GHC	House Creek	HOC	39
GHG	Hog Mountain	HOG	40
GHL	Highland Springs	HLS	22
GMC	McLaughlin Ranch	MCL	37
GMK	Mt. Konoctai	MKI	35
GMO	Moffitt Ranch	MOF	35
GPM	Pine Mountain	PNM	36
GRM	Round Mountain	RDM	
GRT	Round Top Mountain	RTM	45
GSG	Seigler Mountain	SGM	31
GSM	Socrates Mine	SCR	15
GSN	Snow Mountain	SNO	12
GSS	Skaggs Springs	SKG	38

Table 2 (continued)

New Code	Station Name	Old Code	Output* Levels
HAZ	Anzar	ANZ	36
HBT	San Juan Bautista	BTT	34
HCA	Canada Road	CAN	40
HCB	Chamberlin Ranch	CBC	34
HCO	Corn Cob Canyon	CCC	34
HCR	Chase Ranch	CHR	37
HCZ	Cordoza Dairy	CZD	35
HDL	Dillion Ranch	DIL	34
HFE	San Felipe	FEL	35
HFH	Flint Hills	FTH	19
HFP	Fremont Peak State Park	FRP	34
HGS	Gilroy Hot Springs	GHS	42
HGW	Gilroy West	GRW	32
HJG	San Juan Grade	SJG	35
HJS	John Smith Road	JSR	33
HKR	Kincaid Ranch	KNR	33
HLT	Lone Tree Road	LTR	35
HMO	Monterey	MON	33
HOR	O'Connell Ranch	OCR	29
HPH	Parkhill	PKH	35
HPL	Pacheco Lake	PCL	38
HPR	Peckham Road	PMR	34
HQR	Quien Sabe Road	QSR	31
HSF	Saint Francis Retreat	STF	35
HSL	San Luis Dam	SL8	44
JAL	Almaden	ALM	35
JBC	Bear Creek Road	BCR	46
JBG	Bear Gulch	BGH	35
JBL	Camp Ben Lomond	CBL	34
JBM	Black Mountain	BAM	40
JBZ	Buzzard Lagoon Road	BUZ	36
JCB	Chesbro Reservoir	CBO	36
JEC	Eureka Canyon	EUC	32
JEG	El Granada	ELG	33
JHL	Holstrom Ranch	HLM	33
JLT	Los Trancos Woods	LTW	37
JLX	Lexington Reservoir	LXR	45
JMG	Miligra Ridge	MGA	34
JPL	Pleasant Valley	PLV	35
JPP	Portola State Park	POR	
JPR	Presidio	PRO	15
JPS	Pescadero	PES	44
JRG	Rodeo Gulch Road	RGR	33
JRR	Redwood Retreat	RDR	24
JSA	San Andreas Lake	SAC	36
JSC	Stevens Creek	STV	43
JSF	Stanford Telescope	SFT	36

Table 2 (continued)

New Code	Output Station Name	Old Code	Output* Levels
JSG	Saratoga Golf/Country Club	SGC	39
JSJ	St. Joseph's Seminary	STJ	41
JSM	Sawmill Road	SAW	40
JSS	Soda Springs	SOS	46
JST	Santa Teresa	SNT	46
JTG	Trout Gulch Road	TGR	33
JUC	U.C. Santa Cruz	UCS	41
JWS	Woodside	WDS	38
LCF	Crecent Cliffs	CCF	
LRD	Redding Peak	RED	
LSL	South Lassen	SLA	
MBF	Blanchard Fire Station	BFS	44
MCH	Carson Hill	CRH	
MCU	Copperopolis	COP	40
MCS	Central Site	CNS	39
MMW	Mi Wuk Village	MWV	32
MNH	New Hogan Reservoir	NHR	40
MOY	O'Brian Ferry	OBF	41
MRF	Railroad Flat Road	RFR	32
MST	Stent	STN	40
NBP	Berryessa Peak	BRP	42
NBR	Beebe Ranch	BBR	22
NCD	Cavedale Road	CDR	40
NCF	Canfield Road	CAR	38
NFI	Farallones Islands	FAR	18
NFR	Fort Ross	FTR	33
NGV	Green Valley Ranch	GVR	3
NHB	Healdsburg	HLB	40
NHM	Hamilton Ranch	HMR	21
NLN	Lincoln School	LNS	20
NMH	Mt. Saint Helena	SHQ	39
NMT	Middletown	MDT	42
NMW	Mark West Spring	MWS	39
NMX	Mix Canyon	MIX	32
NOL	Olema	OLQ	20
NSH	St. Helena Road	SHR	38
NSP	Sears Point	SPT	21
NTM	Taylor Mountain	TMN	15
NWR	Wright Ranch	WHW	40

Table 2 (continued)

New Code	Output Station Name	Old Code	Output* Levels
OBH	Bloomer Hill	OBLO	41
OCH	Cohasset Ridge	OCOR	40
OGO	Van Goodin Ranch	OGOO	
OHC	Honcut	OHON	40
ORA	Rattlesnake Point	ORAT	42
OST	Stimpson Lane	OSTI	38
OSU	Sutter Buttes	OSUT	33
OTB	Table Mountain	OTAB	41
OWY	Wyandotte	OWYN	40
PAR	Anticline Ridge	ATR	11
PBW	Bitterwater	BTW	17
PCA	Castle Mountain	CAS	30
PCR	Curry Mountain	CRY	30
PGH	Gold Hill	GDH	31
PHC	Hearst Castle	HEC	33
PHR	Hernandez	HER	1
PIV	Indian Valley	IND	29
PJR	Jolon Road	JOL	30
PLO	Lone Oak Road	LOR	11
PMP	Monarch Peak	MOP	32
PPF	Parkfield	PKF	32
PPT	Peach Tree Valley	PTV	32
PSM	Smith Mountain	SMM	31
PTY	Taylor Ranch	TAY	32
PWK	Work Ranch	WKR	31

* Output levels, prior to March 25, 1977, with amplitudes measured peak to peak.

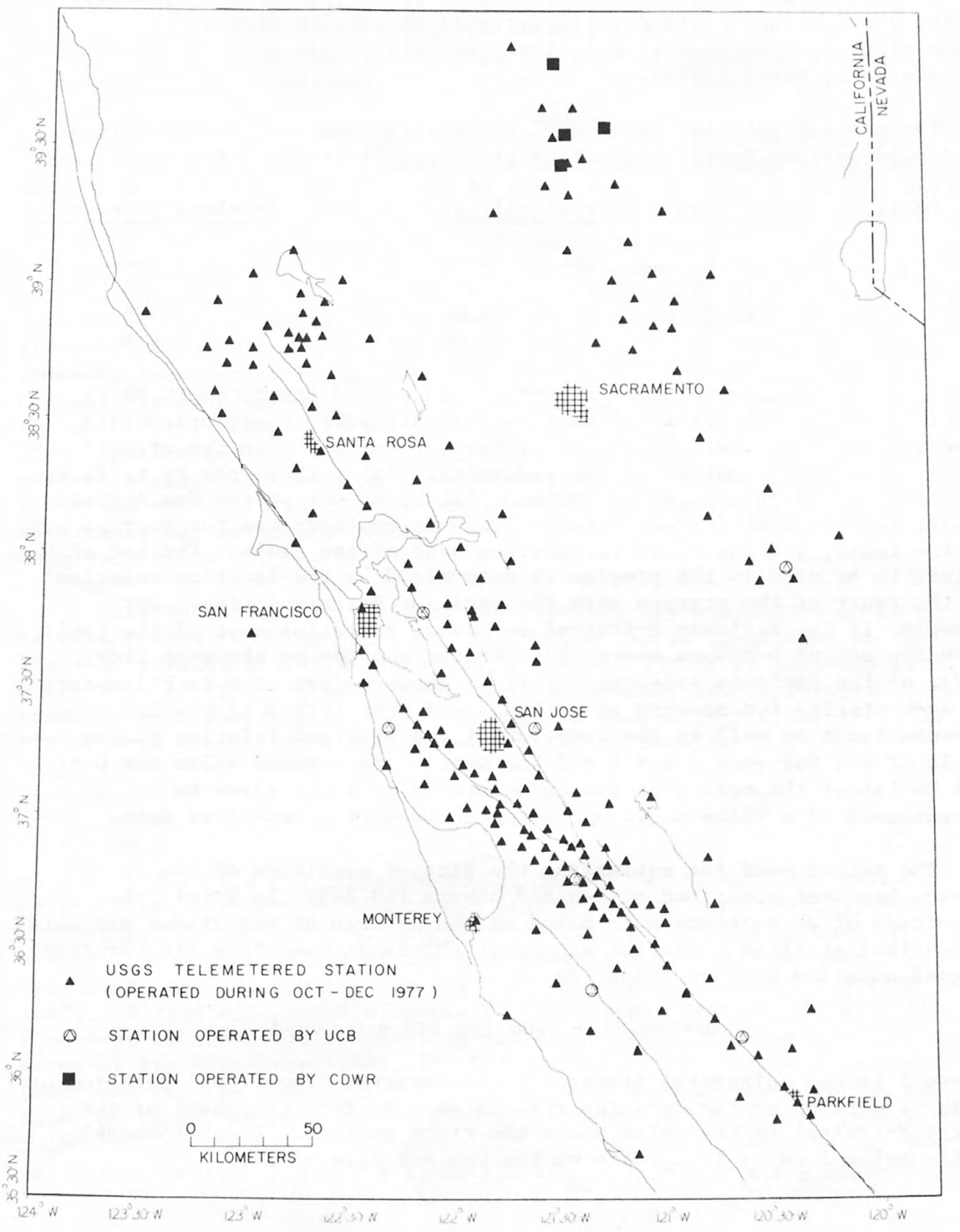

Figure 3. Map showing principal seismograph stations used in locating earthquakes for the fourth quarter of 1977.

Location of earthquakes was based mainly on first P-arrivals. When an adequate location could not be obtained using P-arrivals alone, S-arrivals were used to supplement the P-arrivals whenever possible. The HYPO71 computer program uses Geiger's method (Geiger, 1912) to determine hypocenters by minimizing the residuals between observed and calculated arrivals in a least-squares sense. Traveltimes from a trial hypocenter to the stations and their partial derivatives are computed on the assumptions of a horizontal multilayer velocity model by a technique introduced by Eaton (1969).

The crustal velocity model used was derived mostly from analysis of explosion data by Wesson and others (1973a). It is specified by:

Layer	Depth (km)	P-velocity (km/sec)	S-velocity (km/sec)
1	0 to D	4.0	2.2
2	D to 15	5.9	3.3
3	15 to 25	6.8	3.8
4	below 25	8.05	4.5

The variable boundary between the first and second layer (depth D) is determined for each station from time-term analysis of explosion data whenever they are available. The variable first layer in the crustal model is an approximation of the sedimentary layer above the Pg refractor. To allow for sharp changes in sediment thickness across the San Andreas fault, two D values for each station were determined: one for sources east of the fault, and the other for sources west of the fault. The set of D values to be used in the program is determined by the location relative to the fault of the station with the earliest P-arrival time. For example, if the earliest P-arrival occurs at a station west of the fault, then the set of D values appropriate to the sources on the west side, D(W), of the fault is selected. Table 1 shows values of D in kilometers at each station for sources east (D(E)) and west (D(W)) of the San Andreas fault as well as the location of the stations relative to the fault (K = 1 for east, and K = 2 for west). An assumed value for D of 3.5 km (about the median of the calculated values) is given in parentheses if a value could not be determined from explosion data.

The method used for estimating the Richter magnitude of the earthquakes has been described by Lee and others (1972a). In brief, the magnitude of an earthquake is based on the average of magnitudes estimated at various stations. Station magnitude (M) is derived from its recorded signal duration (τ) according to:

$$M = -0.87 + 2.00 \log (\tau) + 0.0035\Delta$$

where Δ is the epicentral distance in kilometers. The signal duration or coda is defined as the duration time in seconds from the onset of the first P-arrival to the point where the trace amplitude (peak-to-peak) falls below 1 cm as it appears on the Geotech film viewer.

For earthquakes with Richter magnitudes of 3.5 and below, equation (1) gives a good estimate of the magnitude. Richter magnitudes have been calculated (Richter, 1942) for earthquakes with coda magnitudes of 3.5 or greater using records obtained from the UCB Wood-Anderson seismographs at Berkeley and Mount Hamilton, and the Stanford-USGS Wood-Anderson at Palo Alto. The earthquakes for which the Richter magnitude has been determined from Wood-Anderson records are indicated in the catalog by an R next to the magnitude.

Beginning March 25 through April 26, 1977 all Develocorders were calibrated so that output levels would be standardized for all stations recorded on film. Prior to March 25 the introduction of a 5 Hz, 1 volt (peak to peak) signal into each Develocorder produced random output levels for each station and these are listed in Table 2. Since completion of calibrations, on April 26, the same input signal generates a standard 20 mm (peak to peak) output level for each station. Comparing this value with those listed in Table 2 it is apparent that this standardization process has resulted in a decrease in gain for most stations recorded on film. Consequently this has probably resulted in a decrease in coda magnitude for most of the earthquakes reported, since the method for measuring codas was not changed. At present no adequate investigation has been made to accurately determine the actual amount of magnitude bias introduced by these gain changes. However, Bakun (personal communication) has estimated from a small sample study that magnitudes may be biased downward by as much as one-quarter of a magnitude unit.

A substantial effort has been made to identify explosions so as to eliminate them from the catalog. Explosions can be identified on the basis of several criteria: location of a known quarry or blasting site, shallow focal depth, time of day, focal mechanism, and/or through correspondence with quarry operators. During the fourth quarter of 1977, 33 blasts were identified and eliminated from the catalog.

DISCUSSION OF CATALOG

The parameters for the earthquakes listed in the Appendix include the origin time, location of hypocenter (epicenter and focal depth), and magnitude. In addition, six other parameters are listed so that an evaluation of the quality of the hypocenter solution may be made. These parameters are (1) the largest azimuthal separation between stations (GAP), (2) the epicentral distance to the nearest station (DMIN), (3) the root-mean-square error of the time residuals (RMS), (4) the standard error of the epicenter (ERH), (5) the standard error of the focal depth (ERZ) and (6) the number of P- and S-arrivals used in the location (NO). Based on these parameters, the general reliability of each earthquake solution is graded as either excellent (A), good (B), fair (C), or poor (D). Exact rules of quality classification are given in the Appendix.

A brief discussion on the accuracy of hypocenter determinations has been given by Lee and others (1971). To obtain a reliable epicenter, GAP should be less than 180°; to obtain a reliable focal depth, DMIN should be less than the focal depth. In addition, systematic errors arise from uncertainties in the crustal velocity model. These errors cannot be determined except through controlled experiments, e.g., known explosions in the focal region. Because we present all hypocenter solutions of earthquakes in the region we studied, their quality varies. Although standard errors of epicenter and focal depth (ERH and ERZ) are given, they must be interpreted with caution, especially for quality C and D solutions. Hypocenter solutions for known blasts distributed throughout the San Francisco Bay region indicate that the true positions are often within the standard error limits of the solutions, provided that the conditions GAP < 180° and DMIN is within a few kilometers are met. For example, comparison of locations determined for well-recorded quarry blasts (solution quality A) with the known coordinates indicate a typical error of about 1 km. As suggested by known blasts, a general statement on the accuracy of our hypocenter solutions is as follows:

Solution Quality	Approximate accuracy in	
	Epicenter	Focal Depth
A (excellent)	1 km	2 km
B (good)	2.5 km	5 km
C (fair)	5 km	5 km
D (poor)	5 km	5 km

Epicenters listed in the Appendix are plotted according to magnitude in Figure 4.

The dashed lines in Figure 4 indicate the boundaries of the USGS seismograph network as it existed during the fourth quarter of 1977. We feel that the hypocenters listed in the the Appendix represent a nearly complete set of earthquakes above magnitude 1 within these boundaries and that these earthquakes are generally well located. Earthquakes outside the dashed boundaries in Figure 4 tend to be less well located, depending on their distance from the network and their relationship to its geometry. Further, the minimum magnitude event that we can detect and locate increases with increasing distance from the network. For earthquakes outside the network, which yielded unsatisfactory locations on the basis of first P-arrivals alone, S-arrivals were included whenever possible.

We believe that the precision of the earthquake locations (or the relative locations) is better than the absolute accuracy of the earthquake locations. Despite our attempts to model the laterally inhomogeneous nature of the velocity structure within the earth's crust using a variable-thickness surface layer, we suspect that the locations within certain parts of the area included in the boundaries of the network may be systematically biased by as much as 2-3 km (Mayer-Rosa, 1973).

Some of the earthquakes listed in this catalog are multiple events, that is, earthquakes from a given source region which occur in such rapid succession that the seismographs are still recording arrivals from one earthquake when the first arrivals from a following earthquake begin to appear. Depending on the size of the individual events and their separation in time, it may be possible to accurately time and locate the later event(s). Sometimes, however, this is not possible.

The contents of the Appendix, along with similar location information for central California earthquakes since 1969, may be obtained in forms amenable to computer input (magnetic tape) by contacting:

National Oceanic and Atmospheric Administration
Environmental Data and Information Service
NGSDC, Mail Code D62
325 Broadway
Boulder, CO 80303

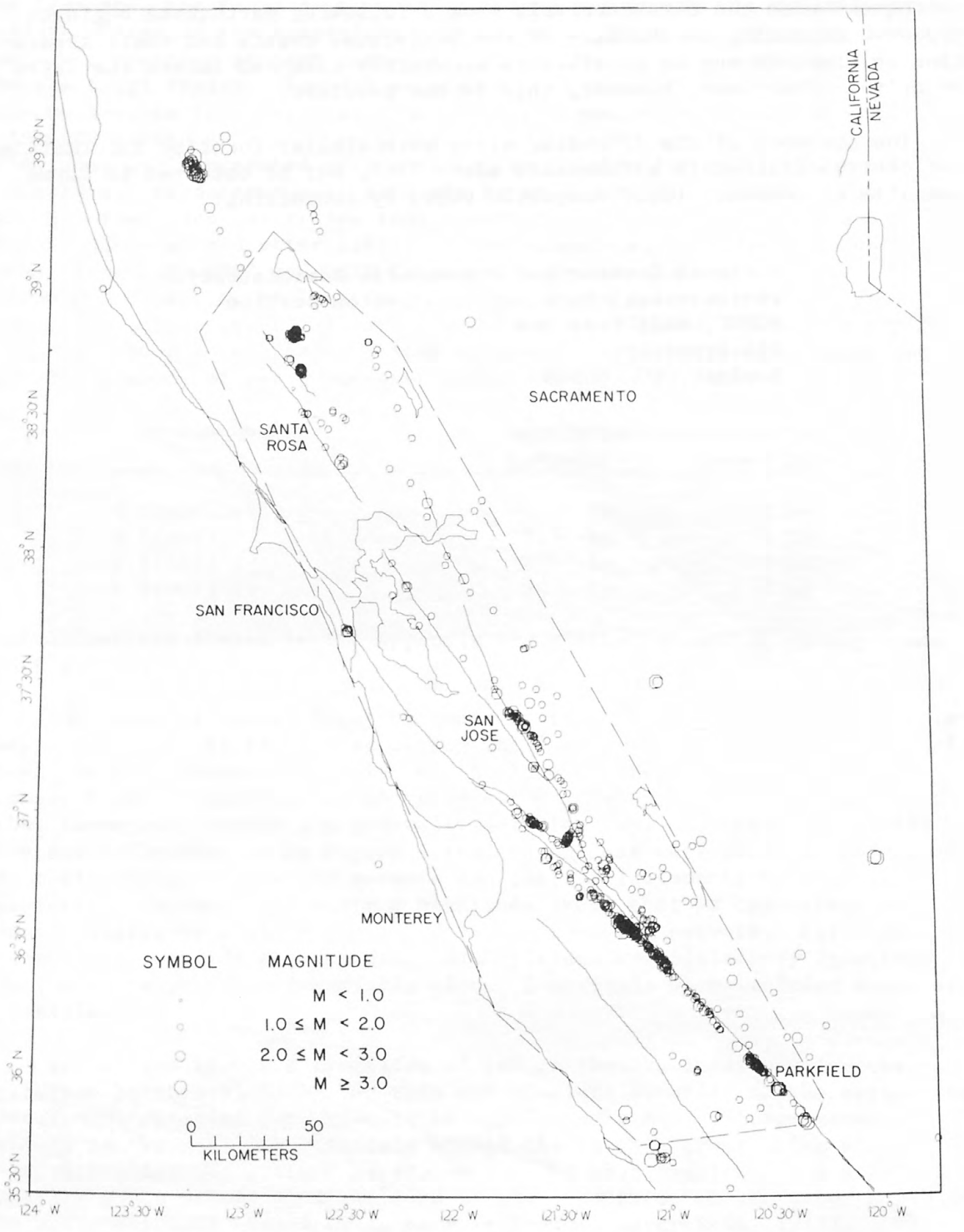

Figure 4. Map showing earthquake epicenters for October - December 1977 reported in the Appendix. Earthquakes in the region enclosed by the dashed line are generally well recorded and located.

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APPENDIX: CATALOG OF EARTHQUAKES OCTOBER - DECEMBER (1977)

Earthquakes along the San Andreas fault system in central California for October - December 1977 are listed chronologically in this APPENDIX.

The following data are given for each event:

1. Origin time in Coordinated Universal Time (UTC): date, hour (HR), minute (MN), and second (SEC). To convert to Pacific Standard Time (PST), subtract eight hours, to Pacific Daylight Time (PDT), subtract seven hours.

2. Epicenter in degrees and minutes of north latitutde (LAT N) and west longitude (LONG W).

3. DEPTH, depth of focus in kilometers. If "*" follows the DEPTH, it means that the focal depth is constrained by the location program.

4. MAG, local magnitude of the earthquake. If "R" follows the magnitude, it indicates the Richter magnitude calculated from Wood-Anderson seismograph records.

5. NO, number of P- and S-arrivals used in locating earthquake.

6. GAP, largest azimuthal separation in degrees between stations.

7. DMIN, epicentral distance in kilometers to the nearest station.

8. RMS, root-mean-square error of the time residuals:

$$RMS = \sqrt{\sum_i R_i^2 / NO}$$

where R_i is the observed seismic-wave arrival time minus the computed time at the i^{th} station.

9. ERH, standard error of the epicenter in kilometers:

$$ERH = \sqrt{SDX^2 + SDY^2}$$

where SDX and SDY are the standard errors in latitude and longitude, respectively, of the epicenter.

10. ERZ, standard error of the depth in kilometers.

11. Q, solution quality of the hypocenter. This measure is intended to indicate the general reliability of each solution.

Q	Epicenter	Focal Depth
A	excellent	good
B	good	fair
C	fair	poor
D	poor	poor

Q is based on both the nature of the station distribution with respect to the earthquake and the statistical measure of the solution. These two factors are each rated independently according to the following schemes.

Station Distribution

	NO	GAP	DMIN
A	≥ 6	≤ 90	$\leq$ DEPTH or 5 km
B	≥ 6	≤ 135	≤ 2 x DEPTH or 10 km
C	≥ 6	≤ 180	≤ 50 km
D	Others		

Statistical Measures

	RMS (sec)	ERH (km)	ERZ (km)
A	<0.15	<1.0	<2.0
B	<0.30	<2.5	<5.0
C	<0.50	<5.0	
D	Others		

Q is taken as the average of the ratings from the two schemes, i.e., an A an a C yield a B, and two B's yield a B. When the two ratings are only one level apart the lower one is used, i.e., an A and a B yield a B.

12. QUADRANGLE, for earthquakes between 35° 00.0' and 40° 00.0' N latitude and 119° 45.0' and 123° 45.0' W longitude, QUADRANGLE indicates the name of the U.S. Geological Survey 7.5' quadrangle (or quadrant of 15' quadrangle), in which the epicenter is located. For earthquakes offshore or outside the designated area, the entry is starred and indicates the general geographic area in which the epicenter is located, for example, "***MONTEREY BAY***".

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
OCT 1	0	59	34.0	36-55.5	121-28.3	3.8	1.2	10	65	3.3	0.09	.5	.4	A	SAN FELIPE
1	8	15	52.6	36-26.9	120-23.3	5.9	2.0	15	211	22.5	0.19	2.0	1.1	C	LILLIS RANCH
1	12	37	1.5	36-42.3	121-22.3	2.6	0.8	11	55	2.6	0.18	.8	.8	B	PAICINES
1	19	33	46.6	36- 3.5	120-59.7	14.1	1.5	9	163	15.1	0.07	.5	.4	B	SAN ARDO
2	5	4	47.7	36- 7.6	120-27.4	6.6	1.7	11	115	4.1	0.08	.6	.5	B	ALCALDE HILLS
2	6	29	28.3	36-54.3	121-29.3	4.6	1.3	24	52	2.2	0.09	.2	.5	A	SAN FELIPE
2	7	37	54.2	36-33.8	121- 3.9	11.9	1.3	16	68	4.8	0.10	.5	.9	A	SAN BENITO
2	12	11	50.6	38-49.2	122-48.1	2.2	2.2	19	53	3.6	0.08	.3	.2	A	THE GEYSERS
2	19	51	34.0	38-48.5	122-48.0	2.4	1.0	8	77	3.9	0.04	.2	.2	A	THE GEYSERS
2	19	51	53.5	38-48.7	122-48.0	1.2	2.4	22	40	3.9	0.08	.2	.2	A	THE GEYSERS
3	3	21	17.6	36- 1.5	120-36.3	1.7	1.6	8	104	5.1	0.06	.4	.4	B	SMITH MTN
3	3	48	3.7	36-46.1	121-31.4	8.1	1.5	26	63	3.3	0.19	.7	1.2	B	SAN JUAN BAUTISTA
3	4	23	20.9	36- 2.8	120-21.2	0.2	1.8	9	171	9.0	0.08	.6	.4	B	KREYENHAGEN HILLS
3	13	4	58.0	38-56.6	122-40.9	1.9	1.3	12	76	1.3	0.15	.9	.5	A	CLEARLAKE HIGHLANDS
3	16	20	43.7	37-15.9	122- 5.5	8.9	1.4	24	62	3.5	0.12	.5	.9	A	CUPERTINO
4	1	49	10.1	36-26.4	121- 3.8	6.7	1.5	18	85	4.4	0.11	.5	1.1	A	TOPO VALLEY
4	3	49	11.0	38-49.2	122-48.0	2.3	1.3	13	81	3.7	0.08	.3	.2	A	THE GEYSERS
4	10	51	46.2	36-46.3	121-28.2	3.0	1.5	17	64	2.8	0.25	.9	.7	B	HOLLISTER
4	11	26	38.6	37-11.5	121-34.5	3.8	2.4	37	94	11.2	0.13	.3	.2	B	MT SIZER
4	14	5	57.3	38-48.9	122-49.0	1.2	1.4	10	55	2.6	0.07	.3	.2	A	THE GEYSERS
5	0	48	56.3	36-35.8	121- 7.5	5.6	1.1	11	59	6.2	0.08	.4	1.0	B	BICKMORE CANYON
5	6	33	16.6	38-23.5	122-39.0	8.6	1.7	14	84	2.8	0.06	.3	.5	A	SANTA ROSA
5	9	0	59.2	36-34.4	121-12.1	4.6	1.0	11	82	1.2	0.10	.5	.8	A	BICKMORE CANYON
5	9	17	17.9	36-34.4	121-12.3	3.8	1.2	13	66	1.4	0.10	.5	.5	A	BICKMORE CANYON
5	12	35	32.5	38-48.6	122-48.1	1.9	1.0	7	78	4.0	0.05	.3	.2	A	THE GEYSERS
5	17	43	56.1	38-49.6	122-48.2	1.4	1.1	9	57	3.5	0.07	.3	.3	A	THE GEYSERS
5	21	12	15.6	38-47.8	122-48.6	3.1	1.0	8	75	4.2	0.16	1.1	.9	B	THE GEYSERS
6	2	1	52.3	38-48.7	122-48.0	1.0	1.8	19	40	3.9	0.09	.2	.2	A	THE GEYSERS
6	2	13	41.4	36-34.5	121-13.8	8.4	2.3	29	32	3.6	0.14	.4	.8	A	BICKMORE CANYON
6	3	41	46.8	36-53.1	121-29.8	5.5	1.1	21	63	2.5	0.11	.4	.8	A	SAN FELIPE
6	8	39	2.9	38- 9.3	121-55.6	21.9	1.9	21	58	11.1	0.23	1.1	1.2	B	DENVERTON
6	11	9	48.4	36-33.0	121- 5.8	11.5	2.1	22	63	4.8	0.13	.5	.7	A	SAN BENITO
6	13	31	0.3	36- 0.5	120-35.3	3.0	1.7	10	115	6.9	0.16	1.6	1.7	B	SMITH MTN
6	18	45	33.5	36-27.7	121- 3.7	2.5	1.6	15	77	5.5	0.15	.6	.7	B	TOPO VALLEY
6	20	37	12.5	36-57.4	121-36.9	4.7	1.4	26	53	2.9	0.13	.3	.4	A	CHITTENDEN
6	21	18	52.0	36-56.3	121-25.8	4.2	1.2	18	74	5.6	0.11	.4	.4	B	SAN FELIPE
7	1	9	8.8	38-49.2	122-48.0	2.3	1.0	9	89	3.8	0.07	.4	.3	A	THE GEYSERS
7	2	1	21.2	38-48.1	122-48.4	3.1	2.0	21	58	4.0	0.19	.5	.4	B	THE GEYSERS
7	2	2	2.9	38-48.1	122-48.4	1.9	0.9	8	75	4.0	0.05	.3	.2	A	THE GEYSERS
7	5	41	56.8	38-49.2	122-47.9	2.3	2.0	21	41	3.9	0.09	.3	.2	A	THE GEYSERS
7	6	56	59.3	36-57.3	121-37.0	3.8	1.1	18	64	2.9	0.09	.3	.2	A	CHITTENDEN
7	7	15	18.7	36-57.5	121-37.2	3.7	1.0	17	65	3.2	0.11	.4	.3	A	CHITTENDEN
7	7	16	6.1	38-48.7	122-50.2	1.3	1.4	13	60	1.5	0.06	.2	.2	A	THE GEYSERS
7	10	23	4.9	38-48.5	122-48.1	1.4	1.3	8	74	4.0	0.08	.4	.3	A	THE GEYSERS
7	22	18	37.3	36-51.5	121-35.6	3.7	1.7	23	74	2.9	0.23	.8	.7	B	SAN JUAN BAUTISTA

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
OCT 8	4	17	1.8	38-40.4	122-46.2	5.5	2.6	29	49	4.3	0.15	.4	1.3	B	JIMTOWN
8	5	17	17.8	38-40.5	122-46.2	5.5	1.9	24	48	4.3	0.16	.5	1.5	B	JIMTOWN
8	8	19	14.4	38-49.1	122-48.2	3.5	1.6	18	43	3.4	0.15	.5	.5	B	THE GEYSERS
8	8	19	49.0	38-48.9	122-48.9	1.8	0.8	7	103	2.7	0.09	.6	.5	B	THE GEYSERS
8	10	56	27.8	38-49.2	122-48.3	2.3	1.1	11	92	3.4	0.08	.3	.2	B	THE GEYSERS
8	11	13	6.9	36-47.2	121-24.0	7.1	1.8	24	38	4.4	0.16	.5	1.1	B	HOLLISTER
8	15	19	32.1	35-42.4	121- 5.1	7.8	2.1	16	255	42.7	0.14	1.8	1.7	C	PEBBLESTONE SHUT-IN
8	16	19	8.0	36-58.5	121-39.5	4.9	2.0	44	40	4.1	0.13	.3	.3	A	WATSONVILLE EAST
8	18	5	11.7	36-28.8	121- 5.9	2.8	1.9	25	84	3.9	0.19	.5	.4	B	TOPO VALLEY
8	19	9	59.8	35-42.3	121- 4.8	8.1	2.8	22	235	42.4	0.17	1.7	1.2	C	PEBBLESTONE SHUT-IN
8	22	32	17.3	38-44.1	122-24.6	3.2	1.3	11	133	8.4	0.10	.7	.6	B	AETNA SPRINGS
9	2	58	51.2	38-40.5	122-46.0	4.5	0.9	15	68	4.1	0.15	.6	1.3	A	JIMTOWN
9	3	26	20.5	37-22.3	121-43.1	5.3	2.5	64	82	3.6	0.14	.3	.3	A	LICK OBSERVATORY
9	19	45	46.1	36-10.6	120-47.0	3.3	1.3	10	114	4.4	0.10	.6	.5	B	MONARCH PEAK
10	0	36	22.3	38-40.6	122-46.6	4.6	2.1	21	46	4.1	0.18	.6	1.7	B	JIMTOWN
10	4	1	48.7	37-14.4	121-36.6	4.8	1.8	36	96	5.8	0.10	.3	.2	B	MT SIZER
10	10	11	43.2	36-53.7	120-50.9	4.3	2.1	22	205	5.9	0.16	1.0	.4	C	CHARLESTON SCHOOL
10	13	12	36.9	38-21.3	122-34.5	7.5	1.5	16	67	9.9	0.15	.6	1.6	B	GLEN ELLEN
11	0	35	13.7	36-49.7	121-35.2	3.7	2.8	49	49	3.6	0.22	.4	.3	B	SAN JUAN BAUTISTA
11	10	33	20.5	36-58.8	121-22.8	6.1	1.0	22	92	1.9	0.13	.5	1.0	B	SAN FELIPE
11	10	44	43.9	38-48.0	122-48.4	1.6	1.1	8	74	4.2	0.10	.5	.4	A	THE GEYSERS
11	11	5	41.1	37-23.6	121-45.9	2.4	2.0	30	76	3.8	0.16	.4	.3	B	CALAVERAS RESERVOIR
11	19	1	47.9	38-48.1	122-48.5	1.4	1.0	8	76	3.9	0.08	.4	.3	A	THE GEYSERS
11	22	41	9.8	36-33.3	121- 8.8	10.6	0.9	11	58	4.4	0.09	.5	1.5	A	BICKMORE CANYON
12	2	56	17.8	36-37.4	121- 8.7	13.3	0.6	14	60	5.3	0.13	.9	1.7	A	BICKMORE CANYON
12	4	2	50.3	36-54.5	121-29.0	7.1	1.0	16	57	2.4	0.08	.4	.6	A	SAN FELIPE
12	7	42	43.9	38-48.3	122-48.3	1.7	0.8	7	86	4.0	0.07	.4	.4	A	THE GEYSERS
12	11	52	21.8	35-60.0	120-35.3	2.3	1.3	11	91	13.4	0.14	.7	1.2	B	STOCKDALE MTN
12	12	35	18.1	37-22.7	121-44.7	2.1	1.7	22	78	2.4	0.09	.3	.2	A	MT DAY
12	15	1	25.1	38-40.6	122-46.2	5.2	1.4	13	68	4.0	0.15	.8	1.3	A	JIMTOWN
12	15	23	40.1	37-22.0	122-14.3	6.3	1.4	12	84	3.4	0.07	.4	.7	A	MINDEGO HILL
12	19	56	4.2	37- 7.0	121-53.3	10.0	1.5	20	75	5.1	0.10	.4	.8	A	LAUREL
13	1	41	38.8	36-35.3	121-14.1	10.9	0.8	12	67	4.3	0.12	.6	1.6	A	BICKMORE CANYON
13	2	9	56.2	36-26.3	121- 1.4	0.6	1.3	9	78	1.0	0.10	.7	.5	A	TOPO VALLEY
13	4	20	4.8	36- 0.2	120-34.9	3.4	1.4	9	62	7.5	0.16	1.3	1.6	B	SMITH MTN
13	6	4	26.1	37-30.2	121- 3.0	7.5	2.4	27	92	46.0	0.19	.6	1.1	C	BRUSH LAKE
13	9	35	57.0	36-26.0	121- 2.6	1.5	2.3	20	67	2.5	0.15	.5	.4	A	TOPO VALLEY
13	13	3	44.1	37-18.4	121-31.7	6.2	1.5	25	128	4.7	0.14	.5	1.4	B	ISABEL VALLEY
13	16	10	27.1	37-30.3	121- 3.5	8.8	3.6R	65	92	45.5	0.22	.5	.7	C	BRUSH LAKE
13	17	57	34.0	38-40.2	122-46.1	5.0	1.5	27	67	4.6	0.16	.5	.8	B	JIMTOWN
13	23	15	28.2	36-46.8	121-18.0	7.1	1.4	20	69	4.0	0.12	.5	1.0	A	TRES PINOS
14	0	40	49.8	36-59.6	121-39.8	5.0	1.9	40	49	5.2	0.16	.4	.4	B	WATSONVILLE EAST
14	1	48	28.5	37-54.0	121-58.7	11.6	2.0	46	45	6.6	0.16	.4	.4	B	CLAYTON
14	5	37	57.4	38-49.0	122-48.6	0.3	1.0	12	54	3.0	0.13	.4	.5	A	THE GEYSERS
14	7	52	30.6	38-49.2	122-47.7	1.2	0.7	9	88	3.8	0.08	.3	.4	A	THE GEYSERS

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
OCT 14	14	15	30.9	38-40.6	122-46.2	5.3	1.4	14	68	4.0	0.12	.5	1.1	A	JIMTOWN
14	16	13	37.2	36-35.4	121- 6.5	12.2	1.5	21	67	7.4	0.14	.6	1.1	A	SAN BENITO
14	17	37	13.0	38-47.8	122-48.4	2.2	1.7	13	71	4.4	0.08	.3	.2	A	THE GEYSERS
14	18	16	38.4	36-54.8	121-28.7	3.9	1.4	22	60	2.6	0.12	.4	.3	A	SAN FELIPE
14	18	44	40.4	36- 1.6	120-35.8	2.9	1.9	12	111	4.8	0.10	1.2	1.4	B	SMITH MTN
14	20	47	28.0	36- 1.6	120-36.4	1.8	1.3	6	113	5.0	0.03	.3	.4	B	SMITH MTN
15	2	4	33.2	38-56.9	122-36.1	5.3	1.7	11	184	6.0	0.13	.9	1.8	C	LOWER LAKE
15	3	20	6.0	38-48.4	122-49.1	1.3	1.1	9	61	2.9	0.08	.3	.3	A	THE GEYSERS
15	4	2	29.8	36-53.3	121-29.2	11.6	1.6	32	40	1.5	0.13	.4	.5	A	SAN FELIPE
15	8	46	22.5	38-48.3	122-48.3	1.7	1.3	7	107	4.0	0.08	.5	.4	B	THE GEYSERS
15	10	42	50.7	39- 3.2	123- 4.3	4.0	1.1	10	249	4.9	0.08	1.5	.6	C	PURDYS GARDENS
15	13	21	1.0	36-58.0	121-38.1	4.2	1.4	20	63	4.5	0.12	.4	.3	A	WATSONVILLE EAST
15	13	56	54.5	36- 2.4	120-37.9	2.9	1.8	9	83	4.7	0.08	.9	.9	A	SLACK CANYON
15	14	53	3.1	36-57.5	121-25.4	8.7	1.5	34	78	3.3	0.14	.4	.9	A	SAN FELIPE
15	15	33	6.6	36-58.5	121-39.2	4.5	1.5	38	39	4.5	0.13	.3	.3	A	WATSONVILLE EAST
15	16	1	21.1	36-32.5	121-10.1	3.4	2.2	32	45	4.2	0.18	.5	.4	B	BICKMORE CANYON
15	16	20	6.6	37-22.1	121-36.1	6.5	1.7	34	116	6.4	0.13	.4	1.7	B	ISABEL VALLEY
15	17	45	51.2	38-48.9	122-48.0	2.3	1.3	14	53	3.9	0.09	.3	.2	A	THE GEYSERS
16	4	32	55.7	36-58.3	121-39.4	4.8	2.1	77	39	4.0	0.17	.3	.3	B	WATSONVILLE EAST
16	6	8	52.4	38-40.4	122-46.6	6.3	1.2	14	51	4.6	0.14	.6	1.4	A	JIMTOWN
16	13	2	45.8	36-10.4	120-47.1	3.5	1.7	16	91	4.7	0.26	1.1	1.1	B	MONARCH PEAK
16	15	0	10.8	36-31.8	121-10.2	10.8	1.3	20	65	4.3	0.20	.9	1.5	B	BICKMORE CANYON
16	16	23	52.2	36-33.5	121-11.2	4.4	1.7	20	64	1.9	0.16	.5	1.1	B	BICKMORE CANYON
16	21	0	24.8	36-33.8	121- 4.6	10.1	2.4	41	66	5.5	0.17	.4	.7	B	SAN BENITO
16	21	48	53.2	36-53.8	121-29.7	5.2	1.6	31	44	2.5	0.11	.3	.6	A	SAN FELIPE
16	22	8	39.9	36-53.8	121-29.8	4.5	1.4	24	43	2.5	0.10	.3	.3	A	SAN FELIPE
16	23	24	12.7	36-54.8	121-28.8	3.8	2.2	38	40	2.6	0.12	.3	.2	A	SAN FELIPE
17	0	34	2.1	36-54.7	121-28.8	3.6	1.4	24	59	2.5	0.12	.3	.3	A	SAN FELIPE
17	3	17	57.1	36-45.6	121- 4.7	4.1	1.5	13	98	11.1	0.09	.4	.4	B	RUBY CANYON
17	3	57	12.1	36-36.2	121-14.1	3.4	1.7	22	62	3.3	0.21	.6	.5	B	BICKMORE CANYON
17	6	16	48.3	36-33.8	121- 3.7	12.7	1.5	16	101	4.4	0.12	.8	.9	B	SAN BENITO
17	10	2	23.0	36-23.5	121- 1.0	9.9	1.7	20	88	3.6	0.19	.8	1.4	B	TOPO VALLEY
17	15	14	38.6	36-27.5	121- 5.2	8.3	1.7	23	72	5.8	0.20	.7	1.1	B	TOPO VALLEY
17	22	19	9.0	36-34.6	121-13.4	7.7	1.7	28	35	3.1	0.14	.4	.8	A	BICKMORE CANYON
18	5	17	47.4	36-26.8	121- 4.2	6.8	1.3	21	83	5.2	0.16	.6	1.3	B	TOPO VALLEY
18	10	8	18.8	36-35.2	121-14.8	10.6	3.4R	72	32	5.3	0.20	.4	.4	B	BICKMORE CANYON
18	10	11	15.2	36-35.1	121-14.3	8.5	1.8	39	42	4.5	0.15	.4	.7	B	BICKMORE CANYON
18	10	17	49.5	36-35.3	121-14.2	8.3	1.1	24	42	4.5	0.14	.5	.9	A	BICKMORE CANYON
18	10	27	16.3	36-35.2	121-14.4	9.6	2.1	42	31	4.7	0.16	.4	.7	B	BICKMORE CANYON
19	0	24	2.6	38-47.9	122-48.4	2.7	1.4	15	67	4.3	0.08	.3	.2	A	THE GEYSERS
19	5	35	4.9	37- 8.4	121-31.7	8.2	1.3	43	101	8.7	0.15	.4	1.1	B	MT SIZER
19	10	42	4.8	36-34.4	121-12.1	3.6	2.0	33	39	1.2	0.17	.4	.4	B	BICKMORE CANYON
19	11	46	8.3	38-20.0	122-34.3	9.7	3.0	56	54	8.3	0.17	.3	.4	B	GLEN ELLEN
19	11	50	39.2	36-35.2	121-14.6	8.7	1.3	21	44	5.0	0.14	.5	1.0	A	BICKMORE CANYON
19	16	8	46.9	36-39.6	120-53.2	5.5	1.7	25	81	8.4	0.17	.7	.9	B	CERRO COLORADO

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
OCT 19	23	22	55.3	36-35.4	121-14.4	9.1	0.9	19	67	4.8	0.11	.4	.9	A	BICKMORE CANYON
20	4	6	52.9	36-24.4	121- 0.6	2.6	1.2	7	127	2.1	0.02	.2	.1	B	TOPO VALLEY
20	4	31	58.0	38-49.1	122-47.8	3.9	2.2	34	38	3.9	0.14	.3	.4	A	THE GEYSERS
20	6	5	15.9	38-49.3	122-48.4	1.6	1.1	19	43	3.2	0.09	.2	.2	A	THE GEYSERS
20	8	19	28.5	38-40.7	122-46.6	5.1	1.0	18	68	4.2	0.15	.6	1.3	B	JIMTOWN
20	9	34	38.6	36-13.2	120-49.1	6.1	1.3	10	104	2.2	0.07	.5	.7	B	MONARCH PEAK
20	13	3	54.4	36-29.0	121- 6.1	3.7	2.1	32	61	3.7	0.20	.5	.5	B	TOPO VALLEY
20	18	55	26.3	36-23.7	121- 0.7	4.8	1.5	19	64	3.4	0.11	.4	.8	A	TOPO VALLEY
20	23	23	50.7	38-19.2	122-34.3	8.1	1.4	10	57	6.9	0.06	.3	1.0	A	GLEN ELLEN
21	1	36	8.0	36-26.7	121- 3.3	0.1	2.0	21	101	4.1	0.12	.4	.5	B	TOPO VALLEY
21	2	27	20.3	37-16.9	121-34.9	7.9	1.5	19	105	8.6	0.14	.6	1.8	B	ISABEL VALLEY
21	3	8	34.8	36-26.9	121- 3.2	0.2	1.5	9	121	4.1	0.10	.5	.5	B	TOPO VALLEY
21	5	50	16.6	38-48.9	122-48.2	2.3	1.0	10	127	3.6	0.17	.8	.5	B	THE GEYSERS
21	10	14	0.5	36-18.3	120-55.3	8.6	1.7	14	99	1.3	0.17	.8	1.3	B	LONOAK
21	10	51	9.1	37-17.0	121-38.5	7.3	1.8	45	77	3.9	0.12	.3	.7	A	LICK OBSERVATORY
21	11	5	47.7	38-48.7	122-49.4	1.4	1.6	14	56	2.2	0.07	.2	.2	A	THE GEYSERS
21	11	7	15.4	38-48.6	122-49.4	1.3	1.2	9	91	2.3	0.05	.2	.2	B	THE GEYSERS
21	11	10	0.6	38-54.9	122-42.6	2.4	1.3	10	114	4.3	0.11	.5	.4	B	CLEARLAKE HIGHLANDS
21	12	44	10.2	38-19.9	122-33.6	10.1	1.9	24	53	7.8	0.10	.3	.4	A	GLEN ELLEN
21	13	29	16.2	35-59.2	120-34.1	1.8	1.8	12	75	9.5	0.10	.5	.4	B	STOCKDALE MTN
21	14	26	21.6	35-59.2	120-34.3	1.4	1.7	11	76	9.5	0.11	.4	.4	B	STOCKDALE MTN
21	17	13	41.6	35-59.6	120-34.6	3.5	1.3	10	90	8.7	0.20	1.1	1.2	B	STOCKDALE MTN
21	18	5	58.2	36-27.7	121- 5.2	7.6	1.5	25	63	5.4	0.18	.6	1.3	B	TOPO VALLEY
21	23	5	21.3	38-40.4	122-46.0	6.7	1.0	11	73	4.3	0.14	.8	1.3	A	JIMTOWN
22	0	38	20.6	36-13.3	120-40.6	9.2	1.6	12	121	10.6	0.07	.5	1.1	B	PRIEST VALLEY
22	3	35	21.2	38-47.4	122-48.2	2.2	1.3	19	64	4.5	0.09	.3	.2	A	THE GEYSERS
22	4	48	1.1	35-48.9	120-22.4	4.7	1.9	10	223	2.5	0.21	2.3	1.2	C	CHOLAME VALLEY
22	6	59	26.4	36-10.2	120-16.3	7.6	1.4	14	275	16.9	0.18	1.6	3.5	C	COALINGA
22	10	27	40.1	38-48.2	122-48.5	1.9	1.2	19	51	3.8	0.07	.2	.1	A	THE GEYSERS
22	11	20	8.3	36-56.0	121-28.0	6.3	1.3	41	61	4.1	0.13	.3	.7	A	SAN FELIPE
22	14	46	42.2	38-48.7	122-47.9	3.0	1.0	9	74	3.8	0.05	.3	.2	A	THE GEYSERS
22	18	27	59.9	38-48.1	122-48.8	2.6	1.1	7	95	3.7	0.02	.2	.1	B	THE GEYSERS
23	0	35	41.3	36-56.0	121-26.0	3.0	1.0	10	89	5.9	0.08	.4	.3	B	SAN FELIPE
23	2	33	40.5	36-29.3	121- 6.0	3.5	1.3	13	97	3.2	0.11	.5	.5	B	TOPO VALLEY
23	8	1	35.3	38-47.9	122-46.3	3.8	1.1	11	68	1.7	0.09	.4	.3	A	THE GEYSERS
23	15	10	31.8	36- 1.7	120-56.9	11.1	1.9	21	85	20.0	0.09	.3	.5	B	SAN ARDO
23	18	57	39.2	38-49.4	122-48.0	1.5	1.2	11	79	3.8	0.08	.3	.3	A	THE GEYSERS
23	19	17	32.2	36-47.5	121-17.6	4.6	1.3	33	67	2.8	0.17	.4	.5	B	TRES PINOS
23	20	33	14.9	39-11.4	122-41.2	4.0	1.7	18	203	13.8	0.19	1.5	.7	C	NW 1/4 CLEARLAKE OAKS
23	23	35	4.3	36-34.1	121-12.4	6.2	1.2	21	68	1.8	0.15	.5	1.0	A	BICKMORE CANYON
24	18	33	42.7	36-38.8	121-17.9	3.7	2.0	31	31	3.0	0.19	.5	.5	B	PAICINES
24	19	8	18.5	36-38.7	121-17.9	4.0	2.9	44	31	3.3	0.18	.4	.4	B	PAICINES
24	23	49	51.5	36-35.2	121-14.2	9.2	1.3	19	68	4.5	0.13	.5	1.0	A	BICKMORE CANYON
25	2	8	30.9	38-48.7	122-48.5	2.0	1.1	7	119	3.3	0.07	.4	.6	B	THE GEYSERS
25	14	36	37.5	38-48.3	122-48.5	1.7	1.0	8	77	3.7	0.09	.4	.4	A	THE GEYSERS

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
OCT 25	14	48	25.4	35-54.6	120-28.6	3.1	1.6	8	73	4.0	0.09	.5	.3	A	PARKFIELD
25	22	30	44.9	36-23.6	120-59.8	9.8	1.5	11	96	3.9	0.10	.6	1.0	B	ROCK SPRING PEAK
26	0	49	6.3	36-54.0	121-29.1	9.2	2.6	77	30	2.0	0.15	.3	.4	A	SAN FELIPE
26	1	3	39.3	38-55.5	122-39.7	4.3	1.8	17	93	1.7	0.18	.7	1.3	B	CLEARLAKE HIGHLANDS
26	2	35	56.7	35-53.0	120-41.1	12.6	1.6	12	183	2.6	0.12	.9	.8	C	VALLETON
26	2	41	46.0	37-18.1	121-39.7	4.3	1.7	41	65	5.0	0.14	.3	.2	A	LICK OBSERVATORY
26	2	50	59.2	37-18.3	121-39.5	4.3	1.6	37	65	5.4	0.10	.3	.2	B	LICK OBSERVATORY
26	14	44	12.7	38-48.5	122-47.7	1.2	1.4	9	77	3.5	0.08	.4	.3	A	THE GEYSERS
26	15	8	17.2	36-47.0	121-31.8	7.1	1.9	38	53	4.2	0.22	.5	1.0	B	SAN JUAN BAUTISTA
27	1	22	25.2	38-49.4	122-48.3	1.0	1.8	19	43	3.4	0.09	.2	.2	A	THE GEYSERS
27	2	40	52.0	38-48.5	122-48.3	0.5	1.4	11	65	3.7	0.10	.4	.5	A	THE GEYSERS
27	4	53	23.1	38-48.3	122-48.3	1.5	1.3	10	74	3.9	0.09	.4	.3	A	THE GEYSERS
27	11	13	16.8	36- 0.0	120-52.6	14.2	1.1	10	170	18.4	0.06	.5	.4	B	SAN ARDO
27	18	17	7.2	36-33.0	121- 6.0	11.0	1.8	19	72	4.9	0.13	.6	1.1	A	SAN BENITO
28	1	19	16.4	36-46.1	121- 8.2	5.5	2.1	42	67	10.0	0.12	.3	.8	B	QUIEN SABE VALLEY
28	8	39	0.3	36-16.2	120-51.1	8.5	1.4	12	126	7.9	0.10	.7	.9	B	HEPSEDAM PEAK
28	11	0	51.8	36-34.1	121-12.3	6.4	3.1	37	34	1.7	0.16	.4	.8	B	BICKMORE CANYON
28	14	51	27.9	36-39.1	121-18.4	4.0	2.3	32	40	3.4	0.16	.4	.4	B	PAICINES
28	14	52	7.5	36-39.4	121-18.3	3.6	1.6	21	47	3.2	0.16	.5	.5	B	PAICINES
28	14	53	42.5	36-40.4	121-19.6	3.7	1.8	22	64	3.9	0.15	.4	.4	A	PAICINES
28	14	56	12.9	36-39.1	121-18.7	4.9	1.3	19	42	3.9	0.13	.5	.5	A	PAICINES
28	17	4	49.5	35-59.6	120-52.8	13.7	1.7	19	173	19.2	0.14	.8	.6	B	HAMES VALLEY
28	17	18	58.7	38-15.6	122-14.1	2.0	1.8	11	83	3.0	0.12	.9	.5	A	MT GEORGE
29	1	29	3.4	36-41.8	121-21.6	2.4	1.9	29	46	2.0	0.17	.4	.4	B	PAICINES
29	8	9	33.5	38-47.7	122-55.9	0.3	1.8	23	46	5.9	0.14	.4	.5	B	ASTI
29	11	16	49.9	36-50.0	121-34.3	2.1	1.5	16	88	2.6	0.21	.6	.5	B	SAN JUAN BAUTISTA
29	12	3	45.4	35-54.8	120-28.9	3.0	1.2	8	74	3.7	0.09	.5	.4	A	PARKFIELD
29	23	6	21.5	38-47.7	122-55.6	3.5	1.1	15	54	6.1	0.18	.6	.5	B	ASTI
29	23	45	30.5	36-36.8	121-16.5	9.2	1.5	25	45	3.5	0.15	.5	.9	A	MT JOHNSON
30	3	35	18.7	36- 0.9	120-36.2	1.9	1.6	19	69	6.1	0.17	.6	.7	B	SMITH MTN
30	7	29	31.2	36-16.8	120-53.4	2.5	1.5	17	98	5.2	0.18	.7	.6	B	LONOAK
30	12	49	58.1	38-32.3	122-18.0	5.5	1.7	25	91	17.2	0.20	.7	1.1	C	CHILES VALLEY
30	12	54	38.9	36-39.0	121-18.0	3.5	2.0	44	32	3.0	0.15	.3	.3	A	PAICINES
30	15	21	48.5	38-48.6	122-48.5	2.1	1.2	13	55	3.4	0.07	.2	.2	A	THE GEYSERS
30	20	26	25.5	36-29.1	121- 6.2	3.6	2.0	31	61	3.8	0.22	.6	.5	B	TOPO VALLEY
30	23	15	32.1	36- 1.4	120-36.2	3.5	2.3	24	50	5.3	0.19	.6	.6	B	SMITH MTN
30	23	18	51.9	36- 1.5	120-36.2	3.7	1.5	11	70	4.9	0.16	1.2	1.3	B	SMITH MTN
31	3	3	29.4	36-32.4	121- 9.9	5.3	2.1	30	54	4.5	0.20	.5	.7	B	BICKMORE CANYON
31	6	23	46.4	38-30.1	122-33.8	6.4	1.4	14	112	4.3	0.11	.6	1.1	B	CALISTOGA
31	10	44	25.5	35-57.7	120-32.4	3.5	1.3	11	74	6.2	0.12	.6	.4	B	STOCKDALE MTN
31	12	38	7.5	35-48.3	121-12.9	9.6	1.7	21	177	14.7	0.10	.5	.5	B	BURNETT PEAK
31	14	31	49.3	35-48.6	120-38.3	12.6	1.4	12	213	11.4	0.03	.3	.2	C	SAN MIGUEL
31	16	18	18.5	36-32.9	121- 6.0	12.5	1.3	13	88	4.8	0.11	.9	1.8	A	SAN BENITO
31	16	23	7.8	36-29.4	121- 6.4	4.2	1.7	18	82	3.6	0.10	.4	.9	A	TOPO VALLEY
NOV 1	0	4	14.9	38-11.0	122- 9.3	0.9	2.9	18	77	12.0	0.22	.8	.8	C	CORDELIA

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
NOV 1	1	17	44.3	38-40.7	122-46.2	5.6	1.5	18	47	3.8	0.13	.5	1.0	A	JIMTOWN
1	4	6	43.3	37-42.0	122-32.2	8.4	2.9	38	166	8.9	0.17	.6	.7	C	***GULF OF THE FARALLONES***
1	4	13	11.6	37-41.8	122-32.6	9.3	2.4	27	183	8.9	0.18	.8	.9	C	***GULF OF THE FARALLONES***
1	5	5	38.8	37-23.8	121-44.5	4.9	2.2	43	83	4.3	0.13	.3	.2	A	MT DAY
1	7	28	38.5	36-43.0	121-25.9	3.0	1.4	24	70	3.8	0.12	.3	.3	A	MT HARLAN
1	15	57	42.5	36-23.8	121- 0.9	5.5	1.7	19	64	3.1	0.14	.5	1.0	A	TOPO VALLEY
1	21	29	6.5	35-59.9	120-35.2	1.3	1.7	10	61	8.0	0.13	.5	.5	B	STOCKDALE MTN
1	23	34	47.8	36-29.2	121- 6.1	5.3	1.6	19	90	3.5	0.21	.9	1.8	B	TOPO VALLEY
2	2	49	59.6	37- 0.3	121-43.5	8.7	2.3	60	41	5.4	0.17	.3	.5	B	MT MADONNA
2	8	12	41.4	38-30.9	122-44.1	4.4	1.7	18	50	4.1	0.15	.5	1.7	A	MARK WEST SPRINGS
2	8	58	7.1	38-30.8	122-44.3	3.4	1.6	13	84	4.3	0.16	.5	.5	B	MARK WEST SPRINGS
2	15	51	29.5	36-27.3	121- 4.7	7.0	1.7	17	82	6.2	0.18	.8	1.6	B	TOPO VALLEY
2	20	24	33.8	36-41.3	121-22.0	4.9	2.3	45	36	3.2	0.18	.4	.4	B	PAICINES
2	22	31	4.1	38-48.4	122-48.3	1.4	1.3	9	73	3.8	0.11	.5	.4	A	THE GEYSERS
2	23	29	47.6	36-18.2	120-31.0	9.2	1.9	24	143	16.8	0.23	1.0	2.1	C	SANTA RITA PEAK
3	0	21	11.0	35-50.2	121-13.2	9.6	3.1	35	173	18.2	0.16	.6	.5	C	BURNETT PEAK
3	0	59	26.0	36-31.6	121-10.5	8.0	1.5	17	67	4.0	0.22	1.0	1.9	B	BICKMORE CANYON
3	8	16	4.6	38-49.1	122-48.1	3.9	1.3	11	90	3.6	0.13	.7	.8	B	THE GEYSERS
3	9	52	41.6	38-40.7	122-46.3	4.9	1.4	13	90	3.9	0.15	.9	1.3	A	JIMTOWN
3	11	56	15.4	36- 2.9	120-37.7	3.2	1.5	6	111	3.8	0.01	.1	.1	B	SLACK CANYON
3	12	50	14.4	38-49.0	122-48.1	3.6	1.3	10	88	3.7	0.14	.8	.7	A	THE GEYSERS
3	13	12	42.3	37-15.4	121-37.3	4.6	1.6	29	91	4.6	0.08	.2	.2	B	ISABEL VALLEY
3	14	34	38.9	38-48.6	122-48.1	0.8	1.9	18	70	3.9	0.09	.2	.2	A	THE GEYSERS
3	16	53	2.1	36-24.8	121- 1.7	8.5	2.8	33	66	1.5	0.13	.3	.7	A	TOPO VALLEY
3	16	55	47.6	36-25.0	121- 1.2	8.3	1.5	13	68	0.9	0.10	.5	.8	A	TOPO VALLEY
3	17	8	42.4	36-25.0	121- 1.8	9.4	3.1	43	56	1.4	0.19	.5	.7	B	TOPO VALLEY
3	17	39	54.9	36-25.0	121- 1.5	8.3	1.9	17	67	1.1	0.14	.6	1.0	A	TOPO VALLEY
3	22	35	36.6	36-24.8	121- 1.1	8.1	1.8	12	86	1.2	0.09	.5	.8	A	TOPO VALLEY
3	22	39	25.6	36-24.7	121- 1.2	8.0	1.8	14	87	1.5	0.09	.4	.7	A	TOPO VALLEY
3	23	9	5.9	36-25.0	121- 0.4	9.4	1.6	11	82	1.4	0.29	1.7	2.8	B	TOPO VALLEY
4	6	27	45.1	36-54.2	121-29.2	9.5	1.8	40	51	2.3	0.13	.3	.6	A	SAN FELIPE
4	7	43	15.7	36-24.8	121- 1.8	9.3	2.3	31	62	1.6	0.18	.5	1.0	B	TOPO VALLEY
4	8	17	24.8	36-29.8	121- 6.9	4.7	1.5	17	67	3.8	0.15	.6	1.2	B	TOPO VALLEY
4	11	44	12.8	36-21.2	120-42.6	8.7	2.1	20	120	9.9	0.22	.9	1.6	B	SAN BENITO MOUNTAIN
4	11	53	46.0	36-34.3	121-12.6	6.1	2.4	30	37	2.0	0.16	.4	1.0	B	BICKMORE CANYON
4	11	54	26.9	36-34.3	121-12.5	7.7	1.5	16	67	1.8	0.18	.7	2.0	B	BICKMORE CANYON
4	15	5	48.4	36-34.7	121-13.0	5.4	3.1	49	32	2.5	0.19	.4	.6	B	BICKMORE CANYON
4	15	12	53.0	36-34.2	121-12.7	5.9	3.5R	54	40	2.1	0.20	.4	.6	B	BICKMORE CANYON
4	15	13	36.7	36-32.7	121-13.7	3.2	3.7R	21	60	4.9	0.15	.4	.5	A	BICKMORE CANYON
4	15	26	19.7	36-34.7	121-12.9	7.0	1.8	25	60	2.4	0.15	.4	.9	A	BICKMORE CANYON
4	15	34	15.4	36-33.9	121-11.7	7.5	1.5	18	66	1.3	0.13	.5	1.0	A	BICKMORE CANYON
4	16	15	46.2	36-34.6	121-12.8	8.2	1.5	18	67	2.1	0.14	.5	1.3	A	BICKMORE CANYON
4	16	43	39.2	36-28.8	121- 4.3	9.8	1.4	11	99	3.4	0.23	1.4	2.3	B	TOPO VALLEY
4	19	38	4.0	36-33.7	121-12.1	7.0	2.3	33	39	1.9	0.16	.4	.9	B	BICKMORE CANYON
4	21	34	11.2	36-34.5	121-13.0	7.7	3.0	45	36	2.5	0.18	.4	.8	B	BICKMORE CANYON

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
NOV	4	21	47	0.2	36-34.1	121-12.1	7.1	2.0	25	39	1.4	0.16	.5	1.0	B	BICKMORE CANYON
	4	21	55	5.0	36-34.4	121-12.6	7.1	2.4	35	35	1.9	0.17	.4	.9	B	BICKMORE CANYON
	4	21	59	19.3	36-34.0	121-12.1	7.1	1.7	22	39	1.5	0.16	.5	1.1	B	BICKMORE CANYON
	4	22	0	57.8	36-34.0	121-12.0	5.7	2.2	31	39	1.4	0.16	.4	.9	B	BICKMORE CANYON
	4	22	29	41.2	39-11.3	123-10.6	0.2	1.6	14	280	21.4	0.16	3.0	2.8	D	UKIAH
	4	22	49	38.5	38-48.6	122-48.2	1.5	1.4	10	79	3.7	0.08	.3	.3	A	THE GEYSERS
	4	23	12	18.0	36-33.9	121-12.0	7.2	1.4	21	67	1.4	0.14	.5	1.0	A	BICKMORE CANYON
	5	2	9	21.9	36-24.8	121- 1.2	8.0	1.9	17	68	1.2	0.11	.4	.8	A	TOPO VALLEY
	5	5	34	51.2	36-27.6	121- 3.8	1.5	1.5	11	101	5.6	0.07	.4	.3	B	TOPO VALLEY
	5	6	5	1.3	36-34.1	121-12.4	7.4	1.4	17	68	1.8	0.14	.6	1.2	A	BICKMORE CANYON
	5	6	42	15.9	37-38.0	121-41.7	6.9	1.4	11	84	5.2	0.11	.6	.6	A	ALTAMONT
	5	7	4	10.0	36-33.4	121-11.1	4.1	2.1	33	43	2.2	0.19	.5	.8	B	BICKMORE CANYON
	5	7	20	8.7	37-38.1	121-41.5	7.2	1.8	15	85	5.0	0.07	.4	.5	A	ALTAMONT
	5	8	39	7.6	36-33.8	121-11.9	6.5	1.5	17	75	1.6	0.15	.6	1.2	B	BICKMORE CANYON
	5	8	39	46.5	38-40.8	122-46.0	3.4	1.3	11	79	3.5	0.18	1.0	.6	B	JIMTOWN
	5	9	3	51.9	36-33.6	121-11.7	7.1	2.0	34	40	1.7	0.16	.4	.8	B	BICKMORE CANYON
	5	9	31	58.6	37-38.0	121-41.6	7.8	1.7	10	85	5.2	0.08	.5	1.0	A	ALTAMONT
	5	9	35	29.0	36-48.2	121-32.0	4.6	2.0	40	38	3.1	0.19	.4	.5	B	SAN JUAN BAUTISTA
	5	13	23	33.2	36-54.6	121-28.9	8.5	2.3	69	36	2.5	0.12	.2	.4	A	SAN FELIPE
	5	15	47	14.0	38-48.1	122-48.7	1.5	1.1	9	69	3.7	0.07	.3	.3	A	THE GEYSERS
	5	16	50	14.1	37-38.2	121-41.0	7.6	1.2	13	167	6.2	0.19	1.2	2.6	C	ALTAMONT
	5	23	54	16.5	37-37.9	121-41.5	7.3	1.3	17	82	5.0	0.16	.7	.8	B	ALTAMONT
	6	0	3	43.4	37-22.4	121-43.5	4.1	1.8	77	81	3.1	0.18	.3	.3	B	LICK OBSERVATORY
	6	10	48	49.9	36-25.1	121- 1.3	7.6	1.5	16	68	0.9	0.09	.4	.7	A	TOPO VALLEY
	6	12	5	8.8	36-36.0	121-13.8	3.2	1.7	20	62	3.8	0.18	.6	.5	B	BICKMORE CANYON
	6	13	30	23.6	36-25.0	121- 1.7	8.1	1.3	12	60	1.3	0.10	.6	1.0	A	TOPO VALLEY
	6	14	22	39.6	37-50.2	122-19.3	8.8	1.7	43	40	9.9	0.16	.4	.7	B	OAKLAND WEST
	7	1	59	35.8	36-42.0	121- 8.0	8.1	1.7	37	85	5.4	0.12	.3	.7	A	CHERRY PEAK
	7	5	29	29.0	36-35.4	121-14.7	8.7	1.1	22	68	4.9	0.15	.5	1.1	A	BICKMORE CANYON
	7	5	54	13.5	38-40.7	122-46.2	5.4	2.1	35	36	3.8	0.20	.4	1.1	B	JIMTOWN
	7	6	3	37.1	38-40.8	122-46.3	5.1	2.0	36	36	3.6	0.21	.5	1.2	B	JIMTOWN
	7	6	11	11.1	38-40.9	122-46.4	5.2	2.1	34	35	3.6	0.19	.4	1.1	B	JIMTOWN
	7	7	44	18.7	36-33.8	121-12.2	5.2	2.1	49	38	1.8	0.18	.4	.4	B	BICKMORE CANYON
	7	7	45	56.6	36-33.9	121-12.0	5.7	1.8	43	64	1.6	0.18	.4	.6	B	BICKMORE CANYON
	7	9	14	18.1	38-40.8	122-46.4	4.5	1.4	27	46	3.8	0.20	.5	1.5	B	JIMTOWN
	7	9	21	26.6	38-40.8	122-46.1	3.7	1.7	32	38	3.7	0.23	.5	.5	B	JIMTOWN
	7	10	30	5.1	38-48.8	122-47.7	1.3	1.2	13	75	3.6	0.08	.3	.2	A	THE GEYSERS
	7	10	33	56.0	38-40.6	122-46.2	5.1	2.0	35	36	4.0	0.19	.4	1.1	B	JIMTOWN
	7	12	46	22.5	36-47.5	121- 1.9	5.5	1.9	40	82	15.6	0.17	.5	1.0	C	RUBY CANYON
	7	19	21	3.3	38-48.2	122-47.5	1.5	2.0	28	38	3.2	0.11	.3	.2	A	THE GEYSERS
	7	20	15	37.6	36-27.6	121- 4.4	7.3	1.2	9	80	5.6	0.11	.7	1.4	A	TOPO VALLEY
	7	23	2	38.9	36-25.0	121- 1.6	7.8	1.3	7	105	1.2	0.07	.7	.9	B	TOPO VALLEY
	8	5	8	0.8	36- 0.8	120-35.7	5.6	2.3	27	53	6.3	0.19	.6	1.1	B	SMITH MTN
	8	5	37	4.4	38-48.8	122-48.2	1.3	1.0	9	74	3.7	0.06	.3	.3	A	THE GEYSERS
	8	20	30	8.8	36-37.5	121-16.5	5.7	1.0	24	50	3.8	0.14	.4	.8	A	PAICINES

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
NOV 9	0	44	13.8	38-48.7	122-48.0	4.0	0.7	10	74	3.9	0.13	.8	.8	A	THE GEYSERS
9	1	59	23.4	37-25.2	121-36.3	5.9	1.5	23	150	10.1	0.18	.7	1.4	C	EYLAR MTN
9	4	54	35.6	38-48.2	122-47.6	0.9	1.0	10	77	3.4	0.09	.4	.4	A	THE GEYSERS
9	4	55	27.7	38-48.3	122-47.6	1.3	0.8	8	75	3.3	0.11	.6	.6	A	THE GEYSERS
9	9	16	3.0	38-56.9	122-42.5	1.8	1.0	12	80	3.5	0.14	.6	.7	A	CLEARLAKE HIGHLANDS
9	14	14	15.0	35-55.4	120-29.8	13.3	2.1	16	78	3.2	0.15	.8	.7	A	PARKFIELD
9	15	41	52.9	36-39.3	121-19.2	5.6	1.0	23	40	4.0	0.14	.4	.9	A	PAICINES
9	17	36	45.7	38-48.8	122-47.9	3.7	1.3	20	40	3.8	0.13	.4	.4	A	THE GEYSERS
9	21	0	16.2	36- 0.5	120-35.8	0.9	1.4	10	101	6.7	0.12	.5	.5	B	SMITH MTN
9	22	27	40.2	37-27.7	121-49.3	5.3	2.0	37	68	2.3	0.17	.4	.4	B	CALAVERAS RESERVOIR
10	0	34	15.5	36-28.8	121- 6.4	10.1	1.7	29	60	10.1	0.20	.6	1.2	B	TOPO VALLEY
10	7	21	7.5	36-25.6	121- 2.7	7.0	1.2	13	89	2.4	0.10	.5	1.0	A	TOPO VALLEY
10	8	46	55.1	39-17.0	122-43.5	8.6	2.6	30	213	19.3	0.14	1.2	.7	C	FOUTS SPRINGS
10	15	45	8.3	36- 5.9	120-38.2	3.4	1.4	7	140	4.9	0.06	1.2	1.6	C	SLACK CANYON
11	7	29	51.7	36-36.4	121-15.0	5.0	1.4	23	42	3.2	0.15	.4	.9	B	BICKMORE CANYON
11	9	16	15.0	36- 2.1	120-36.8	2.4	0.9	7	107	4.3	0.06	.7	.6	B	SMITH MTN
11	10	10	5.9	38-39.6	122-45.7	5.7	1.4	17	50	5.8	0.14	.5	1.2	B	JIMTOWN
11	15	51	18.7	36-32.7	121-10.4	7.6	2.3	31	45	3.6	0.14	.3	.8	A	BICKMORE CANYON
11	15	53	58.4	36-32.8	121-10.2	7.9	1.2	13	66	3.5	0.10	.5	.9	A	BICKMORE CANYON
11	16	26	38.5	38-49.2	122-48.2	2.4	1.9	25	42	3.5	0.08	.2	.2	A	THE GEYSERS
11	18	10	38.3	38-49.2	122-48.3	3.7	2.2	27	42	3.4	0.13	.3	.3	A	THE GEYSERS
11	18	54	16.5	36-24.9	121- 1.5	9.2	1.5	17	87	1.2	0.17	.7	1.3	B	TOPO VALLEY
11	19	56	10.2	36-55.0	121-28.7	3.7	1.6	26	55	2.6	0.12	.3	.3	A	SAN FELIPE
11	19	58	16.7	36-24.9	121- 1.5	9.2	2.6	28	67	1.3	0.12	.4	.7	A	TOPO VALLEY
11	22	59	34.4	36-24.8	121- 1.1	7.7	1.3	9	106	1.3	0.07	.5	.7	B	TOPO VALLEY
12	0	34	40.6	36-54.8	121-28.8	3.7	1.4	17	60	2.6	0.11	.4	.3	A	SAN FELIPE
12	2	35	39.3	38-48.0	122-48.1	0.8	1.8	17	63	4.0	0.10	.3	.3	A	THE GEYSERS
12	5	37	6.1	36-55.0	121-28.8	3.3	1.2	15	60	2.5	0.13	.5	.5	A	SAN FELIPE
12	9	43	30.5	37-28.8	121-38.0	5.2	1.6	13	150	12.8	0.12	.6	.4	B	MT DAY
12	11	47	46.1	38-48.5	122-48.9	1.6	1.5	14	60	3.0	0.07	.3	.2	A	THE GEYSERS
12	12	19	39.7	36-34.8	121-12.7	5.8	1.4	17	66	2.0	0.17	.7	1.4	B	BICKMORE CANYON
12	13	44	16.3	36-47.4	121-17.9	3.8	1.4	25	66	2.9	0.14	.4	.4	A	TRES PINOS
12	18	48	3.6	36-33.0	121-13.1	3.6	1.4	29	37	3.8	0.27	.7	.7	B	BICKMORE CANYON
12	19	51	51.2	36- 7.5	120-24.5	4.6	2.2	26	140	4.1	0.25	.8	.9	C	CURRY MTN
12	23	29	11.2	37-16.4	121-37.8	6.1	1.2	29	84	4.2	0.09	.3	.9	A	LICK OBSERVATORY
13	10	41	22.6	36-34.4	121-12.6	6.8	1.1	27	61	1.9	0.14	.4	.8	A	BICKMORE CANYON
13	12	56	32.0	36-32.7	121-10.6	7.8	0.7	13	65	3.6	0.17	.8	1.6	B	BICKMORE CANYON
13	15	23	26.1	37-50.8	121-56.9	3.6	1.1	18	80	6.2	0.17	.5	.4	B	DIABLO
13	16	40	5.1	38-48.4	122-48.0	1.0	2.1	24	44	3.9	0.11	.3	.3	A	THE GEYSERS
13	20	24	45.8	38-39.7	122-20.8	12.5	1.6	11	116	13.3	0.06	.4	1.4	B	WALTERS SPRINGS
13	23	7	15.6	36-25.8	121- 2.0	0.0	1.5	11	120	1.5	0.05	.2	.2	B	TOPO VALLEY
14	1	35	38.0	38-56.4	122-40.3	5.9	1.6	12	112	0.2	0.12	.8	1.0	B	CLEARLAKE HIGHLANDS
14	2	55	56.8	37- 0.9	121-43.3	6.5	1.7	37	42	4.5	0.13	.3	.7	A	MT MADONNA
14	10	44	41.8	38-48.6	122-48.3	1.8	1.2	7	151	3.6	0.06	.4	.3	B	THE GEYSERS
14	21	33	36.6	36-49.5	121-20.2	4.6	1.5	25	64	3.5	0.12	.4	.5	A	TRES PINOS

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
NOV 15	6	14	26.3	36-42.6	121-22.5	3.7	1.6	19	68	2.8	0.13	.4	.4	A	PAICINES
15	6	45	51.9	35-38.9	121- 6.0	6.9	3.0	18	235	6.1	0.17	1.6	1.4	C	PEBBLESTONE SHUT-IN
15	13	26	33.7	36-46.9	121-19.0	6.3	1.5	19	77	4.2	0.11	.4	1.0	A	TRES PINOS
15	20	24	59.7	36-32.9	121-10.8	8.8	1.3	21	66	3.1	0.18	.7	1.4	B	BICKMORE CANYON
16	6	12	31.2	36-53.9	121-29.0	8.4	1.2	54	40	1.7	0.15	.3	.6	A	SAN FELIPE
16	9	53	49.7	36-47.8	121-32.9	5.1	1.4	53	39	2.2	0.28	.5	1.0	B	SAN JUAN BAUTISTA
16	20	12	26.2	36-47.4	121-17.8	7.6	1.5	25	67	2.9	0.12	.4	.9	A	TRES PINOS
17	2	11	58.9	38-31.3	122-45.8	1.5	1.7	15	63	4.8	0.13	.5	.6	A	HEALDSBURG
17	3	15	23.7	38-47.4	122-48.2	2.4	1.2	14	78	4.5	0.08	.3	.2	A	THE GEYSERS
17	5	27	2.8	38-49.2	122-48.2	3.7	2.1	26	42	3.4	0.14	.4	.3	A	THE GEYSERS
17	6	8	42.1	37-17.9	121-38.4	8.7	1.8	58	72	5.4	0.14	.3	.6	A	LICK OBSERVATORY
17	6	11	3.6	36- 9.8	120-46.3	0.3	1.9	21	93	6.1	0.20	.8	1.0	B	MONARCH PEAK
17	7	19	0.2	36-54.4	121-28.4	8.2	1.3	31	60	2.1	0.10	.3	.6	A	SAN FELIPE
17	14	3	27.5	36-39.8	120-55.5	5.2	1.0	19	91	9.6	0.13	.5	.4	B	CERRO COLORADO
17	17	58	10.3	36-34.4	121-12.3	5.2	1.5	28	61	1.5	0.19	.5	.7	B	BICKMORE CANYON
17	20	33	51.6	36-34.4	121-12.5	6.3	1.7	28	36	1.8	0.15	.4	.9	A	BICKMORE CANYON
17	21	17	41.9	36-34.0	121- 9.4	12.7	1.3	24	48	3.0	0.17	.6	1.0	B	BICKMORE CANYON
17	21	23	22.5	36-33.8	121- 9.6	12.4	1.5	31	51	2.9	0.14	.4	.6	A	BICKMORE CANYON
17	23	49	32.7	38-57.3	122-42.4	2.5	1.1	11	127	3.8	0.10	.5	.3	B	CLEARLAKE HIGHLANDS
17	23	57	43.4	38-57.0	122-43.0	3.3	1.5	11	124	4.2	0.21	1.1	.9	B	CLEARLAKE HIGHLANDS
18	2	10	24.6	38-36.5	122-48.4	5.1	0.9	20	54	9.1	0.16	.5	2.8	B	HEALDSBURG
18	2	17	18.3	35-41.2	121- 2.2	6.5	3.8R	25	192	10.5	0.25	1.2	1.8	C	PEBBLESTONE SHUT-IN
18	3	14	39.3	35-39.4	121- 3.2	10.7	1.9	12	214	9.5	0.13	1.3	.8	C	PEBBLESTONE SHUT-IN
18	3	54	58.3	36-46.2	121-16.8	7.3	1.6	58	38	3.7	0.16	.3	.7	B	TRES PINOS
18	7	12	1.3	35-39.5	121- 2.1	8.4	2.0	16	212	11.0	0.21	1.6	2.1	C	PEBBLESTONE SHUT-IN
18	7	55	19.8	38-48.2	122-48.6	1.9	0.8	14	61	3.7	0.09	.3	.2	A	THE GEYSERS
18	8	45	38.7	38-49.2	122-48.9	1.3	0.8	12	50	2.4	0.12	.4	.3	A	THE GEYSERS
18	9	59	56.6	38-49.4	122-48.0	3.4	2.1	18	44	3.8	0.13	.4	.4	A	THE GEYSERS
18	10	49	46.7	38-57.9	123-17.0	2.0	1.4	11	180	8.4	0.14	.9	.7	C	NE 1/4 ORNBAUN VALLEY
18	13	54	1.8	36-26.0	121- 2.6	3.7	1.8	25	67	2.4	0.23	.7	.9	B	TOPO VALLEY
18	14	26	30.1	36-15.3	120-51.6	2.5	1.3	13	112	7.4	0.15	.7	.7	B	HEPSEDAM PEAK
18	15	37	16.1	36-31.7	121- 9.1	8.8	1.0	22	65	4.7	0.27	.9	1.8	B	BICKMORE CANYON
18	16	33	25.0	36-27.7	121- 5.3	9.0	1.0	20	128	5.5	0.20	1.0	1.7	B	TOPO VALLEY
18	16	36	45.1	36-45.5	121- 1.0	5.5	2.3	45	72	12.5	0.15	.4	.7	C	RUBY CANYON
18	18	44	30.2	38-48.2	122-48.8	0.9	1.0	16	64	3.5	0.10	.3	.3	A	THE GEYSERS
18	19	51	43.4	36-38.9	121-16.5	5.2	1.2	15	83	2.0	0.13	.6	1.0	A	PAICINES
19	0	18	55.6	38-49.5	122-48.4	0.3	1.0	12	53	3.2	0.14	.5	.5	A	THE GEYSERS
19	0	31	39.9	36-34.5	121-13.0	7.0	1.8	34	32	2.4	0.17	.4	.9	B	BICKMORE CANYON
19	2	2	34.6	38-49.3	122-49.0	1.5	0.8	8	119	2.3	0.08	.5	.3	B	THE GEYSERS
19	2	18	46.3	36-58.0	121-38.4	4.4	1.0	23	46	4.3	0.16	.5	.5	B	WATSONVILLE EAST
19	9	23	59.4	37-23.3	121-45.3	3.1	1.2	15	78	3.3	0.08	.3	.2	A	CALAVERAS RESERVOIR
19	9	46	59.7	37-23.6	121-45.8	2.3	1.5	36	77	3.8	0.13	.3	.3	A	CALAVERAS RESERVOIR
19	11	52	49.9	36-35.1	121-14.3	7.3	1.0	23	43	4.6	0.18	.6	1.3	B	BICKMORE CANYON
19	12	28	22.7	36-33.9	121-11.9	5.7	1.3	25	40	1.4	0.14	.4	.9	A	BICKMORE CANYON
19	18	36	49.2	37-23.5	121-46.0	2.0	2.4	46	132	3.7	0.13	.5	.3	B	CALAVERAS RESERVOIR

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
NOV 19	22	12	52.9	37-23.5	121-46.0	2.8	1.2	6	140	3.6	0.05	.6	.2	B	CALAVERAS RESERVOIR
20	0	23	9.5	36-58.5	121-39.2	3.7	1.9	40	47	4.4	0.16	.3	.3	B	WATSONVILLE EAST
20	3	12	24.8	36-25.5	120-42.7	10.3	1.8	27	133	11.2	0.22	.9	1.4	B	IDRIA
20	4	46	11.9	38-48.8	122-47.9	1.5	1.0	18	48	3.9	0.10	.2	.2	A	THE GEYSERS
20	12	22	31.7	38-48.0	122-46.3	1.5	0.8	10	83	1.5	0.07	.3	.3	A	THE GEYSERS
20	13	30	11.4	36-35.2	121-14.4	8.8	2.4	37	31	4.8	0.15	.3	.7	B	BICKMORE CANYON
20	14	10	30.1	36-42.6	121-10.7	5.1	1.0	20	111	5.0	0.14	.5	.5	B	CHERRY PEAK
20	19	7	25.5	38-49.9	122-44.9	1.6	1.4	19	56	3.0	0.13	.3	.3	A	WHISPERING PINES
20	20	19	4.8	36-33.4	121-11.7	6.4	2.2	39	40	2.0	0.17	.4	.8	B	BICKMORE CANYON
20	20	53	56.6	36-33.6	121-11.7	5.2	2.0	39	40	1.8	0.18	.4	.5	B	BICKMORE CANYON
20	22	45	11.9	38-48.3	122-49.6	1.4	0.8	14	59	2.5	0.10	.3	.3	A	THE GEYSERS
21	0	48	11.9	36- 0.2	120-52.8	13.4	1.3	9	170	18.5	0.05	.4	.4	B	SAN ARDO
21	1	44	39.1	36-34.3	121-12.7	7.1	1.7	37	37	2.1	0.15	.3	.7	A	BICKMORE CANYON
21	4	11	18.7	36-34.2	121-12.8	7.0	2.2	55	33	2.2	0.20	.4	.8	B	BICKMORE CANYON
21	4	47	59.3	36-34.3	121-12.5	7.1	1.4	31	38	1.8	0.19	.5	1.0	B	BICKMORE CANYON
21	7	15	17.8	36-58.8	121-39.4	3.3	1.7	51	40	4.2	0.22	.4	.3	B	WATSONVILLE EAST
21	9	21	54.5	36-38.5	121-18.6	9.0	1.0	21	40	3.4	0.20	.7	1.3	B	PAICINES
21	20	4	33.0	36-57.7	121-37.7	4.3	0.9	19	64	4.1	0.13	.4	.4	A	WATSONVILLE EAST
21	23	9	16.1	36-33.6	121-11.3	4.6	1.4	23	64	1.8	0.18	.6	1.1	B	BICKMORE CANYON
21	23	15	35.1	35-51.0	120-35.2	5.4	1.4	9	185	7.8	0.11	1.2	.9	C	RANCHITO CANYON
22	1	16	44.8	38-49.2	122-48.2	3.3	1.0	13	81	3.5	0.12	.5	.4	A	THE GEYSERS
22	11	46	21.0	37-35.8	121-58.9	5.4	1.3	27	49	4.4	0.12	.3	.3	A	NILES
22	14	28	10.5	37-30.9	121-49.9	5.6	1.0	20	63	3.4	0.17	.5	.6	B	LA COSTA VALLEY
22	15	3	20.5	38-48.7	122-48.3	3.5	0.6	9	75	3.6	0.15	.9	.7	A	THE GEYSERS
22	15	41	20.7	38-48.8	122-49.0	1.7	1.2	10	85	2.5	0.05	.2	.2	A	THE GEYSERS
22	18	36	55.6	36-11.6	120-48.2	6.9	1.7	13	106	2.6	0.17	1.0	1.5	B	MONARCH PEAK
22	19	46	10.0	38-48.4	122-48.4	1.8	0.6	7	87	3.7	0.06	.4	.3	A	THE GEYSERS
22	21	15	52.5	39-27.2	123-18.8	8.2	4.9R	55	238	52.5	0.19	1.4	.7	C	NE 1/4 WILLITS
22	21	29	38.6	38-48.5	122-49.1	0.8	1.1	18	52	2.8	0.22	.6	.6	B	THE GEYSERS
23	5	59	12.1	38-48.3	122-48.0	1.6	1.1	8	71	3.9	0.08	.4	.3	A	THE GEYSERS
23	6	20	9.8	36-34.1	121-12.7	7.3	2.2	39	37	2.1	0.17	.4	.8	B	BICKMORE CANYON
23	6	21	20.1	36-34.4	121-12.8	7.5	1.6	24	39	2.2	0.14	.4	.9	A	BICKMORE CANYON
23	7	16	22.6	38-25.6	122-13.8	5.5	1.8	21	90	15.2	0.26	1.1	1.4	C	CAPELL VALLEY
23	7	33	20.4	37- 4.9	121-29.0	8.7	1.3	40	71	3.6	0.13	.3	.6	A	GILROY HOT SPRINGS
23	8	56	52.3	36-34.5	121-12.8	7.2	1.2	19	68	2.2	0.14	.5	1.1	A	BICKMORE CANYON
23	10	1	19.4	39-26.2	123-19.9	3.2	2.2	20	289	51.6	0.19	4.3	.6	D	NE 1/4 WILLITS
23	11	15	38.9	36-34.5	121-12.9	7.4	1.3	20	68	2.3	0.14	.5	1.0	A	BICKMORE CANYON
23	13	52	46.2	39-28.9	123-19.4	4.1	2.0	19	293	55.6	0.29	11.2	2.4	D	NE 1/4 WILLITS
23	13	53	54.7	39-23.3	123-17.1	6.5	3.4R	20	282	45.0	0.13	2.6	1.0	D	NE 1/4 WILLITS
23	13	57	17.6	39-24.8	123-19.3	3.0	3.0	14	287	49.1	0.15	4.0	.6	D	NE 1/4 WILLITS
23	14	38	22.3	39-26.7	123-19.0	4.4	2.4	15	289	51.8	0.21	14.5	3.6	D	NE 1/4 WILLITS
23	14	42	40.8	39-23.0	123-17.2	5.0	2.8	15	282	44.5	0.15	7.5	2.5	D	NE 1/4 WILLITS
23	15	27	15.3	39-23.7	123-18.6	3.0	3.5	14	284	46.7	0.13	3.2	.5	D	NE 1/4 WILLITS
23	15	27	33.6	36-58.6	121-38.3	5.8	1.1	17	48	4.7	0.08	.3	.6	A	WATSONVILLE EAST
23	15	29	14.7	39-23.5	123-18.0	7.6	3.3	19	283	46.0	0.16	3.4	1.1	D	NE 1/4 WILLITS

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
NOV	23	16	22	43.3	39-25.0	123-17.8	7.7	2.9	15	288	48.2	0.16	4.5	1.4	D NE 1/4 WILLITS
	23	16	34	32.9	39-22.8	123-16.6	3.8	2.1	21	281	43.7	0.24	4.3	.8	D NE 1/4 WILLITS
	23	17	17	57.1	39-25.7	123-19.9	2.9	2.0	21	288	50.8	0.20	1.9	.6	C NE 1/4 WILLITS
	23	17	45	19.5	39-23.8	123-18.1	7.1	2.1	15	286	46.5	0.13	3.0	1.8	D NE 1/4 WILLITS
	23	19	5	11.1	39-25.6	123-18.5	6.0	2.8	14	290	49.6	0.19	5.7	3.0	D NE 1/4 WILLITS
	23	21	51	39.0	37- 1.0	121-27.7	4.0	0.9	29	67	2.2	0.14	.4	.4	A GILROY HOT SPRINGS
	23	23	20	56.7	36-45.2	121-28.1	4.5	1.8	43	53	2.0	0.20	.4	.6	B HOLLISTER
	24	3	12	10.7	36- 0.2	120-35.1	3.6	1.5	9	92	11.9	0.09	.8	.9	B SMITH MTN
	24	10	21	58.7	38-40.5	122-45.0	5.7	0.9	15	65	3.9	0.12	.5	1.1	A JIMTOWN
	24	10	57	56.1	38-48.5	122-48.7	0.8	0.9	13	62	3.2	0.09	.3	.3	A THE GEYSERS
	24	12	43	2.3	38-48.0	122-48.5	2.7	1.2	14	76	1.6	0.09	.3	.2	A THE GEYSERS
	24	14	30	48.5	36- 1.7	120-37.7	9.0	2.3	33	78	12.2	0.26	.7	1.2	B SLACK CANYON
	24	16	2	42.2	36-54.1	121-28.8	7.7	1.0	39	45	1.8	0.12	.3	.5	A SAN FELIPE
	24	17	59	1.3	36- 2.6	120-38.5	10.9	2.2	23	83	10.3	0.25	.9	1.1	B SLACK CANYON
	24	21	59	45.4	36-35.8	121- 5.3	6.5	1.4	25	46	5.7	0.15	.4	1.0	A SAN BENITO
	24	22	10	56.0	37-29.7	121-41.9	2.7	1.3	25	112	10.1	0.13	.4	.4	B MT DAY
	25	0	43	50.9	36- 2.6	120-38.4	8.9	1.7	22	82	10.2	0.26	.9	2.0	B SLACK CANYON
	25	1	52	38.3	39-26.2	123-20.2	3.1	2.2	21	312	51.9	0.20	1.8	.6	C NE 1/4 WILLITS
	25	2	43	22.4	37-23.0	121-45.5	2.8	2.1	38	76	2.6	0.17	.4	.3	B CALAVERAS RESERVOIR
	25	4	50	57.3	36-29.7	121- 6.5	3.6	1.0	18	123	3.3	0.17	.7	.7	B TOPO VALLEY
	25	11	46	57.0	39-24.5	123-18.0	0.8	2.4	18	309	47.4	0.15	6.9	6.8	D NE 1/4 WILLITS
	25	11	47	55.8	39-25.9	123-20.5	2.7	2.1	18	312	51.6	0.27	3.1	2.0	D NE 1/4 WILLITS
	25	15	15	8.7	38-28.8	122-40.2	6.9	1.2	11	73	7.1	0.13	.7	1.6	B SANTA ROSA
	25	15	22	46.3	36-31.2	121- 9.4	7.4	1.6	31	43	3.6	0.27	.7	1.6	B BICKMORE CANYON
	25	21	32	16.3	37-18.0	121-38.6	5.0	1.4	31	70	5.4	0.11	.3	.3	B LICK OBSERVATORY
	26	4	31	56.4	37-11.0	121-38.6	5.9	2.9	73	75	2.9	0.12	.2	.6	A MORGAN HILL
	26	7	26	13.9	37-10.6	121-38.4	5.9	1.3	37	88	2.2	0.09	.2	.5	A MORGAN HILL
	26	8	12	55.2	38-48.6	122-47.7	1.4	1.3	20	40	3.5	0.12	.3	.3	A THE GEYSERS
	26	9	0	55.5	36-29.1	121- 5.9	3.5	1.4	21	79	3.4	0.17	.6	.6	B TOPO VALLEY
	26	10	18	45.8	36-34.2	121-12.2	6.5	1.4	22	67	1.4	0.16	.5	1.1	B BICKMORE CANYON
	26	15	57	21.9	36- 1.5	120-36.0	8.6	1.3	8	121	5.1	0.18	1.6	3.2	B SMITH MTN
	26	17	31	8.3	36-24.9	121- 1.1	8.4	1.5	14	68	1.1	0.10	.5	.9	A TOPO VALLEY
	26	17	32	27.9	36- 3.1	120-38.1	6.8	1.2	8	114	4.1	0.06	.6	1.1	B SLACK CANYON
	26	18	47	1.3	36-23.6	121- 0.9	4.7	1.0	10	100	3.5	0.07	.5	.7	B TOPO VALLEY
	26	19	16	21.7	38-48.9	122-47.9	2.9	1.5	21	41	3.9	0.08	.2	.2	A THE GEYSERS
	26	20	30	14.7	37-11.0	121-38.7	5.7	2.2	72	75	2.9	0.11	.2	.3	A MORGAN HILL
	26	20	31	48.6	37-10.8	121-38.4	5.9	0.8	18	87	2.4	0.09	.3	.4	A MORGAN HILL
	27	5	9	19.2	38-39.8	122-46.1	4.9	1.8	30	36	5.4	0.20	.5	1.0	B JIMTOWN
	27	6	16	21.1	36-34.1	121- 5.3	6.4	1.3	17	87	6.2	0.16	.7	1.8	B SAN BENITO
	27	7	28	47.9	36-30.8	121- 8.3	4.0	1.4	16	84	4.0	0.28	1.2	1.8	B BICKMORE CANYON
	27	8	40	54.3	36-33.1	121- 5.0	10.8	1.5	28	65	4.7	0.19	.6	1.1	B SAN BENITO
	28	1	53	38.6	36-14.5	120-46.8	4.2	1.5	12	144	3.2	0.36	3.9	1.9	C MONARCH PEAK
	28	3	31	16.0	36-53.6	121-19.6	4.6	1.3	29	152	1.9	0.13	.5	.7	B THREE SISTERS
	28	7	19	45.3	37-20.3	121-41.3	7.1	1.7	72	76	6.5	0.12	.2	.6	A LICK OBSERVATORY
	28	8	6	29.8	37- 1.5	121-27.3	10.5	2.4	79	73	2.6	0.15	.3	.4	B GILROY HOT SPRINGS

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
NOV 28	12	56	55.7	36-13.9	120-49.5	4.4	1.1	12	121	3.3	0.15	.9	1.8	B	MONARCH PEAK
28	14	24	53.8	37- 1.5	121-27.3	10.1	1.9	47	74	2.6	0.15	.4	.6	B	GILROY HOT SPRINGS
28	14	32	54.1	38-47.8	122-48.6	2.4	1.1	20	44	1.8	0.08	.2	.1	A	THE GEYSERS
28	15	31	46.4	37- 3.0	121-45.2	11.0	1.3	24	34	2.4	0.12	.4	.8	A	LOMA PRIETA
28	19	18	9.2	37-18.2	121-38.9	6.1	1.3	20	91	5.5	0.13	.5	2.8	B	LICK OBSERVATORY
28	20	58	40.6	36-29.4	121- 6.4	4.7	1.5	13	81	3.6	0.11	.5	1.0	A	TOPO VALLEY
28	22	36	26.0	38-48.2	122-49.5	1.5	2.7	28	43	2.9	0.11	.2	.2	A	THE GEYSERS
28	22	38	32.0	38-48.3	122-49.0	1.2	2.1	22	43	3.2	0.08	.2	.2	A	THE GEYSERS
28	22	39	6.1	38-48.2	122-49.3	1.4	1.2	9	116	3.0	0.09	.4	.3	B	THE GEYSERS
28	22	59	38.4	38-48.0	122-49.4	1.4	1.8	18	49	3.2	0.07	.2	.2	A	THE GEYSERS
28	23	23	5.3	38-48.1	122-49.4	1.5	1.1	9	63	2.9	0.05	.2	.2	A	THE GEYSERS
29	0	19	14.8	38-48.1	122-48.9	1.7	0.9	8	83	3.4	0.08	.4	.3	A	THE GEYSERS
29	0	55	41.8	38-48.4	122-49.0	1.7	1.1	8	84	3.1	0.05	.2	.2	A	THE GEYSERS
29	1	33	54.3	38-48.6	122-48.6	3.5	0.7	7	89	3.2	0.07	.6	.4	A	THE GEYSERS
29	2	15	29.3	38-49.5	122-47.8	2.5	0.7	6	104	3.9	0.01	.1	.1	B	THE GEYSERS
29	3	20	45.8	36-19.6	120-55.8	3.8	1.8	14	79	1.3	0.13	.6	1.0	A	LONOAK
29	5	15	46.3	38-27.4	122-38.2	6.7	1.3	10	99	7.4	0.11	.6	1.5	B	SANTA ROSA
29	10	6	10.6	38-48.2	122-49.5	1.3	1.8	18	59	2.8	0.08	.2	.2	A	THE GEYSERS
29	12	6	22.5	36- 0.2	120-34.3	4.7	1.5	9	143	7.6	0.07	.6	3.8	C	SMITH MTN
29	15	4	39.7	36-27.3	121- 4.1	3.6	2.5	28	98	5.5	0.18	.5	.8	B	TOPO VALLEY
29	16	42	1.8	35-55.5	120-29.9	12.9	3.8R	21	71	3.2	0.15	.7	.5	A	PARKFIELD
29	18	22	7.4	35-55.4	120-30.0	12.1	3.5	23	61	3.4	0.16	.7	.6	B	STOCKDALE MTN
29	20	29	49.0	38-49.7	122-48.0	0.9	0.8	14	79	3.7	0.11	.3	.3	A	THE GEYSERS
30	0	28	2.5	39-31.8	123- 9.3	4.1	2.6	17	294	52.9	0.20	7.0	1.2	D	BRUSHY MTN
30	8	9	29.6	38-48.1	122-48.3	0.4	1.3	17	62	4.1	0.11	.3	.3	A	THE GEYSERS
30	8	43	20.3	36-58.3	121-26.1	7.7	1.0	35	60	3.2	0.11	.3	.7	A	SAN FELIPE
30	9	17	47.7	39-26.2	123-18.7	4.4	2.4	18	288	50.8	0.23	13.5	4.2	D	NE 1/4 WILLITS
30	12	57	37.2	38-31.7	122-36.9	5.3	1.4	22	117	1.1	0.19	.7	1.3	B	CALISTOGA
30	13	51	25.9	35-55.1	120-30.5	11.1	2.1	19	131	4.4	0.15	.8	.7	B	STOCKDALE MTN
30	14	9	7.1	36-34.3	121-11.7	11.1	1.9	31	41	0.7	0.15	.4	.8	B	BICKMORE CANYON
30	16	16	58.2	38-40.6	122-46.4	8.1	1.3	13	68	4.1	0.10	.4	1.0	A	JIMTOWN
30	16	50	58.6	38-40.3	122-46.1	4.8	1.8	25	55	4.6	0.19	.5	1.0	B	JIMTOWN
30	18	7	22.7	36-31.4	121- 7.1	4.7	1.5	23	49	4.2	0.17	.5	.4	B	SAN BENITO
30	18	33	27.2	35-49.2	120-47.9	9.1	2.7	23	156	14.3	0.12	.5	.7	B	BRADLEY
30	18	35	49.4	35-49.2	120-47.0	11.2	1.5	9	224	13.2	0.08	1.0	1.6	C	BRADLEY
30	19	50	58.9	38-11.6	121-53.5	6.2	1.7	9	186	20.6	0.14	1.4	1.3	C	DENVERTON
DEC 1	0	28	1.2	39-29.0	123- 8.8	4.9	2.2	27	289	48.3	0.29	2.1	1.6	C	NW 1/4 POTTER VALLEY
1	0	50	46.2	39-29.5	123-11.8	4.3	1.9	20	291	51.5	0.30	2.3	2.2	C	NW 1/4 POTTER VALLEY
1	2	60	1.0	36-32.9	121-10.9	8.0	1.1	21	66	3.1	0.14	.5	1.0	A	BICKMORE CANYON
1	3	0	0.9	36-32.2	121-11.5	8.5	1.2	13	71	4.3	0.20	1.1	2.2	B	BICKMORE CANYON
1	3	52	40.2	37-23.2	121-43.9	5.7	2.0	60	83	3.6	0.14	.3	.5	A	MT DAY
1	19	36	58.4	36-37.3	121-17.3	10.2	1.8	28	43	2.6	0.11	.3	.6	A	MT JOHNSON
2	6	50	23.1	36-26.2	121- 2.4	3.4	1.6	21	78	2.3	0.19	.7	.7	B	TOPO VALLEY
2	8	19	16.8	35-59.2	120-34.2	1.1	1.5	9	86	9.4	0.12	.6	.5	B	STOCKDALE MTN
2	12	16	37.6	37-46.9	121-50.2	3.3	1.8	39	97	4.5	0.19	.6	.4	B	TASSAJARA

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
DEC	2	14	35	3.6	36-30.7	121- 8.0	9.0	1.3	19	70	4.2	0.22	.8	1.7	B	BICKMORE CANYON
	2	17	0	27.1	36-53.1	120-57.9	4.2	1.6	31	137	13.4	0.16	.6	.3	C	ORTIGALITA PEAK NW
	2	19	35	21.1	38-48.5	122-47.8	0.8	1.1	9	68	3.6	0.09	.4	.4	A	THE GEYSERS
	2	20	35	54.3	37-22.3	121-43.1	9.1	1.8	32	82	3.6	0.13	.4	.8	A	LICK OBSERVATORY
	2	22	38	22.5	37-46.9	121-50.2	3.3	1.7	34	97	4.5	0.19	.5	.4	B	TASSAJARA
	3	0	30	59.5	35-38.2	120-59.9	6.7	1.5	12	220	14.8	0.18	1.9	4.4	C	LIME MTN
	3	0	44	36.6	38-47.0	122-26.5	5.0	1.4	14	130	2.5	0.18	1.1	1.8	B	JERICHO VALLEY
	3	5	44	9.5	37- 1.5	121-27.5	3.7	1.1	19	72	2.2	0.15	.6	.4	B	GILROY HOT SPRINGS
	3	5	59	19.2	36-52.5	120-53.4	4.3	1.4	23	219	6.8	0.17	1.1	.4	C	ORTIGALITA PEAK NW
	3	7	56	15.0	37- 9.1	121-34.3	4.7	2.1	76	92	4.8	0.15	.3	.3	B	MT SIZER
	3	11	32	8.2	38-29.7	122-33.1	4.4	1.2	11	136	5.7	0.11	.8	1.8	B	KENWOOD
	3	13	3	24.7	36-26.2	121- 1.7	8.3	1.6	27	70	1.6	0.17	.6	1.1	B	TOPO VALLEY
	3	13	15	41.4	38-31.2	122-36.8	5.4	1.8	30	41	0.5	0.18	.5	.9	B	CALISTOGA
	3	18	41	6.5	35-59.9	120-35.3	1.5	1.9	16	62	7.9	0.16	.5	.5	B	STOCKDALE MTN
	3	18	44	42.4	35-45.6	121- 5.1	3.5	1.6	17	132	10.5	0.23	1.2	1.1	C	BRYSON
	3	20	50	1.9	36- 0.6	120-35.5	3.5	2.1	17	65	6.7	0.15	.7	.8	B	SMITH MTN
	3	22	50	44.0	38-48.6	122-48.7	2.7	1.3	13	54	3.2	0.05	.2	.1	A	THE GEYSERS
	4	0	3	28.6	36- 9.6	120-46.1	6.6	1.8	14	115	6.6	0.15	.8	1.4	B	MONARCH PEAK
	4	0	19	15.1	36-35.2	121-14.1	8.9	1.8	33	31	4.3	0.18	.4	1.0	B	BICKMORE CANYON
	4	2	13	43.6	36-47.6	121-20.1	7.1	0.6	19	74	2.3	0.11	.5	.9	A	TRES PINOS
	4	2	22	40.3	38-40.4	122-46.5	5.6	2.3	31	35	4.5	0.16	.4	1.2	B	JIMTOWN
	4	2	50	39.9	38-40.6	122-46.7	5.2	1.0	18	48	4.4	0.19	.7	1.3	B	JIMTOWN
	4	3	13	0.1	38-40.6	122-46.6	4.9	1.3	28	34	4.3	0.20	.5	1.2	B	JIMTOWN
	4	3	25	58.5	35-52.1	120-26.0	11.4	1.1	9	110	2.3	0.15	1.4	1.6	B	CHOLAME HILLS
	4	3	48	54.3	38-48.4	122-48.0	0.3	1.1	14	68	3.9	0.15	.5	.5	B	THE GEYSERS
	4	13	2	44.3	36-34.2	121-12.8	6.9	1.5	41	36	2.2	0.17	.4	.8	B	BICKMORE CANYON
	4	14	3	59.7	36-59.3	121-40.8	3.3	1.4	52	34	4.1	0.23	.4	.3	B	WATSONVILLE EAST
	4	20	27	7.4	37-22.3	121-43.5	8.4	1.2	40	81	3.2	0.13	.4	.7	A	LICK OBSERVATORY
	5	0	18	44.9	36-48.1	121-23.0	7.2	1.5	25	41	4.2	0.11	.3	.8	A	HOLLISTER
	5	1	20	27.5	37-57.5	122-19.4	7.9	1.3	13	62	6.3	0.14	.6	1.0	A	RICHMOND
	5	11	41	40.5	38-49.2	122-48.1	3.9	1.3	17	42	3.7	0.15	.6	.8	A	THE GEYSERS
	5	11	44	41.3	36-23.0	121- 0.7	7.6	1.3	26	61	4.6	0.21	.7	1.6	B	TOPO VALLEY
	5	19	20	34.3	36-48.2	121-23.0	8.3	1.3	17	56	4.3	0.10	.4	1.0	A	HOLLISTER
	5	20	17	34.4	37-57.1	122- 4.0	6.6	1.3	14	53	4.6	0.15	.6	.6	B	WALNUT CREEK
	6	2	22	14.9	36-27.5	121- 2.7	9.7	1.8	31	70	4.3	0.18	.5	1.0	B	TOPO VALLEY
	6	2	41	10.4	35-59.5	120-32.9	14.3	1.5	17	68	8.5	0.07	.4	.3	A	STOCKDALE MTN
	6	2	44	13.4	38-49.3	122-48.2	1.2	1.2	17	48	3.4	0.10	.3	.2	A	THE GEYSERS
	6	6	56	55.0	38-49.0	122-48.4	3.3	1.2	17	42	3.2	0.14	.5	.3	A	THE GEYSERS
	6	7	48	0.2	36-49.6	121-17.0	8.6	1.4	32	52	1.8	0.14	.4	.7	A	TRES PINOS
	6	9	42	22.1	36-50.0	121-17.2	10.2	1.7	35	56	2.1	0.14	.4	.7	A	TRES PINOS
	6	13	25	39.4	37-45.6	122- 8.1	4.2	1.4	34	32	4.4	0.19	.6	.6	B	OAKLAND EAST
	6	14	43	21.8	38-58.1	123-44.6	5.1	1.8	18	303	19.7	0.10	2.9	.4	D	POINT ARENA
	6	17	33	6.6	36-34.4	121-12.5	6.9	2.1	25	46	1.8	0.09	.3	.6	A	BICKMORE CANYON
	7	4	47	17.8	36-58.8	121-39.2	4.0	1.9	41	52	4.1	0.18	.4	.3	B	WATSONVILLE EAST
	7	10	38	35.3	36-44.7	121-28.1	8.0	1.5	35	49	2.3	0.16	.4	.7	B	MT HARLAN

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
DEC 7	14	49	3.8	37-25.7	121-39.8	4.7	2.0	30	120	11.2	0.11	.4	.3	B	MT DAY
7	16	34	54.5	38-48.8	122-48.0	2.0	1.2	8	89	3.9	0.09	.6	.4	A	THE GEYSERS
7	18	38	19.1	36-49.9	121-34.9	6.5	2.5	48	45	3.8	0.19	.4	.6	B	SAN JUAN BAUTISTA
8	1	34	0.3	36-41.0	121-19.5	8.0	1.1	13	67	3.3	0.08	.4	.8	A	PAICINES
8	6	0	14.5	39-16.3	123-13.7	2.5	2.1	21	262	31.4	0.24	1.5	.7	C	REDWOOD VALLEY
8	7	35	22.3	37- 7.9	121-30.8	8.4	1.2	18	127	7.1	0.12	.5	1.3	B	MT SIZER
8	18	4	21.1	37-52.2	122-15.2	8.4	2.3	63	33	1.7	0.17	.3	.5	B	OAKLAND WEST
8	18	9	25.2	37-52.4	122-15.2	6.5	1.4	39	33	10.4	0.18	.4	.6	B	OAKLAND WEST
8	18	48	42.9	37- 4.7	121-30.2	5.3	1.8	53	75	5.3	0.16	.3	.6	B	GILROY
9	0	56	26.0	36-31.6	121-10.0	6.7	1.8	19	90	13.2	0.21	.8	2.8	B	BICKMORE CANYON
9	2	26	55.2	37-41.8	122-32.1	6.1	2.3	35	108	8.5	0.22	.6	.7	B	***GULF OF THE FARALLONES***
9	3	32	46.3	37- 7.0	121-29.9	5.3	1.6	43	103	5.1	0.15	.4	.4	B	GILROY HOT SPRINGS
9	11	24	36.2	37-15.8	121-37.3	4.9	1.5	46	89	4.5	0.11	.3	.2	A	ISABEL VALLEY
9	12	5	40.5	35-43.3	119-45.4	3.9	1.6	11	335	55.2	0.23	4.4	1.1	D	ANTELOPE PLAIN
9	13	39	31.7	36-32.1	121- 9.4	9.4	2.2	45	45	5.3	0.27	.6	1.2	B	BICKMORE CANYON
9	14	48	37.2	36-56.8	121-41.8	8.8	1.4	53	39	0.8	0.26	.5	.9	B	WATSONVILLE EAST
9	19	49	1.0	36-44.8	121-23.6	5.9	0.7	17	79	1.7	0.19	.8	1.5	B	MT HARLAN
10	5	18	7.7	37-15.5	121-50.4	3.1	1.2	30	30	6.7	0.07	.2	.1	B	SAN JOSE EAST
10	10	25	7.6	38-48.8	122-49.4	1.2	1.0	15	47	2.1	0.10	.3	.2	A	THE GEYSERS
10	10	41	14.2	36-30.6	121- 0.9	17.1	1.3	15	81	5.4	0.16	.9	1.4	B	SAN BENITO
10	19	20	44.0	36-10.1	120-39.3	7.0	1.8	15	105	9.0	0.16	.8	2.1	B	PRIEST VALLEY
10	20	48	46.0	38-48.2	122-48.1	1.1	1.4	10	72	0.8	0.09	.4	.3	A	THE GEYSERS
10	23	36	0.7	37-20.3	121-41.6	5.1	2.1	39	76	4.6	0.14	.3	.4	A	LICK OBSERVATORY
11	4	32	8.4	38-48.0	122-48.2	1.9	2.4	31	35	1.2	0.10	.2	.2	A	THE GEYSERS
11	5	12	11.6	38-45.2	122-24.0	8.5	1.2	11	152	7.0	0.11	.9	1.6	B	JERICHO VALLEY
11	9	12	52.3	36-35.4	121- 7.6	9.2	1.5	24	42	5.8	0.15	.5	.9	A	BICKMORE CANYON
11	18	49	9.3	36-52.9	121-31.5	6.3	1.7	23	45	4.2	0.07	.2	.4	A	CHITTENDEN
11	19	17	20.5	36-53.2	121-24.7	8.2	1.8	28	55	2.2	0.12	.4	.6	A	SAN FELIPE
11	22	35	14.9	36-57.3	121-35.9	5.9	2.2	33	34	1.3	0.12	.3	.7	A	CHITTENDEN
12	1	11	45.8	37-20.2	121-41.5	5.0	3.4R	49	73	4.5	0.14	.3	.3	A	LICK OBSERVATORY
12	1	40	4.6	37-20.4	121-41.0	6.6	1.4	17	77	6.8	0.10	.4	1.7	B	LICK OBSERVATORY
12	1	46	43.9	37-20.3	121-41.5	4.9	2.0	42	75	4.5	0.15	.3	.4	A	LICK OBSERVATORY
12	2	26	1.8	38-49.1	122-48.2	2.9	1.6	17	78	1.4	0.08	.3	.2	A	THE GEYSERS
12	3	44	40.2	36-14.1	120-50.5	5.4	2.1	14	82	4.8	0.15	.7	1.6	A	MONARCH PEAK
12	5	0	29.1	36-58.3	121-38.8	3.8	1.7	22	47	4.7	0.11	.3	.3	A	WATSONVILLE EAST
12	9	58	38.9	38-48.0	122-48.7	1.0	1.5	16	62	1.8	0.11	.3	.3	A	THE GEYSERS
12	11	27	13.5	39-25.1	123-16.5	2.8	2.0	15	309	47.5	0.20	2.3	1.5	C	NE 1/4 WILLITS
13	0	53	4.8	37-42.2	122-31.9	6.0	1.7	28	105	9.0	0.13	.4	.6	B	***GULF OF THE FARALLONES***
13	2	35	27.9	36- 2.2	120-37.8	7.8	2.1	20	66	4.8	0.17	.6	1.3	B	SLACK CANYON
13	3	13	34.7	36-22.0	120-59.4	7.9	1.4	13	66	6.9	0.13	.6	1.5	A	LONOAK
13	5	33	51.7	36-27.4	121- 4.6	8.1	2.1	38	64	5.9	0.16	.4	.8	B	TOPO VALLEY
13	9	20	24.4	36- 2.8	120-36.5	6.7	1.3	10	73	2.8	0.15	.7	1.6	A	SMITH MTN
13	17	13	4.1	36-18.8	120-55.0	4.4	1.8	13	82	1.1	0.15	.6	1.1	A	LONOAK
13	20	6	2.0	38-18.7	122-20.2	4.4	1.7	26	48	11.2	0.15	.5	.6	B	NAPA
13	20	6	54.8	39- 6.3	123- 2.3	1.1	1.7	19	200	7.3	0.13	.9	.7	C	PURDYS GARDENS

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
DEC	13	23	42	24.7	36-33.7	121-11.4	6.1	1.2	18	66	1.6	0.18	.7	1.3	B	BICKMORE CANYON
	13	23	51	16.9	39-13.7	122-42.5	4.4	1.9	16	262	15.0	0.08	1.8	.8	C	NW 1/4 CLEARLAKE OAKS
	14	12	1	37.8	36-57.3	121-35.9	5.6	1.7	33	46	1.4	0.14	.4	.9	A	CHITTENDEN
	14	12	28	57.5	36- 1.1	120-36.5	10.1	2.4	23	50	5.9	0.15	.5	.6	A	SMITH MTN
	14	16	35	57.8	36-44.7	121-20.9	8.3	1.6	18	47	3.5	0.15	.6	1.0	A	PAICINES
	14	17	3	23.0	36-34.0	121- 8.4	11.4	1.3	21	62	4.4	0.16	.6	1.1	B	BICKMORE CANYON
	14	18	8	48.6	36-36.3	121-10.6	10.1	0.9	13	53	3.6	0.17	.9	1.9	B	BICKMORE CANYON
	14	20	15	4.4	38-48.7	122-47.9	1.2	1.2	12	73	0.7	0.08	.3	.2	A	THE GEYSERS
	14	22	49	16.1	38-47.9	122-46.2	1.7	1.0	9	94	1.6	0.09	.5	.4	B	THE GEYSERS
	14	23	12	54.1	36-27.2	121- 4.6	6.2	1.5	21	63	6.1	0.09	.3	.8	A	TOPO VALLEY
	15	6	50	53.8	36-31.4	121- 9.1	6.1	1.4	14	46	4.2	0.15	.6	1.3	A	BICKMORE CANYON
	15	8	2	17.0	36- 5.6	120-41.5	4.9	2.2	18	116	3.2	0.19	.9	.8	B	SLACK CANYON
	15	11	15	28.9	36-34.6	121-13.7	9.2	4.2R	57	32	3.5	0.20	.4	.7	B	BICKMORE CANYON
	15	11	33	58.1	36-34.7	121-13.4	8.4	1.8	20	40	3.1	0.11	.4	.7	A	BICKMORE CANYON
	15	13	13	58.2	36-35.5	121- 4.7	12.2	1.3	12	74	4.7	0.06	.3	.6	A	SAN BENITO
	15	13	45	53.5	36-35.2	121-13.8	9.8	1.2	22	57	3.8	0.14	.5	.9	A	BICKMORE CANYON
	15	14	51	45.1	36-34.8	121-13.6	8.9	1.7	20	69	6.0	0.15	.5	1.2	A	BICKMORE CANYON
	15	15	20	19.5	36-35.2	121-13.9	8.1	1.1	16	67	4.0	0.16	.7	1.4	B	BICKMORE CANYON
	15	15	24	10.6	36-17.3	120-52.7	6.2	1.1	8	107	5.4	0.10	.9	1.7	B	LONOAK
	15	16	49	26.5	36- 1.2	120-36.9	1.8	1.7	9	148	5.9	0.16	1.4	1.0	C	SMITH MTN
	15	16	56	43.6	36-17.5	120-52.8	6.5	1.2	7	113	5.1	0.09	.9	1.7	B	LONOAK
	15	17	4	22.3	38-47.6	122-48.8	2.4	1.8	18	70	2.3	0.13	.4	.3	A	THE GEYSERS
	15	22	52	4.8	36-34.8	121-13.4	7.5	1.5	20	39	3.2	0.12	.4	.7	A	BICKMORE CANYON
	16	0	1	46.7	38-48.4	122-47.7	1.6	1.2	11	68	0.1	0.08	.3	.2	A	THE GEYSERS
	16	4	1	9.1	36-58.0	121-38.4	3.8	2.1	40	52	4.3	0.20	.4	.3	B	WATSONVILLE EAST
	16	4	4	1.7	36-34.9	121-13.5	7.8	1.5	25	59	3.3	0.17	.5	1.1	B	BICKMORE CANYON
	16	4	4	17.5	36-34.5	121-13.3	6.5	2.2	31	61	3.0	0.14	.4	.5	A	BICKMORE CANYON
	16	9	46	40.6	36-50.8	121-25.0	7.0	1.5	26	56	1.4	0.12	.4	.8	A	HOLLISTER
	16	10	4	8.8	36-34.8	121-13.7	7.5	1.8	34	32	3.6	0.17	.4	.9	B	BICKMORE CANYON
	16	10	41	47.4	35-55.5	120-30.3	12.0	3.5	20	63	3.7	0.16	.7	.6	B	STOCKDALE MTN
	16	10	58	42.8	36- 1.3	120-36.4	8.9	1.7	12	71	5.4	0.12	.7	1.4	A	SMITH MTN
	16	15	48	58.8	35-57.3	120-32.6	6.4	2.4	22	72	6.4	0.20	.6	.8	B	STOCKDALE MTN
	16	16	25	15.3	36-30.2	121- 8.5	11.3	1.0	15	88	3.2	0.23	1.1	2.3	B	BICKMORE CANYON
	16	18	29	34.3	35-32.0	120-43.8	13.1	1.5	10	247	36.9	0.07	1.3	.5	C	TEMPLETON
	16	21	46	55.1	36-34.6	121-13.7	7.7	1.8	23	56	6.3	0.20	.6	1.6	B	BICKMORE CANYON
	16	21	59	57.8	38-48.6	122-47.7	0.1	1.4	14	72	0.4	0.22	.7	.7	B	THE GEYSERS
	16	22	9	11.1	36-27.7	121- 3.3	9.7	2.1	23	80	5.2	0.21	.7	1.4	B	TOPO VALLEY
	17	0	30	57.4	38- 7.9	122- 9.3	1.5	1.9	9	103	1.5	0.12	.8	.5	B	CORDELIA
	17	1	6	46.1	36-14.0	120-49.1	4.8	1.2	7	134	3.0	0.06	.6	1.0	B	MONARCH PEAK
	17	7	27	27.0	36-18.7	120-53.4	6.8	0.8	6	101	3.6	0.06	.6	1.2	B	LONOAK
	17	9	31	11.2	36-34.6	121-13.5	7.4	2.3	34	32	3.2	0.11	.3	.5	A	BICKMORE CANYON
	17	9	34	18.5	36-34.8	121-13.2	8.4	1.1	12	68	2.8	0.10	.5	.9	A	BICKMORE CANYON
	17	14	0	25.4	36-34.5	121-12.5	3.5	1.7	24	66	1.7	0.15	.4	.3	B	BICKMORE CANYON
	17	16	4	35.6	37-20.1	121-41.1	7.0	1.4	11	90	6.9	0.06	.3	1.0	A	LICK OBSERVATORY
	17	18	29	45.8	36-48.6	121-31.4	3.6	1.9	25	37	2.1	0.18	.5	.4	B	SAN JUAN BAUTISTA

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
DEC 17	22	52	38.7	38-47.9	122-48.5	3.0	1.8	18	64	1.7	0.07	.2	.1	A	THE GEYSERS
17	23	41	2.6	37-21.5	121-43.5	0.1	1.2	9	77	2.8	0.16	.8	.9	B	LICK OBSERVATORY
18	7	5	44.7	36-53.5	121-31.9	7.1	1.4	21	56	3.6	0.12	.4	.9	A	CHITTENDEN
18	15	5	58.5	38-41.5	122-24.3	12.6	1.4	15	114	13.2	0.18	.7	1.5	B	AETNA SPRINGS
18	15	50	42.9	36-34.8	121-13.4	8.5	1.0	16	59	3.1	0.10	.4	.8	A	BICKMORE CANYON
18	16	4	14.2	38-48.6	122-47.8	2.6	1.5	18	53	0.3	0.14	.4	.3	A	THE GEYSERS
18	17	11	13.4	36-34.7	121-13.4	8.1	1.5	31	60	3.0	0.11	.3	.6	A	BICKMORE CANYON
18	17	16	54.7	38-48.7	122-48.5	2.5	1.7	25	34	1.3	0.09	.2	.1	A	THE GEYSERS
18	18	28	52.7	36- 1.2	120-36.5	7.5	2.1	17	71	5.6	0.14	.6	1.2	A	SMITH MTN
18	18	51	54.1	36- 1.4	120-36.5	8.7	1.6	18	75	5.3	0.14	.6	1.1	A	SMITH MTN
18	22	58	57.5	39-15.1	122-43.1	2.8	1.8	7	321	16.5	0.12	2.2	.7	C	FOUTS SPRINGS
19	8	34	4.1	36-44.8	121-18.2	7.5	1.0	17	77	1.9	0.12	.5	1.1	A	PAICINES
19	16	33	3.9	36-41.4	121-21.6	4.2	1.6	31	41	2.7	0.14	.3	.5	A	PAICINES
20	3	46	5.8	38-48.1	122-46.2	1.7	1.7	27	51	1.4	0.11	.3	.2	A	THE GEYSERS
20	7	15	28.2	38-39.5	122-45.8	6.7	1.2	16	48	5.8	0.12	.4	1.1	A	JIMTOWN
20	8	40	53.5	36-34.2	121- 4.5	11.0	1.3	19	72	5.1	0.16	.6	1.1	B	SAN BENITO
20	11	51	30.3	38-48.7	122-48.6	2.9	1.0	16	70	1.4	0.06	.2	.1	A	THE GEYSERS
20	16	59	30.2	37-59.1	122- 3.5	13.1	1.9	26	46	7.1	0.12	.4	.3	A	WALNUT CREEK
20	18	51	4.3	38-48.3	122-49.8	1.8	0.9	11	60	2.5	0.06	.3	.2	A	THE GEYSERS
20	20	36	51.9	37-42.5	122-31.9	8.0	1.7	19	104	9.5	0.16	.5	.9	B	***GULF OF THE FARALLONES***
20	20	38	45.3	38-48.0	122-47.8	0.2	2.2	18	50	0.9	0.20	.5	.5	B	THE GEYSERS
20	20	41	19.5	38-48.4	122-48.2	0.9	1.2	7	82	0.8	0.14	.8	.8	A	THE GEYSERS
20	20	41	52.9	38-48.4	122-48.2	0.6	1.4	13	74	0.9	0.11	.4	.4	A	THE GEYSERS
20	20	48	46.1	38-48.6	122-48.1	3.5	1.4	8	134	0.7	0.04	.3	.2	B	THE GEYSERS
21	4	23	41.1	39-23.7	123-16.1	5.7	2.9	30	236	44.9	0.16	2.2	1.1	C	NE 1/4 WILLITS
21	7	43	38.4	36-35.2	121-13.7	8.3	1.2	9	67	3.7	0.12	.8	1.8	A	BICKMORE CANYON
21	9	13	13.9	35-59.6	120-33.9	3.5	1.4	8	84	9.0	0.08	.7	.6	B	STOCKDALE MTN
21	11	1	14.9	38-30.8	122-45.1	1.8	1.4	11	61	4.8	0.15	.7	.7	A	HEALDSBURG
21	18	14	27.8	35-39.4	121- 3.2	12.7	2.1	9	217	9.5	0.08	1.3	.7	C	PEBBLESTONE SHUT-IN
21	21	31	10.3	36-48.6	122-22.7	4.7	1.9	16	244	36.3	0.22	1.4	4.5	C	*** MONTEREY BAY ***
22	2	59	1.6	37-43.3	122-11.6	4.6	1.6	17	61	6.7	0.08	.3	.3	B	SAN LEANDRO
22	4	56	17.0	37-22.4	122-16.0	10.4	1.9	24	86	5.0	0.10	.4	.4	A	LA HONDA
22	9	4	12.7	37-22.9	121-44.3	5.3	1.8	32	80	2.9	0.14	.4	.3	A	MT DAY
22	11	37	58.9	36-32.6	121-10.2	9.0	1.5	20	49	4.0	0.23	.8	1.6	B	BICKMORE CANYON
22	13	1	31.4	36- 3.5	120-38.1	3.1	1.2	5	116	3.8	0.01	.1	.1	C	SLACK CANYON
22	13	37	14.5	36- 0.8	120-35.8	0.4	1.5	8	100	6.2	0.11	.6	.6	B	SMITH MTN
22	14	22	45.3	36-54.1	121-29.4	4.6	1.5	33	43	2.4	0.12	.3	.3	A	SAN FELIPE
22	14	53	33.9	37-20.5	121-40.8	6.4	1.2	11	80	7.0	0.13	.6	3.3	B	LICK OBSERVATORY
22	21	55	9.8	36-54.4	121-33.3	5.1	1.2	14	50	4.0	0.05	.2	.5	A	CHITTENDEN
23	6	25	34.6	37-21.5	121-42.1	8.3	1.5	50	81	4.8	0.14	.3	.9	A	LICK OBSERVATORY
23	9	13	33.2	36- 2.4	120-37.5	1.9	1.6	9	88	4.3	0.18	1.3	1.2	B	SMITH MTN
23	9	47	26.4	37-28.8	121-49.9	5.2	1.3	32	65	4.3	0.14	.3	.3	A	CALAVERAS RESERVOIR
23	11	30	25.4	36-48.3	121-18.8	9.5	2.2	66	38	4.7	0.18	.3	.5	B	TRES PINOS
23	16	8	37.8	36-55.0	121-25.4	4.6	1.4	45	71	1.6	0.15	.3	.5	B	SAN FELIPE
23	19	6	4.4	36-31.3	121- 7.6	8.2	1.4	19	81	4.8	0.26	1.0	1.9	B	BICKMORE CANYON

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
DEC 24	1	32	13.1	36- 1.3	120-36.8	1.3	1.2	10	108	5.5	0.12	.6	.7	B	SMITH MTN
24	3	17	35.3	38-51.5	121-56.9	3.1	2.3	25	84	30.0	0.35	1.0	1.3	C	ZAMORA
24	11	9	33.3	36-26.1	121- 2.3	0.1	1.7	14	81	2.2	0.12	.5	.6	A	TOPO VALLEY
24	13	38	18.5	36-37.9	121- 8.0	13.9	1.2	26	63	4.6	0.13	.4	.4	A	CHERRY PEAK
24	15	32	51.6	36-13.1	120-48.8	3.1	1.1	10	105	1.7	0.13	1.0	.6	B	MONARCH PEAK
24	19	18	38.5	37-27.3	121-32.0	4.5	1.4	8	211	11.6	0.14	1.7	1.5	C	EYLAR MTN
25	7	31	49.5	38-47.9	122-48.5	3.6	2.1	36	35	1.7	0.15	.3	.3	A	THE GEYSERS
25	16	18	17.4	36-34.4	121-13.4	8.5	1.8	38	41	3.1	0.16	.4	.8	B	BICKMORE CANYON
25	16	27	23.6	38-42.8	122-49.8	3.9	2.1	32	32	5.8	0.19	.4	.5	B	JIMTOWN
25	18	58	40.8	37-18.3	121-39.4	4.4	1.5	16	82	5.4	0.08	.3	.2	B	LICK OBSERVATORY
26	0	36	37.6	37-23.2	121-43.4	6.0	1.3	33	85	4.2	0.12	.3	1.0	A	MT DAY
26	3	7	40.7	36-30.3	121- 8.1	6.6	1.2	23	47	3.8	0.28	.9	1.8	B	BICKMORE CANYON
26	8	22	19.9	37-22.1	121-36.1	6.1	1.2	34	116	6.4	0.18	.6	2.4	B	ISABEL VALLEY
26	9	3	50.7	37-42.8	122-33.1	5.6	1.8	37	107	10.9	0.14	.4	.5	B	***GULF OF THE FARALLONES***
27	3	11	52.4	38-48.8	122-50.1	1.5	1.7	24	63	1.5	0.11	.3	.2	A	THE GEYSERS
27	6	15	21.3	38-48.8	122-50.0	1.6	1.8	27	33	1.5	0.10	.2	.2	A	THE GEYSERS
27	6	16	4.3	38-48.8	122-50.0	1.4	1.3	21	46	1.5	0.10	.3	.2	A	THE GEYSERS
27	6	21	3.9	38-48.7	122-50.1	1.4	1.3	19	55	1.6	0.08	.2	.2	A	THE GEYSERS
27	10	33	38.4	36-22.1	120-58.8	5.7	1.9	19	61	7.2	0.15	.5	1.5	B	LONOAK
27	14	9	3.2	38-48.3	122-48.3	0.9	1.3	16	62	1.1	0.05	.1	.1	A	THE GEYSERS
27	17	23	32.2	38-47.0	122-26.7	6.4	1.5	23	124	2.5	0.11	.5	.9	B	JERICHO VALLEY
27	17	30	38.5	38-47.0	122-26.9	0.3	1.6	16	117	2.5	0.16	.9	1.5	B	JERICHO VALLEY
27	17	33	30.6	38-46.9	122-26.8	5.5	1.5	22	120	2.6	0.15	.7	1.1	B	JERICHO VALLEY
27	18	56	36.8	35-48.0	120-23.2	5.8	2.5	25	243	9.5	0.24	2.2	.9	C	CHOLAME HILLS
28	2	59	38.0	35-48.0	120-22.8	5.5	3.6R	18	225	4.3	0.19	1.5	.8	C	CHOLAME HILLS
28	3	6	29.4	35-50.1	120-24.0	6.0	2.2	14	162	4.3	0.16	1.1	.9	C	CHOLAME HILLS
28	3	50	20.2	36-58.1	121-39.0	4.0	2.1	47	38	4.2	0.18	.4	.3	B	WATSONVILLE EAST
28	12	21	3.2	35-47.3	120-22.0	5.5	3.0	16	246	4.9	0.17	1.8	.8	C	CHOLAME VALLEY
28	12	26	28.5	38-43.0	122-49.6	3.8	1.1	28	57	5.5	0.20	.5	.7	B	JIMTOWN
28	13	11	33.2	36-37.6	121- 7.9	13.7	1.2	31	57	5.0	0.17	.6	.6	B	CHERRY PEAK
28	15	51	56.6	36-41.3	121-25.3	5.3	1.7	25	62	0.8	0.19	.6	.6	B	MT HARLAN
28	20	8	2.2	36-41.3	121-25.3	6.2	1.0	21	62	0.8	0.16	.5	1.0	B	MT HARLAN
29	3	50	31.1	36-40.8	121-20.7	4.2	2.1	35	29	3.2	0.17	.4	.5	B	PAICINES
29	4	28	27.7	37-22.7	121-44.1	4.3	2.0	36	80	2.8	0.15	.4	.3	B	MT DAY
29	5	11	13.9	36-41.3	121-25.2	7.8	1.0	19	64	0.6	0.19	.7	1.2	B	MT HARLAN
29	7	26	30.0	36-41.3	121-25.3	7.1	1.3	23	62	0.8	0.18	.6	1.0	B	MT HARLAN
29	8	34	16.4	36-41.1	121-24.9	7.2	0.9	20	60	0.2	0.18	.6	1.1	B	MT HARLAN
29	14	9	16.3	36-49.4	120- 1.7	4.9	3.3	6	147	34.1	0.02	.4	.2	B	BIOLA
29	16	15	58.7	36-49.2	120- 0.9	5.8	3.1	46	140	33.3	0.23	.9	1.0	C	BIOLA
29	18	27	29.3	38-48.6	122-49.4	1.2	1.3	20	44	2.4	0.11	.3	.2	A	THE GEYSERS
30	13	16	3.9	36-51.6	121-36.3	5.0	2.0	58	55	3.0	0.25	.5	.5	B	SAN JUAN BAUTISTA
30	13	53	16.4	36- 3.1	120-37.1	6.6	1.6	14	86	3.0	0.11	.7	1.0	A	SMITH MTN
30	17	49	34.5	36-15.2	120-52.3	9.2	2.2	27	107	8.6	0.26	.8	1.3	B	HEPSEDAM PEAK
30	20	13	59.0	36-46.3	121- 7.6	6.4	1.3	26	122	10.4	0.20	.8	2.2	B	QUIEN SABE VALLEY
30	22	42	18.9	36-41.1	121-25.6	6.9	1.4	31	53	1.2	0.12	.3	.6	A	MT HARLAN

CENTRAL CALIFORNIA EARTHQUAKES--FOURTH QUARTER 1977 (CONTINUED)

1977	HR	MN	SEC	LAT N	LONG W	DEPTH	MAG	NO	GAP	DMIN	RMS	ERH	ERZ	Q	QUADRANGLE
DEC 30	22	45	40.5	36-40.9	121-25.5	6.0	1.1	23	66	1.1	0.15	.5	1.0	B	MT HARLAN
31	4	31	9.3	37-39.2	121-38.9	5.6	1.2	11	126	0.6	0.13	.9	.6	B	ALTAMONT
31	10	45	15.8	36-41.0	121-25.7	6.7	1.4	29	53	1.4	0.15	.4	.8	B	MT HARLAN
31	14	37	10.7	36-34.3	121-12.8	7.7	2.4	45	36	2.2	0.18	.4	.7	B	BICKMORE CANYON
31	18	29	34.0	36-56.5	121-26.4	4.7	3.1	82	50	4.7	0.17	.3	.3	B	SAN FELIPE
31	22	3	52.2	38-48.6	122-47.9	2.1	1.1	11	70	0.4	0.08	.3	.2	A	THE GEYSERS

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