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ARCATA--BERKELEY--CALISTOGA--CONCORD

FRESNO--LLANADA--MANZANITA LAKE

MINERAL--MOUNT HAMILTON--PALO ALTO--PARAISO

POINT REYES--PRIEST--SAN FRANCISCO

SANTA CRUZ--SHASTA--VINEYARD

Earthquakes and the Registration of Earthquakes

From January 1, 1964 to March 31, 1964

By

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Don Pershing

and

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University of California

Berkeley

1966

BULLETIN OF THE SEISMOGRAPHIC STATIONS
of the University of California

Volume 34, Number 1

January 1, 1964 to March 31, 1964

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INTRODUCTION

Each quarterly issue of the Bulletin includes determinations of epicenters, origin times, magnitudes, and other information available at the time of writing, for earthquakes in northern California and adjoining areas. Recorded arrival times of seismic waves are tabulated only for the major earthquakes in the local area and for teleseisms.

Information items regarding the seismographic stations which comprise the Berkeley network are repeated in every issue. Information of a general nature, such as the Modified Mercalli Intensity Scale, will be found only in the first number of each volume.

PERSONNEL (AUGUST 1966)

Station Director	Bruce A. Bolt
Director Emeritus	Perry Byerly
Associate Research Seismologist	Cinna Lomnitz
Assistant Research Seismologist	Helen Freedman
Postgraduate Research Seismologist	D. J. Sutton
Associate	Don Tocher (Earthquake Mechanism Laboratory, Institute for Earth Sciences, ESSA, San Francisco)
Associate Engineer	Walter Marion
Full-time Technical Staff	G.D. Mitchell, R. Sell, M. Hilger, D. Pershing
Research Assistants	W. Bakun, K. Casaday, J. Derr, J. Filson, D. Leppaluoto
Secretary	Loretta Martin

MAILING ADDRESS

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University of California	845-6000 (Est. 3977)
475 Earth Sciences Building	(Area Code 415)
Berkeley, California 94720	

THE BYERLY SEISMOGRAPHIC STATION (BKS)

Standardized equipment began operating in a newly constructed tunnel east of the main campus on June 8, 1962. The closest buildings, part of the Lawrence Radiation Laboratory, are about 0.8 km away. The tunnel was cut into the upper part of the Claremont Formation. Of Miocene age, this formation consists of thin layers of cherty material alternating with shale.

A plan of the tunnel is shown in the diagram. Piers are constructed of reinforced concrete with no isolation from floor and walls. The temperature is stable. A ventilating and dehumidifying system is connected to all rooms.

The short-period world-wide standard instruments are operated with an approximate magnification of 25,000 at 1 sec and the long-period standard instruments with 3,000 at 30 sec.

On March 20, 1964, the Regents of the University of California named this station the "Byerly Seismographic Station" in recognition of the work of Professor Perry Byerly.

HISTORY OF THE UNIVERSITY OF CALIFORNIA STATIONS

"The Seismographic Stations at Mount Hamilton and Berkeley present several items of interest in the history of earthquake science, one of which is that according to the available records they were the first seismographic stations set up in America. Furthermore, they have functioned continuously from their founding to the present day, with improvements in instrumental equipment from time to time as the development of the science and opportunity have permitted.

"Several outstanding figures in the seismology of the 1880's were impressed with the importance of these stations, and Ewing, Milne, and Gray each took a personal interest in aiding one or both stations to obtain their own best and most modern types of instruments."

The quotation is from "History of the University of California Seismographic Stations and Related Activities" by Professor George D. Louderback, published in the Bulletin of the Seismological Society of America, Vol. 32, No. 3, pp. 205-229, 1942. In this paper may be found a detailed account of the development of the Berkeley stations from the installation of the instruments (the first earthquake known recorded at Mount Hamilton was on April 24, 1887) to 1942.

Since 1942, the number of seismographic stations associated with the University of California has increased from six to twenty in 1962. In 1950, Professor Perry Byerly was appointed Director by the Regents; he had been in charge of instruction and research since 1925. In 1960, the University entered into a contract with the Air Force Office of Scientific Research of the Research Projects Agency of the Department of Defense. Funds were made available under the Vela Uniform program to design and operate a telemetered network of eight new stations in central California and to construct a new seismic vault near the Berkeley campus.

STATIONS IN OPERATION: JANUARY - MARCH 1964

Station	North Latitude	West Longitude	Elev. Meters	Symbol	Present Auspices and Date Established
Berkeley (Haviland)	37° 52.4	122° 15.6	81	BRK, BRX	Univ. of California, 1887
Berkeley (Strawberry)	37° 52.6	122° 14.1	276	BKS	Univ. of California, 1962
Mt. Hamilton	37° 20.5	121° 38.5	1282	MHC	Lick Observatory, 1887
Palo Alto	37° 25.0	122° 10.9	83	PAC	Stanford University, 1927
San Francisco	37° 46.6	122° 27.1	100	SFB	Univ. of San Francisco, 1931
Fresno	36° 46.0	119° 47.8	88	FRE	Fresno City College, 1935
Mineral	40° 20.7	121° 36.3	1495	MIN	National Park Service, 1938
Arcata	40° 52.6	124° 04.5	59	ARC	Humboldt State College, 1948
Shasta	40° 41.7	122° 23.3	312	SHS	Bureau of Reclamation, 1942
Manzanita Lake	40° 32.2	121° 33.7	1800	MLC	National Park Service, 1956
Vineyard (local)	36° 45.0	121° 23.1	330	VIN	W. A. Taylor and Co., 1959
(telemeter)	36° 45.0	121° 23.3	380	VIT	
Concord	37° 58.1	122° 04.3	36	CNC	Diablo Valley College, 1960
Santa Cruz	37° 00.4	121° 59.8	128	SCC	City of Santa Cruz, 1961
Paraiso	36° 19.9	121° 22.2	363	PRS	Paraiso Hot Springs, 1961
Llanada	36° 37.0	120° 56.6	475	LLA	Charles McCullough Ranch, 1961
Calistoga	38° 38.2	122° 35.1	457	CLS	Terrance Kirk Ranch, 1961
Point Reyes	38° 04.8	122° 52.0	404	PRC	Federal Aviation Agency, 1961
Priest	36° 08.5	120° 39.9	1187	PRI	Federal Aviation Agency, 1961

STATION INSTRUMENTATION

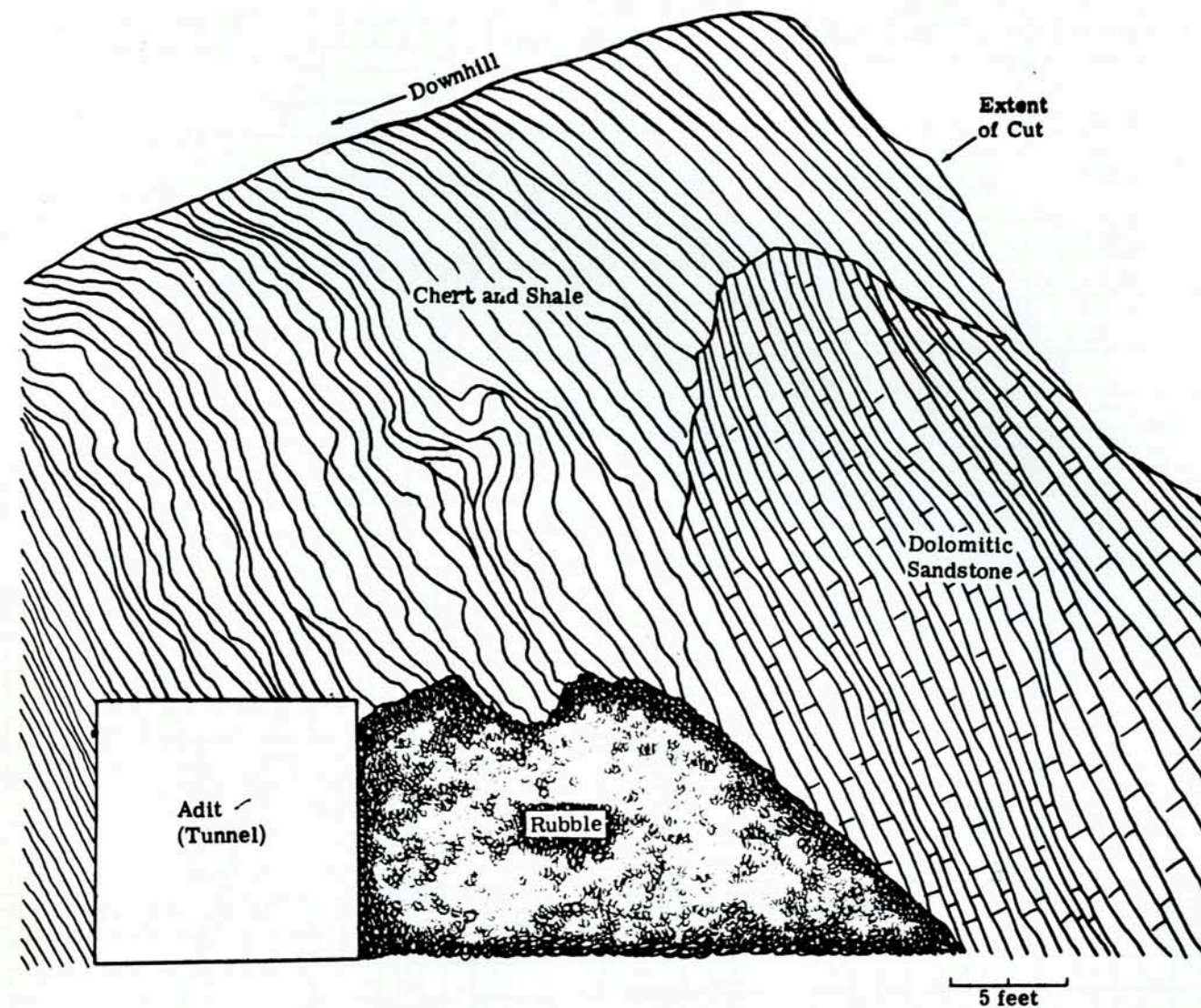
January - March 1964

Station	Type of Instrument	T _o sec	T _g sec	Component
BRK	Benioff 100 kg (Z)	1.0	0.2	Z
BRK	Benioff 100 kg (Z)	1.0	8.0	Z
	100X torsion	0.8	-	N,W
BKS	Benioff 100 kg Sprengnether	1.0	0.75	N,E,Z
	Wood-Anderson torsion	30	100	N,E,Z
		0.8	-	S,W
BRX	Galitzin-Wilip moving coil	12	12	N,E,Z
	Press-Ewing moving coil	30	90	N,E,Z
MHC [△]	Benioff 14 kg (Z)	1.0	0.2	Z
	Wood-Anderson torsion	0.8	-	S,E
PAC	Benioff 100 kg (Z)	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	N,E
SFB	Lehner-Griffith moving coil	1.2	0.3	Z
	Wood-Anderson torsion	0.8	-	S,W
FRE	Sprengnether moving coil	2.0	2.0	N,E,Z
MIN	Benioff 100 kg (Z)	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	S,E
ARC	Marion-Slichter moving coil	1.1	0.2	Z
	Wood-Anderson torsion	0.8	-	N,E
SHS	Benioff 50 kg moving coil	1.5	0.45	N,E,Z
MLC	Loucks-Omori	6	-	S,E
VIN	Torsion strong-motion	0.8	-	N,S
	Wood-Anderson torsion	0.8	-	S,W
VIT [△]	Benioff 14 kg (Z)	1.0	0.2	Z
CNC [△]	Benioff 100 kg (Z)	1.0	0.2	Z
SCC [△]	Benioff 14 kg (Z)	1.0	0.2	Z
PRS [△]	Benioff 14 kg (Z)	1.0	0.2	Z
LLA [△]	Benioff 14 kg (Z)	1.0	0.2	Z
CLS [△]	Benioff 14 kg (Z)	1.0	0.2	Z
PRC [△]	Benioff 14 kg (Z)	1.0	0.2	Z
PRI [△]	Benioff 14 kg (Z)	1.0	0.2	Z

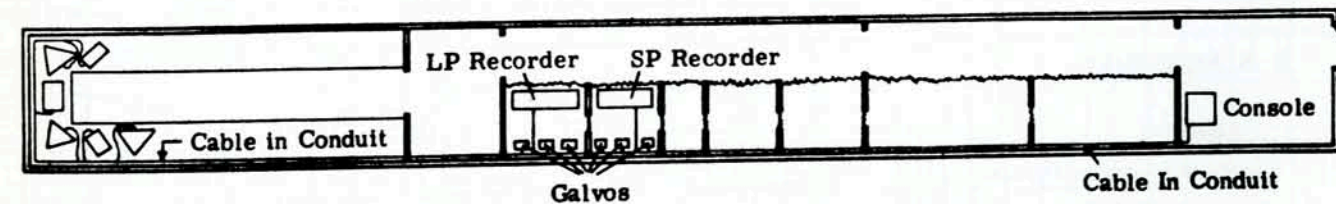
△ Signals from these ten stations are transmitted via leased telephone lines to recorders at Berkeley.

Direction of Motion: In the "Component" column, each horizontal component seismograph is designated by the direction of ground motion corresponding to upward trace motion on the seismogram when it is oriented so that time increases from left to right. On all vertical component (Z) instruments, upward trace motion corresponds to upward ground motion.

Relative magnification curves of instruments recording through the telemeter system are listed on the following pages. Absolute magnification may be obtained by use of calibration pulses recorded daily from each telemetered station.

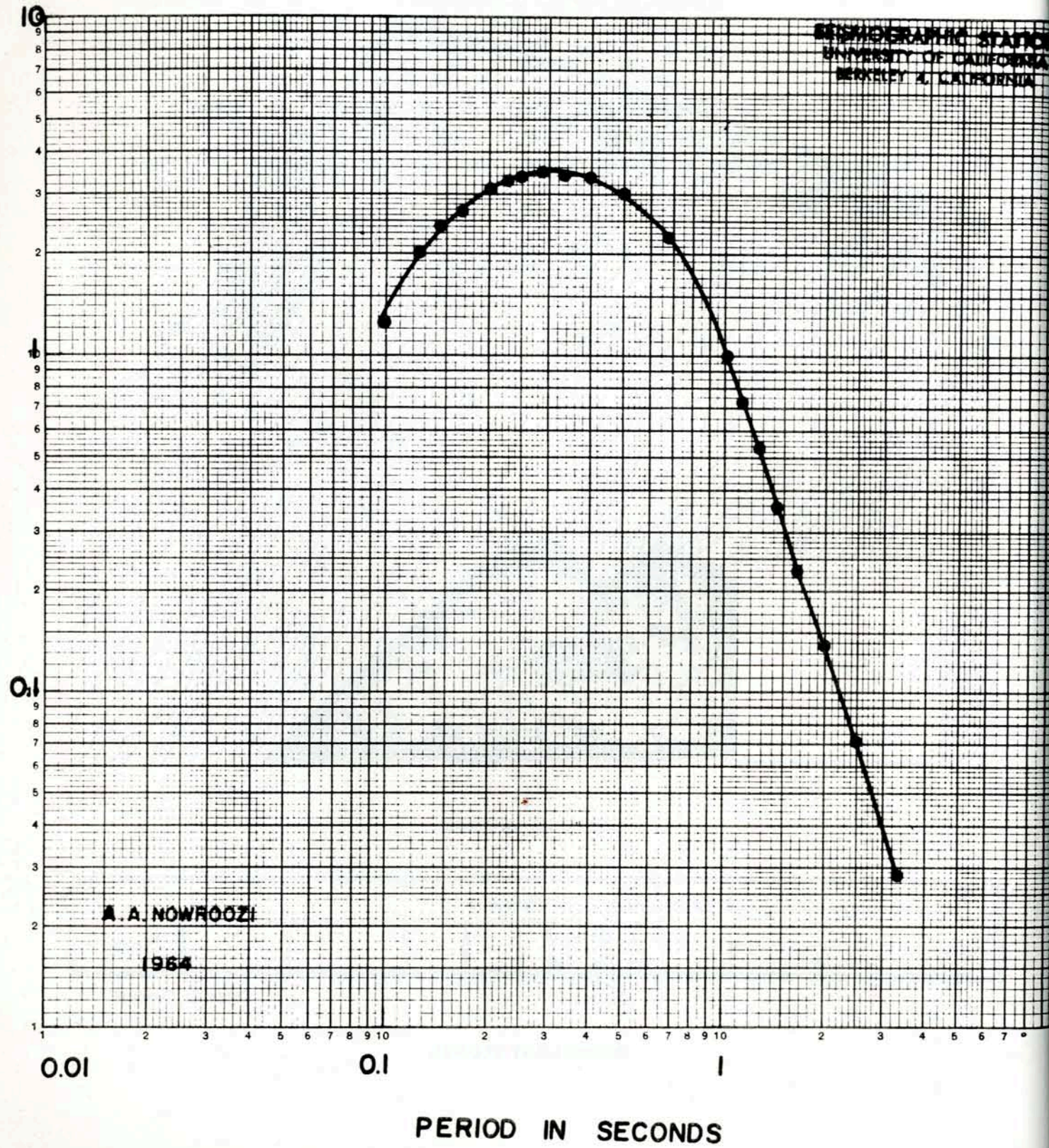


GEOLOGIC SECTION

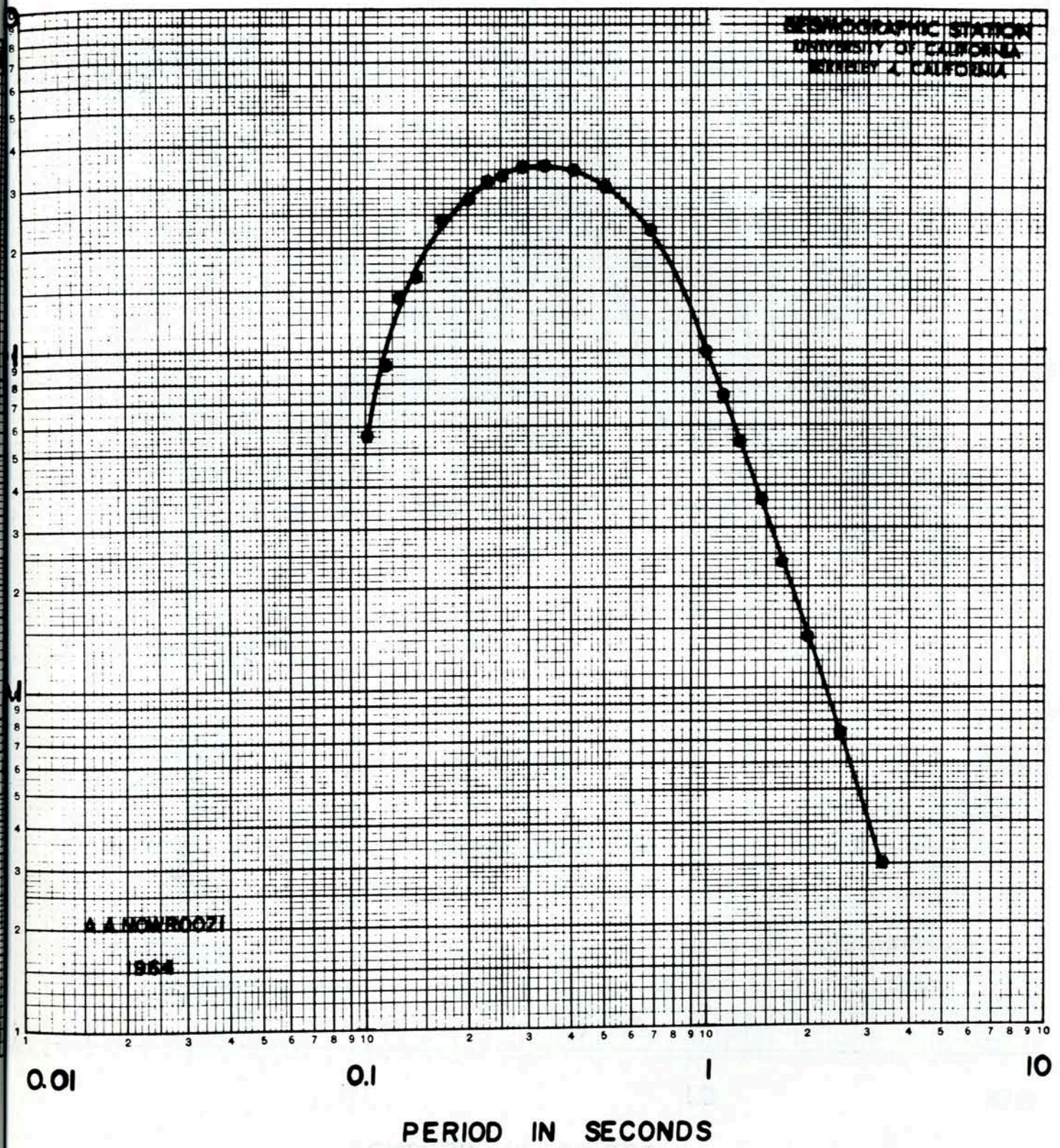


SEISMOLOGY TUNNEL

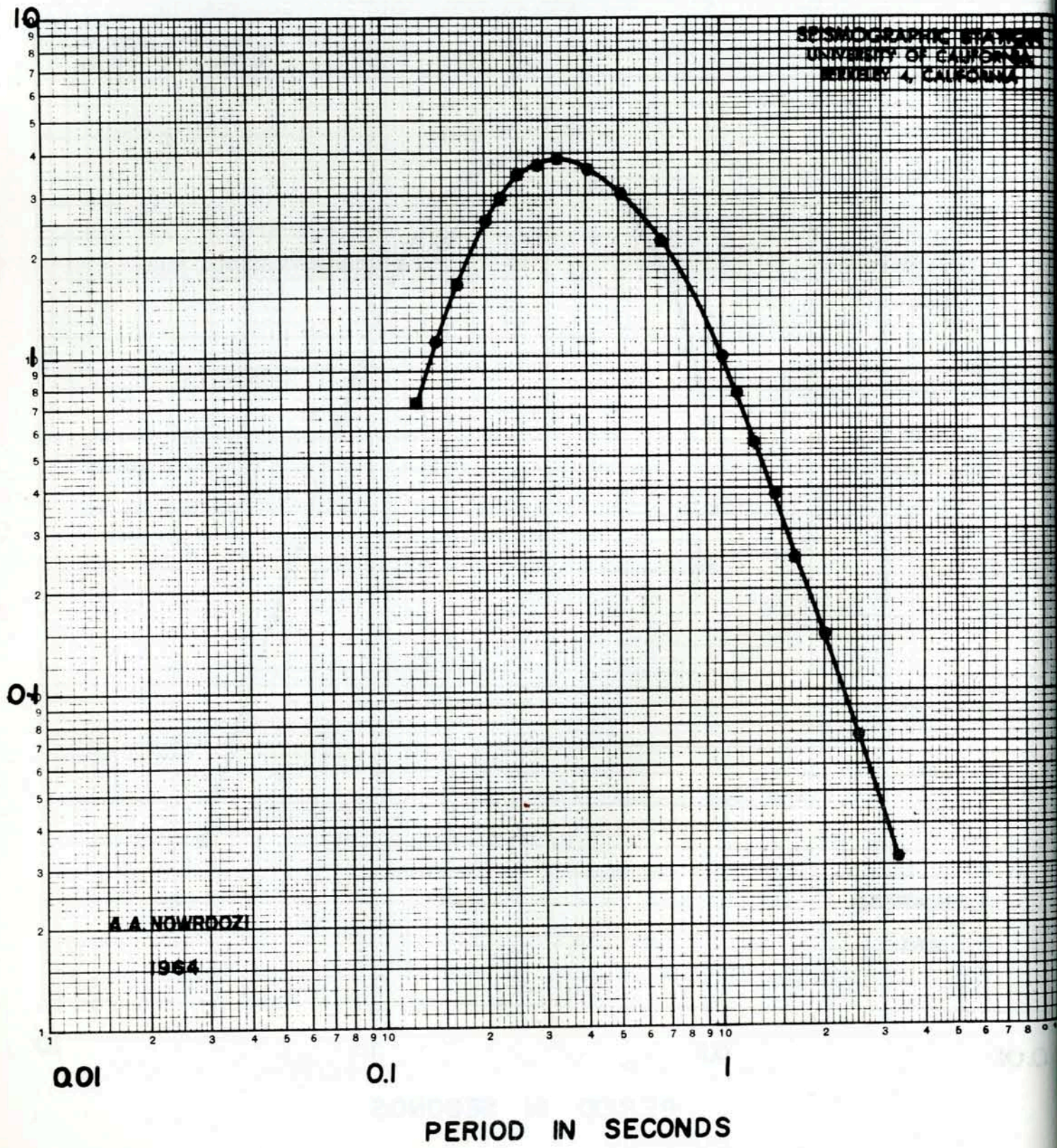
RESPONSE OF SEISMOMETER-DEVELORECORDER SYSTEM. 100KG. Z. S.P



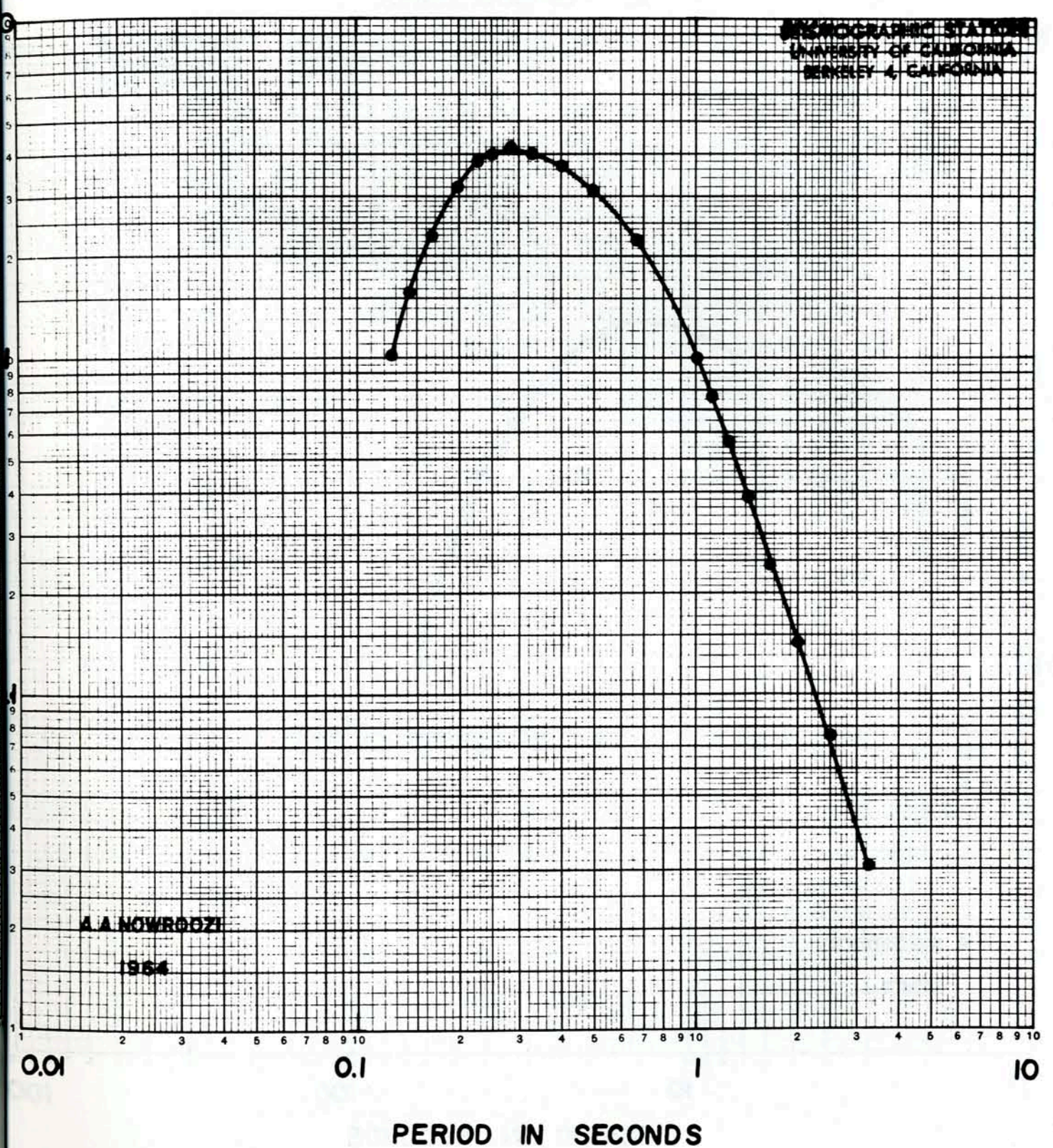
RESPONSE OF SEISMOMETER - HELICORDER SYSTEM. 100KG. Z. S.P



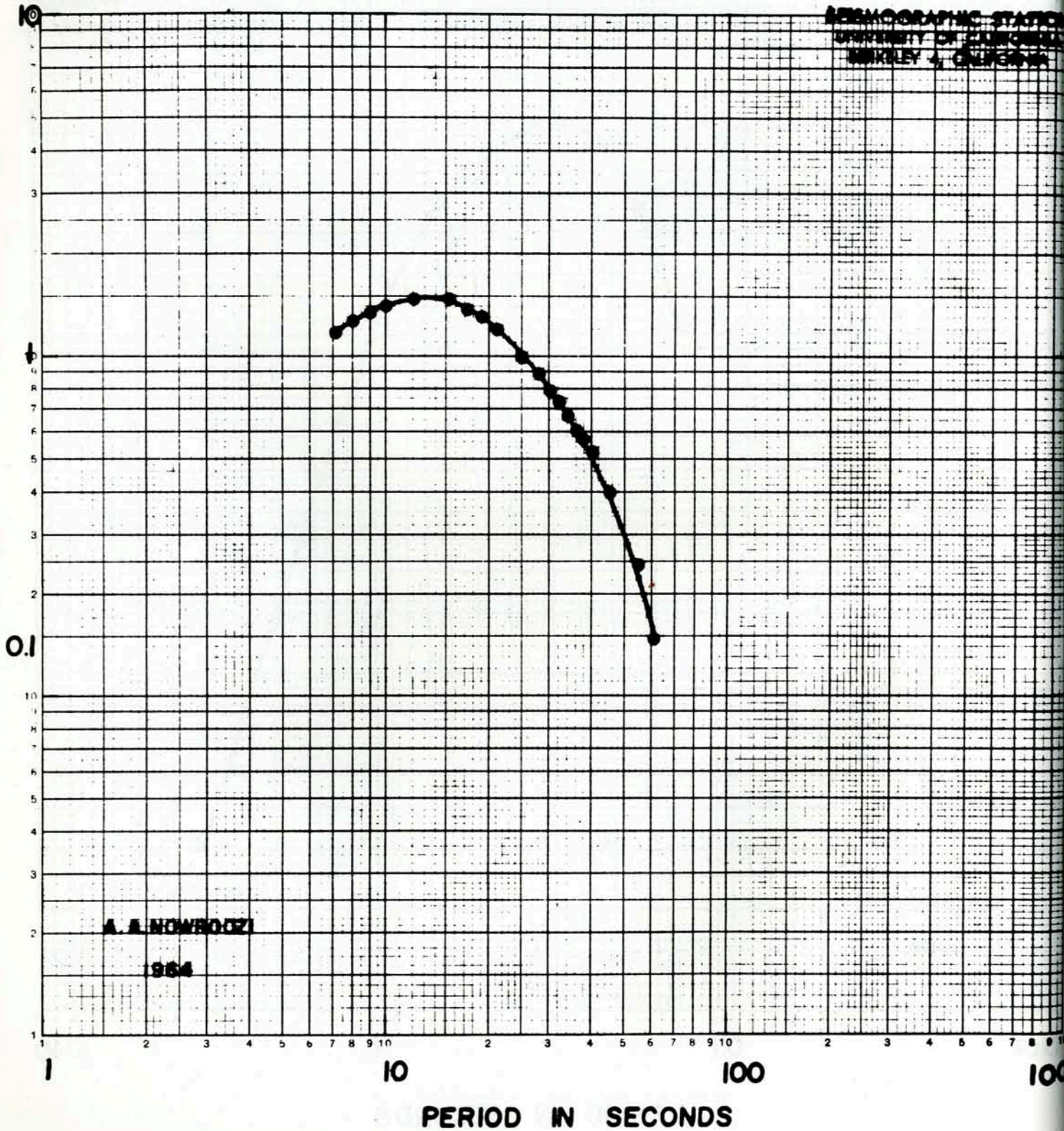
RESPONSE OF SEISMOMETER—HELICORDER SYSTEM. 14.7 KG. Z. S.P



RESPONSE OF SEISMOMETER—DEVELOPORDER SYSTEM. 14.7 KG. Z. S.P



**RESPONSE OF SEISMOMETER — HELICORDER
SYSTEM. PRESS-EWING.
Z. T.G=30S., T.S.=15S.**



**LOCAL EARTHQUAKES
FURTHER ERRATA (1959-1963)**

<u>Vol.</u>	<u>Page</u>	<u>Date</u>	<u>Time (GCT)</u>	<u>Correction</u>
22	122	Oct. 22, 1952	00-45-52	Time should read 00-45-51 Latitude should read 37° 48' Longitude should read 122° 10' 10 miles SE of Berkeley.
27	87	April 19, 1957	01-29-38	Latitude should be 37° 30'.
29	7	March 9, 1959	13-13-50	Latitude should be 38° 37'.
29	93	July 10, 1959	01-12-34	Latitude should be 36° 59'.
30	7	Feb. 14, 1960	15-21-51	Latitude should be 37° 49'.
31	68	May 13, 1961	18-19-12	Magnitude less than 2; not a Berkeley local. Position uncertain.
33	115	Aug. 25, 1963	33-22-08.5	Time should read 13-22-08.5.

Note: The above errors correspond to local earthquakes listed in the Bulletin of the Seismographic Stations, 1959 through 1963. Please enter the corrections in the appropriate volume, page, and column as shown.

MODIFIED MERCALLI INTENSITY SCALE OF 1931

(Abridged)

- I. Not felt except by a very few under especially favorable circumstances.
- II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
- III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing truck. Duration estimated.
- IV. During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls made creaking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
- V. Felt by nearly everyone; many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned; disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
- VI. Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
- VII. Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
- VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Disturbs persons driving motor cars.
- IX. Damage considerable in specially designed structures; well designed frame structures thrown out of plumb; great in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
- X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
- XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipe lines completely out of service. Earth slips and land slips in soft ground. Rails bent greatly.
- XII. Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.

PART I. LOCAL EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

This section includes information on earthquakes in northern California (including adjacent offshore areas) and in adjoining sections of Nevada and Oregon which were well enough recorded to permit a determination of the epicenter. Latitude and longitude of each epicenter and the corresponding date and origin time are tabulated in the following list; epicenters are also plotted on one or both of the two maps immediately following the list.

For the entire northern California region, every effort is made to list all earthquakes of Richter magnitude 3.0 and above, but it is likely that some such shocks have been omitted because the available seismographic data were inadequate for epicenter determination. Within the limited region covered by the map of the central Coast Ranges of California, locatable shocks of magnitude 2.5 and over are included in the tabulation and plotted on the map. Shocks of magnitude 3.0 and over occurring in the limited region are plotted on both maps. Shocks of magnitude less than 3.0 in northern California (and less than 2.5 in the central Coast Ranges) are tabulated only if reported felt or if of special interest for some other reason. Identified artificial earthquakes (explosions) ordinarily are not tabulated.

Epicenters are located by an IBM 7090 computer program. Information on Version I of this program may be found in "Computer Location of Local Earthquakes within the Berkeley Seismographic Network" by Bolt and Turcotte, published in Computers in the Mineral Industries, Part 2 (George Parks, Editor); Stanford University Publications, Geological Sciences, Vol. 9, No. 2, pp. 561-576, 1964.

Explanation of the table:

Map No. for each epicenter corresponds to the number plotted beside that epicenter on the maps. Epicenters without numbers lie outside the area of the map. The underlining of a map number in the table (and on the maps) indicates that one point on a map has been used to represent more than one earthquake in the table.

Date and Origin Time are given in Greenwich Civil Time (GCT). Subtract eight (8) hours to convert to Pacific Standard Time (PST).

M is the Richter magnitude of the earthquake as determined from the maximum trace amplitudes recorded for the shock by standard Wood-Anderson torsion seismographs.

h is the focal depth given to the nearest kilometer or by the following ranges: a, 0-5; b, 6-10; c, 11-15; d, 16-30 km.

No. of Stas. is the number of stations used by the computer program in locating the epicenter.

The quality of the solution is partially reflected by the listed number of stations. The highest quality locations are given to the nearest

minute of arc in latitude and longitude and to the tenth of a second origin time. Poorer quality locations are given to the nearest minute in latitude and longitude, to the nearest second in origin time, and are denoted by an asterisk.

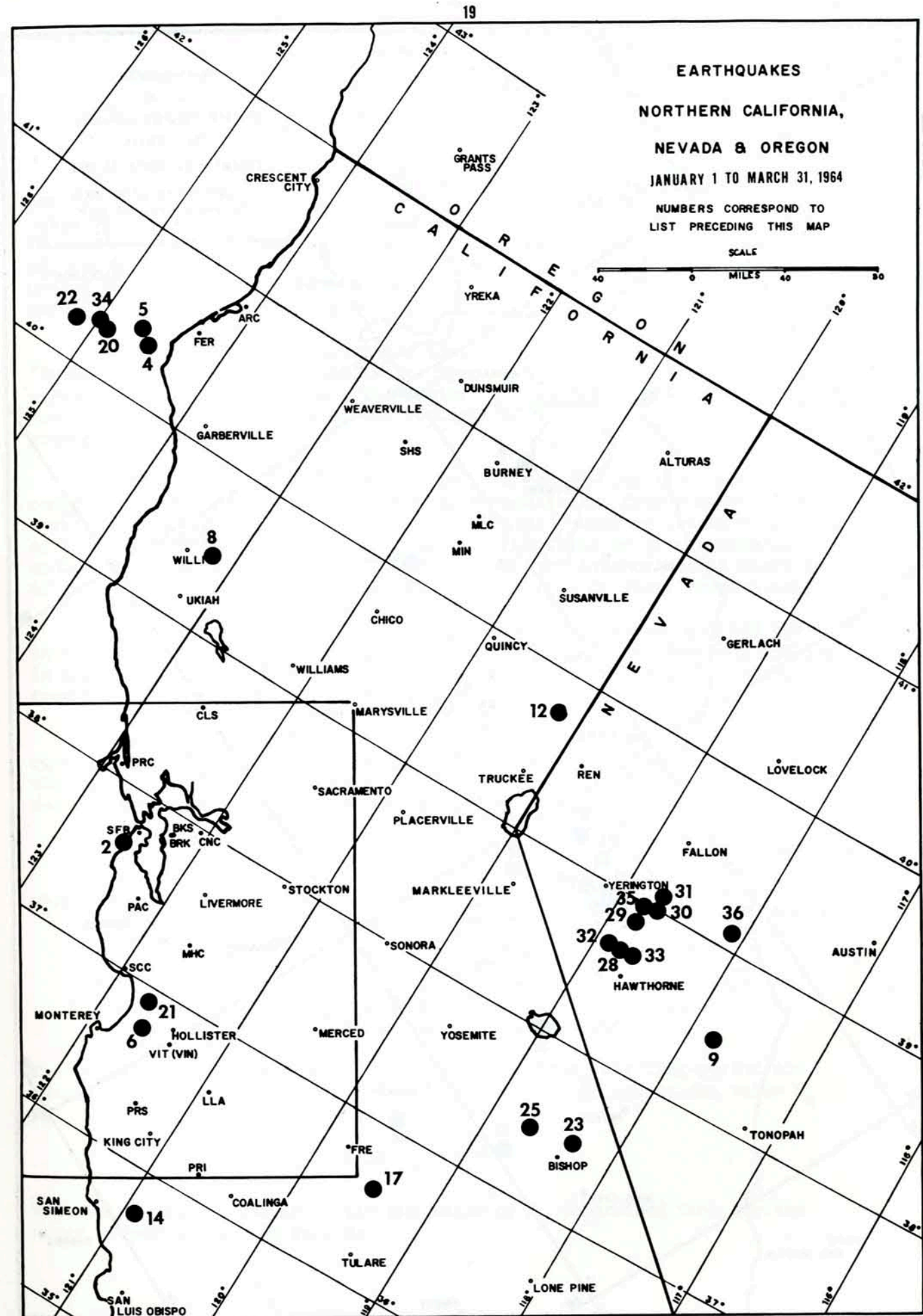
Under Remarks will be found a short descriptive location of the epicenter, usually relative to a point named on the map. Information on small foreshocks and aftershocks is sometimes included under Remarks, but when numerous foreshocks or aftershocks accompany a large earthquake, a separate tabulation may be included following the main list of local shocks.

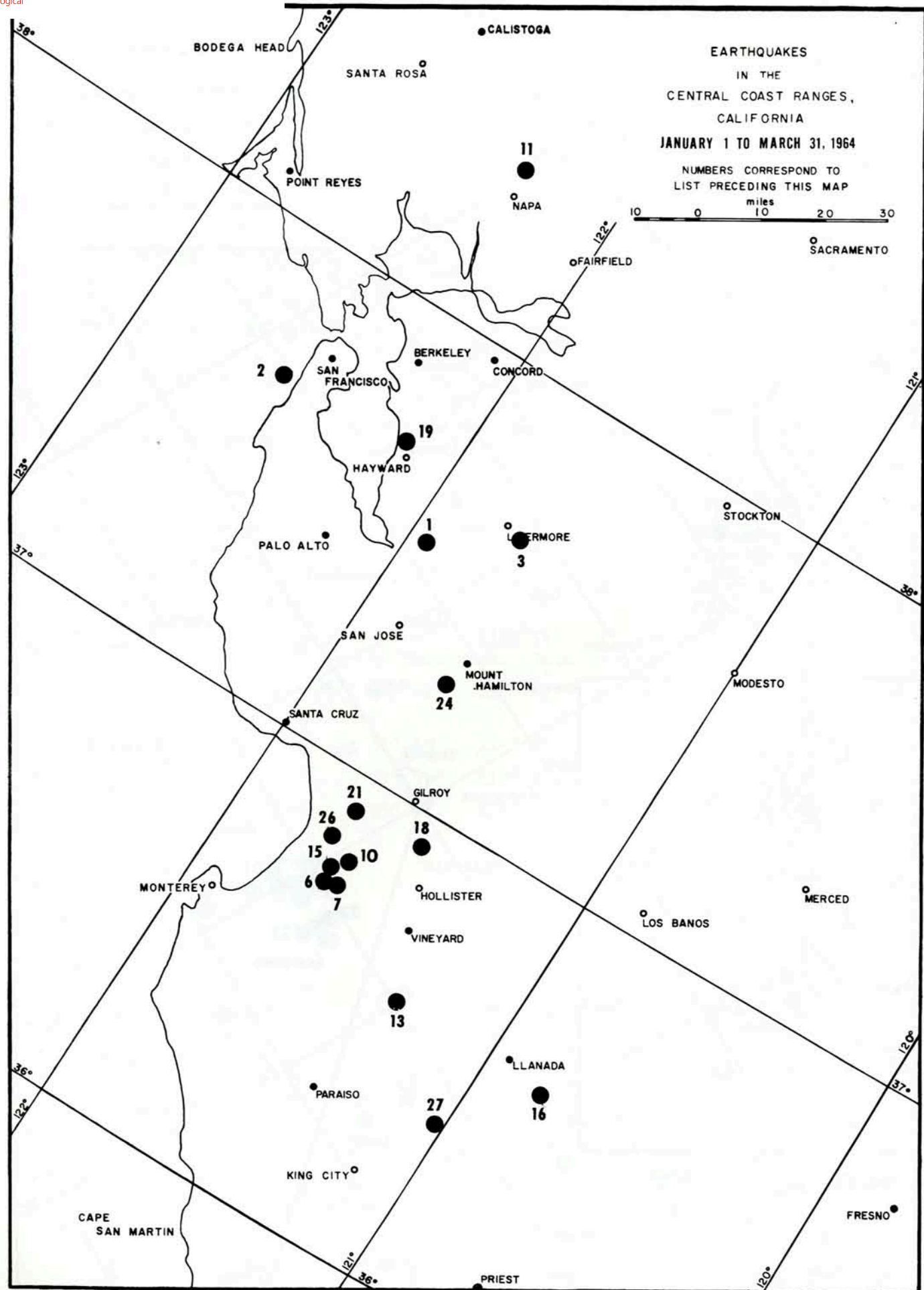
Information on maximum intensities of shocks reported felt is also included under Remarks. Reports on felt earthquakes may be obtained from the Seismological Field Survey of the U.S. Coast and Geodetic Survey, which publishes a more complete summary in "Abstracts of Earthquake Reports for the Pacific Coast and Western Mountain Region." This regular quarterly publication may be obtained from the District Officer, San Francisco District, Coast and Geodetic Survey, 121 Customhouse, San Francisco, California 94126, or from the Director, U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland 20852. Intensities given in Roman numerals are assigned by the Coast and Geodetic Survey and based on the Modified Mercalli Intensity Scale of 1931.

EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
1	Jan. 7	2.6	20-25-37.6	37° 31'9	121° 55'8	a	15	E of Irvington.
2	Jan. 9	3.0	16-20-17.5	37° 41'1	122° 33'2	a	10	Felt in W San Francisco and W San Mateo County.
3	Jan. 12	2.6	07-48-14.2	37° 39'3	121° 43'1	b	14	SE of Livermore.
4	Jan. 17	3.7	06-02-18.3	40° 20'9	124° 34'8	a	16	Off Cape Mendocino.
4	Jan. 17	3.3	06-04-03.2	40° 21'4	124° 32'2	a	5	Same location as preceding.
5	Jan. 17	3.7	07-50-21.1	40° 25'3	124° 41'0	d	10	Same location as preceding.
6	Jan. 24	3.2	11-09-20.9	36° 44'1	121° 38'6	a	18	NE of Salinas.
7	Jan. 25	2.6	19-36-30.2	36° 45'1	121° 36'1	a	14	Aftershock of preceding.
*8	Jan. 27	3.0	10-44-10.	39° 28'	123° 11'	0	9	Felt in Mendocino County.
*-	Jan. 28	4.5	04-56-49.	43° 18'	125° 54'	0	3	Off Oregon Coast.
9	Jan. 28	3.4	10-43-55.1	38° 28'6	117° 48'3	a	11	E of Walker Lake, Nev.
10	Jan. 29	2.9	01-14-02.3	36° 48'4	121° 37'4	b	15	SW of San Juan Bautista.
11	Jan. 29	2.7	07-29-38.1	38° 22'3	122° 18'3	b	10	N of Napa.
12	Feb. 3	3.5	10-21-24.3	39° 45'8	120° 12'9	a	15	Felt over 300 sq. mi. of Lassen and Sierra counties. Max. intensity IV.
13	Feb. 8	2.5	22-48-55.4	36° 36'1	121° 18'0	a	10	SE of Vineyard.
14	Feb. 10	3.9	05-47-25.0	35° 45'0	120° 56'4	a	19	NE of Paso Robles.
15	Feb. 10	2.5	11-06-20.3	36° 47'5	121° 38'7	a	13	SW of San Juan Bautista.
16	Feb. 11	2.6	15-26-57.8	36° 34'8	120° 48'5	b	10	E of Llanada.
17	Feb. 15	3.0	15-47-25.3	36° 37'2	119° 28'4	b	11	SE of Fresno.
18	Feb. 15	2.7	22-28-42.0	36° 55'1	121° 27'7	a	14	N of Hollister.
19	Feb. 26	2.5	09-50-00.5	37° 41'8	122° 09'3	a	16	Felt at Hayward.
20	Feb. 26	4.5	20-32-51.4	40° 18'5	124° 53'5	c	20	Felt over 1,200 sq. mi. of Humboldt County. Max. intensity IV-V at Ferndale.
21	Feb. 27	3.3	08-37-02.6	36° 55'2	121° 41'5	b	20	Felt at Mountain View, III.
22	Mar. 3	4.4	20-02-35.6	40° 15'0	125° 10'0	d	18	Off Cape Mendocino.
-	Mar. 5	4.9	11-42-19.2	40° 28'8	127° 56'4	c	17	Off Cape Mendocino.

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
*23	Mar. 9	3.9	02-06-29.	37° 29'	118° 20'	0	14	Intensity IV at Bishop.
24	Mar. 13	2.7	22-29-00.8	37° 16'	121° 39'	7	15	S of Mt. Hamilton.
25	Mar. 14	3.5	17-42-26.8	37° 25'	118° 41'	1	15	W of Bishop.
26	Mar. 16	2.7	14-06-24.7	36° 50'	121° 42'	4	10	SE of Watsonville.
27	Mar. 20	2.6	13-15-51.0	36° 24'	121° 01'	6	7	SW of Llanada.
28	Mar. 22	3.8	15-56-21.3	38° 42'	118° 48'	4	-	Felt. Foreshock of following. Data from USCGS.
28	Mar. 22	5.5	16-30-55.9	38° 42'	118° 48'	4	-	Felt over area of 7500 sq. mi. of eastern California and western Nevada. Max. intensity V. Intensity V at Hawthorne, IV at Reno. Data from USCGS.
29	Mar. 22	3.5	16-39-54.5	38° 54'	118° 48'	4	-	Aftershock of 28. Data from USCGS.
30	Mar. 22	3.5	18-14-52.2	39° 00'	118° 42'	4	-	Aftershock of 28. Data from USCGS.
31	Mar. 22	3.5	18-17-45.8	39° 06'	118° 42'	4	-	Aftershock of 28. Data from USCGS.
32	Mar. 23	3.9	15-32-57.0	38° 42'	118° 54'	4	-	Aftershock of 28. Felt at Hawthorne. Data from USCGS.
33	Mar. 24	3.5	23-57-10.0	38° 42'	118° 42'	4	-	Aftershock of 28. Data from USCGS.
*34	Mar. 25	3.9	08-46-07.	40° 19'	125° 00'	0	15	Intensity III at Scotia.
*35	Mar. 27	3.0	13-51-21.	38° 59'	118° 49'	0	7	Aftershock of 28.
*36	Mar. 28	3.9	23-05-54.	39° 07'	118° 07'	0	14	E of Rawhide, Nevada.





PART II. REGISTRATION OF EARTHQUAKES

This section tabulates measured arrival times of prominent phases of earthquakes recorded at selected stations of the seismographic network operated by the University of California (Berkeley). Information regarding the stations and instrumentation will be found in the introductory section of this Bulletin. Earthquakes in the northern California, Nevada, and Oregon region are included in the following tabulation only if of magnitude 4.0 or over, or if of special interest.

Components of ground motion are indicated by N, E, and Z in the "Phase" column. Where no such letter appears, the reading is for the vertical component (Z) alone. The letter "i" (impetus) preceding a phase designates sudden beginning of the motion; "e" (emersio) designates a gradual beginning.

In the column headed "Ground Motion", "c" or "d" indicates initial compression or dilatation of the ground, respectively, from a wave of the compressional type; "+" or "-" indicates initial upward or downward motion of the ground, respectively, from a wave not known to be of the compressional type. N, E, S, or W indicates that the initial horizontal direction of ground motion was toward the north, east, south, or west, respectively.

The maximum amplitude of earth displacement in microns (μ) and periods in seconds (sec) in the indicated phases are given for the Berkeley station in the column headed "Time (GCT)". Total horizontal amplitudes combined from N and E components are designated by "H" (e.g., PH, PPH).

Berkeley (BKS) magnitudes given for teleseisms in the "Remarks" column correspond to the magnitude based on surface waves (M_s). In calculating the published value, body wave amplitudes and periods of body waves are used to determine M_B (body wave magnitude) by:

$$M_B = Q + \log_{10} (A/T),$$

where $A = 1/2$ peak-to-peak ground amplitude in microns,

$T =$ period in seconds

Q is the empirically determined function of distance and depth given by Gutenberg and Richter ("Magnitude and Energy of Earthquakes", *Annali di Geofisica*, 9:1-15, 1956).

The arithmetic average of the available values of M_B for long-period and short-period records of body waves is converted to an equivalent value M_s by

$$M_s = 1.59 M_B - 3.97.$$

This value is then compared with the value of M_s determined from surface waves of period near 20 seconds.

Frequently quoted sources of information regarding epicenters, origin times, or shock magnitudes are as follows:

- USCGS - U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland
- BCIS - Bureau Central International de Seismologie, Strasbourg, France
- PAL - Lamont Geological Observatory, Palisades, New York
- PAS - Seismological Laboratory, Pasadena, California
- WMSO - Wichita Mountains Observatory, Oklahoma
- BKS - Byerly Seismographic Station, Berkeley
- BRK - indicates the average magnitude determined by the Berkeley network.

All measurement and interpretation of seismograms (i.e., identification of phases, arrival times, directions of initial ground motion, and ground amplitudes and periods) are done at Berkeley. Readings from the remaining stations in the network other than the five listed (BKS, CLS, MHC, PRI, MIN) are available on request. Requests for additional data or for copies of seismograms should be addressed to the Director.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h. m. s.		
1964					
Jan. 1	MHC	eP	09 49 08	c	USCGS: 18.2°N, 105.9°W, 0 = 09 43 59.5. Off coast of Jalisco, Mexico. h about 33 km.
	MIN	eZ	31.8	d	
	CLS	eP	22.3	d	
	PRI	eP	48 53.3	d	
Jan. 1	BKS	eNE	14 39		USCGS: 4.3°S, 105.9°W, 0 = 14 18 53.9. Galapagos Islands. h about 33 km.
	MHC	eP	27 11.7	c	
	MIN	eZ	29		
	CLS	eP	10.5	c	
	PRI	eP	48.3	c	
Jan. 1	BKS	eP	17 37 00.0	Ec	USCGS: 45.4°N, 151.9°E, 0 = 17 26 43.5 Kurile Islands. h about 45 km.
		iZ	12.0	d	
		eZ	46.2	c	
		eSNE	45 24.0	NEd	
		e(G)NE	52.5		
		e(R)NE	55.0		
			mu sec		
		PZ	0.075	1.2	
		SH	6.32	16	
		Max. H	7.9	34	
	MHC	eP		04.4	c
	MIN	iP		52.1	c
	CLS	eP	36	55.1	c
	PRI	eP	37	13.7	c
Jan. 2	MIN	eP	05 11 19.3	c	
Jan. 2	MIN	iP	05 29 58.7	c	USCGS: 54.6°N, 161.5°E, 0 = 05 21 00.5 Kamchatka Pen., h about 33 km.
Jan. 2	MHC	eP	06 44 44.0	c	
	MIN	eP	52.6	c	USCGS: 21.6°S, 68.2°W, 0 = 06 32 58.9 Chile - Bolivia border, h about 110 km.
	CLS	eP	50.9	c	
	PRI	eP	36.0	c	
Jan. 2	MIN	eZ	11 52 16.4	d	
Jan. 2	CLS	eP	19 28 18	c	USCGS: 8.4°S, 157.1°E, 0 = 19 15 23.9 Solomon Islands. h about 33 km.
	PRI	eP	17	c	
Jan. 3	BKS	eP	21 36 04.3	c	USCGS: 20.4°S, 178.2°W, 0 = 21 24 56.3 Fiji Islands. h about 526 km.
	MHC	eP	04.5	d	
	MIN	iP	13.5	c	
	CLS	eP	04.8	d	
	PRI	eP	04.6	c	
Jan. 3	BKS	eP	22 07 54.0	d	
	MHC	eP	52.5	c	
	MIN	eZ	56.2	d	
	CLS	eP	55.5	c	
	PRI	eP	46.5	d	
Jan. 4	MIN	eP	21 32 01.5	c	USCGS: 52.9°S, 20.9°E, 0 = 21 12 09.3 Bouvet Islands. h about 33 km.
Jan. 5	MIN	eZ	01 37 07.7	d	
Jan. 5	MIN	eZ	09 09 11.4	c	USCGS: 32.5°N, 141.7°E, 0 = 08 57 22.3 South of Honshu, Japan. h about 33 km.
Jan. 5	MIN	eZ	09 18 02.6	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964					
			h. m. s.		
Jan. 5	BKS	eE	10 46.0		USCGS: 26.6°S, 175.7°W, 0 = 10 11 53.0
		eZ	48.5		Kermadec Islands. h about 31 km.
	MHC	eP	24 21.5	d	
	MIN	eZ	29.1	c	
	CLS	eP	21.6	c	
	PRI	eP	22.9	c	
Jan. 5	MIN	iP	12 06 29.1	c	USCGS: 53.8°N, 165.3°W, 0 = 12 00 05.0
					Fox Islands. h about 63 km.
Jan. 5	BKS	eP	18 44 13	E	USCGS: 8.0°S, 74.5°W, 0 = 18 33 54.7
		eN	16	N	Central Peru, h about 150 km.
		eNE	48.7	NE	
	MHC	eP	08.7	c	
	MIN	eZ	19.8	c	
	CLS	eP	16.8	c	
	PRI	eP	00.2	c	
Jan. 5	MIN	eZ	23 00 44.6	c	
Jan. 5	MIN	eZ	23 29 22.2	c	
Jan. 6	BKS	eN	00 06 14	S	
		eE	26.2	W	
		eP	06	d	
		eNE	07 34	d	
	MHC	eP	06 08.2	d	
	MIN	eZ	02.6	d	
	CLS	eP	08.0	c	
	PRI	eP	05 53.8	c	
Jan. 6	BKS	eP	06 07 23.8	d	USCGS: 27.2°N, 127.3°E, 0 = 05 54 42.7
	MHC	eP	26.7	c	Ryukyu Islands. h about 110 km.
	MIN	iP	17.9	d	
	CLS	eP	20.8	d	
	PRI	eP	33.2	c	
Jan. 6	MIN	iP	19 36 56.4	d	USCGS: 44.3°N, 114.7°W, 0 = 19 35 09.8
					Central Idaho. h about 33 km.
Jan. 6	BKS	eP	23 55 03.0	d	USCGS: 50.9°N, 157.3°E, 0 = 23 45 23.4
		eZ	15.0	c	Kurile Islands. h about 33 km.
		iZ	34.5	d	Magnitude 5 1/2 - 5 3/4 (BKS)
		eSNE	00 02 52	SEd	
		eScSNE	04 56	SW	
		eSSE	06 42	Wd	
		e(G)NE	08.8		
		e(R)E	11.4		
			mu sec		
		PZ	2.78 8		
		SH	5.4 24		
		Max H	11 28		
	MHC	eP	23 55 07.2	c	
	MIN	iP	54 53.8	d	
	CLS	eP	57.5	c	
	PRI	eP	55 11.5	c	
Jan. 7	MIN	iP	08 53 11.0	c	USCGS: 54.0°N, 165.5°W, 0 = 08 46 48.0
					Fox Islands. h about 80 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964					
			h. m. s.		
Jan. 9	BKS	eP	03 10 47.5	c	USCGS: 41.7°N, 141.9°E, 0 = 02 59 21.6
		eZ	11 11.4	d	Off coast of Hokkaido, Japan.
	MHC	eP	10 52.5	d	h about 50 km.
	MIN	eZ	22.6	d	
	PRI	eP	11 01.8	c	
Jan. 9	BKS	eP	18 42 12.8	c	USCGS: 45.5°N, 150.9°E, 0 = 18 31 52.4
		epP	22.8	c	Kurile Islands. h about 40 km.
		ePP	44 48.0	c	
		ePcP	43 12	c	
		eSNE	50 26		
		eSSNE	54 32	SEd	
		e(G)NE	57.5		
		e(R)NE	19 00.3		
		iEN	18 50 38		
			mu sec		
		PZ	2.73 10		
		PPZ	0.055 1.3		
		SH	8.8 26		
		Max H	24.6 44		
	MHC	eP	42 17.4	c	
	MIN	eP	04.0	c	
	PRI	eP	27.4	d	
Jan. 10	BKS	eP	05 01 59.0	c	USCGS: 42.0°N, 142.6°E, 0 = 04 50 53.4
		iZ	02 06.3	d	Near coast of Hokkaido, Japan.
		iPcP	03 07.8	c	h about 33 km.
		eSNE	11 10.0	SEd	
		iPSNE	12 00.0	SEd	
		eSSE	15 20.0	Wd	
		eSSSNE	18.8		
		eRNE	22.6		
			mu sec		
		PZ	2.14 10		
		SH	3.62 36		
		Max H.	6.02 30		
	MHC	eP	02 03.1	c	
	MIN	iP	01 12.1	c	
	CLS	eP	54.5	c	
	PRI	eP	02 14.4	c	
Jan. 10	BKS	iP	17 04 01.5	d	USCGS: 15.4°S, 175.0°W, 0 = 16 52 36.2
		iZ	13.1	d	Tonga Islands. h about 33 km.
		e(G)NE	23.4		
		e(R)E	26.5		
	MHC	eP	04 03.2	c	
	MIN	iP	12.1	c	
	CLS	eP	02.3	d	
	PRI	eP	02.7	d	
Jan. 10	BKS	iP	17 07 55.0	d	USCGS: 45.4°N, 150.0°E, 0 = 16 59 26.5
		eZ	08 03.7	c	Kurile Islands. h about 50 km.
	MHC	eP	07 55.0	d	
	MIN	iP	42.6	d	
	CLS	eP	45.4	c	
	PRI	eP	01.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			1964		
			h. m. s.		
Jan. 12	BKS	eP	06 06 54.8	SEc	USCGS: 53.2°N, 166.3°W, 0 = 06 00 13.2. Fox Islands. h about 33 km.
		iZ	07 09.2	c	
		iSNE	12 22	SW	
		eNE	13 40	SWd	
		e(G)NE	14 28	NE	
		e(R)NE	15 44		
			mu sec		
		PZ	1.26 8		
		SH	3.38 18		
		Max H	12.2 20		
	MHC	eP	07 00.8	d	
	MIN	iP	06 44.6	d	
	CLS	eP	48.9	c	
	PRI	eP	07 13.3	c	
Jan. 12	BKS	eP	11 26 13.7	d	USCGS: 5.4°S, 146.8°E, 0 = 11 13 19.6 Near east coast of New Guinea. h about 229 km.
	MHC	eP	16.0	d	
	MIN	eP	27 15.5	d	
	CLS	eP	26 12.5	d	
	PRI	eP	19.3	c	
Jan. 12	BKS	eP	12 55 11.8	d	USCGS: 31.5°N, 49.4°E, 0 = 12 45 51.1 Western Iran. h about 67 km.
		iZ	29.5	d	
	MHC	eP	10.7	d	
	MIN	eP	13.9	c	
	CLS	eP	12.5	d	
	PRI	eP	06.3	d	
Jan. 13	BKS	e(G)NE	17 40.0		USCGS: 2.3°N, 102.0°W, 0 = 17 23 30.1 West of Galapagos Islands. h about 33 km.
		e(R)	43.1		
	MHC	eZ	31 01.5	c	
	CLS	eP	10.0	d	
	PRI	eP	44.9	c	
Jan. 13	BKS	eP	19 01 33	d	USCGS: 11.6°S, 166.2°E, 0 = 18 49 11.6 Santa Cruz Islands. h about 59 km.
		iZ	42		
		e(L)E	26.6		
	MHC	eP	01 34.4	c	
	MIN	iP	47.9	c	
	CLS	eP	33.3	c	
	PRI	eP	35.7	c	
Jan. 14	MIN	eZ	01 20 36.9	c	USCGS: 52.9°N, 159.6°E, 0 = 01 11 12.6 Near east coast of Kamchatka Pen. h about 50 km.
Jan. 15	BKS	iP	18 59 37.0	d	USCGS: 20.4°N, 178.4°E, 0 = 18 46 32.9 Kermadec Islands. h about 211 km.
	MHC	eP	36.8	c	
	CLS	eP	37.9	c	
	PRI	eP	35.7	c	
Jan. 15	MIN	iP	21 37 23.5	c	USCGS: 23.7°N, 45.0°W, 0 = 21 26 43.2 North Atlantic Ocean. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			1964		
			h. m. s.		
Jan. 15	BKS	iP	21 47 56.7	We	USCGS: 29.1°W, 140.8°E, 0 = 21 36 05.0 South of Honshu, Japan. h about 70 km.
		iZ	48 06.3	d	
		ePP	50 51.4	c	
		e(S)N	58 02	Sd	
		eSSE	22 03 00	We	
		eSSSNE	06.6		
		e(G)NE	08.4		
		e(R)E	11.2		
			mu sec		
		PZ	5.0 8		
		PPZ	0.4 2.0		
		SH	5.45 24.		
		Max H	10.3 34		
	MHC	eP	21 48 00.5	c	
	MIN	iP	47 2.5	c	
	CLS	eP	53.1	c	
	PRI	eP	48 07.6	c	
Jan. 15	MIN	iZ	23 16 12.6	d	USCGS: 17.4°S, 179.7°E, 0 = 23 05 02 Fiji Islands. h about 599 km.
Jan. 16	MIN	iZ	04 30 23.2	c	
Jan. 16	MIN	iZ	11 00 01.9	c	USCGS: 50.5°N, 154.0°E, 0 = 10 50 36 Kurile Islands. h about 203 km.
Jan. 17	BKS	iP	03 04 52.5	d	USCGS: 45.4°N, 151.3°E, 0 = 02 54 22.6 Kurile Islands. h about 55 km.
	MHC	eP	57.5	d	
	MIN	eP	32.2	d	
	CLS	eP	46.9	d	
	PRI	eP	59.0	c	
Jan. 17	BKS	iP	03 07 12.5	d	USCGS: 21.6°S, 169.9°E, 0 = 02 54 26.8 Loyalty Islands. h about 33 km.
		iZ	47.2	c	
		e(ScS)NE	18 08	SW	
		e(PS)NE	19 04	SW	
		e(SS)NE	23.0		
		e(SSS)	27.3		
		e(R)NE	34.0		
	MHC	eP	07 12.5	d	
	MIN	eZ	22.7	c	
	CLS	eP	12.0	d	
	PRI	eP	13.3	d	
Jan. 17	MIN	iP	05 46 39.6	c	
Jan. 17	BKS	eNE	07 13.3	d	USCGS: 31.1°N, 114.2°W, 0 = 07 08 28 Gulf of California. h about 14 km.
	PRI	eP	10 33.5	d	
Jan. 17	MIN	eZ	07 14 23		
Jan. 18	MHC	eP	07 21 43.8		USCGS: 32.5°S, 103.7°W, 0 = 07 10 22 Easter Island. h about 33 km.
	CLS	eP	37.8	d	
	PRI	eP	33.1	d	
Jan. 18	BKS	eP	12 18 05.2	c	USCGS: 23.1°N, 120.5°E, 0 = 12 04 40.0 Taiwan, 110 dead, 479 injured h about 33 km. Magnitude 6 3/4 - 7 (BKS)
		iPP	22 12	d	
		eSNE	28 40	NWa	
		ePKKPE	34.9	Wd	
		eSSSNE	39.4	SEd	
		eSPE	30 12	Ed	
		eP'P'	42 32	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Jan. 18		e(G)NE	12 44.5		
(cont.)		e(R)NE	48.4		
			mu sec		
		PZ	2.44 9		
		PPZ	3.65 8		
		SH	5.25 12		
		MaxH	18.9 42		
	MHC	eP	18 08.3	d	
	MIN	iP	17 59.0	d	
	CLS	eP	18 00.8	c	
	PRI	eP	14.9	c	
Jan. 18	BKS	iP	22 45 01.8	d	USCGS: 18.8°N, 69.4°W, 0=22 36 17.6 Dominican Republic. h about 95 km.
		eZ	25.6	c	
	MHC	eP	44 57.9	c	
	MIN	iP	59.5	c	
	CLS	eP	45 04.2	c	
	PRI	eP	44 51.1	c	
Jan. 19	BKS	iP	07 08 55.2	c	USCGS: 58.6°S, 25.1°W, 0=07 49 55.9 Sandwich Islands. h about 33 km.
	MHC	eP	53.5	c	
	MIN	iZ	49.2	d	
	CLS	eP	55.7	c	
	PRI	eP	51.7	c	
Jan. 20	BKS	iPNE	17 21 05.5	SWd	USCGS: 20.7°S, 169.9°E, 0=17 08 37.4 Loyalty Islands. h about 141 km.
		iNE	19.0	NEd	
		i(PcP)	38.4	d	
		i(ScS)NE	31 26.0	SWd	
		iSSE	36 20.0	E	
		e(G)E	40.3		
		e(R)NE	44.0		
		eP'P'E	48.0		
		ePcP	21 42	d	
		eSN	30 30	N	
		e(SS)N	36 18	S	
			mu sec		
		PZ	8.4 10		
		SH	5.27 10		
		MaxH	14.4 56		
	MHC	iP	21 06.4	d	
	MIN	iP	13.2	c	
	CLS	iP	05.7	d	
	PRI	iP	07.2	d	
Jan. 20	BKS	eE	17 54.3		
	MHC	eP	47 12.3	c	
	MIN	iP	07.8	c	
	CLS	eP	11.0	d	
	PRI	eP	12.1	d	
Jan. 23	BKS	eP	00 12 15.3	c	USCGS: 13.7°S, 165.9°E, 0=23 59 43.6* New Hebrides Islands. h about 33 km. Magnitude 6 3/4 - 7 (BKS) *Jan. 22.
		iZ	24.3	d	
		ePPE	15 00.0	c	
		eSNE	22 40.0	SW	
		ePS	23 30.0	d	
		eSSE	27.9		
		eSSS	31 36	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Jan. 23		e(G)NE	00 34.2		
(cont.)		e(R)NE	37.8		
			mu sec		
		PZ	7.6 9		
		PPZ	3.05 8		
		SH	8.13 32		
		MaxH	14.4 18		
	MHC	eP	12 17	c	
	MIN	eP	20.8	d	
	CLS	eP	15.5	c	
	PRI	eP	18.7	c	
Jan. 24	MIN	eP	06 48 31.6	c	USCGS: 60.4°N, 146.5°W, 0 = 06 42 53.4 Near coast of Southern Alaska. h about 33 km.
Jan. 24	MIN	eP	10 44 56.6	d	USCGS: 23.5°S, 179.9°E, 0 = 10 33 24 South of Fiji Islands. h about 550 km.
Jan. 24	BKS	eP	17 28 55.7	c	USCGS: 38.7°N, 129.4°E, 0 = 17 17 45.5 Near east coast of Korea. h about 542 km.
	MHC	eP	59.7	c	
	MIN	iP	48.9	c	
	CLS	eP	52.2	c	
	PRI	eP	29 07.3	c	
Jan. 24	BKS	iP	19 32 20.1	c	
	MHC	eP	15.4	c	
	CLS	eP	34.3	c	
Jan. 24	BKS	eZ	20 04 18.8	d	USCGS: 17.8°S, 178.5°W, 0 = 20 53 25.7 Fiji Islands. h about 584 km.
	MHC	eZ	19.5	d	
	PRI	eZ	19.3	d	
Jan. 24	MIN	eP	21 24 30.7	c	USCGS: 21.7°S, 176.2°W, 0 = 21 12 23.2 Tonga Islands. h about 32 km.
Jan. 24	MHC	eP	21 42 14	c	USCGS: 44.5°N, 150.3°E, 0 = 21 31 24.2 Kurile Islands. h about 33 km.
	MIN	eZ	41 40		
	CLS	eP	42 15	c	
	PRI	eP	10.7	c	
Jan. 25	MIN	iZ	04 21 25.4	d	USCGS: 20.2°N, 143.8°W, 0 = 04 09 13 Mariana Islands. h about 33 km.
Jan. 25	MIN	iZ	12 21 45.8	d	USCGS: 28.3°S, 176.5°W, 0 = 12 04 08.8 Kermadec Islands. h about 17 km.
Jan. 26	BKS	iP	09 20 47.2	d	USCGS: 16.3°S, 71.7°W, 0 = 09 09 33.9 Southern Peru. h about 116 km. (6 injured) Magnitude 6 1/4 - 6 1/2 (BKS)
		iZ	58.2	d	
		isP	21 23.0	d	
		eZ	16.0	d	
		eSNE	30 02	NEc	
		esSE	46	SEc	
		eSSNE	34 48		
		e(G)NE	39.0		
		eNE	40.7		
			mu sec		
		PZ	2.23 10		
		SH	12.2 20		
		MaxH	13.2 56		
	MHC	eP	20 43.2	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Jan. 26 (cont.)	MIN	eP'P'	09 48 34.8	d	
	CLP	iP	20 53.0	d	
	CLS	eP	50.9	d	
		eP'P'	21 23.8	c	
	PRI	eP	20 34.5	d	
		eP'P'	48 37.6	d	
Jan. 28	BKS	eP	14 23 06.0	d	USCGS: 36.5°N, 70.9°E, 0=14 09 17.1 Hindu Kush. Felt: Northwestern Pakistan. h about 207 km.
		eZ	56.8	c	
	MHC	eP	05.6	c	
		eS	27 02.5	d	
	MIN	iP	22 53.2	c	
		iPP	26 53.7	c	
	CLS	eP	22 59.2	c	
		eS	26 43	c	
	PRI	eP	23 15.3	c	
		eS	27 19.1	d	
Jan. 28	BKS	iP	14 38 42.0	c	
		eZ	39 15.8	c	
	MHC	eP	38 40.8	c	
	MIN	eP	48.2	c	
	CLS	eP	44.6	c	
	PRI	eP	37.1	c	
Jan. 29	MIN	eZ	21 16 11.0	d	
Jan. 30	BKS	eP	05 43 50.0	d	USCGS: 24.5°N, 108.6°W, 0=05 39 44.6 Gulf of California. h about 49 km.
		eZ	44 06.5	c	
	MHC	eP	43 40.9	c	
	MIN	eZ	44 07.2	d	
	CLS	eP	15.9	d	
	PRI	eP	43 25.5	c	
Jan. 30	MIN	eZ	17 32 15.7	c	USCGS: 23.4°N, 143.3°E, 0=17 20 13.4 Volcano Islands. h about 33 km.
Jan. 31	BKS	iP	04 23 20.5	d	USCGS: 61.5°N, 151.9°W, 0=04 17 12.4 Southern Alaska. h about 33 km.
		eNE	30.0	d	
			mu sec		
		PZ	0.058 1.7		
	MHC	eP	26.3	d	
	MIN	iP	05.2	d	
	CLS	eP	12.9	d	
	PRI	eP	39.6	d	
Jan. 31	MIN	iP	17 10 24.6	d	USCGS: 51.3°N, 124.7°W, 0=17 07 43 Vancouver Islands. h about 14 km.
Feb. 1	BKS	eP	01 54 52	c	USCGS: 51.8°N, 170.8°W, 0=01 47 52.1 Fox Islands. h about 34 km.
		eZ	02 00 48	c	
		e(G)NE	03.5		
		e(R)	04.3		
			mu sec		
		MaxH	3.95 14		
	MHC	eP	01 55 02.7	c	
	MIN	eP	54 47.2	c	
	CLS	eP	51.0	c	
	PRI	eP	55 15.2	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Feb. 2	MIN	eP	09 08 03.0	d	USCGS: 24.2°N, 122.6°E, 0=08 54 48.3 Near east coast of Taiwan. h about 28 km.
Feb. 3	BKS	eZ	08 48 28	c	USCGS: 31.5°N, 114.2°W, 0=08 43 36.3 Gulf of California. h about 14 km.
		e(R)NE	08 48.0		
			mu sec		
		MaxH	13.4 17		
	MHC	eP	45 54.0	d	
		eS	47 50.0	c	
	MIN	iZ	46 37.6	d	
	PRI	eP	45 22.0	c	
		eS	47 20.7	c	
Feb. 3	PRI	eP	09 17 43.9	c	USCGS: 31.3°N, 114.2°W, 0=09 15 42 Gulf of California. h about 14 km.
Feb. 3	PRI	eP	17 28 15.4	c	
Feb. 3	MIN	iP	19 04 23.7	c	USCGS: 49.6°N, 156.7°E, 0=18 54 49 Kurile Islands. h about 40 km.
Feb. 4	BKS	eZ	05 43 14	c	USCGS: 31.3°N, 114.3°W, 0=05 40 23.3 Gulf of California. h about 14 km.
	MIN	eZ	42 20.9	c	
	PRI	eP	15.1	c	
Feb. 4	BKS	eZ	10 12 18	d	USCGS: 48.2°N, 154.4°E, 0=10 62 21.4 Kurile Islands. h about 40 km.
	MHC	eZ	24	d	
	MIN	iP	10.9	d	
	CLS	eP	12.9	d	
	PRI	eZ	35.4	d	
Feb. 5	MIN	iP	10 43 28.1	d	
Feb. 5	BKS	iP	11 30 43.5	c	USCGS: 30.4°S, 177.9°W, 0=11 18 16.3 Kermadec Islands. h about 114 km.
	MHC	eP	43.0	d	
	MIN	iP	52.8	c	
	PRI	eP	42.1	d	
Feb. 5	BKS	eP	11 41 44.8	c	USCGS: 36.5°N, 141.0°E, 0=11 30 15.7 Central Honshu, Japan. h about 46 km.
		iZ	42 00.2	d	
		iSNE	51 14.0	NEd	
		eSSNE	55.5		
		eSSSNE	59.2		
		e(G)NE	12 00.7		
		e(R)E	03.0		
			mu sec		
		PZ	1.54 14		
		SH	3.76 20		
		MaxH	4.50 32		
	MHC	eP	41 49.7	d	
	MIN	eZ	42.0		
	PRI	eP	57.7	d	
Feb. 5	BKS	iP	11 46 38.6	NEc	USCGS: 19.7°S, 179.8°W, 0=11 35 18.6 Fiji Islands. h about 414 km.
		epP	53.7	d	
			mu sec		
		PZ	0.164 1.1		
	MHC	iP	39.2	c	
	MIN	iP	47.9	c	
		ipP	47 02.1	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Feb. 5 (cont.)	PRI	eP	11 47 39.2	c	
Feb. 6	BKS	eP	04 45 09.7	d	USCGS: 6.8°N, 73.1°W, 0 = 04 35 56.8 Northern Columbia. h about 140 km.
	MHC	eP	05.6	c	
	MIN	iP	12.6	c	
	CLS	eP	13.1	d	
	PRI	eP	44 58.7	c	
Feb. 6	BKS	eP	13 13 22.7	c	USCGS: 55.7°N, 155.8°W, 0 = 13 07 25.2 Kodiak Island. h about 33 km.
		iZ	35.4	c	
		iPNE	22.0	NWd	
		eZ	14 34.0	c	
		eSE	18 14.0	Ed	
		e(G)E	20.3		
		e(R)E	20.8		
			mu sec		
		PZ	22.3 26		
		SH	76 17		
	MHC	eP	13 25.2	d	
	MIN	eP	08.6	c	
		eS	18 00.0		
	PRI	eP	37.2	c	
Feb. 6	BKS	iP	13 19 41.5	d	USCGS: 55.8°N, 155.9°W, 0 = 13 13 45.2 Kodiak Island. h about 33 km.
	MHC	eP	48.1	c	
	MIN	iP	28.5	c	
	CLS	eP	34.8	d	
	PRI	eP	20 01.1	d	
Feb. 6	BKS	iE	14 21 32	E	USCGS: 4.0°S, 103.4°W, 0 = 14 13 10.8 1,300 Km West of Galapagos Islands, h about 33 km.
	MHC	eP	19.5	c	
	MIN	iZ	37.9	c	
	PRI	eP	08.7	c	
Feb. 7	BKS	iP	13 10 04.5	d	USCGS: 39.8°N, 142.8°E, 0 = 12 58 53.6 Off east coast of Honshu, Japan. h about 45 km.
		ipP	16.5	c	
		eZ	32.4		
			mu sec		
		PZ	0.072 1.5		
	MHC	eP	08.6	c	
	MIN	eP	09 57.6	c	
		ipP	10 09.7	c	
	CLS	eP	00.2	c	
	PRI	eP	17.0	c	
Feb. 8	BKS	eP	11 25 56.2	d	USCGS: 52.3°N, 175.6°E, 0 = 11 17 46.5 Rat Islands. h about 60 km.
		ipP	26 12.5	c	
		esP	26.0	c	
		epP	27 36.5	c	
		eScP	31 21.5	d	
		eSNE	32 57.0	NE	
		e(G)ne	36.3		
			mu sec		
		PZ	0.015 0.6		
		PPZ	0.036 0.9		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Feb. 8 (cont.)	MHC	eP	11 26 01.7	c	
		epP	18.2	c	
		eScP	31 26.8	d	
	CLS	eP	25 50.9	d	
		epP	26 07.1	c	
		eScP	31 20.2	c	
	PRI	eP	26 12.9	c	
		epP	28.9	d	
		eScP	31 22.3	c	
Feb. 8	MIN	eP	17 22 32.3	c	USCGS: 28.6°N, 44.0°W, 0 = 17 12 05 North Atlantic Ocean. h about 33 km.
Feb. 9	BKS	iPNE	02 11 06.3	SWd	USCGS: 16.5°S, 179.2°W, 0 = 02 00 07.3 Fiji Island. h about 480 km.
		ePP	14 04.3	d	
			mu sec		
		PZ	6.7 1.1		
		PPZ	7.1 1.5		
	MHC	eP	07.0	d	
	MIN	iP	15.1	d	
	CLS	eP	06.9	d	
	PRI	eP	07.3	d	
Feb. 9	MIN	eZ	20 12 21.0	d	
Feb. 9	MIN	iP	22 54 20.3	c	
Feb. 9	MIN	iP	24 00 09.3	c	
Feb. 10	MIN	eZ	10 08 00.7	c	USCGS: 20.9°S, 178.6°W, 0 = 09 56 44.9 Fiji Islands. h about 575 km.
Feb. 10	MHC	eP'	17 47 05.3	c	USCGS: 6.1°S, 104.1°E, 0 = 17 27 07 Near west coast of Sumatra. h about 126 km.
	MIN	iP'	01.1	d	
	CLS	eP'	02.5	c	
	PRI	eP'	07.1	c	
Feb. 12	BKS	eP	20 45 12.5	c	USCGS: 3.5°S, 146.6°E, 0 = 20 31 53.2 Admiralty Islands. h about 33 km.
		eSKSE	55 40.0	W	
		eSNE	56 18.0	SWd	
		ePSE	57 36.0	Wd	
		eZ	21 01 36.0	Wd	
		iSSNE	02 40.0	NWc	
		e(G)N	09.4		
		e(R)E	13.6		
			mu sec		
		PZ	.086 1.5		
		SH	2.13 22		
		MaxH	17.83 32		
	MHC	eZ	26.0	c	
	MIN	eZ	45 18.4	c	
	CLS	eP	12.9	d	
	PRI	eP	22.5	c	
Feb. 12	BKS	eP	22 45 24.0	d	USCGS: 15.3°S, 174.4°W, 0 = 22 33 59.2 Samoa Islands. h about 33 km.
		iZ	31.5	c	
		iSNE	54 52.0	NE	
		iNE	55 16.0	NEd	
		e(G)N	23 03.6		
		e(R)NE	06.0		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.)			h. m. s.		
Feb. 12		PZ	mu sec		
		SH	.286 2.0		
		MaxH	3.27 20		
			8.38 32		
	MHC	eP	22 45 23.9	c	
	MIN	iZ		d	
	CLS	eP		c	
	PRI	eP		c	
Feb. 13	BKS	eP	11 34 10.8	c	USCGS: 18.1°S, 56.8°W, 0 = 11 21 46.7 Bolivia-Brazil border. h about 33 km.
		PZ	mu sec		
			0.051 0.9		
	MHC	eP		d	
	MIN	iZ		c	
	CLS	eP		c	
	PRI	eP		d	
Feb. 14	BKS	iP	16 42 41.2	d	USCGS: 5.1°S, 151.7°E, 0 = 16 29 45.0 New Britain. h about 55 km.
		iZ	43 04.2	d	
		ePPE	46 14.0	Ec	
		eSE	53 36.0	W	
		ePSE	54 40.0	Wd	
		eSSNE	59 32.0	SWc	
		eSSSE	17 02.6		
		e(G)NE	06.0		
		e(R)NE	10.3		
			mu sec		
		PZ	0.052 1.0		
		PPZ	1.8 32		
		MaxH	33.8 28		
	MHC	eP	16 42 41.2	d	
	MIN	iP		d	
		ePP	46 15.5		
	CLS	eP	42 40.0		
	PRI	eP		d	
Feb. 16	MIN	eZ	21 47 35	d	USCGS: 5.6°S, 152.0°E, 0 = 21 34 32.3 New Britain. h about 49 km.
Feb. 17	MIN	eP	00 17 13.1	c	
Feb. 17	MIN	eZ	15 43 30.9	d	
Feb. 18	BKS	eP	04 53 46.0	d	USCGS: 15.5°S, 175.0°W, 0 = 04 42 47.7 Tonga Islands. h about 289 km.
		ipP	54.2	d	
			mu sec		
		PZ	0.052 1.0		
	MIN	iP		c	
		ipP	54 10.3	d	
	CLS	eP	53 46.7	d	
	PRI	eP		c	
Feb. 18	MIN	iP	04 57 56.4	c	USCGS: 14.2°N, 146.5°E, 0 = 04 45 42.0 Mariana Islands. h about 78 km.
	CLS	eP		d	
Feb. 18	BKS	iP	10 47 54.2	d	USCGS: 10.3°S, 161.2°E, 0 = 10 35 20.1 Solomon Islands. h about 73 km.
	MHC	eP		c	
	MIN	iP	48 00.6	c	
	PRI	eZ	47 57.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Feb. 18	MIN	eP	12 46 06.2	c	
Feb. 19	BKS	eP	15 37 42.5	c	USCGS: 21.4°S, 70.7°W, 0 = 15 25 58.9 Near coast of Northern Chile. h about 80 km.
		PZ	mu sec		
			0.103 1.5		
	MHC	eP		c	
	CLS	eP		d	
	PRI	eP		c	
Feb. 20	BKS	iP	03 35 12.5	d	
		eZ	23.4	c	
	MHC	eP	18.0	c	
	MIN	iZ	03.6	c	
	CLS	eP	14.0	c	
	PRI	eP	29.3	c	
Feb. 20	BKS	eP	10 04 17.0	d	
		eZ	28.0	d	
	MHC	eP	21.7	c	
	MIN	iP	09.8	c	
		ipP	20.8	c	
	PRI	eP	31.2	c	
Feb. 20	BKS	eNE	12 20.0		
Feb. 22	BKS	eP	02 00 24.0	d	USCGS: 36.9°S 176.9°E, 0 = 01 47 32.1 Near coast of New Zealand. h about 203 km.
	MHC	eP	23.7	c	
	MIN	eP	32.9	d	
	CLS	eP	25.2	d	
	PRI	eP	22.8	c	
Feb. 22	BKS	eP	09 03 09.7	d	USCGS: 30.1°S, 177.3°W, 0 = 08 50 35.0 Kermadec Islands. h about 33 km.
		epP	22.5	c	
		e(R)NE	mu sec		
			29.1		
		PZ	0.327 0.9		
	MHC	eP	09.2	c	
	MIN	eP	18.6	d	
	CLS	eP	10.2	c	
	PRI	eP	08.0	c	
Feb. 22	BKS	iP	16 15 54.8	d	USCGS: 30.1°S, 138.8°E, 0 = 16 54 35.6 South of Honshu, Japan. h about 411 km.
			mu sec		
		PZ	0.042 0.8		
	MHC	eP	58.3	d	
	MIN	eZ	49.1	c	
	CLS	eP	51.1	d	
	PRI	eP	16 05.5	d	
Feb. 22	BKS	eP	18 00 49.7	d	USCGS: 48.5°N, 154.9°E, 0 = 17 50 56.2 Kurile Islands. h about 60 km.
	MHC	eP	54.1	c	
	MIN	iP	41.2	d	
	CLS	eP	45.0	d	
	PRI	eP	01 03.8	c	
Feb. 23	BKS	eP	12 37 55.3	d	USCGS: 15.4°S, 173.8°W, 0 = 12 26 40.4 Samoa Islands. h about 96 km.
			mu sec		
		PZ	0.044 0.8		
	MHC	eP	55.7	d	
	MIN	iP	06.1	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Feb. 23	CLS	eP	12 37 55.4	c	
(cont.)	PRI	eP	55.5	d	
Feb. 24	BKS	eP	05 14 05.5	d	USCGS: 24.8°S, 179.7°W, 0=05 02 13.5
	MHC	eP	05.8	d	South of Fiji Islands
	MIN	iZ	15.4	d	h about 290 km.
	CLS	eP	06.4	d	
	PRI	eP	05.3	d	
Feb. 24	BKS	eP	10 12 04.0	c	USCGS: 7.3°S, 67.8°E, 0=10 52 18.7
		iZ	11.7	d	Chagos Archipelago.
	MHC	eP	06.2	c	h about 33 km.
	MIN	iP	11 57.1	c	
	CLS	eP	12 01.7	c	
	PRI	eP	09.8	c	
Feb. 24	MIN	eZ	15 03 09.3	c	
Feb. 24	BKS	iP	20 11 46.5	c	USCGS: 19.2°S, 169.4°E, 0=19 59 33.7
	MHC	eP	47.5	c	New Hebrides Islands.
	MIN	iZ	53.6	c	h about 244 km.
	CLS	eP	46.5	c	
	PRI	eP	48.2	c	
Feb. 25	BKS	eP	21 30 04	c	USCGS: 26.5°N, 111.4°W, 0=21 26 57
		eZ	34.7	c	Gulf of California.
	MHC	eP	30 01.5	c	h about 33 km.
	CLS	eP	05.0	c	
	PRI	eP	29 54.3	d	
Feb. 25	BKS	eZ	00 02.5	c	USCGS: 30.1°S, 177.9°W, 0=23 23 33.3
	MHC	eP	23 36 06.8	d	Kermadec Islands. h about 51 km.
	MIN	iZ	35 43.2	c	
	CLS	eP	36 07.5	c	
	PRI	eP	05.3	c	
Feb. 26	MIN	eP	09 37 08.3	d	USCGS: 27.3°N, 54.5°E, 0=09 16 55.2
					Southern Iran. h about 33 km.
Feb. 26	BKS	iP	21 28 55.5	d	USCGS: 20.7°S, 174.4°W, 0=21 17 08.1
		iZ	29 13.3	c	Tonga Islands. h about 33 km.
		eZ	51.7	c	
	MHC	eP	28 54.9	c	
	MIN	eP	29 10.2	d	
	CLS	eP	28 55.9	c	
	PRI	eP	54.6	d	
Feb. 27	BKS	eP	02 52 14.8	d	USCGS: 7.6°S, 39.6°E, 0=02 32 23.7
	MHC	eP	13.0	d	Near coast of Tanganyika Lake.
	MIN	eP	01.2	c	h about 33 km.
	CLS	eP	11.6	d	
	PRI	eP	16.2	d	
Feb. 27	BKS	eP	11 40 52.8	d	USCGS: 18.9°N, 104.0°W, 0=11 35 32.4
		ipP	41 08.5	d	Near coast of Colima, Mexico.
		ePP	47.0	d	h about 33 km.
		e(S)N	45 28.0	S	
		e(G)NE	46.5		
		e(R)	48.0		
			mu sec		
		PZ	0.15 1.5		
		PPZ	0.143 2.0		

Date	Sta.	Phase	Time (GCT)	Ground motion	Remarks
1964			h. m. s.		
(Cont.)					
Feb. 27	MHC	eP	11 40 45.6	c	
	MIN	iP	41 06.1	d	
		ipP	14.1	c	
	CLS	eP	40 59.2	d	
	PRI	eP	31.8	c	
Feb. 27	BKS	eP	15 29 13.5	c	USCGS: 21.7°N, 94.4°E, 0 = 15 10 48.4
		iZ	27.0	d	Central Burma. h about 102 km.
		eSNE	39.3	SWd	
		eSSNE	45.3	NE	
		e(G)NE	00.5		
		e(R)N	05.5		
	MHC	eP	29 15.4	c	
	MIN	iP	10.3	d	
	CLS	eP	12.6	d	
	PRI	eP	18.5	c	
Feb. 28	MIN	eP	19 26 40.5	c	
Feb. 28	MHC	eP	20 58 34.0	d	USCGS: 13.3°N, 144.7°E, 0 = 20 46 00.1
	CLS	eP	27.0	c	Mariana Islands. h about 33 km.
	PRI	eP	39.2	c	
Feb. 29	MIN	iP	07 38 41.0	c	USCGS: 15.5°S, 178.7°W, 0 = 07 27 31.9
					Fiji Islands. h about 407 km.
Feb. 29	MIN	eP	15 31 40.9	c	USCGS: 34.8°N, 141.7°E, 0 = 15 20 12.8
					Off east coast of Honshu, Japan.
					h about 34 km.
Mar. 1	BKS	iP	00 08 30.4	c	
		ePPNE	26.5	NW	
		e(R)E	46.6		
	MHC	eP	08 31.3	d	
	MIN	iZ	28.7	c	
	CLS	eP	28.8	d	
	PRI	eP	34.0	d	
Mar. 2	MIN	eP	12 46 20.9	d	USCGS: 13.9°N, 91.1°W, 0 = 12 39 17.6
					Near coast of Guatemala.
					h about 130 km.
Mar. 2	BKS	iP	19 44 14.5	c	USCGS: 18.9°S, 174.8°W, 0 = 19 32 41.7
		iZ	23.8	d	Tonga Islands. h about 105 km.
		eSNE	53 44.0	NW	
		eGNE	20 03.5		
			mu sec		
		PZ	0.076 0.9		
		SH	3.52 18		
		MaxH	3.64 28		
	MHC	eP	19 44 15.2	d	
	MIN	iP	25.4	c	
	CLS	eP	15.2	d	
	PRI	eP	14.1	d	
Mar. 3	MIN	iP	07 05 45.1	d	USCGS: 43.8°N, 128.4°W, 0 = 07 04 15.2
					Off coast of Oregon. h about 33 km.
Mar. 4	MIN	iP	03 09 09.7	c	USCGS: 43.6°N, 28.9°W, 0 = 02 58 29.2
					Azores. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 4	MIN	eP	03 30 15.6	c	USCGS: 20.9°S, 168.6°E, 0=03 17 22.7 Loyalty Islands. h about 33 km.
Mar. 4	MIN	eP	12 49 44.2	c	
Mar. 4	MIN	eP	13 10 09.3	d	USCGS: 25.8°N, 110.5°W, 0=13 11 16 Gulf of California. h about 33 km.
Mar. 5	BKS	eP	06 20 33.5	c	USCGS: 45.2°S, 46.4°E, 0=06 00 41.3 Indian Ocean. h about 40 km.
		iZ	46.8	d	
	MHC	eP	27.0	c	
	MIN	eP	26.6	c	
	CLS	eP	33.2	d	
	PRI	eP	17.0	d	
Mar. 5	BKS	e(R)NE	21 04.5		USCGS: 16.4°S, 173.0°W, 0=20 31 57.4 Tonga Islands. h about 33 km.
Mar. 6	BKS	eP	19 10 04.8	d	USCGS: 6.1°S, 154.4°E, 0=18 57 16.1 New Britain. h about 74 km.
		eSE	20 24.0	Wc	
		eNE	33.5		
		e(R)E	37.0		
			mu sec		
		PZ	1.17 12		
		SH	1.66 32		
		MaxH	5.10 36		
	MHC	eP	10 07.1	c	
	MIN	iP	07.7	c	
	CLS	eP	03.8	d	
	PRI	eP	10.4	d	
Mar. 6	BKS	eP	21 17 32	c	USCGS: 19.7°S, 70.5°W, 0=21 05 50.2 Northern Chile. h about 50 km.
	MHC	eP	26.7	c	
	MIN	eP	36.6	d	
	CLS	eP	34.2	c	
	PRI	eP	18.2	c	
Mar. 8	BKS	eNE	02 18.5		
Mar. 8	MIN	iP	05 07 40.2	c	
Mar. 10	MHC	eP	09 09 01	d	USCGS: 19.2°N, 108.6°W, 0=09 04 13.6 Off coast of Jalisco, Mexico h about 33 km.
	MIN	eP	25.6	c	
	CLS	eP	08 50.8	c	
	PRI	eP	43.3	c	
Mar. 11	MIN	eP	01 24 23.8	c	
Mar. 11	MIN	iP	06 47 01.2	d	USCGS: 57.9°N, 158.6°W, 0=06 41 08 Alaskan Peninsula. h about 127 km.
Mar. 13	BKS	e(S)NE	04 41 20	Sc	USCGS: 4.1°S, 105.1°W, 0=04 26 23.5 West of Galapagos Islands. h about 33 km.
		eNE	44.9		
		e(R)N	47.1		
			mu sec		
		MaxH	5.0 28		
	MHC	eP	34 31.1	d	
	CLS	eP	42.4	d	
	PRI	eP	14.6	c	
Mar. 13	BKS	eP	05 58 40.3	d	USCGS: 52.1°N, 170.0°W, 0=05 51 31.2 Fox Islands. h about 33 km.
		e(S)NE	06 04.2	NEc	
		e(G)NE	06.5		
	MHC	eP	58 37.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
(cont.)					
Mar. 13	MIN	eZ	05 58 27.4	d	
	CLS	eP	41.1	d	
	PRI	eP	32.8	d	
Mar 13	BKS	eP	12 01 12.2	c	USCGS: 12.9°N, 90.4°W, 0 = 11 54 06.1 Near coast of Guatemala. h about 128 km.
		iZ	20.0	c	
		e(G)NE	10.7		
		e(R)	14.4		
			mu sec		
		PZ	.031 1.2		
		MaxH	1.85 32		
	MHC	eP	01 06.3	c	
	MIN	iP	20.2	d	
	CLS	eP	17.4	c	
	PRI	eP	00 55.3	d	
Mar. 14	MIN	eZ	02 49 45.5	c	USCGS: 47.1°N, 8.3°E, 0 = 02 37 24.6 Switzerland, Felt. h about 33 km.
Mar. 14	MHC	eP	03 03 05.5	d	USCGS: 18.7°N, 145.6°E, 0 = 02 51 04.1 Mariana Islands. h about 136 km.
	MIN	iP	00.3	d	
	CLS	eP	02 51.5	d	
	PRI	eP	03 11.5	d	
Mar. 14	MIN	eZ	11 56 10		USCGS: 20.6°S, 178.5°W, 0 = 11 44 53.8 Fiji Islands. h about 561 km.
Mar. 14	MIN	eP	12 28 37.3	c	USCGS: 20.6°S, 178.2°W, 0 = 12 16 53.4 Fiji Islands. h about 260 km.
Mar. 14	BKS	eP	15 17 03.2	d	USCGS: 13.7°S, 172.3°E, 0 = 15 05 54.4 New Hebrides Islands. h about 611 km.
	MHC	eP	04.4	d	
	MIN	iP	10.5	c	
	CLS	eP	03.3	c	
	PRI	eP	05.7	d	
Mar. 14	BKS	iP	15 22 16.0	d	USCGS: 15.9°N, 60.5°W, 0 = 15 12 22.4 Leeward Islands. h about 31 km.
		eZ	22.7	d	
	MHC	eP	12.9	d	
	MIN	iP	13.9	c	
	CLS	eP	18.2	d	
	PRI	eP	06.4	c	
Mar. 15	MIN	eP	08 12 54.4	c	USCGS: 49.7°N, 78.0°E, 0 = 07 59 58.0 Kazakh S.S.R., h = 0 km - (blast).
Mar. 15	MHC	eP	09 59 07.2	c	USCGS: 53.0°N, 157.3°E, 0 = 09 49 42.4 Kamchatka Peninsula. h about 170 km.
	MIN	iP	58 52.2	c	
	CLS	eP	57.0	c	
	PRI	eP	16.2	c	
Mar. 15	BKS	eP	22 42 59.0	d	USCGS: 36.2°N, 7.6°W, 0 = 22 30 26.0 West of Gibraltar. Felt. h about 27 km. Magnitude 7 (BKS)
		ipP	43 16.5	d	
		ePP	46 08.2	d	
		eZ	44 33.0	d	
		iZ	43 12.0	d	
		iSNE	53 24	SW	
		iScS	53 48	c	
		iPSE	54 20		
		eSSNE	58 36	SW	
		e(G)NE	23 05.1		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Mar. 15		e(R)NE	23 10.3		
			mu sec		
		PZ	11.8 10		
		PPZ	5.78 8		
		SH	5.02 18		
		MaxH	36 22		
	MHC	eP	22 43 00.9	c	
	MIN	iZ	42 49.1	c	
	CLS	iP	43 58.7	c	
	PRI	eP	01.2	c	
Mar. 16	BKS	eP	08 55 00.3	c	USCGS: 44.8°N, 146.8°E, 0 = 08 44 32.8 Kurile Islands. h about 140 km.
		iZ	33.0	d	
			mu sec		
		PZ	0.04 1.0		
	MHC	eP	05.1	c	
	MIN	iP	54 52.1	c	
		ipP	55 26.2	d	
	CLS	eP	54 56.1	c	
	PRI	eP	55 14.1	c	
Mar. 16	BKS	e(G)NE	20 37.0		USCGS: 27.3°N, 110.9°W, 0 = 20 30 49 Gulf of California. h about 33 km.
		e(R)	38.0		
	PRI	eZ	33.0		
Mar. 16	BKS	eP	20 50 47.8	c	USCGS: 19.5°N, 65.3°W, 0 = 20 40 47.9 Northeast of Puerto Rico. h about 33 km.
	MHC	eP	47.9	c	
	MIN	iP	57.4	c	
	CLS	eP	48.3	c	
	PRI	eP	47.3	c	
Mar. 17	BKS	e(S)N	05 17.8		USCGS: 8.9°S, 108.8°W, 0 = 05 01 57 South west of Galapagos Islands. h about 33 km.
		e(R)N	24.6		
Mar. 18	BKS	eP	04 46 36.0	c	USCGS: 52.5°N, 153.6°E, 0 = 04 37 26.9 Sea of Okhotsk. h about 440 km.
		ePcP	47 21.2	d	
		esP	48 02	c	
		iPPN	48 53	Nc	
		eSNE	54 04	SWc	
		eScSNE	55 40	SW	
		eSSNE	58.0		
		e(G)NE	00.9		
			mu sec		
		PZ	0.23 1.0		
		PPZ	1.60 5		
		SH	9.50 10		
	MHC	eP	46 41.1	c	
	MIN	iP	26.8	c	
	CLS	eP	31.3	c	
	PRI	eP	50.8	c	
Mar. 18	MIN	iP	12 56 53.1	c	
Mar. 19	BKS	iP	04 57 04.2	d	USCGS: 21.9°S, 179.5°E, 0 = 04 45 50.9 Fiji Islands. h about 613 km.
	MIN	iP	12.9	d	
	CLS	eP	04.7	d	
	PRI	eP	03.3	d	

Date	Sta.	Phase	Time (GCT)	Ground motion	Remarks
1964			h. m. s.		
Mar. 19	BKS	iP	08 54 49.5	c	USCGS: 20.3°S, 178.3°E, 0 = 08 43 40.5 Fiji Islands. h about 504 km.
	MHC	eP	48.0	c	
	MIN	iP	59.1	c	
	CLS	eP	50.5	c	
	PRI	eP	46.0	d	
Mar. 19	BKS	eE	10 35.0		USCGS: 14.7°N, 56.3°E, 0 = 09 42 34.9 Caribbean Sea. h about 33 km.
		eN	43.0		
	MIN	eP	01 32.6	c	
Mar. 19	MIN	iP	12 02 07.6	c	USCGS: 28.4°N, 139.6°E, 0 = 11 50 54.2 Bonin Islands. h about 450 km.
Mar. 19	BKS	iP	21 55 21.2	SWd	USCGS: 15.1°S, 172.6°W, 0 = 21 44 03.8 Samoa Islands. h about 33 km. Magnitude 6 1/4 - 6 1/2 (BKS)
		ipP	30.5	d	
		iZ	56 06.5	c	
		eSNE	22 04 32	SWc	
		eScSNE	05 12	NEc	
		eSSE	08 52	Wc	
		e(G)NE	12.3		
		e(R)NE	15.4		
			mu sec		
		PZ	1.16 8		
		SH	3.57 24		
		MaxH	33.2 32		
	MHC	eP	21 55 21.6	d	
	MIN	iP	32.8	d	
		ipP	21.0	d	
	CLS	eP	22.1	d	
	PRI	eP	21.1	d	
		epP	32.3	c	
Mar. 20	MIN	iP	06 43 09.5	c	USCGS: 12.9°N, 89.9°W, 0 = 06 35 51.6 Near coast of San Salvador. h about 125 km.
Mar. 20	BKS	iP	07 05 01.0	d	USCGS: 2.0°S, 79.7°W, 0 = 06 55 28.1 Ecuador. h about 71 km.
		iZ	08.8	d	
			mu sec		
		PZ	0.121 1.1		
	MHC	eP	04 56.2	d	
	MIN	eP	05 07.2	d	
		ipP	36.0	c	
	CLS	eP	05.3	d	
		epP	11.8	d	
	PRI	eP	45.9	d	
		epP	54.5	c	
Mar. 21	BKS	iP	03 56 16	d	USCGS: 6.4°S, 127.9°E, 0 = 03 42 19.6 Banda Sea. h about 367 km. Magnitude 6 3/4 (BKS)
		ePP	04 00 41	d	
		ePPP	03 10	c	
		eSKSNE	04 06 12	NWc	
		eSNE	07 56	SWc	
		eSPE	09 30	Ec	
		ePPSNE	11 24	SWd	
		eSSN	15 30	S	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Mar. 21			h. m. s.		
		e(G)NE	04 26.5		
		e(R)E	33.5		
			mu sec		
		PZ	0.91 10		
		PPZ	2.22 28		
		SH	4.33 20		
		MaxH	11.8 60		
	MHC	eP	03 56 11	e	
		ePP	49.0		
	MIN	eP	12.1	c	
	CLS	eP	05	c	
		ePP	42.2	d	
Mar. 21	MHC	eZ	05 58 31	c	USCGS: 8.7°S, 109.2°W, 0 = 05 50 03 2,100 km southwest of Galapagos Islands. h about 33 km.
Mar. 21	BKS	iP	15 13 35.2	c	USCGS: 18.7°N, 103.1°W, 0 = 15 08 14.3 Near coast of Michoacan, Mexico. h about 83 km.
		iZ	49.2	c	
		eNE	14 02.0	NWd	
		eZ	16 18.0	c	
		eSNE	18 32.0	SWd	
		e(G)NE	20 22.0		
		e(R)NE	21 27.0		
			mu sec		
		PZ	1.43 8		
		MaxH	9.2 14		
	MHC	eP	13 29.1	c	
	MIN	iP	49.1	d	
	CLS	eP	41.3	c	
	PRI	eP	15.9	c	
Mar. 21	BKS	eP	16 39 35.8	c	USCGS: 27.6°S, 177.2°W, 0 = 16 27 11.7 Kermadec Islands. h about 33 km.
		iZ	49.0	d	
		eSNE	49.8		
		e(G)E	17 01.0		
		e(R)	17 04.8		
			mu sec		
		PZ	0.087 1.0		
	MHC	eP	16 39 36.0	c	
	MIN	iP	45.9	d	
	CLS	eP	37.1	c	
	PRI	eP	34.8	c	
Mar. 21	MIN	iP	06 27 49.8	d	USCGS: 61.3°N, 147.8°W, 0 = 06 22 15 East of Anchorage, Alaska. h about 62 km.
Mar. 22	BKS	iP	07 15 34.5	d	USCGS: 5.5°S, 77.1°W, 0 = 07 05 39.7 Northern Peru. h about 147 km.
	MHC	eP	30.5	d	
	MIN	iP	41.0	d	
	CLS	eP	39.1	d	
	PRI	eP	21.1	c	
Mar. 22	BKS	eP	08 47 48	d	USCGS: 35.7°S, 72.9°W, 0 = 08 35 06.4 Near coast of Central Chile. h about 33 km.
		iZ	55.5	c	
		eSN	58.3		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Mar. 22			h. m. s.		
		e(G)E	09 11.0		
		e(R)	16.4		
	MHC	eP	08 47 44.4	c	
	CLS	eP	51.4	d	
	PRI	eP	35.5	c	
Mar. 24	MIN	eP	09 40 50.7	c	USCGS: 51.1°N, 129.6°W, 0 = 09 37 56.2 Vancouver Islands. h about 22 km.
Mar. 25	BKS	iP	02 54 51.5	c	USCGS: 36.3°N, 140.9°E, 0 = 02 43 23.5 Near east coast of Honshu, Japan. h about 67 km.
		iZ	55 09.5	c	
	MHC	eP	08.3	c	
	MIN	iP	54 46.0	c	
	PRI	eP	55 10.8	c	
Mar. 25	MIN	iP	05 03 29.6	d	USCGS: 36.3°N, 141.1°E, 0 = 04 52 07.8 Near east coast of Honshu, Japan. h about 60 km.
Mar. 25	MIN	eP	10 17 15.5	d	USCGS: 7.7°N, 75.3°W, 0 = 10 08 06.8 Northern Columbia. h about 48 km.
Mar. 25	MIN	eP	11 45 30.6	d	USCGS: 19.7°S, 175.9°W, 0 = 11 33 48.4 Tonga Islands. h about 170 km.
Mar. 26	BKS	eP	02 17 01	c	USCGS: 11.3°N, 142.0°E, 0 = 02 04 20.2 Mariana Islands. h about 33 km.
		eZ	30	c	
		eSNE	27 36	NW	
		ePPSE	29.1		
		eLNE	39.9		
		eRE	44.0		
			mu sec		
		PZ	0.50 10		
		SH	1.74 16		
		MaxH	2.27 20		
	MHC	eP	17 09.5	c	
	MIN	eP	07.2	c	
	CLS	eP	07.4	c	
	PRI	eP	15.2	d	
Mar. 26	MIN	eP	07 23 21.7	c	USCGS: 46.4°N, 145.1°E, 0 = 07 13 04.5 Sea of Okhotsk. h about 180 km.
Mar. 26	MIN	eP	07 55 41.3	c	USCGS: 39.1°N, 10.7°W, 0 = 07 43 39.1 Near coast of Portugal. h about 33 km.
Mar. 26	BKS	eP	13 38 12.0	c	USCGS: 4.4°S, 104.7°W, 0 = 13 29 56.2 North of Easter Island. h about 33 km.
		eSNE	44 54	NWc	
		eGNE	48.4		
		eR	50.7		
			mu sec		
		PZ	0.625 12		
		SH	5.75 18		
		MaxH	17.7 28		
	MHC	eP	38 03.5	c	
	MIN	eZ	26		
	CLS	eP	12.3	c	
	PRI	eP	37 54.8	c	
Mar. 27	MIN	eZ	13 46 46.0	d	USCGS: 19.0°S, 167.5°W, 0 = 13 33 54.1 Near Hebrides Islands. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 27	BKS	iP	20 33 36.8	c	USCGS: 23.7°S, 179.9°E, 0=20 22 10.6
		iZ	34 01.2	d	South of Fiji Islands.
		eZ	34 40	c	h about 520 km.
		eSNE	43 12	SEd	
		eRNE	54.8		
			mu sec		
		PZ	1.94 7		
		SH	1.82 18		
	MHC	eP	33 37.3	c	
	MIN	eP	44.7	c	
	CLS	eP	37.9	c	
	PRI	eP	36.9	c	
Mar. 27	BKS	eP	03 42 05.4	d	USCGS: 61.1°N, 147.6°W, 0=03 36 12.7
			mu sec		Alaska. h about 33 km.
		PZ	79.5 5		Magnitude 8.6 (BKS)
	MHC	eP	11.2	d	Destructive in Alaska.
	MIN	iP	41 47.3	d	
		iS	46 01.7		
	CLS	eP	41 57.5	d	
Mar. 27	MHC	eP	05 00 04.3	d	USCGS: 59.8°N, 149.4°W, 0=04 54 07.9
	CLS	eP	04 59 50.9	d	Alaska aftershock. 6 about 25 km.
	PRI	eP	05 00 17.8	d	
Mar. 27	CLS	eP	05 38 27.3	d	USCGS: 58.1°N, 150.1°W, 0=05 31 05.4
	PRI	eP	54.5	d	Alaska aftershock. h about 33 km.
Mar. 28	CLS	eP	05 41 23.6	c	USCGS: 57.2°N, 153.0°W, 0=05 35 38.4
	PRI	eP	48.7	d	Alaska aftershock. h about 33 km.
Mar. 28	MHC	eP	05 52 30.7	c	
	CLS	eP	15.2	d	
	PRI	eP	42.7	c	
Mar. 28	BKS	eP	06 14 34.5	c	USCGS: 60.1°N, 148.6°W, 0=06 08 44.2
			mu sec		Alaska aftershock. h about 20 km.
		PZ	.041 1.0		
	MHC	eP	40.7	c	
		ePcP	18 51.5	d	
	CLS	eP	14 27.3	c	
		ePcP	18 47.2	c	
	PRI	eP	14 54.0	c	
		ePcP	18 55.1	c	
Mar. 28	MHC	eP	06 35 08.3	d	USCGS: 57.7°N, 150.8°W, 0=06 29 17.4
	CLS	eP	34 55.0	d	Alaska aftershock. h about 20 km.
	PRI	eP	35 22.0	d	
Mar. 28	BKS	iP	06 38 23.4	d	USCGS: 60.1°N, 147.6°W, 0=06 32 38.6
		ePcP	41 40.5	d	Alaska aftershock. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
(cont.)					
Mar. 28					
			mu sec		
		PZ	.035 1.0		
	MHC	eP	29.2	c	
	CLS	eP	16.0	d	
	PRI	eP	43.1	d	
Mar. 28	BKS	iP	06 47 15.0	d	USCGS: 59.9°N, 147.8°W, 0 = 06 41 28.0
	iZ		48 44.0	c	Alaska aftershock. h about 15 km.
			mu sec		
		PZ	.118 1.4		
	MHC	eP	47 21.4	d	
	MIN	iP	46 57.6	d	
	CLS	eP	47 07.8	d	
	PRI	eP	37.8	d	
Mar. 28	BKS	iP	06 49 46.7	d	USCGS: 58.3°N, 151.3°W, 0 = 06 43 57.4
	iZ		55.0	d	Alaska aftershock. h about 25 km.
		iPcP	53 08.0	d	
			mu sec		
		PZ	.547 2.0		
	MHC	eP	53.0	d	
	MIN	iP	29.0	c	
	CLS	eP	39.5	d	
		ePcP	50 59.0	d	
	PRI	eP	49 06.6	d	
		ePcP	53 07.6	c	
Mar. 28	BKS	eP	06 59 20.3	d	USCGS: 58.8°N, 149.5°W, 0 = 06 53 35.6
		iPcP	07 02 40.0	c	Alaska aftershock. h about 20 km.
		iZ	46.0	d	
			mu sec		
		PZ	.212 1.9		
	MHC	eP	06 59 27.9	d	
		ePcP	07 02 41.7	c	
	MIN	iP	06 59 04.9	d	
	CLS	eP	14.2	d	
		ePcP	07 02 37.5	d	
	PRI	eP	06 59 41.5	d	
		ePcP	07 02 44.6	c	
Mar. 28	BKS	iP	07 16 07.2	NWd	USCGS: 58.8°N, 149.5°W, 0 = 07 10 21.4
		ePcP	19 23.0	c	Alaska aftershock. h about 20 km.
		iZ	32.5	d	
			mu sec		
		PZ	.833 2		
	MHC	eP	16 13.5	d	
		ePcP	19 27.0	d	
	MIN	iP	15 50.6	d	
	CLS	eP	16 00.1	d	
		ePcP	19 23.2	d	
	PRI	eP	16 26.5	d	
		ePcP	19 31.5	c	
Mar. 28	MIN	iP	07 29 55.1	c	USCGS: 59.3°N, 149.8°W, 0 = 07 24 21.7
					Alaska aftershock. h about 20 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Mar. 28	MIN	iP	07 33 48.6	c	USCGS: 57.9°N, 150.4°W, 0 = 07 28 20.5 Alaska aftershock. h about 20 km.
Mar. 28	BKS	iP	07 36 17.5	c	USCGS: 57.4°N, 151.7°W, 0 = 07 30 29.6 Alaska aftershock. h about 15 km.
		PZ	.258 2.0		
	MHC	eP	23.8	c	
	MIN	iP	02.4	c	
	CLS	eP	08.2	c	
	PRI	eP	34.0	d	
Mar. 28	MIN	iP	07 49 25.0	c	
Mar. 28	BKS	eP	08 39 32.8	d	USCGS: 58.1°N, 151.1°W, 0 = 08 33 47.0 Alaska aftershock. h about 25 km.
		iZ	41 14.5	d	
		PZ	.298 2.1		
	MHC	eP	39 41.1	d	
	MIN	iP	18.9	d	
	CLS	eP	27.6	d	
	PRI	eP	54.4	d	
Mar. 28	MIN	iP	08 45 26.8	d	USCGS: 57.5°N, 151.6°W, 0 = 08 39 54.9 Alaska aftershock. h about 20 km.
Mar. 28	BKS	eP	09 06 44.2	c	USCGS: 56.5°N, 152.0°W, 0 = 09 01 00.5 Alaska aftershock. h about 20 km.
		PZ	.518 2.4		
	MHC	eP	51.3	d	
	MIN	iP	29.8	c	
	CLS	eP	37.5	c	
	PRI	eP	04.6	c	
Mar. 28	MIN	iP	09 11 30.9	d	USCGS: 56.6°N, 153.2°W, 0 = 09 05 56.4 Alaska aftershock. h about 25 km.
Mar. 28	MIN	iP	09 17 37.8	c	
Mar. 28	MIN	iP	09 19 34.2	d	
Mar. 28	MIN	iP	09 39 33.2	d	USCGS: 56.8°N, 152.3°W, 0 = 09 34 01.5 Alaska aftershock. h about 20 km.
Mar. 28	BKS	iP	09 58 34.5	d	USCGS: 59.1°N, 151.5°W, 0 = 09 45 07.8 Alaska aftershock. h about 33 km.
		iZ	58.2	c	
		eZ	10 01 19.5	d	
		PZ	.223 1.6		
	MHC	eP	41.5	e	
	MIN	iP	17.9	c	
	CLS	eP	28.0	c	
	PRI	eP	55.1	c	
Mar. 28	BKS	eP	10 12 36.5	c	USCGS: 42.9°N, 101.6°W, 0 = 10 08 45.0 Nebraska. h about 41 km.
	MHC	eP	36.1	c	
	MIN	iP	23.0	d	Felt.
	CLS	eP	36.0	c	
	PRI	eP	35.7	c	
Mar. 28	MIN	eP	10 38 33.5	d	USCGS: 57.7°N, 152.2°W, 0 = 10 33 00.2 Alaska aftershock. h about 35 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 28	BKS	eP	10 41 27.0	c	USCGS: 60.9°N, 143.7°W, 0=10 35 31.2 Alaska aftershock. h about 25 km. Magnitude 5 3/4 - 6 (BKS)
		eZ	42 32.0	d	
		ePcP	44 37.0		
		eSNE	46 15.0	SE	
		eE	46 32.0	E	
		eScP	48 22.0	c	
			mu sec.		
		PZ	1.28 2.5		
	MHC	eP	41 33.6	c	
		ePcP	44 44.3	c	
		eScP	48 23.3	c	
	MIN	iP	40 51.6	d	
	CLS	eP	41 20.0	c	
		eScP	48 18.9	c	
	PRI	eP	41 46.1	d	
		ePcP	44 48.3	c	
		eScP	48 27.0	c	
Mar. 28	MIN	iP	10 54 49.9	c	USCGS: 59.1°N, 148.3°W, 0=10 49 23.2 Alaska aftershock. h about 15 km.
Mar. 28	MIN	iP	11 04 46.6	c	USCGS: 57.4°N, 157.6°W, 0=10 54 16.3 Alaska aftershock. h about 30 km.
Mar. 28	BKS	iP	11 14 16.2	d	USCGS: 60.1°N, 148.4°W, 0=11 08 26.0 Alaska aftershock. h about 15 km.
		iZ	14 32.0	d	
		ePcP	17 30.5	d	
			mu sec.		
		PZ	.283 1.6		
	MHC	eP	14 22.5	d	
		ePcP	17 32.5	d	
	CLS	eP	14 08.9	d	
		ePcP	17 29.0	d	
		eScP	20 24.2		
	PRI	eP	14 35.9	d	
		ePcP	17 37.5	c	
Mar. 28	MIN	iP	11 37 49.1	d	USCGS: 59.0°N, 149.5°W, 0=11 32 19.0 Alaska aftershock. h about 20 km.
Mar. 28	BKS	eP	11 48 25.7	c	
	MHC	eP	27.2	c	
	MIN	iP	19.3	c	
	CLS	eP	24.8	c	
	PRI	eP	29.4	c	
Mar. 28	MIN	eP	11 55 28.3	d	USCGS: 58.2°N, 149.8°W, 0=11 50 01.9 Alaska aftershock. h about 25 km.
Mar. 28	MIN	iP	12 08 44.9	c	USCGS: 60.3°N, 146.6°W, 0=12 03 16.5 Alaska aftershock. h about 15 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 28	BKS	iP	12 26 42.0	d	USCGS: 56.5°N, 154.0°W, 0=12 20 49.8
		iZ	27 31.8	d	Alaska aftershock.
		ePcP	29 54.0	d	h about 25 km.
			mu sec		
		PZ	0.67 1.5		
	MHC	eP	26 48.6	d	
		ePcP	29 57.4	c	
	MIN	iP	26 28.2	d	
	CLS	eP	35.3	d	
		ePcP	29 52.7	d	
	PRI	eP	27 02.1	d	
		ePcP	30 00.9	d	
Mar. 28	MIN	iP	12 31 24.7	d	
Mar. 28	MIN	iP	12 37 21.6	c	USCGS: 59.1°N, 149.6°W, 0=12 31 29.8 Alaska aftershock. h about 20 km.
Mar. 28	BKS	eZ	12 53 19.5	d	USCGS: 60.5°N, 145.9°W, 0=12 48 34 Alaska aftershock.
	MHC	eZ	22.3	c	h about 33 km.
	MIN	eZ	56.4	c	
	CLS	eZ	17.7	c	
	PRI	eZ	25.8	d	
Mar. 28	MIN	iP	13 06 41.6	c	USCGS: 60.1°N, 147.0°W, 0=13 01 14.2 Alaska aftershock. h about 20 km.
Mar. 28	MIN	iP	13 33 07.7	d	USCGS: 60.3°N, 147.1°W, 0=13 27 38.5 Alaska aftershock. h about 15 km.
Mar. 28	MIN	iP	14 23 42.1	c	USCGS: 58.0°N, 149.7°W, 0=14 18 16.1 Alaska aftershock. h about 20 km.
Mar. 28	MIN	iP	14 38 48.3	d	USCGS: 57.8°N, 152.1°W, 0=14 33 13.6 Alaska aftershock. h about 25 km.
Mar. 28	MIN	iP	14 51 46.9	c	USCGS: 57.8°N, 151.3°W, 0=14 46 19.2 Alaska aftershock. h about 33 km.
Mar. 28	BKS	iP	14 53 23.5	d	USCGS: 60.4°N, 146.5°W, 0=14 47 37.1 Alaska aftershock. h about 10 km.
		PZ	.97 1.7		Magnitude 6 (BKS)
	MHC	eP	29.2	c	
	MIN	iP	05.7	d	
	PRI	eP	41.7	d	
	CLS	eP	16.3	d	
	PRI	eP	41.7	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 28	BKS	iP	14 55 02.0	d	USCGS: 60.4°N, 147.1°W, 0=14 49 13.7 Alaska aftershock. h about 10 km.
	MHC	eP	05.9	d	
	MIN	iP	54 43.6	d	
	CLS	eP	54.5	d	
	PRI	eP	55 21.5	d	
Mar. 28	BKS	iP	16 32 00.2	c	USCGS: 57.5°N, 150.9°W, 0=16 26 16.9 Alaska aftershock. h about 30 km.
		PZ	mu sec		
			.055 1.2		
	MHC	eP	06.4	c	
	MIN	iP	31 44.9	c	
	CLS	eP	52.7	c	
	PRI	eP	32 19.9	c	
Mar. 28	BKS	iP	16 50 18.3	c	USCGS: 59.3°N, 147.8°W, 0=16 44 35.9 Alaska aftershock. h about 25 km.
		PZ	mu sec		
			.084 1.0		
	MHC	eP	24.5	c	
	MIN	iP	01.0	c	
	CLS	eP	10.9	c	
	PRI	eP	37.8	c	
Mar. 28	MIN	iP	16 53 11.0	c	
Mar. 28	MIN	iP	18 09 03.9	d	
Mar. 28	BKS	iP	20 34 54.5	d	USCGS: 59.8°N, 148.7°W, 0=20 29 08.6 Alaska aftershock. h about 40 km.
		iZ	38 15.6		
		iSN	39 44		
		eZ	41.3		
		eNE	42.2		
			mu sec		
		PZ	32.3 15		
		SH	8.06 10		
	MHC	eP	35 00.9	d	
	MIN	iP	34 37.2	d	
	CLS	eP	07.3	d	
	PRI	eP	35 14.2	d	
Mar. 28	MIN	eP	22 34 16.8	d	USCGS: 58.2°N, 150.4°W, 0=22 28 47.0 Alaska aftershock. h about 20 km.
Mar. 28	BKS	iP	23 52 05.2	d	USCGS: 57.0°N, 151.0°W, 0=23 46 22.0 Alaska aftershock. h about 33 km.
		PZ	mu sec		
			.264 1.2		
	MHC	eZ	11.7	d	
	MIN	iP	51 48.8	d	
	CLS	eP	58.1	d	
		ePcP	55 11.3		
Mar. 29	MIN	iP	00 58 36.3	d	USCGS: 57.4°N, 151.5°W, 0=00 53 05.8 Alaska aftershock. h about 20 km.
Mar. 29	MIN	eP	01 01 00.9	c	
Mar. 29	BKS	iP	01 15 27.1	d	USCGS: 59.6°N, 149.2°W, 0=01 09 36.4 Alaska aftershock. h about 20 km.
		ePcP	18 41.5		
		eZ	48.6		
			mu sec		
		PZ	0.07 1.5		
	MHC	eP	15 33.4	d	
	MIN	iP	10.1	d	
		iPcP	18 44.8	c	
	CLS	eP	15 19.7	d	
	PRI	eP	47.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 29	BKS	eP	01 35 20.0	d	USCGS: 57.5°N, 149.2°W, 0=01 29 33.7 Alaska aftershock. h about 20 km.
		PZ	0.436 1.2		
	MHC	eP	26.4	d	
	MIN	iP	04.4	d	
	CLS	eP	12.7	d	
	PRI	eP	40.0	d	
Mar. 29	MIN	iP	01 53 54.7	d	USCGS: 56.3°N, 153.7°W, 0=01 48 18.5 Alaska aftershock. h about 20 km.
Mar. 29	MIN	iP	02 24 42.8	d	USCGS: 59.0°N, 149.2°W, 0=02 19 13.2 Alaska aftershock. h about 20 km.
Mar. 29	MIN	iP	03 12 49.8	d	USCGS: 59.7°N, 148.8°W, 0=03 07 19.5 Alaska aftershock. h about 30 km.
Mar. 29	BKS	iP	04 17 57.3	d	USCGS: 60.2°N, 145.5°W, 0=04 12 15.7 Alaska aftershock. h about 15 km.
		PZ	.161 1.2		
	MHC	eP	18 03.3	d	
	MIN	iP	17 39.3	d	
	CLS	eP	49.6	d	
	PRI	eP	18 16.6	d	
Mar. 29	MIN	iP	05 26 34.1	d	USCGS: 57.1°N, 150.4°W, 0=05 21 09.8 Alaska aftershock. h about 20 km.
Mar. 29	MIN	eP	05 43 24.1	c	USCGS: 56.9°N, 153.3°W, 0=05 37 47.4 Alaska aftershock. h about 25 km.
Mar. 29	BKS	eP	06 10 35.5	d	USCGS: 56.1°N, 154.3°W, 0=06 04 44.5 Alaska aftershock. h about 30 km.
		PZ	.602 2.2		
	MHC	eP	41.8	d	
	MIN	eP	21.5	d	
	CLS	eP	28.5	d	
	PRI	eP	55.2	d	
Mar. 29	MIN	eP	06 35 04.9	d	USCGS: 58.1°N, 149.8°W, 0=06 24 39.4 Alaska aftershock. h about 33 km.
Mar. 29	MIN	eP	07 58 24.3	d	USCGS: 56.1°N, 154.2°W, 0=07 52 46.4 Alaska aftershock. h about 25 km.
Mar. 29	MIN	iP	09 21 27.5	c	USCGS: 58.4°N, 150.5°W, 0=09 15 55.4 Alaska aftershock. h about 15 km.
Mar. 29	BKS	iP	10 13 52.2	c	USCGS: 60.0°N, 148.6°W, 0=10 08 02.4 Alaska aftershock. h about 20 km.
		PZ	.385 1.7		
	MHC	eP	58.4	c	
	MIN	iP	35.4	c	
	CLS	eP	44.8	c	
	PRI	eP	11.8	c	
Mar. 29	MIN	iP	10 55 09.4	d	USCGS: 58.2°N, 150.4°W, 0=10 49 40.3 Alaska aftershock. h about 25 km.
Mar. 29	MIN	iP	11 49 38.8	c	USCGS: 60.0°N, 144.1°W, 0=11 44 04.3 Alaska aftershock. h about 25 km.
Mar. 29	MIN	iP	12 02 07.3	d	USCGS: 58.0°N, 151.6°W, 11 56 33.0 Alaska aftershock. h about 20 km.
Mar. 29	MIN	iP	16 14 43.7	c	USCGS: 60.3°N, 146.6°W, 0=16 09 15.3 Alaska aftershock. h about 15 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 29	MIN	eP	16 23 55.3	d	USCGS: 60.4°N, 146.0°W, 0=16 18 29.3 Alaska aftershock. h about 15 km.
Mar. 29	BKS	eP	16 46 41.1	c	USCGS: 59.7°N, 147.0°W, 0=16 40 57.9 Alaska aftershock. h about 15 km.
		PZ	.506 2.0		
	MHC	eZ	47.8	c	
	MIN	iP	24.0	c	
	CLS	eP	33.8	c	
	PRI	eZ	47 01.8	d	
Mar. 29	BKS	iP	16 51 16.4	c	USCGS: 59.8°N, 146.9°W, 0=16 45 33.6 Alaska aftershock. h about 20 km.
		eZ	54 35.4		
		PZ	.225 1.3		
	MHC	eP	51 22.5	c	
	MIN	iP	50 59.0	c	
	CLS	eP	51 08.7	c	
	PRI	eP	35.9	c	
Mar. 29	BKS	eP	16 59 10.6	d	USCGS: 60.3°N, 146.1°W, 0=16 53 26.6 Alaska aftershock. h about 15 km.
		PZ	.203 1.4		
	MHC	eP	16.8	d	
	MIN	iP	58 57.7	d	
	CLS	eP	59 03.2	d	
	PRI	eP	30.3	d	
Mar. 29	BKS	eP	21 53 18.8	c	
	MHC	eP	20.6	c	
	MIN	iP	22.1	d	
	CLS	eP	16.9	c	
	PRI	eP	22.6	c	
Mar. 30	BKS	eP	02 08 45.4	c	
		PZ	.075 1.2		
	MHC	eP	51.9	c	
	MIN	eP	28.9	c	
	CLS	eP	08 38.3	c	
	PRI	eP	09 05.5	c	
Mar. 30	BKS	eP	02 23 53.3	d	USCGS: 56.6°N, 152.9°W, 0=02 18 06.3 Alaska aftershock. h about 25 km. Magnitude 6 1/2 - 6 3/4 (BKS)
		ipP	24 02.8	d	
		ePcP	26 37.0	c	
		eSNE	28 27.0	SE	
		iZ	25 01.0	d	
		e(R)	30.7		
		PZ	mu sec		
		SH	1.00 15		
		SH	30.8 13		
	MHC	eP	24 01.2	c	
	MIN	iP	23 29.0	d	
	CLS	eP	46.7	c	
	PRI	eP	24 12.7	c	
Mar. 30	BKS	eZ	04 59 08.3	c	
		PZ	mu sec		
		PZ	.035 0.9		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 30	MHC	eP	04 59 02.8	d	
(cont.)	MIN	eP	15.7	c	
	CLS	eP	13.3	c	
	PRI	eP	58 51.0	c	
Mar. 30	BKS	eP	07 15 13.5	c	USCGS: 59.9°N, 145.7°W, 0=07 09 34.0 Alaska aftershock. h about 15 km.
		eSNE	19 57.0		Magnitude 6 (BKS)
			mu sec		
	PZ		5.26 8		
	SH		4.78 9		
	MHC	eP	15 19.5	c	
	MIN	eP	14 55.6	c	
	CLS	eP	15 05.6	c	
	PRI	eP	32.8	c	
Mar. 30	MIN	iP	11 54 13.5	d	USCGS: 56.4°N, 152.5°W, 0=11 48 40.4 Alaska aftershock. h about 20 km.
Mar. 30	MIN	iP	12 11 10.5	c	USCGS: 60.1°N, 147.0°W, 0=12 05 43.5 Alaska aftershock. h about 25 km.
Mar. 30	BKS	eP	13 09 22.0	c	USCGS: 56.5°N, 152.7°W, 0=13 03 34.9 Alaska aftershock. h about 20 km.
		eSNE	14.1		
			mu sec		
	PZ		1.37 16		
	MHC	eP	28.4	c	
	MIN	eP	06.8	d	
	CLS	eP	15.2	c	
	PRI	eP	42.4	c	
Mar. 30	MIN	eP	13 37 50.3	d	USCGS: 56.4°N, 152.6°W, 0=13 32 18.5 Alaska aftershock. h about 15 km.
Mar. 30	MIN	iP	14 16 21.5	d	USCGS: 57.4°N, 152.3°W, 0=14 10 48.6 Alaska aftershock. h about 30 km.
Mar. 30	BKS	eP	15 13 34.7	c	USCGS: 58.7°N, 149.6°W, 0=15 07 49.3 Alaska aftershock. h about 25 km.
		ePcP	16 52.0		
		eZ	59.5		
	MHC	eP	13 40.0	d	
		ePcP	16 54.1	d	
	MIN	iP	13 07.7	d	
	CLS	eP	27.0	d	
		ePcP	16 50.6	c	
	PRI	eP	13 54.0	d	
		ePcP	16 58.5	c	
Mar. 30	BKS	iP	16 15 12.2	d	USCGS: 60.3°N, 146.6°W, 0=16 09 15.3 Alaska aftershock. h about 15 km.
		eSME	19 52		
		iZ	22 14		
			mu sec		
	PZ		3.42 1.5		
	MHC	eP	15 18.6	d	
		eScP	22 12.5	d	
	MIN	iP	14 57.8	d	
	CLS	eP	15 05.4	d	
		eScP	22 08.4	d	
	PRI	eP	15 32.3	d	
		eScP	22 17.5	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Mar. 30	MHC	eP	18 54 13.8	d	
	MIN	eZ	24.1	c	
	CLS	eP	26.0	d	
	PRI	eP	12.8	d	
Mar. 30	MIN	eP	20 38 03.6	d	USCGS: 59.4°N, 145.1°W, 0=20 32 46.8 Alaska aftershock. h about 15 km.
Mar. 30	MIN	iP	23 57 06.0	c	USCGS: 59.6°N, 147.4°W, 0=23 51 46.0 Alaska aftershock. h about 33 km.
Mar. 31	MIN	eP	00 24 21.6	c	USCGS: 59.5°N, 146.3°W, 0=00 44 53 Alaska aftershock. h about 15 km.
Mar. 31	MIN	eP	00 50 13.8	d	USCGS: 57.6°N, 150.1°W, 0=01 57 54.3 Alaska aftershock. h about 20 km.
Mar. 31	MIN	eP	02 03 19.9	d	USCGS: 59.7°N, 149.8°W, 0=02 45 26.9 Alaska aftershock. h about 10 km.
Mar. 31	MIN	iP	02 51 04.7	d	USCGS: 60.3°N, 146.3°W, 0=04 20 16.3 Alaska aftershock. h about 5 km.
Mar. 31	MIN	eP	04 25 43.8	c	USCGS: 58.3°N, 149.3°W, 0=07 08 54.5 Alaska aftershock. h about 20 km.
Mar. 31	MIN	eP	07 14 19.3	d	USCGS: 59.8°N, 148.6°W, 0=08 40 52.2 Alaska aftershock. h about 36 km.
Mar. 31	MIN	eP	08 46 21.5	d	USCGS: 50.8°N, 130.2°W, 0=09 01 30.2 Vancouver Island region. h about 15 km.
Mar. 31	BKS	eP	09 04 52.2	c	Magnitude 6 - 6 1/4 (BKS)
		iSNE	07.6		
			mu sec		
	PZ		6.6 11.2		
	SH		15.7 14		
	MHC	eP	05 00.9	c	
	MIN	eP	04 23.1	c	
	CLS	eP	40.9	c	
	PRI	eP	05 19.0	c	
Mar. 31	MIN	iP	11 09 05.9	d	USCGS: 58.9°N, 149.9°W, 0=11 03 35.4 Alaska aftershock. h about 20 km.
Mar. 31	MIN	eP	11 24 44.1	d	USCGS: 60.0°N, 146.5°W, 0=11 19 18 Alaska aftershock. h about 15 km.
Mar. 31	MIN	iP	11 30 25.3	d	USCGS: 58.2°N, 150.3°W, 0=11 24 57.4 Alaska aftershock. h about 33 km.
Mar. 31	MIN	iP	11 58 44.3	c	USCGS: 60.1°N, 146.4°W, 0=11 52 13.9 Alaska aftershock. h about 15 km.
Mar. 31	MIN	iP	11 59 14.5	c	USCGS: 56.5°N, 152.3°W, 0=11 53 14.4 Alaska aftershock. h about 25 km.
Mar. 31	MIN	iP	16 49 14.7	d	USCGS: 59.7°N, 148.7°W, 0=16 43 45.5 Alaska aftershock. h about 33 km.
Mar. 31	MIN	iP	18 43 00.1	c	USCGS: 60.4°N, 146.0°W, 0=18 37 36.8 Alaska aftershock. h about 33 km.
Mar. 31	MIN	iP	21 09 31.7	c	USCGS: 58.2°N, 150.3°W, 0=21 04 01.1 Alaska aftershock. h about 20 km.
Mar. 31	MIN	iP	23 42 16.9	c	USCGS: 59.9°N, 145.8°W, 0=23 36 56.0 Alaska aftershock. h about 30 km.

Berkeley
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ARCATA--BERKELEY--CALISTOGA--CONCORD

FRESNO--LLANADA--MANZANITA LAKE

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OROVILLE

Earthquakes and the Registration of Earthquakes

From April 1, 1964 to June 30, 1964

By

Cinna Lomnitz,

Don Pershing

and

David Leppaluoto

University of California

Berkeley

1966

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INTRODUCTION

Each quarterly issue of the Bulletin includes determinations of epicenters, origin times, magnitudes, and other information available at the time of writing, for earthquakes in northern California and adjoining areas. Recorded arrival times of seismic waves are tabulated only for the major earthquakes in the local area and for teleseisms.

Information items regarding the seismographic stations which comprise the Berkeley network are repeated in every issue. Information of a general nature, such as the Modified Mercalli Intensity Scale, will be found only in the first number of each volume.

PERSONNEL (OCTOBER 1966)

Station Director	Bruce A. Bolt
Director Emeritus	Perry Byerly
Associate Research Seismologist	Cinna Lomnitz
Assistant Research Seismologist	Helen Freedman
Postgraduate Research Seismologist	D. J. Sutton
Associate	Don Tocher (Earthquake Mechanism Laboratory, Institute for Earth Sciences, ESSA, San Francisco)
Associate Engineer	Walter Marion
Full-time Technical Staff	G.D. Mitchell, R. Sell, M. Hilger, D. Pershing
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Secretary	Loretta Martin

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THE BYERLY SEISMOGRAPHIC STATION (BKS)

Standardized equipment began operating in a newly constructed tunnel east of the main campus on June 8, 1962. The closest buildings, part of the Lawrence Radiation Laboratory, are about 0.8 km away. The tunnel was cut into the upper part of the Claremont Formation. Of Miocene age, this formation consists of thin layers of cherty material alternating with shale.

A plan of the tunnel is shown in the diagram. Piers are constructed of reinforced concrete with no isolation from floor and walls. The temperature is stable. A ventilating and dehumidifying system is connected to all rooms.

The short-period world-wide standard instruments are operated with an approximate magnification of 25,000 at 1 sec and the long-period standard instruments with 3,000 at 30 sec.

On March 20, 1964, the Regents of the University of California named this station the "Byerly Seismographic Station" in recognition of the work of Professor Perry Byerly.

HISTORY OF THE UNIVERSITY OF CALIFORNIA STATIONS

"The Seismographic Stations at Mount Hamilton and Berkeley present several items of interest in the history of earthquake science, one of which is that according to the available records they were the first seismographic stations set up in America. Furthermore, they have functioned continuously from their founding to the present day, with improvements in instrumental equipment from time to time as the development of the science and opportunity have permitted.

"Several outstanding figures in the seismology of the 1880's were impressed with the importance of these stations, and Ewing, Milne, and Gray each took a personal interest in aiding one or both stations to obtain their own best and most modern types of instruments."

The quotation is from "History of the University of California Seismographic Stations and Related Activities" by Professor George D. Louderback, published in the Bulletin of the Seismological Society of America, Vol. 32, No. 3, pp. 205-229, 1942. In this paper may be found a detailed account of the development of the Berkeley stations from the installation of the instruments (the first earthquake known recorded at Mount Hamilton was on April 24, 1887) to 1942.

Since 1942, the number of seismographic stations associated with the University of California has increased from six to twenty in 1962. In 1950, Professor Perry Byerly was appointed Director by the Regents; he had been in charge of instruction and research since 1925. In 1960, the University entered into a contract with the Air Force Office of Scientific Research of the Research Projects Agency of the Department of Defense. Funds were made available under the Vela Uniform program to design and operate a telemetered network of eight new stations in central California and to construct a new seismic vault near the Berkeley campus.

STATIONS IN OPERATION: APRIL - JUNE 1964

<u>Station</u>	<u>North Latitude</u>	<u>West Longitude</u>	<u>Elev. Meters</u>	<u>Symbol</u>	<u>Present Auspices and Date Established</u>
Berkeley (Haviland)	37° 52!4	122° 15!6	81	BRK, BRX	Univ. of California, 1887
Berkeley (Strawberry)	37° 52!6	122° 14!1	276	BKS	Univ. of California, 1962
Mt. Hamilton	37° 20!5	121° 38!5	1282	MHC	Lick Observatory, 1887
Palo Alto	37° 25!0	122° 10!9	83	PAC	Stanford University, 1927
San Francisco	37° 46!6	122° 27!1	100	SFB	Univ. of San Francisco, 1931
Fresno	36° 46!0	119° 47!8	88	FRE	Fresno City College, 1935
Mineral	40° 20!7	121° 36!3	1495	MIN	National Park Service, 1938
Arcata	40° 52!6	124° 04!5	59	ARC	Humboldt State College, 1948
Shasta	40° 41!7	122° 23!3	312	SHS	Bureau of Reclamation, 1942
Manzanita Lake	40° 32!2	121° 33!7	1800	MLC	National Park Service, 1956
Vineyard (local)	36° 45!0	121° 23!1	330	VIN	W. A. Taylor and Co., 1959
(telemeter)	36° 45!0	121° 23!3	380	VIT	
Concord	37° 58!1	122° 04!3	36	CNC	Diablo Valley College, 1960
Santa Cruz	37° 00!4	121° 59!8	128	SCC	City of Santa Cruz, 1961
Paraiso	36° 19!9	121° 22!2	363	PRS	Paraiso Hot Springs, 1961
Llanada	36° 37!0	120° 56!6	475	LLA	Charles McCullough Ranch, 1961
Calistoga	38° 38!2	122° 35!1	457	CLS	Terrance Kirk Ranch, 1961
Point Reyes	38° 04!8	122° 52!0	404	PRC	Federal Aviation Agency, 1961
Priest	36° 08!5	120° 39!9	1187	PRI	Federal Aviation Agency, 1961
Oroville	39° 33!3	121° 30!0	1180	ORV	California Department of Water Resources, 1963

STATION INSTRUMENTATION

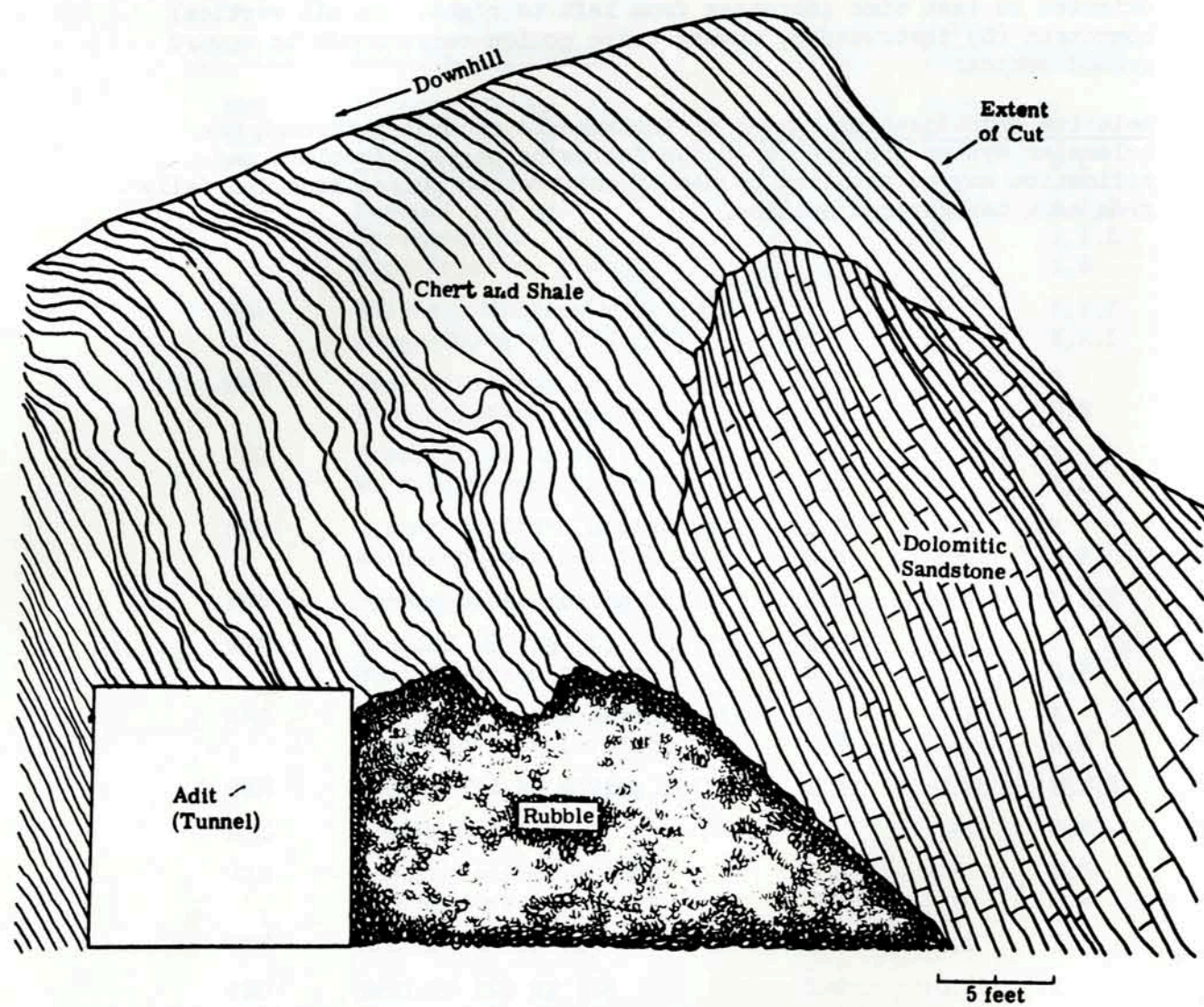
April - June
1964

Station	Type of Instrument	T _o sec	T _g sec	Component
BRK	Benioff 100 kg (Z)	1.0	0.2	Z
BRK	Benioff 100 kg (Z)	1.0	8.0	Z
	100X torsion	0.8	-	N,W
BKS	Benioff 100 kg	1.0	0.75	N,E,Z
	Sprengnether	30	100	N,E,Z
	Wood-Anderson torsion	0.8	-	S,W
BRX	Galitzin-Wilip moving coil	12	12	N,E,Z
	Press-Ewing moving coil	30	90	N,E,Z
MHC ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
	Wood-Anderson torsion	0.8	-	S,E
PAC	Benioff 100 kg (Z)	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	N,E
SFB	Lehner-Griffith moving coil	1.2	0.3	Z
	Wood-Anderson torsion	0.8	-	S,W
FRE	Sprengnether moving coil	2.0	2.0	N,E,Z
MIN	Benioff 100 kg (Z)	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	S,E
ARC	Marion-Slichter moving coil	1.1	0.2	Z
	Wood-Anderson torsion	0.8	-	N,E
SHS	Benioff 50 kg moving coil	1.5	0.45	N,E,Z
MLC	Loucks-Omori	6	-	S,E
VIN	Torsion strong-motion	0.8	-	N,S
	Wood-Anderson torsion	0.8	-	S,W
VIT ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
CNC ^Δ	Benioff 100 kg (Z)	1.0	0.2	Z
SCC ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
PRS ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
LLA ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
CLS ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
PRC ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
PRI ^Δ	Benioff 14 kg (Z)	1.0	0.2	Z
ORV	Benioff 100 kg (Z)	1.0	0.75	N,E,Z
	Geotech moving coil	20	100	N,E,Z

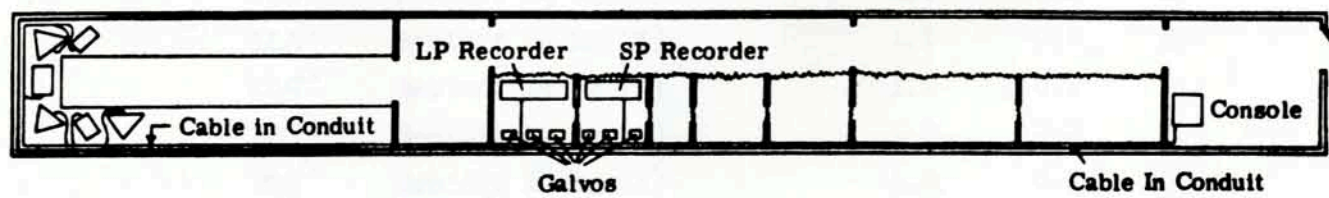
^ΔSignals from these ten stations are transmitted via leased telephone lines to recorders at Berkeley.

Direction of Motion: In the "Component" column, each horizontal component seismograph is designated by the direction of ground motion corresponding to upward trace motion on the seismogram when it is oriented so that time increases from left to right. On all vertical component (Z) instruments, upward trace motion corresponds to upward ground motion.

Relative magnification curves of instruments recording through the telemeter system are listed on the following pages. Absolute magnification may be obtained by use of calibration pulses recorded daily from each telemetered station.

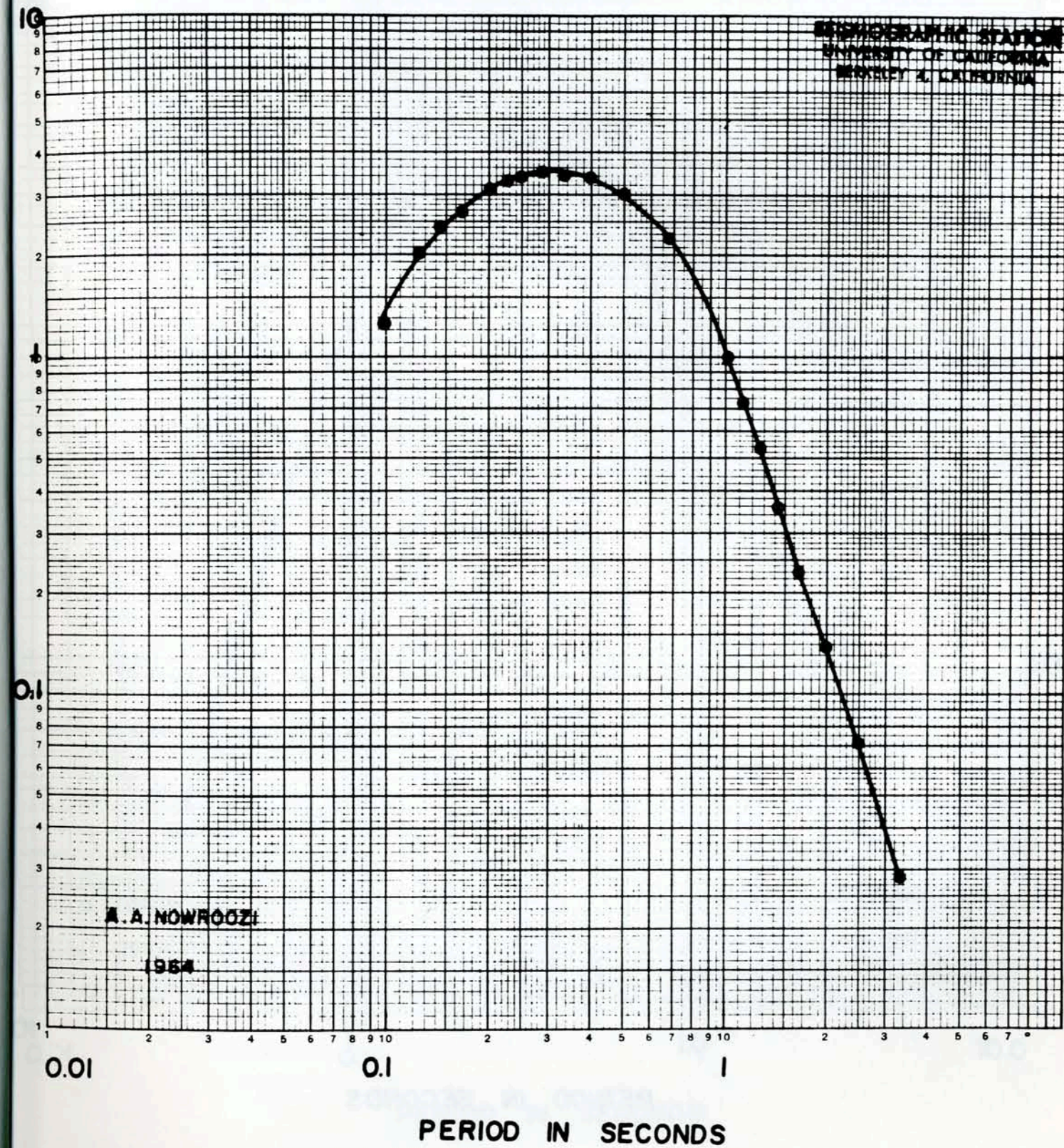


GEOLOGIC SECTION

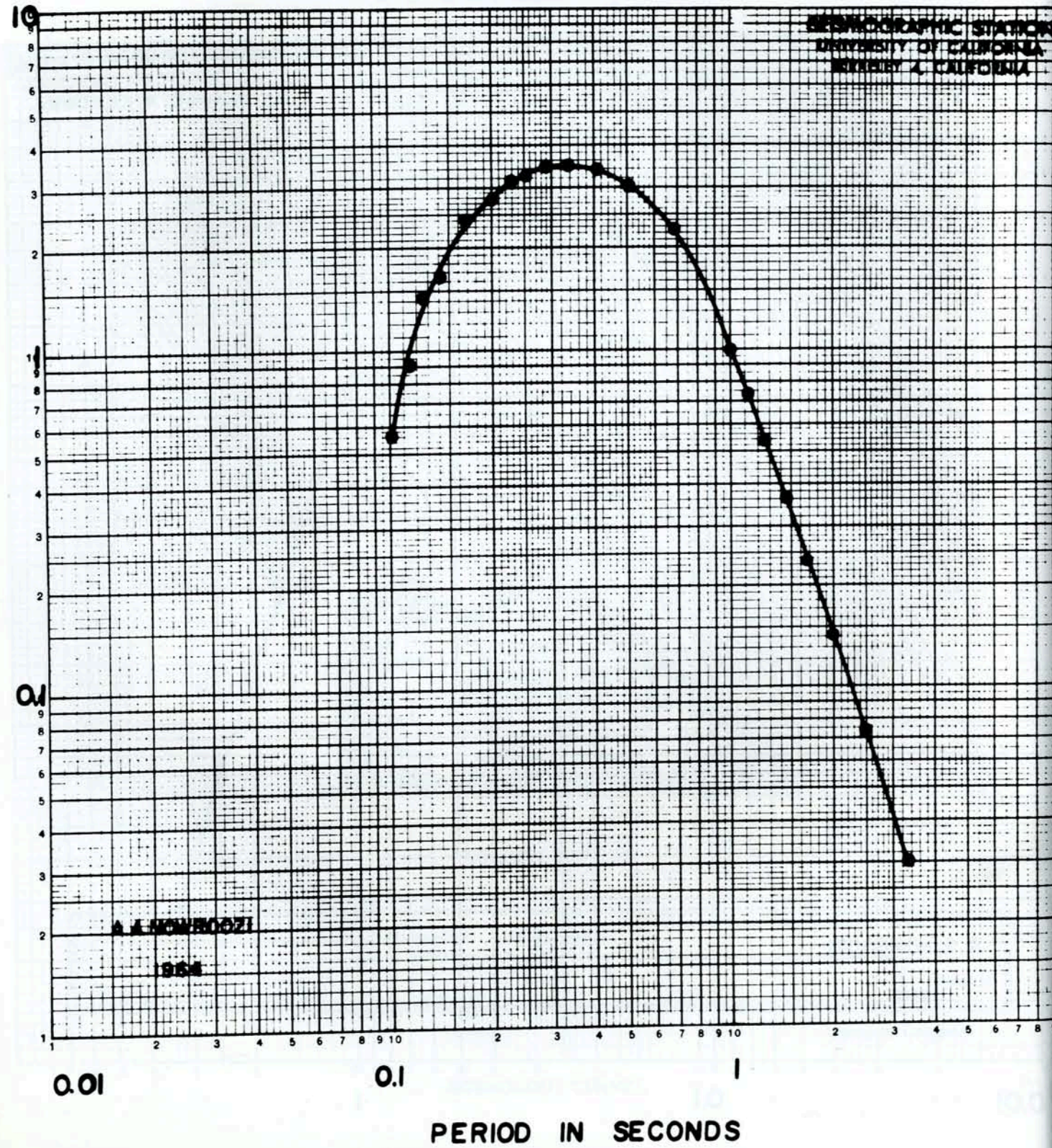


SEISMOLOGY TUNNEL

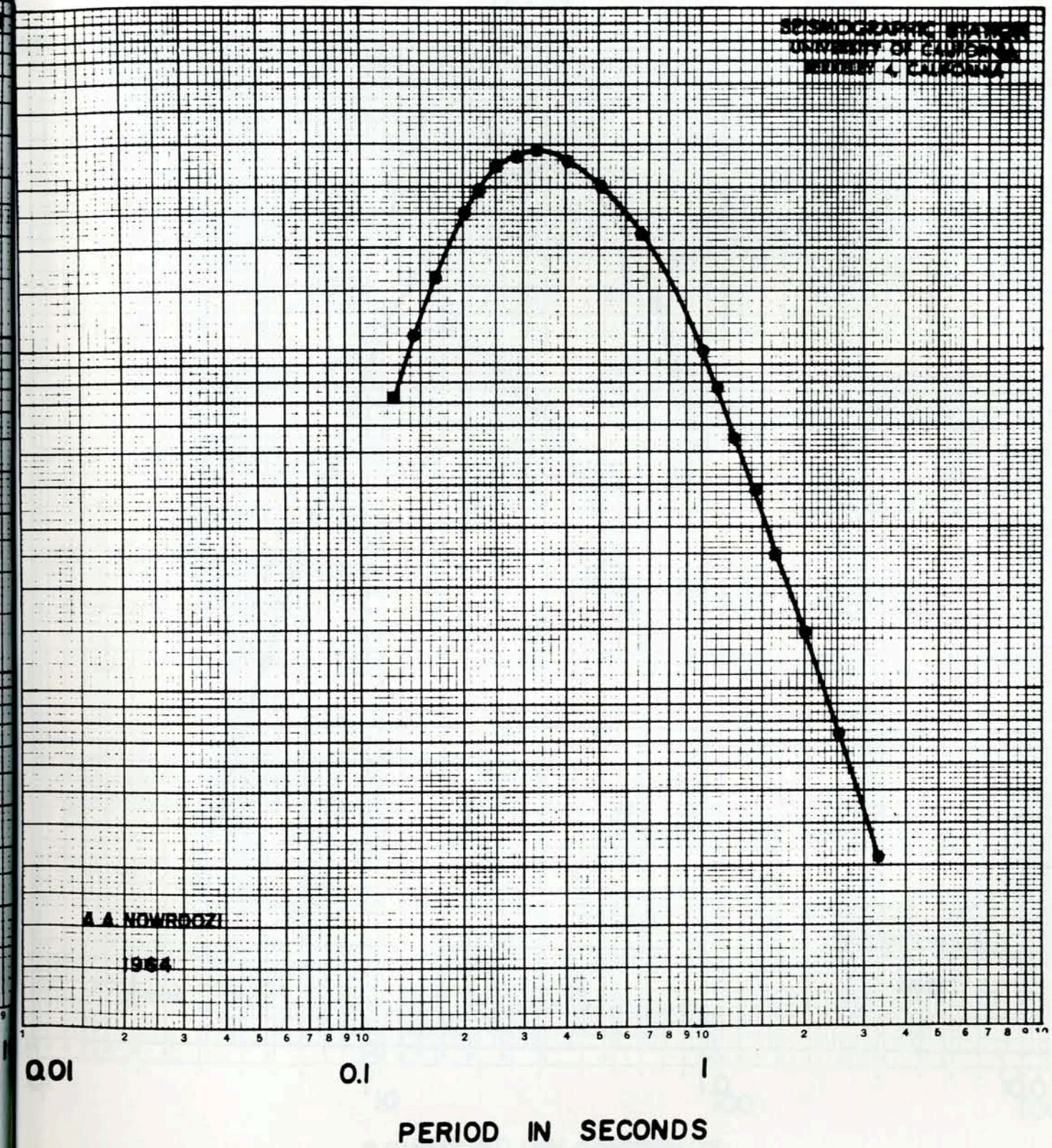
RESPONSE OF SEISMOMETER-DEVELOCORDER SYSTEM. 100KG. Z. S. P



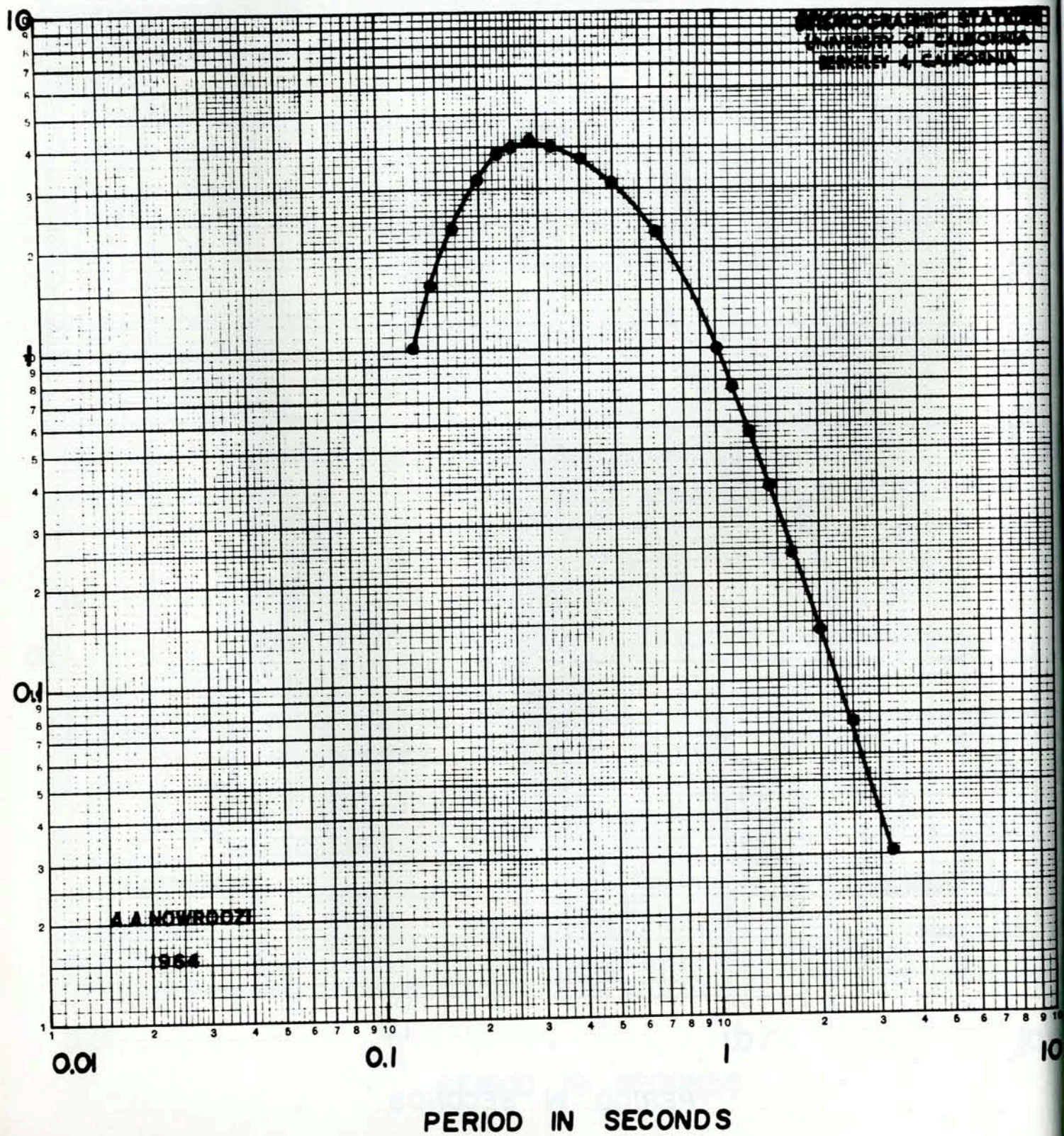
RESPONSE OF SEISMOMETER - HELICORDER SYSTEM. 100KG. Z. S.P.



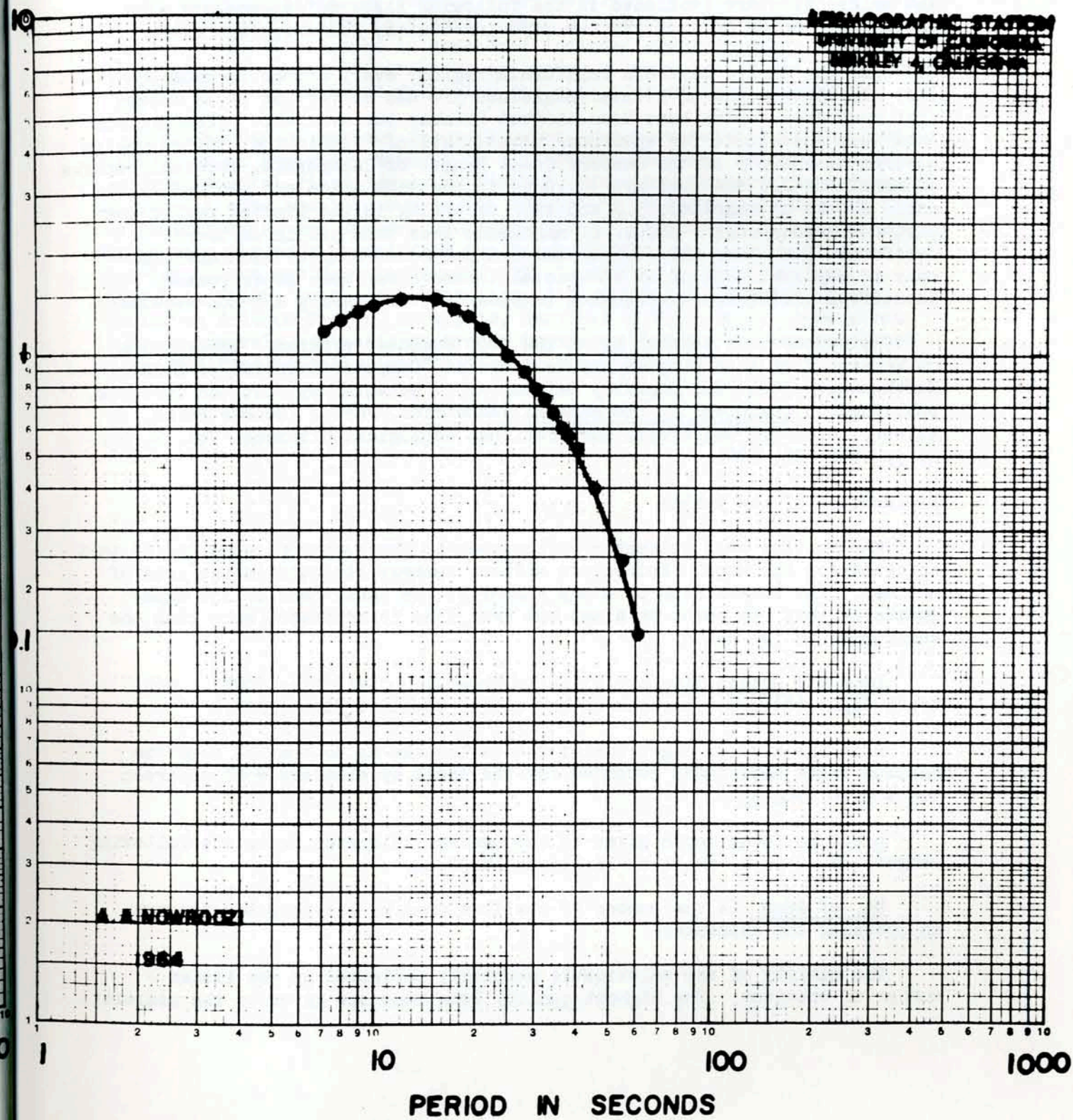
RESPONSE OF SEISMOMETER - HELICORDER SYSTEM. 14.7 KG. Z. S.P.



RESPONSE OF SEISMOMETER-DEVELOPORDER SYSTEM. 14.7 KG. Z. S.P



RESPONSE OF SEISMOMETER-HELICORDER SYSTEM. PRESS-EWING. Z. T.G=30S., T.S=15S.



PART I. LOCAL EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

This section includes information on earthquakes in northern California (including adjacent offshore areas) and in adjoining sections of Nevada and Oregon which were well enough recorded to permit a determination of the epicenter. Latitude and longitude of each epicenter and the corresponding date and origin time are tabulated in the following list; epicenters are also plotted on one or both of the two maps immediately following the list.

For the entire northern California region, every effort is made to list all earthquakes of Richter magnitude 3.0 and above, but it is likely that some such shocks have been omitted because the available seismographic data were inadequate for epicenter determination. Within the limited region covered by the map of the central Coast Ranges of California, locatable shocks of magnitude 2.5 and over are included in the tabulation and plotted on the map. Shocks of magnitude 3.0 and over occurring in the limited region are plotted on both maps. Shocks of magnitude less than 3.0 in northern California (and less than 2.5 in the central Coast Ranges) are tabulated only if reported felt or if of special interest for some other reason. Identified artificial earthquakes (explosions) ordinarily are not tabulated.

Epicenters are located by an IBM 7090 computer program. Information on Version I of this program may be found in "Computer Location of Local Earthquakes within the Berkeley Seismographic Network" by Bolt and Turcotte, published in Computers in the Mineral Industries, Part 2 (George Parks, Editor); Stanford University Publications, Geological Sciences, Vol. 9, No. 2, pp. 561-576, 1964.

Explanation of the table:

Map No. for each epicenter corresponds to the number plotted beside that epicenter on the maps. Epicenters without numbers lie outside the area of the map. The underlining of a map number in the table (and on the maps) indicates that one point on a map has been used to represent more than one earthquake in the table.

Date and Origin Time are given in Greenwich Civil Time (GCT). Subtract eight (8) hours to convert to Pacific Standard Time (PST).

M is the Richter magnitude of the earthquake as determined from the maximum trace amplitudes recorded for the shock by standard Wood-Anderson torsion seismographs.

h is the focal depth given to the nearest kilometer or by the following ranges: a, 0-5; b, 6-10; c, 11-15; d, 16-30 km.

No. of Stas. is the number of stations used by the computer program in locating the epicenter.

The quality of the solution is partially reflected by the listed number of stations. The highest quality locations are given to the nearest

minute of arc in latitude and longitude and to the tenth of a second origin time. Poorer quality locations are given to the nearest minute in latitude and longitude, to the nearest second in origin time, and are denoted by an asterisk.

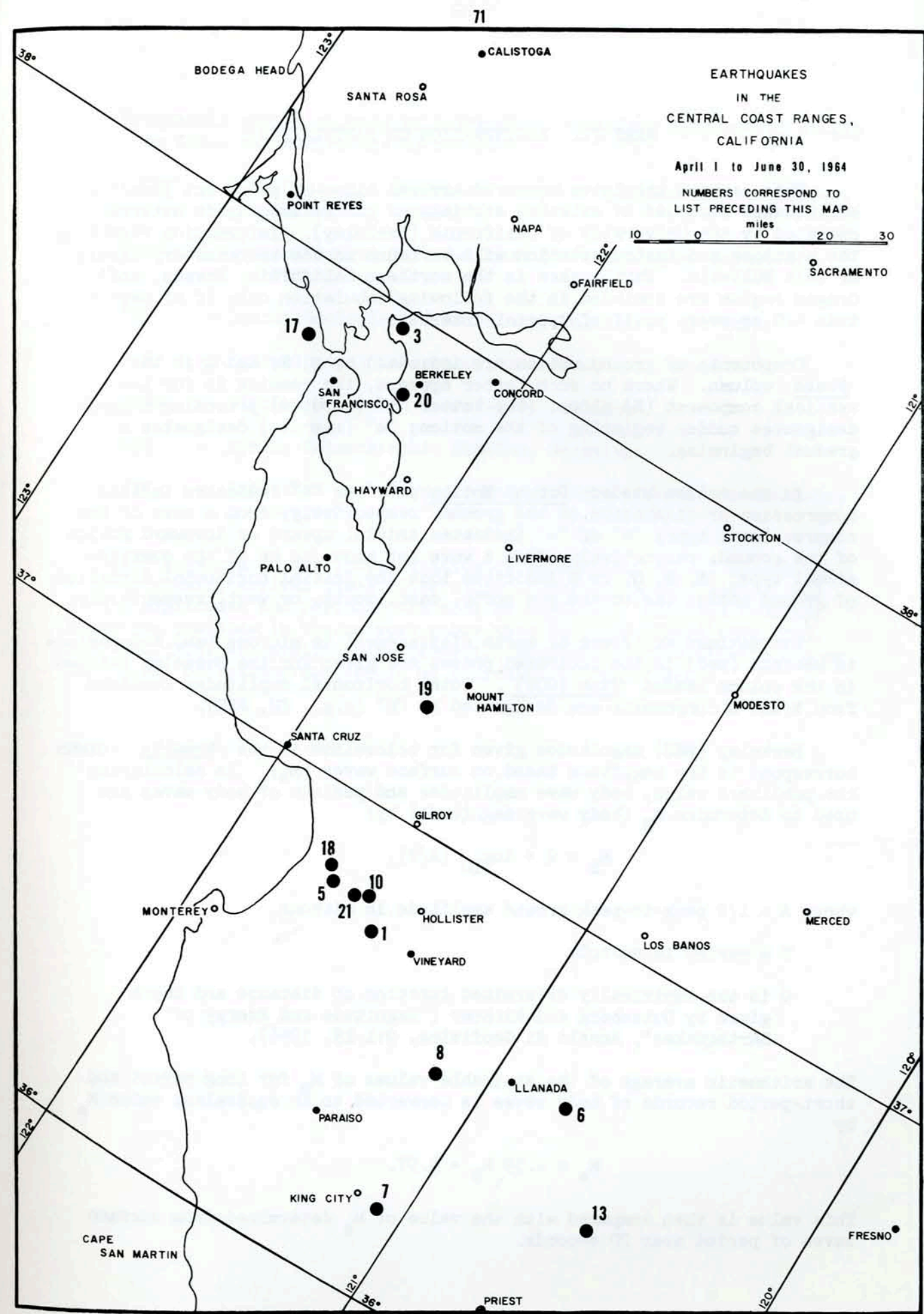
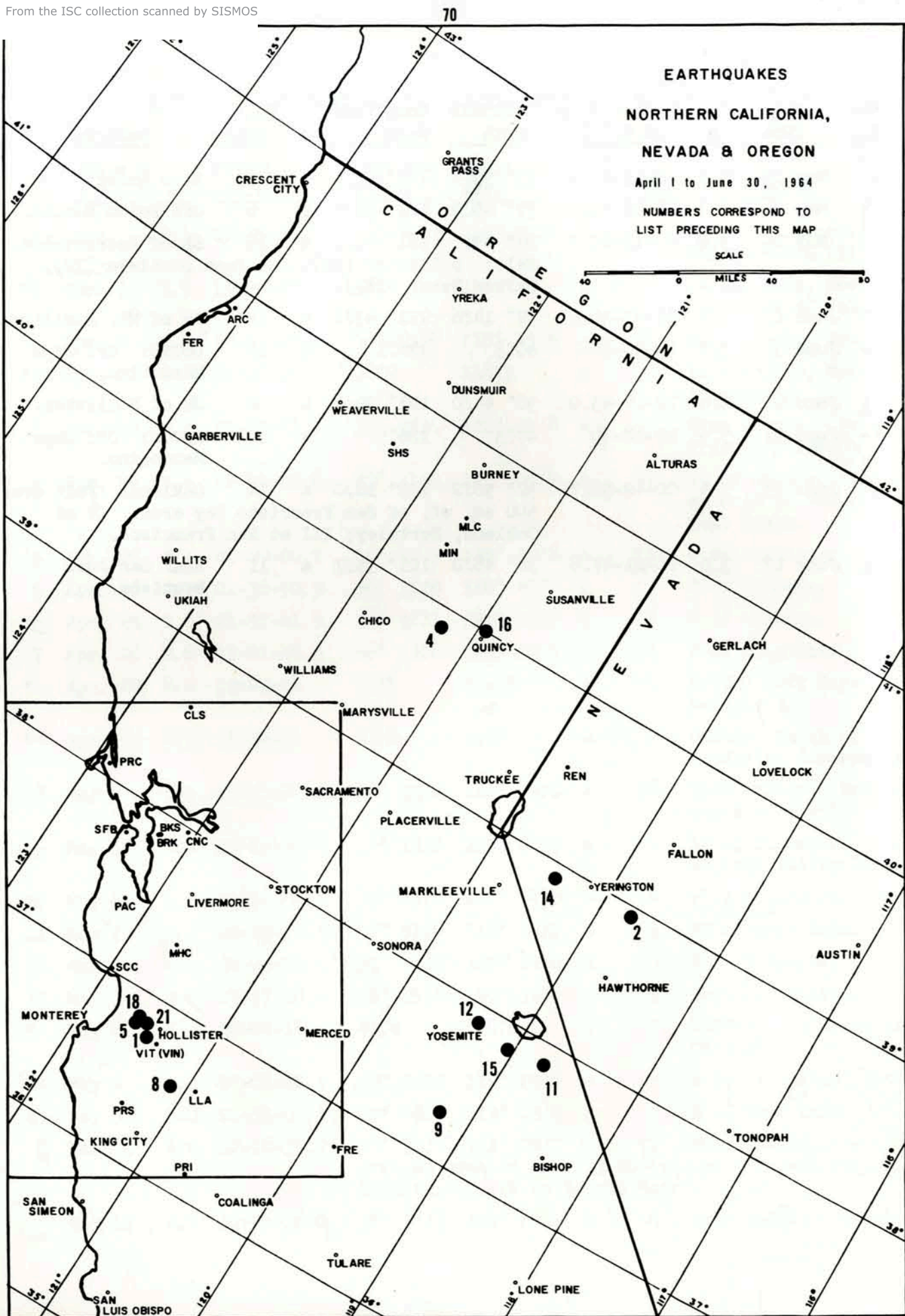
Under Remarks will be found a short descriptive location of the epicenter, usually relative to a point named on the map. Information on small foreshocks and aftershocks is sometimes included under Remarks, but when numerous foreshocks or aftershocks accompany a large earthquake, a separate tabulation may be included following the main list of local shocks.

Information on maximum intensities of shocks reported felt is also included under Remarks. Reports on felt earthquakes may be obtained from the Seismological Field Survey of the U.S. Coast and Geodetic Survey, which publishes a more complete summary in "Abstracts of Earthquake Reports for the Pacific Coast and Western Mountain Region." This regular quarterly publication may be obtained from the District Officer, San Francisco District, Coast and Geodetic Survey, 121 Customhouse, San Francisco, California 94126, or from the Director, U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland 20852. Intensities given in Roman numerals are assigned by the Coast and Geodetic Survey and based on the Modified Mercalli Intensity Scale of 1931.

EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
1	Apr. 3	3.1	06-35-51.7	36° 45'2	121° 30'1	a	11	SW of Hollister. Felt: Harris Ranch (II).
*2	Apr. 7	3.5	19-09-04	38°9	118°7	a	10	Walker Lake, Nev. Foreshock of following.
<u>2</u>	Apr. 9	3.7	18-43-20.4	38° 55'6	118° 43'6	a	11	Walker Lake, Nev.
* <u>2</u>	Apr. 11	3.2	03-25-08	38°9	118°7	a	10	Walker Lake, Nev. Aftershock.
3	Apr. 12	2.4	21-35-47.2	37° 57'6	122° 22'8	a	8	Near Pinole. Felt: Pinole, Etiwanda (III).
4	Apr. 24	3.4	07-44-02.6	39° 51'0	121° 16'2	a	15	SW of Quincy. Felt over an area of 900 sq. mi. V at Doyle.
5	Apr. 26	3.1	08-29-00.7	36° 47'5	121° 39'8	a	15	W of Hollister.
6	Apr. 26	2.7	21-36-52.9	36° 37'9	120° 46'2	b	8	E of Llanada.
<u>6</u>	Apr. 26	2.6	21-37-41.9	36° 37'3	120° 47'3	b	6	E of Llanada.
7	Apr. 28	2.8	15-01-48.3	36° 13'8	121° 05'0	b	7	Near King City.
*-	Apr. 29	4.6	19-22-24	41°4	124°9	d	5	USCGS: Off Cape Mendocino.
*-	Apr. 29	4.5	19-46-40	41°8	127°0	d	5	USCGS: North of Mendocino Escarpment.
8	May 5	3.3	13-25-29.2	36° 33'0	121° 09'0	a	16	Bear Valley. Fore-shock of May 13.
9	May 5	2.8	21-14-25.2	37° 18'2	119° 20'3	a	6	SE of Yosemite. III at Long Valley Dam.
10	May 6	2.8	15-58-06.9	36° 49'6	121° 34'6	b	14	W of Hollister.
11	May 7	3.7	02-23-18.3	37° 51'6	118° 46'3	a	9	SE of Mono Lake.
12	May 7	2.9	04-24-22.1	37° 54'0	119° 24'0	a	9	E of Yosemite.
13	May 7	2.5	17-53-58.0	36° 25'6	120° 32'6	a	5	North of Priest.
*-	May 8	4.3	10-04-16	43°4	126°6	d	4	USCGS: Off coast of Oregon.
14	May 9	3.0	07-06-02.1	38° 55'2	119° 29'4	a	6	W of Yerington, Nev.
15	May 9	3.0	21-54-03.5	37° 48'0	119° 03'0	a	8	S of Mono Lake.
<u>8</u>	May 13	4.0	12-18-37.2	36° 32'9	121° 09'7	b	17	Bear Valley. Felt over an area of about 3,000 sq. mi. of west central California. IV at Harris Ranch.
<u>8</u>	May 13	2.7	12-44-26.0	36° 33'3	121° 09'1	b	6	Bear Valley aftershock.

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
16	May 15	3.1	05-33-41.9	39° 59'4	120° 57'0	a	4	Near Quincy.
17	May 24	2.7	16-50-39.1	37° 49'2	122° 36'4	b	6	Off Point Bonita.
18	May 24	3.2	20-12-23.2	36° 49'7	121° 41'7	a	15	SE of Watsonville. Felt: Hollister (IV), San Juan Bautista (IV), Harris Ranch (III).
19	June 2	2.9	01-37-36.5	37° 14'6	121° 43'1	a	14	SW of Mt. Hamilton.
*-	June 3	3.9	13-50-16	40°3	126°1	d	16	USCGS: Off Cape Mendocino.
<u>1</u>	June 6	2.6	12-14-43.9	36° 44'0	121° 30'6	b	8	SW of Hollister.
*-	June 11	5.5	22-18-20	40°3	126°5	d	17	USCGS: Off Cape Mendocino.
20	June 13	3.4	00-42-56.7	37° 50'2	122° 18'0	a	14	Oakland. Felt over 500 sq. mi. of San Francisco Bay area. IV at Oakland, Berkeley; III at San Francisco.
21	June 13	3.0	08-21-47.8	36° 48'0	121° 35'7	a	11	Near San Juan Bautista.



PART II. REGISTRATION OF EARTHQUAKES

This section tabulates measured arrival times of prominent phases of earthquakes recorded at selected stations of the seismographic network operated by the University of California (Berkeley). Information regarding the stations and instrumentation will be found in the introductory section of this Bulletin. Earthquakes in the northern California, Nevada, and Oregon region are included in the following tabulation only if of magnitude 4.0 or over, or if of special interest.

Components of ground motion are indicated by N, E, and Z in the Phase column. Where no such letter appears, the reading is for the vertical component (Z) alone. The letter "i" (impetus) preceding a phase designates sudden beginning of the motion; "e" (emersio) designates a gradual beginning.

In the column headed Ground Motion, "c" or "d" indicates initial compression or dilatation of the ground, respectively, from a wave of the compressional type; "+" or "-" indicates initial upward or downward motion of the ground, respectively, from a wave not known to be of the compressional type. N, E, S, or W indicates that the initial horizontal direction of ground motion was toward the north, east, south, or west, respectively.

The maximum amplitude of earth displacement in microns (μ) and periods in seconds (sec) in the indicated phases are given for the Berkeley station in the column headed Time (GCT). Total horizontal amplitudes combined from N and E components are designated by "H" (e.g., PH, PPH).

Berkeley (BKS) magnitudes given for teleseisms in the Remarks column correspond to the magnitude based on surface waves (M_s). In calculating the published value, body wave amplitudes and periods of body waves are used to determine M_B (body wave magnitude) by:

$$M_B = Q + \log_{10} (A/T),$$

where $A = 1/2$ peak-to-peak ground amplitude in microns,

T = period in seconds

Q is the empirically determined function of distance and depth given by Gutenberg and Richter ("Magnitude and Energy of Earthquakes", *Annali di Geofisica*, 9:1-15, 1956).

The arithmetic average of the available values of M_B for long-period and short-period records of body waves is converted to an equivalent value M_s by

$$M_s = 1.59 M_B - 3.97.$$

This value is then compared with the value of M_s determined from surface waves of period near 20 seconds.

Frequently quoted sources of information regarding epicenters, origin times, or shock magnitudes are as follows:

- USCGS - U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland
- BCIS - Bureau Central International de Seismologie, Strasbourg, France
- PAL - Lamont Geological Observatory, Palisades, New York
- PAS - Seismological Laboratory, Pasadena, California
- WMSO - Wichita Mountains Observatory, Oklahoma
- BKS - Byerly Seismographic Station, Berkeley
- BRK - indicates the average magnitude determined by the Berkeley network.

All measurement and interpretation of seismograms (i.e., identification of phases, arrival times, directions of initial ground motion, and ground amplitudes and periods) are done at Berkeley. Readings from the remaining stations in the network other than the five listed (BKS, CLS, MHC, PRI, MIN) are available on request. Requests for additional data or for copies of seismograms should be addressed to the Director.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 1	MIN	eP	00 06 39.4	c	USCGS: 60°4 N, 146°4 W, 0 = 00 01 10.6. Alaska aftershock. h about 10 km.
Apr. 1	MIN	eP	01 59 28.7	c	USCGS: 59°7 N, 146°1 W, 0 = 01 54 09.3. Alaska aftershock. h about 15 km.
Apr. 1	MIN	iP	03 28 45.3	c	USCGS: 57°2 N, 151°3 W, 0 = 03 23 17.2. Alaska aftershock. h about 25 km.
Apr. 1	MIN	eP	04 54 54.7	d	USCGS: 57°2 N, 151°4 W, 0 = 04 44 26. Alaska aftershock. h about 20 km.
Apr. 1	MIN	iP	05 38 25.4	c	USCGS: 59°9 N, 146°0 W, 0 = 05 33 02.9. Alaska aftershock. h about 15 km.
Apr. 1	MIN	iP	06 21 49.2	d	USCGS: 60°2 N, 147°1 W, 0 = 06 16 21. Alaska aftershock. h about 15 km.
Apr. 1	MIN	eP	06 45 16.9	c	USCGS: 60°4 N, 146°7, 0 = 06 39 48.5. Alaska aftershock. h about 10 km.
Apr. 1	MIN	eP	08 38 48.2	d	USCGS: 59°9 N, 146°6 W, 0 = 08 33 22.0. Alaska aftershock. h about 10 km.
Apr. 1	MIN	iP	11 06 54.3	d	USCGS: 60°4 N, 146°5 W, 0 = 11 01 25.5. Alaska aftershock. h about 10 km.
Apr. 1	MIN	eP	13 38 51.1	c	USCGS: 59°7 N, 148°2 W, 0 = 13 33 23. Alaska aftershock. h about 20 km.
Apr. 1	MIN	eP	14 00 01.5	d	USCGS: 57°3 N, 151°3 W, 0 = 13 54 31.9. Alaska aftershock. h about 20 km.
Apr. 1	MIN	eP	16 34 27.5	c	USCGS: 59°7 N, 146°5 W, 0 = 16 29 09.0. Alaska aftershock. h about 15 km.
Apr. 1	MIN	iP	20 18 36.4	d	USCGS: 58°3 N, 149°6 W, 0 = 20 13 08.3. Alaska aftershock. h about 33 km.
Apr. 2	BKS	eP'	01 30 42.8	d	USCGS: 5°9 N, 95°7 E, 0 = 01 11 54.7. North of Sumatra. h about 130 km.
		ePP	32 32	d	
		ePKP	39 55	c	
		eSPP	44 04	d	
		eSSNE	49 28	SW	
		iP'P'E	52 26		
		eL	02 01.0		
		eNE	04.2		
		e(R)	06.7		
			mu sec		
		PPZ	1.20 16		
	MHC	eP'	01 30 45.5	d	
	MIN	iP'	37.5	c	
	CLS	eP'	40.0	d	
	PRI	eP'	48.8	d	
Apr. 2	MIN	eP	09 10 21.5	d	USCGS: 57°9 N, 151°1 W, 0 = 09 04 51.9. Alaska aftershock. h about 33 km.
Apr. 2	MIN	iP	10 03 27.7	d	USCGS: 56°5 N, 152°8 W, 0 = 09 52 54.5. Alaska aftershock. h about 20 km.
Apr. 2	MIN	iP	11 46 40.9	d	USCGS: 58°8 N, 149°6 W, 0 = 11 41 10.7. Alaska aftershock. h about 20 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 2	BKS	eP	22 40 05.3	c	USCGS: 54°8 N, 144°3 W, 0 = 22 34 31.7. Alaska aftershock. h about 20 km. Magnitude 5 (BKS).
		eSNE	44 50.0		
			mu sec		
		PZ	.217 2.3		
	MHC	eP	22 40 09.8	c	
	CLS	eP	39 59.6	d	
	PRI	eP	40 25.8	c	
Apr. 3	BKS	iP	22 39 35.8	d	USCGS: 61°6 N, 147°6 W, 0 = 22 33 42.2. Alaska aftershock. h about 40 km. Magnitude 5 3/4 - 6 (BKS).
		iPcP	42 30.5		
			mu sec		
		PZ	.394 8		
	MHC	eP	22 39 42.0	d	
	MIN	iP	17.6	c	
	CLS	eP	27.6	d	
	PRI	eP	54.5	d	
Apr. 4	MIN	iP	04 40 26.3	d	USCGS: 60°3 N, 146°5 W, 0 = 04 34 56.9. Alaska aftershock. h about 5 km.
Apr. 4	BKS	eP	04 59 41.3	c	USCGS: 60°1 N, 146°7 W, 0 = 04 54 01.7. Alaska aftershock. h about 40 km. Magnitude 5 3/4 (BKS).
			mu sec		
		PZ	2.86 10		
	MHC	eP	04 59 49.0	c	
	MIN	eP	25.3	c	
	CLS	eP	34.8	c	
	PRI	eP	01.7	c	
Apr. 4	MIN	iP	06 58 51.9	d	USCGS: 60°4 N, 146°0 W, 0 = 06 53 25.9. Alaska aftershock. h about 15 km.
Apr. 4	BKS	eP	08 46 12.8	d	USCGS: 56°5 N, 152°6 W, 0 = 08 40 29.8. Alaska aftershock. h about 15 km. Magnitude 5 1/4 (BKS).
		eSNE	50 56.0		
			mu sec		
		PZ	3.91 19		
		SH	4.14 16		
	MHC	eP	08 46 21.9	d	
	MIN	iP	02.0	d	
	CLS	eP	05.8	d	
	PRI	eP	35.5	d	
Apr. 4	BKS	iP	09 16 45.1	c	USCGS: 56°9 N, 152°7 W, 0 = 09 10 55.1 Alaska aftershock. h about 15 km. Magnitude 5 1/4 (BKS).
		eZ	19 52.0		
			mu sec		
		PZ	.404 2.0		
	MHC	eP	09 16 51.2	c	
	MIN	iP	30.8	c	
	CLS	eP	37.7	d	
	PRI	eP	17 05.0	c	
Apr. 4	MIN	iP	15 13 37.7	c	USCGS: 59°6 N, 146°9 W, 0 = 15 08 12.3. Alaska aftershock. h about 15 km.
Apr. 4	BKS	iP	17 52 00.8	d	USCGS: 56°3 N, 154°4 W, 0 = 17 46 08.6. Alaska aftershock. h about 25 km. Magnitude 5 1/2 - 6 (BKS).
		eSNE	56 47.0		
			mu sec		
		PZ	9.14 18		
		SH	13.55 16		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 4	MHC	eP	17 52 07.7	d	
(cont.)	MIN	iP	51 47.4	d	
	CLS	eP	53.9	d	
	PRI	eP	52 20.7	d	
Apr. 4	BKS	eP	18 05 37.1	d	USCGS: 56°4 N, 154°5 W, 0 = 17 59 43.3. Alaska aftershock. h about 25 km.
		PZ	.138 1.3		
	MHC	eP	18 05 43.5	d	
	MIN	iP	23.4	d	
	CLS	eP	30.4	d	
	PRI	eP	57.0	d	
Apr. 4	MIN	iP	20 07 09.3	d	USCGS: 59°5 N, 147°6 W, 0 = 20 01 44.8. Alaska aftershock. h about 33 km.
Apr. 4	MIN	eP	22 22 02.7	d	USCGS: 59°4 N, 145°2 W, 0 = 22 16 54.5. Alaska aftershock. h about 10 km.
Apr. 5	BKS	eP	01 28 03.1	c	USCGS: 56°2 N, 153°5 W, 0 = 01 22 13.3. Alaska aftershock. h about 25 km. Magnitude 5 3/4 (BKS).
		eZ	31 23.8		
		eSNE	48.0		
			mu sec		
		PZ	6.02 18		
		SH	5.59 18		
	MHC	eP	01 28 07.9	c	
	MIN	iP	27 46.7	c	
	CLS	eP	54.8	c	
	PRI	eP	28 20.8	d	
Apr. 5	BKS	eP	01 47 31.5	c	USCGS: 56°2 N, 153°3 W, 0 = 01 41 45.0. Alaska aftershock. h about 35 km.
			mu sec		
		PZ	.175 1.6		
	MHC	eP	01 47 37.0	c	
	MIN	iP	17.6	d	
	CLS	eP	25.0	c	
	PRI	eP	51.5	c	
Apr. 5	MIN	eP	02 41 34.6	c	USCGS: 60°1 N, 145°8 W, 0 = 02 36 10.8. Alaska aftershock. h about 15 km.
Apr. 5	MIN	iP	17 46 18.2	d	USCGS: 56°3 N, 152°9 W, 0 = 17 40 43.1. Alaska aftershock. h about 10 km.
Apr. 5	MIN	iP	17 47 24.9	d	USCGS: 59°6 N, 144°9 W, 0 = 17 42 07.4. Alaska aftershock. h about 15 km.
Apr. 5	BKS	iP	19 34 04.2	c	USCGS: 60°2 N, 146°7 W, 0 = 19 28 18.1. Alaska aftershock. h about 15 km.
			mu sec		
		PZ	.362 1.5		
	MHC	eP	19 34 07.3	c	
	MIN	iP	46.8	c	
		ipP	54.4	d	
	CLS	eP	33 53.5	d	
		ePcP	37 20.2	c	
	PRI	eP	34 20.9	d	
		ePcP	37 28.1	c	
Apr. 6	MIN	iP	10 47 58.8	d	USCGS: 59°9 N, 145°6 W, 0 = 10 42 36.3. Alaska aftershock. h about 15 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 6	MIN	eZ	16 22 19.4	c	USCGS: 45°2 N, 150°9 E, 0 = 16 10 52.2. Kurile Islands. h about 33 km.
Apr. 6	MIN	eP	17 41 20.2	d	USCGS: 59°9 N, 147°8 W, 0 = 17 35 50.6. Alaska aftershock. h about 15 km.
Apr. 7	MIN	iP	01 49 16.6	c	USCGS: 54°6 N, 145°5 W, 0 = 01 43 28.7. Alaska aftershock. h about 15 km.
Apr. 7	MIN	eP	03 23 02.4	d	USCGS: 59°6 N, 145°5 W, 0 = 03 17 43. Alaska aftershock. h about 15 km.
Apr. 7	MIN	iP	04 00 15.4	c	USCGS: 61°1 N, 148°7 W, 0 = 03 53 57. Alaska aftershock. h about 33 km.
Apr. 7	MIN	eP	04 40 46.4	d	USCGS: 58°3 N, 149°7 W, 0 = 04 35 18.6. Alaska aftershock. h about 15 km.
Apr. 7	MIN	eP	05 01 14.6	d	USCGS: 58°1 N, 157°4 W, 0 = 04 54 42. Alaska aftershock. h about 15 km.
Apr. 7	MIN	eP	06 07 18.9	c	
Apr. 7	MIN	eP	08 08 49.5	c	USCGS: 58°2 N, 152°2 W, 0 = 08 03 13.7. Alaska aftershock. h about 30 km.
Apr. 7	MIN	eP	08 16 11.0	d	
Apr. 7	MIN	eP	09 09 10.7	c	
Apr. 7	MIN	eP	11 06 00.5	c	
Apr. 7	BKS	eP	13 36 33.0	c	USCGS: 0°1 N, 123°2 E, 0 = 13 18 18.9. Celebes. h about 150 km. Magnitude 6.3 (CGS).
		eZ	56.0	c	
	MHC	eP	35.2	c	
	MIN	eP	33.2	d	
	CLS	eP	32.0	c	
	PRI	eP	38.0	c	
Apr. 7	MIN	iP	16 33 53.8	d	USCGS: 54°6 N, 145°0 W, 0 = 16 28 38. Alaska aftershock. h about 33 km.
Apr. 7	MIN	eP	18 07 54.3	d	
Apr. 7	BKS	iP	19 34 04.8	c	USCGS: 55°7 N, 151°9 W, 0 = 19 28 24.7. Alaska aftershock. h about 20 km. Magnitude 5.6 (CGS).
		iZ	33.0	d	
		eP	06		
		eSNE	38 48		
		eGE	40.6		
			mu sec		
		PZ	0.143 1.5		
		MaxH	3.72 28		
	MHC	eP	19 34 10.7	d	
	MIN	iP	33 50.5	d	
	CLS	eP	57.5	d	
	PRI	eP	24.2	d	
Apr. 7	MIN	iP	00 03 32.1	d	
Apr. 8	MIN	iP	00 41 55.7	c	USCGS: 57°2 N, 152°6 W, 0 = 00 36 21.2. Alaska aftershock. h about 20 km.
Apr. 8	MIN	iP	02 14 09.4	d	USCGS: 46°1 N, 152°8 E, 0 = 02 04 06.5. Kurile Islands. h about 40 km.
Apr. 8	MIN	iP	04 05 37.9	d	USCGS: 60°0 N, 149°5 W, 0 = 04 00 01.1. Alaska aftershock. h about 33 km.
Apr. 8	MIN	eP	04 40 40.7	c	USCGS: 59°4 N, 147°6 W, 0 = 04 35 18. Alaska aftershock. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 8	MIN	eP	05 15 16.8	c	
Apr. 8	BKS	iP	08 27 55.2	d	USCGS: 6°8 S, 68°9 E, 0 = 08 08 11.8.
		iZ	29 09.0		Indian Ocean. h about 33 km.
		eZ	09 09.5		Magnitude 6.0 (CGS).
	MHC	eP	08 27 56.8	c	
	MIN	eP	47.0	c	
	CLS	eP	52.0	d	
	PRI	eP	56.8	d	
Apr. 8	MIN	eP	09 49 20.7	c	USCGS: 60°3 N, 146°8 W, 0 = 09 43 51.
					Alaska aftershock. h about 33 km.
Apr. 8	MIN	eP	09 59 26.7	c	USCGS: 60°5 N, 141°0 W, 0 = 09 54 16.6.
					Alaska aftershock. h about 20 km.
Apr. 8	BKS	eP	11 08 28.8	d	USCGS: 45°8 N, 150°8 E, 0 = 10 58 09.1.
		ipP	41.4	c	Kurile Islands. h about 40 km.
		iZ	53.0	d	Magnitude 5 1/2 - 5 3/4 (BKS).
		ePcP	09 26.0	d	
		ePP	10 51.0	c	
		eSNE	16 54.0	SEd	
		eSSNE	20 44.0	SEd	
		eGNE	23.8		
		eRE	26.6		
			mu sec		
		PZ	2.0 16		
		SH	6.04 26		
		MaxH	16.9 40		
	MHC	eP	11 08 29.5	d	
	MIN	iP	20.6	c	
		ipP	35.0	d	
		eS	16 41.0		
	CLS	eP	08 17.8	d	
	PRI	eP	24.0	d	
Apr. 8	MIN	eP	13 10 12.1	c	
Apr. 8	MIN	eP	16 52 08.3	d	USCGS: 60°3 N, 147°8 W, 0 = 16 46 38.
					Alaska aftershock. h about 33 km.
Apr. 8	MIN	eP	19 04 10.5	c	USCGS: 56°9 N, 149°9 W, 0 = 18 58 50.5.
					Alaska aftershock. h about 35 km.
Apr. 8	BKS	eP	19 39 02.6	c	USCGS: 59°6 N, 147°0 W, 0 = 19 33 19.0.
		eZ	23.4	d	Alaska aftershock. h about 15 km.
		eSNE	43 50.0	SW	
		eGNE	45.0		
		eRNE	46.0		
			mu sec		
		PZ	0.031 1.1		
		MaxH	4.7 24		
	MHC	eP	19 39 08.5	d	
	MIN	iP	38 44.7	d	
	CLS	eP	54.7	d	
	PRI	eP	39 21.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 8	BKS	eP	19 56 01.5	d	USCGS: 60°4 N, 145°9 W, 0 = 19 50 16.8
		eZ	11.8	c	Alaska aftershock. h about 10 km.
			mu sec		
		PZ	0.131 1.4		
		MaxH	4.93 20		
	MHC	eP	19 56 07.4	d	
	MIN	eP	55 44.3	d	
	CLS	eP	54.0	d	
	PRI	eP	56 21.0	d	
Apr. 9	MIN	iP	00 49 10.6	c	USCGS: 49°1 N, 127°5 W, 0 = 00 46 53.
					Vancouver Island. h about 33 km.
Apr. 9	BKS	eP	04 22 31.5	c	USCGS: 13°5 N, 89°9 W, 0 = 04 15 23.0.
		eGNE	32.0		San Salvador. h about 90 km.
			mu sec		Magnitude 5.0 (CGS).
		PZ	0.104 1.4		
	MHC	eP	04 22 26.5	d	
	MIN	eP	38.7	c	
	CLS	eP	37.3	d	
	PRI	eP	14.3	c	
Apr. 9	MIN	eP	05 06 50.0	d	
Apr. 9	MIN	eP	05 48 53.1	c	USCGS: 60°0 N, 148°2 W, 0 = 05 43 24.
					Alaska aftershock. h about 33 km.
Apr. 9	MIN	eP	06 58 58.0	d	USCGS: 60°0 N, 148°9 W, 0 = 06 53 16.
					Alaska aftershock. h about 25 km.
Apr. 9	MIN	eP	07 16 25.6	c	
Apr. 9	MIN	eP	10 42 41.0	c	USCGS: 59°1 N, 148°4 W, 0 = 10 37 15.
					Alaska aftershock. h about 20 km.
Apr. 9	MIN	eP	12 38 55.1	d	USCGS: 59°5 N, 148°9 W, 0 = 12 33 23.9.
					Alaska aftershock. h about 20 km.
Apr. 9	BKS	eP	13 11 56.8	c	USCGS: 59°6 N, 146°1 W, 0 = 13 06 15.2.
		iZ	12 21.0		Alaska aftershock. h about 15 km.
		eSNE	16 44.0		
			mu sec		
		PZ	0.109 1.2		
		SH	2.16 11		
		MaxH	5.38 14		
	MHC	eP	13 12 02.8	c	
	MIN	eP	11 38.0	d	
	CLS	eP	49.4	c	
	PRI	eP	12 16.2	c	
Apr. 9	MIN	iP	13 27 58.2	c	USCGS: 56°8 N, 152°0 W, 0 = 13 22 29.6.
					Alaska aftershock. h about 33 km.
Apr. 9	MIN	eP	14 20 02.4	c	USCGS: 59°8 N, 146°0 W, 0 = 14 14 36.5.
					Alaska aftershock. h about 10 km.
Apr. 9	MHC	eP	22 06 10.6	c	USCGS: 18°5 S, 71°5 W, 0 = 21 54 42.1.
	MIN	eP	22.2	d	South of Peru. h about 39 km.
	CLS	eP	18.0	c	
	PRI	eP	02.7	d	
Apr. 10	BKS	iP	01 13 52.5	d	USCGS: 59°7 N, 148°2 W, 0 = 01 08 00.2.
		eZ	14 05.5	c	Alaska aftershock. h about 15 km.
		eSNE	18 40.0	SWd	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 10 (cont.)		eGN eRNE	01 20.5 21.4		
			mu sec		
		PZ	0.224 1.6		
		SH	1.66 17		
		MaxH	5.9 16		
	MHC	eP	01 13 04.8	c	
	MIN	iP	32.8	c	
	CLS	eP	41.6	c	
	PRI	eP	14 07.7	c	
Apr. 10	MIN	iP	01 44 03.2	d	
Apr. 10	MIN	iP	06 16 22.4	c	
Apr. 10	MIN	eP	07 09 36.5	d	USCGS: 60°2 N, 147°0 W, 0 = 07 04 11. Alaska aftershock. h about 33 km.
Apr. 10	MIN	eP	11 59 25.1	c	
Apr. 10	MIN	eP	12 12 08.8	c	
Apr. 10	MIN	eP	13 22 26.2	d	USCGS: 13°5 N, 144°9 E, 0 = 13 10 05.6. Mariana Islands. h about 101 km.
Apr. 10	MIN	iP	19 11 23.5	d	USCGS: 59°7 N, 148°2 W, 0 = 19 05 52.6. Alaska aftershock. h about 15 km.
Apr. 10	BKS	iP	21 50 17.5	d	USCGS: 60°1 N, 153°7 W, 0 = 21 44 06.7. Alaska aftershock. h about 10 km.
		iZ	31.5	d	
		eZ	54 09.8	d	Magnitude 5.6 (CGS).
		eSE	55 16.0		
		eGNE	57.0		
			mu sec		
		PZ	0.097 1.3		
		MaxH	6.62 36		
	MHC	eP	21 50 24.9	c	
	MIN	eP	00.8	d	
	CLS	eP	10.5	d	
	PRI	eP	36.4	c	
Apr. 11	MIN	iP	00 44 36.2	d	USCGS: 57°4 N, 150°0 W, 0 = 00 39 10.6. Alaska aftershock. h about 15 km.
Apr. 11	BKS	iPNE	01 16 34.3	SWd	USCGS: 29°0 S, 178°9 W, 0 = 01 04 30.2. Kermadec Islands. h about 302 km.
			mu sec		
		PZ	0.27 1.0		
	MHC	eP	01 16 34.5	d	
	MIN	eP	42.8	d	
	CLS	eP	35.5	d	
	PRI	eP	33.4	d	
Apr. 11	MIN	eP	04 45 32.0	c	USCGS: 58°8 N, 152°6 W, 0 = 04 40 00. Alaska aftershock. h about 33 km.
Apr. 11	MIN	iP	07 39 16.7	d	USCGS: 59°6 N, 144°8 W, 0 = 07 33 52. Alaska aftershock. h about 33 km.
Apr. 11	MIN	eP	09 29 19.5	c	USCGS: 56°4 N, 152°2 W, 0 = 09 23 51.5. Alaska aftershock. h about 33 km.
Apr. 11	MIN	eP	10 25 59.3	c	USCGS: 60°8 N, 143°5 W, 0 = 10 20 40. Alaska aftershock. h about 20 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 11	MIN	eP	12 22 06.5	c	USCGS: 56°6 N, 151°0 W, 0 = 12 16 41.1. Alaska aftershock. h about 20 km.
Apr. 11	MIN	iP	16 14 02.4	c	USCGS: 40°5 N, 25°0 E, 0 = 16 00 42.8. Aegean Sea. h about 33 km.
Apr. 11	MIN	iP	16 15 52.3	c	USCGS: 58°1 N, 149°8 W, 0 = 16 10 25. Alaska aftershock. h about 20 km.
Apr. 11	MIN	eP	19 14 46.8	c	
Apr. 11	MIN	iP	22 08 05.8	c	USCGS: 60°2 N, 149°9 W, 0 = 22 02 38.2. Alaska aftershock. h about 20 km.
Apr. 11	MIN	eP	01 20 53.9	c	USCGS: 60°0 N, 144°9 W, 0 = 01 15 38. Alaska aftershock. h about 30 km.
Apr. 12	BKS	iP	01 30 16.0	c	USCGS: 56°6 N, 152°2 W, 0 = 01 24 31.2. Alaska aftershock. h about 22 km. Magnitude 5.6 (CGS).
		iZ	26.9	c	
		iPP	31 15.9	d	
		iPcP	33 13.9	c	
		eZ	37 14.9	d	
		ePNE	30 18.0	NWd	
		eSNE	35 00.0	SEc	
		eN	36.3		
		eRE	37.3		
			mu sec		
		PZ	0.80 18		
		SH	1.23 16		
		MaxH	40.8 24		
	MHC	eP	01 30 22.0	d	
	MIN	iP	00.9	d	
	CLS	eP	09.1	c	
	PRI	eP	36.0	c	
Apr. 12	MIN	iP	01 37 09.9	c	
Apr. 12	MIN	eP	06 13 24.0	c	USCGS: 13°6 S, 166°0 E, 0 = 06 00 46.4. New Hebrides Islands. h about 33 km.
Apr. 12	MIN	iP	09 40 14.1	d	USCGS: 56.6° N, 152°1 W, 0 = 09 34 44.1. Alaska aftershock. h about 20 km.
Apr. 12	BKS	eP	11 23 43.0	d	USCGS: 33°9 S, 179°8 W, 0 = 11 10 54.8. Off North New Zealand.
		eZ	58.0	c	
		iZ	24 39.4	d	h about 89 km.
	MHC	eP	23 41.4	c	
	MIN	eP	52.2	c	
	CLS	eP	43.8	c	
	PRI	eP	41.5	c	
Apr. 12	MIN	iP	12 41 26.1	d	USCGS: 56°4 N, 151°4 W, 0 = 12 36 23. Alaska aftershock. h about 30 km.
Apr. 12	MIN	eP	12 41 48.4	d	
Apr. 12	MIN	iP	12 53 26.3	d	USCGS: 56°6 N, 151°3 W, 0 = 12 48 02.2. Alaska aftershock. h about 33 km.
Apr. 12	MIN	iP	14 41 26.6	d	USCGS: 61°2 N, 151°1 W, 0 = 14 35 39.2. Alaska aftershock. h about 28 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 12	MIN	eP	15 13 47.9	d	USCGS: 61°2 N, 147°4 W, 0 = 15 08 09.5. Alaska aftershock. h about 20 km.
Apr. 12	MIN	iP	17 27 26.1	c	
Apr. 12	MIN	iP	03 14 34.6	d	USCGS: 23°7 S, 179°0 W, 0 = 03 02 46.3. South of Fiji Islands. h about 360 km.
Apr. 13	MIN	iP	06 34 41.5	c	USCGS: 19°5 S, 177°7 W, 0 = 06 23 34.1. Tonga Islands. h about 574 km.
Apr. 13	MIN	eP	08 42 49.5	c	USCGS: 45°3 N, 18°1 E, 0 = 08 30 03.6. Northern Yugoslavia (2 killed). h about 33 km.
Apr. 13	MIN	eP	08 47 26.0	d	USCGS: 58°4 N, 151°2 W, 0 = 08 41 53.9. Alaska aftershock. h about 33 km.
Apr. 13	BKS	iP	08 57 07.1	d	USCGS: 22°3 N, 142°1 E, 0 = 08 45 24.6. Bonin Island. h about 309 km.
	MHC	eP	10.2	c	
	MIN	iP	04.5	d	
	CLS	eP	00.9	c	
	PRI	eP	16.8	c	
Apr. 13	BKS	eP	12 31 07.5	d	USCGS: 59°4 N, 143°9 W, 0 = 12 25 36.0. Alaska aftershock. h about 40 km.
		epP	27.6	d	
		ePP	32 12.6	c	
		ePcP	33 40.0	c	
		eSNE	35 24.0	SE	
		eRNE	37.7		
		MaxH	mu sec		
			2.13 36		
	MHC	eP	12 31 23.3	c	
	MIN	iZ	10.6	d	
	CLS	eP	04.7	c	
	PRI	eP	26.4	c	
Apr. 13	BKS	eP	14 10 45.6	c	USCGS: 57°6 N, 151°2 W, 0 = 14 05 00.0. Alaska aftershock. h about 25 km.
		PZ	6.5 1.4		
	MHC	eP	14 10 50.9	d	
	MIN	iP	29.6	d	
	CLS	eP	37.9	d	
	PRI	eP	11 05.1	d	
Apr. 13	MHC	eP	16 19 57.0	c	USCGS: 56°6 N, 152°1 W, 0 = 16 14 06.3. Alaska aftershock. h about 33 km.
	MIN	iP	20 09.3	c	
	CLS	eP	19 43.5	d	
	PRI	eP	20 08.8	d	
Apr. 13	MIN	iP	18 21 44.4	d	
Apr. 13	BKS	eP	21 31 25.0	d	USCGS: 57°5 N, 153°9 W, 0 = 21 25 33.0. Kodiak Island. h about 30 km.
		PZ	0.083 1.3		
	MHC	eP	21 31 34.8	c	
	MIN	iP	13.2	d	
	CLS	eP	20.2	c	
	PRI	eP	47.3	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Apr. 13	BKS	iP	21 48 44.0	c	USCGS: 59°4 N, 143°1 W, 0 = 21 43 16.5. Alaska aftershock. h about 33 km.
		eZ	49 11.1	d	
		eGNE	54.4		
		eR	55.2		
	MHC	eP	48 50.0	c	
	MIN	iP	24.1	d	
	CLS	eP	30.6	c	
	PRI	eP	49 02.6	d	
Apr. 14	MIN	eP	06 25 02.9	c	USCGS: 60°2 N, 146°8 W, 0 = 06 19 38 Alaska aftershock. h about 33 km.
Apr. 14	MIN	eP	08 04 58.9	d	USCGS: 6°4 N, 147°0 W, 0 = 07 59 25.4. Alaska aftershock. h about 33 km.
Apr. 14	MIN	eZ	09 11 25.7	d	USCGS: 17°5 S, 167°9 E, 0 = 08 58 4.9. New Hebrides Islands. h about 33 km.
Apr. 14	MIN	eP	09 53 22.8	c	USCGS: 56°0 N, 150°0 W, 0 = 09 48 11. Alaska aftershock. h about 25 km.
Apr. 14	MIN	eP	11 03 36.5	c	USCGS: 59°9 N, 146°8 W, 0 = 10 58 11. Alaska aftershock. h about 20 km.
Apr. 14	BKS	iP	16 01 04.0	c	USCGS: 61°3 N, 147°3 W, 0 = 15 55 10.9. Alaska aftershock. h about 30 km. Felt: Anchorage. Magnitude 5.4 (CGS).
		eZ	15.5	c	
		eGE	07.4		
		eRNE	08.0		
		PZ	mu sec		
			0.31 1.4		
		MaxH	3.8 32		
	MHC	eP	16 01 09.3	d	
	MIN	iP	00 45.4	d	
	CLS	eP	55.8	d	
	PRI	eP	01 22.7	d	
Apr. 14	BKS	iP	17 05 33.7	d	USCGS: 61°4 N, 150°8 W, 0 = 16 59 30.1. Alaska aftershock. h about 35 km. Felt: Anchorage.
		PZ	0.042 1.0		
	MHC	eP	17 05 39.6	d	
	MIN	iP	16.0	d	
	CLS	eP	26.2	d	
	PRI	eP	52.8	d	
Apr. 14	BKS	iP	22 35 09.5	c	USCGS: 59°9 N, 145°6 W, 0 = 22 29 31.1. Alaska aftershock. h about 23 km.
	MHC	eP	16.2	d	
	MIN	iP	51.8	c	
	CLS	eP	02.6	d	
	PRI	eP	29.4	c	
Apr. 14	MIN	eP	22 39 07.5	c	
Apr. 14	BKS	eP	23 01 24.0	c	USCGS: 58°0 N, 152°6 W, 0 = 22 55 31.3. Alaska aftershock. h about 30 km.
		eSE	06 14.0	E	
		eGNE	07 36.0		
		eRNE	08.7		
		PZ	mu sec		
			0.06 1.3		
	MHC	eP	23 01 30.7	c	
	MIN	iP	07.1	d	
	CLS	eP	16.9	c	
	PRI	eP	43.7	c	

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
Apr. 15	BKS	eP	08	29 08.0	d	
	MHC	eP		11.7	c	
	MIN	iP	28	49.9	c	
	CLS	eP		51.5	d	
	PRI	eP		25.5	c	
Apr. 15	MIN	eP	09	29 43.7	c	
Apr. 15	MIN	iP	13	47 05.3	d	
Apr. 15	BKS	iZ	14	31 35.6	c	
	MHC	eP		18.0	c	
	MIN	iP		27.0	c	
	PRI	eP		03.1	c	
Apr. 15	BKS	iP	15	36 39.1	d	USCGS: 56°5 N, 154°4 W, 0 = 15 30 47.1.
		ipP		36 58.0	d	Alaska aftershock. h about 35 km.
		iPP		37 27.5	d	Magnitude 5 - 5 1/4 (BKS).
		ePcP		40 12.5	c	
		ePNE		36 40.0	NWd	
		iPPNE		37 25.0	NWd	
		eSNE		41 24.0	NEd	
		eRNE		43.8		
			mu	sec		
		PZ	2.3	20		
		SH	6.24	18		
		MaxH	22.8	22		
	MHC	eP	15	36 42.5	c	
	MIN	iP		24.9	d	
	CLS	eP		32.3	d	
	PRI	eP		58.8	d	
Apr. 15	MIN	iP	15	43 24.6	c	
Apr. 16	BKS	eSE	01	25 16	E	USCGS: 37°0 N, 142°7 E, 0 = 01 04 34.5.
		eSS		29 50	E	Off east coast of Honshu, Japan.
		eGNE		34.3		h about 38 km.
	MHC	eP		16 12.2	d	
	MIN	iP		15 49.2	c	
	CLS	eP		16 15.1	c	
	PRI	eP		14.0	c	
Apr. 16	BKS	eP	03	25 21.0	d	
	MHC	eP		27.5	c	
	MIN	iP		06.4	c	
	CLS	eP		14.3	c	
	PRI	eP		41.1	c	
Apr. 16	BKS	eGE	05	01.5		USCGS: 31°8 N, 113°7 W, 0 = 04 56 47.
	MIN	eZ	04	58 18.8	c	Gulf of California. h about 19 km.
	PRI	eP		57 45.4	c	
		eS		58 45.0		
Apr. 16	BKS	eNE	06	25.0		USCGS: 30°8 N, 113°9 W, 0 = 06 20 08.2.
		eRNE		26.5		Gulf of California. h about 33 km.
	MIN	eZ	06	22 55.5	d	
	PRI	eP		21 55.4	d	
Apr. 16	MIN	eZ	07	06 10.2	d	USCGS: 31°3 N, 113°7 W, 0 = 07 03 34.
						Gulf of California. h about 33 km.
Apr. 16	MIN	eP	07	42 57.7	c	

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
Apr. 16	BKS	eNZ	09	22.7	c	USCGS: 31°1 N, 113°8 W, 0 = 09 18 12.
		eZ		24.5		Gulf of California. h about 29 km.
	MIN	eZ	20	57.4	c	
	PRI	eP		06.1	c	
		eS	22	16.5		
Apr. 16	MIN	eP	12	01 34.1	d	
Apr. 16	MIN	eP	12	16 52.2	d	
Apr. 16	BKS	eSN	13	55.7		USCGS: 52°1 N, 169°4 W, 0 = 13 48 08.9.
		eGN		58.0		Fox Islands. h about 33 km.
		eR		59.5		
	MHC	eP	50	15.0	c	
	MIN	eP		00.0	d	
	PRI	eP		31.0	c	
Apr. 16	MIN	iP	14	21 56.8	c	USCGS: 52°3 N, 169°9 W, 0 = 14 12 37.6.
						Fox Islands. h about 40 km.
Apr. 16	BKS	eP	19	32 42.0	Wd	USCGS: 56°4 N, 152°9 W, 0 = 19 26 57.4.
		ePP		33 33.5	d	Alaska aftershock. h about 30 km.
		eSNE		37 30.0	SEc	Magnitude 5 1/2 - 5 3/4 (BKS).
		eGNE		38.8		
		eR		39.7		
			mu	sec		
		PZ	0.376	2.0		
		SH	9.9	17		
		MaxH	41.7	12		
	MHC	eP	19	32 51	c	
	MIN	iP		29.1	d	
	CLS	eP		31.0	c	
	PRI	eP		59.3	d	
Apr. 17	MIN	eP	04	09 11.8	d	
Apr. 17	MIN	iP	04	22 13.6	d	
Apr. 17	BKS	eP	04	55 18.0	d	USCGS: 56°4 N, 152°9 W, 0 = 04 49 30.5.
		ePP		56 24.0	d	Alaska aftershock. h about 25 km.
		eSNE	05	00 00.0	NEc	
		eGNE		01 26.0		
		eRE		02.3		
			mu	sec		
		PZ	3.84	14		
		SH	7.7	12		
		MaxH	29.4	14		
	MHC	eP	05	55 24.7	c	
	MIN	iP		01.2	c	
	CLS	eP		08.5	c	
	PRI	eP		35.5	c	
Apr. 17	BKS	eP	06	12 44.7	c	USCGS: 6°6 S, 154°9 E, 0 = 06 00 00.2.
	MHC	eP		45.8	c	Solomon Islands. h about 85 km.
	MIN	iP		49.3	d	
	CLS	eP		43.7	c	
	PRI	eP		49.9	c	
Apr. 17	BKS	eP	09	14 55.5	d	USCGS: 57°7 N, 151°4 W, 0 = 09 09 07.8.
		eZ		15 10.7	d	Alaska aftershock. h about 20 km.
		eSNE		19 40.0		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Apr. 17		eGN	09 20.9		
(cont.)		eR	22.0		
			mu sec		
		PZ	0.094 1.2		
	MHC	eP	09 15 02.3	c	
	MIN	iP	14 40.1	d	
	CLS	eP	49.0	c	
	PRI	eP	15 16.1	c	
Apr. 17	MIN	eP	10 05 16.8	c	
Apr. 17	MIN	eP	11 54 03.9	c	
Apr. 17	MIN	eP	24 03 39.4	d	
Apr. 18	MIN	iP	01 37 56.4	d	
Apr. 18	MIN	iP	03 11 56.2	d	
Apr. 18	BKS	eP	05 38 09.0	d	USCGS: 45°5 N, 151°1 E, 0 = 05 27 44.6. Kurile Islands. h about 33 km.
	MHC	eP	09.8	d	
	MIN	iP	37 57.2	c	
	CLS	eP	38 01.5	c	
	PRI	eP	22.5	c	
Apr. 18	MIN	eP	07 16 20.4	c	
Apr. 18	MIN	iP	07 21 58.3	d	
Apr. 18	MIN	iP	07 34 45.8	c	
Apr. 18	MIN	eP	07 49 32.6	c	USCGS: 60°2 N, 147°6 W, 0 = 07 44 03. Alaska aftershock. h about 33 km.
Apr. 18	MIN	eP	07 51 22.4	c	USCGS: 56°5 N, 153°0 W, 0 = 07 55 47.6. Alaska aftershock. h about 33 km.
Apr. 18	MIN	iP	07 52 26.1	c	
Apr. 18	MIN	iP	15 20 15.2	d	USCGS: 57°4 N, 152°3 W, 0 = 15 14 42.9. Alaska aftershock. h about 33 km.
Apr. 18	BKS	eP	20 14 10	d	
		eSNE	19 12		
		eGNE	20.3		
		eRNE	21.5		
	MIN	iP	13 55.2	d	
Apr. 18	MIN	eP	20 21 51.9	d	
Apr. 18	MIN	eP	23 43 26.2	c	USCGS: 59°3 N, 147°5 W, 0 = 23 38 03.4. Alaska aftershock. h about 20 km.
Apr. 19	BKS	eSE	04 09.0		USCGS: 55°1 S, 128°5 W, 0 = 03 44 55.0. South Pacific Ocean. h about 33 km.
		ePSE	10.4		
		eSSNE	15.0		
		eGE	22.6		
		eRNE	27.7		
Apr. 19	MIN	iP	04 07 43.4	d	USCGS: 15°4 S, 173°7 W, 0 = 03 56 13.7. Tonga Islands, h about 51 km.
Apr. 19	BKS	eP	05 25 47.3	c	USCGS: 41°7 S, 83°9 W, 0 = 05 13 01.6. Off coast of southern Chile. h about 33 km.
		eS	36 28.0	S	
		eN	53.5		
	MHC	eP	25 39.3	d	
	MIN	eZ	51.9	c	
	PRI	eP	32.7	c	
Apr. 19	BKS	eP'N	14 31 30	Nc	USCGS: 60°5 S, 58°3 W, 0 = 14 12 21.9. Near South Shetland Islands.
		eSKSN	37 28	N	
		eSE	39 26	E	h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Apr. 19		eSPNE	14 41 00		
(cont.)		eSSN	47 22		
		eP'P'NE	50.9		
		eGNE	58.3		
		eR	15 04.6		
			mu sec		
		SH	1.13 26		
		MaxH	12.2 64		
Apr. 19	MHC	eP	19 52 43.0	d	USCGS: 13°8 S, 75°3 W, 0 = 19 41 31.3. South Peru. h about 96 km.
	MIN	eP	42.6	c	
	CLS	eP	48.0	d	
	PRI	eP	31.0	c	
Apr. 20	BKS	eP	03 40 17.7	d	
		eN	46 18.0	N	
		eE	47.4		
	MHC	eP	40 24.0	d	
	MIN	eP	39 59.7	d	
	CLS	eP	40 07.3	d	
	PRI	eP	37.4	d	
Apr. 20	MIN	eP	08 13 23.2	d	USCGS: 60°2 N, 147°0 W, 0 = 08 07 54.8. Alaska aftershock. h about 15 km.
Apr. 20	MHC	eP	11 03 30.8	d	USCGS: 22°9 S, 69°2 W, 0 = 10 51 13.0. Northern Chile. h about 78 km.
	MIN	eP	14.4	c	
	CLS	eP	37.5	c	
	PRI	eP	22.0	c	
Apr. 20	MIN	eP	11 20 01.3	c	USCGS: 56°7 N, 148°1 W, 0 = 11 14 48.0. Alaska aftershock. h about 30 km.
Apr. 20	BKS	eP	12 02 34.5	d	USCGS: 61°4 N, 147°3 W, 0 = 11 56 41.6. Alaska aftershock. h about 30 km. Magnitude 5 1/2 - 5 3/4 (BKS).
		iNEZ	36.0	SEc	
		ePcPE	05 20.0	Ec	
		eSE	07 23.0	W	
		iPP	03 40.0	d	
		iSNE	07 24.0	SEc	
		eGNE	09.0		
		eRNE	10.1		
			mu sec		
		PZ	1.84 8		
		PPZ	3.54 12		
		SH	9.60 30		
		MaxH	11.27 26		
	MHC	eP	12 02 40.7	d	
	MIN	iP	17.0	d	
	CLS	eP	26.1	c	
	PRI	eP	53.2	d	
Apr. 20	BKS	eP	15 46 21.0		
		eR	53.6		
			mu sec		
		PZ	0.067 1.1		
	MHC	eP	15 46 27.1	d	
	MIN	iP	02.9	d	
	CLS	eP	13.6	d	
	PRI	eP	40.6	d	

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
Apr. 20	BKS	eP	16 24	09.3	d	USCGS: 60°7 N, 145°3 W, 0 = 16 18 26.4. Alaska aftershock. h about 15 km.
		eZ		14.0	d	
		eSNE		28.0		
		eRNE		31.5		
			mu	sec		
		MaxH	2.95	24		
	MHC	eP	16 24	16.9	c	
	MIN	eP	23	51.8	d	
	CLS	eP	24	02.9	d	
	PRI	eP		30.3	c	
Apr. 21	MIN	eP	04 44	45.6	c	USCGS: 18°4 N, 98°1 W, 0 = 04 38 44.2. Puebla, Mexico. h about 70 km.
Apr. 21	BKS	eP	05 07	27.5	Ec	USCGS: 61°5 N, 147°4 W, 0 = 05 01 35.7. Alaska aftershock. h about 40 km. Felt: Anchorage.
		iZ		07 38.0	c	
		eZ		11 17.5	c	
		eSNE		12.0	SWd	
		eRNE		14.5		
			mu	sec		
		PZ	0.139	1.1		
		MaxH	6.5	28		
	MHC	eP	05 07	33.8	c	
	MIN	eP		08.6	d	
	CLS	eP		20.2	c	
	PRI	eP		46.5	c	
Apr. 21	MIN	iP	08 47	32.6	c	
Apr. 21	MIN	eP	09 50	20.2	c	
Apr. 21	MIN	iP	10 18	31.4	c	
Apr. 22	MIN	eZ	09 31	46.6	c	
Apr. 22	BKS	eNE	10 05.0		c	USCGS: 56°1 N, 34°9 W, 0 = 09 46 54.2. North Atlantic Ocean. h about 33 km.
	MHC	eP	09 56	53.7	c	
	MIN	eP		31.6	c	
	PRI	eP		56.2	d	
Apr. 22	MIN	iP	11 20	05.8	c	USCGS: 57°8 N, 149°5 W, 0 = 11 14 43.0. Alaska aftershock. h about 33 km.
Apr. 22	BKS	eP	20 12	44.0	d	USCGS: 15°5 S, 165°5 E, 0 = 20 00 22.8. New Hebrides Islands. h about 123 km.
		eSNE		23 52.0	NWc	
		eNE		35.5		
		eRNE		38.7		
	MHC	eP	12	44.5	c	
	CLS	eP		42.5	c	
	PRI	eP		46.0	c	
Apr. 23	MIN	eP	02 03	09.4	d	USCGS: 32°1 N, 138°7 E, 0 = 01 51 10.6. South of Honshu, Japan. h about 33 km.
Apr. 23	MIN	eZ	03 12	07.2	c	USCGS: 56°8 N, 149°6 W, 0 = 03 06 42.6 Alaska aftershock. h about 33 km.
Apr. 23	MIN	eP	03 19	05.2	d	USCGS: 60°9 N, 144°3 W, 0 = 03 13 55.7. Alaska aftershock. h about 35 km.
Apr. 23	BKS	eP	03 46	55.5	c	USCGS: 5°3 S, 134°0 E, 0 = 03 32 50.3. Darwin, Australia. h about 33 km. Magnitude 6 1/2 - 7 (BKS).
		epP		47 12.0	d	
		ePKPE		50 46.0	Wd	

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
Apr. 23		ePP	03 51	11.0	d	(cont.)
		ePPP		25.5	d	
		eSKSE	57	30.0	E	
		eSNE	58	40.0	S	
		eSSNE	04 05	14.0	NW	
		eGNE		15.2		
		eR		18.7		
			mu	sec		
		PZ	2.41	10		
		PPZ	10.0	2.96		
		SH	2.93	28		
		MaxH	21.0	20		
	MHC	eP	03 46	58.2	c	
		epP		47 14.6	d	
		ePKP		51 13.6	c	
	MIN	iP		46 55.8	c	
		ipP		47 14.6	d	
	CLS	eP		46 54.3	c	
		epP		47 10.3	d	
		ePKP		50 09.3	d	
	PRI	eP		47 02.5	c	
		epP		15.3	c	
Apr. 23	MIN	eP	04 02	42.5	c	
Apr. 23	MIN	eP	05 07	05.4	d	
Apr. 23	MIN	eP	08 28	17.8	d	
Apr. 23	MIN	eP	10 45	38.1	d	USCGS: 6°6 S, 155°1 E, 0 = 10 32 47.9. Solomon Islands. h about 66 km.
Apr. 23	MIN	eP	11 31	15.5	d	
Apr. 23	BKS	eP	15 02	18.0	d	USCGS: 60°9 N, 144°6 W, 0 = 11 25 55. Alaska aftershock. h about 33 km.
		eR		09.5		
			mu	sec		
		PZ	0.175	1.4		
	MHC	eP	15 02	24.3	d	
	MIN	iP		02.6	d	
	CLS	eP		10.9	d	
	PRI	eP		30.8	d	
Apr. 24	BKS	eP	03 56	36		USCGS: 59°5 N, 144°5 W, 0 = 03 51 05.0. Alaska aftershock. h about 33 km.
		iZ		57 14		
		eSE	04 00	56		
		eRNE		03.4		
			mu	sec		
		PZ	1.79	8		
		SH	4.13	10		
		MaxH	5.13	24		
	MHC	eP	03 56	45	d	
	MIN	eP		17.1	c	
	CLS	eP		28.2	d	
	PRI	eP		55.7	d	

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
Apr. 24	BKS	eP	06 09	26.6	d	USCGS: 5°1 S, 144°2 E, 0 = 05 56 10.1.
		eNE		28.0	NE	Northeast of New Guinea.
		iZ	10	18.0	d	h about 106 km.
		eZ	13	06.0	c	Magnitude 6 3/4 (BKS).
		ePP	13	16.0	Ec	
		eSKSNE	19	54.0	SWc	
		eSNE	20	36.0	SE	
		eGN		35.2		
		eRE		39.0		
			mu	sec		
		PZ	4.2	12		
		PPZ	5.73	10		
		SH	9.55	20		
	MHC	eP	06 09	27.4	c	
		ePP	13	25.2	c	
	MIN	iP	09	28.6	d	
	CLS	eP		25.3	d	
		ePP	13	18.2	d	
		epPP		46.5	c	
	PRI	eP	09	32.6	d	
		ePP	13	29.4	d	
Apr. 24	BKS	eP	14 47	38.7	c	USCGS: 13°3 N, 88°8 W, 0 = 14 40 28.3.
		iZ	48	24.5	c	Near coast of El Salvador.
		eZ		26.0	d	h about 158 km.
		eSNE	53	28.0	NE	
		eNE	54	24.0	SWc	
		eScSNE	57	48.0	SW	
	MHC	eP	47	33.9	d	
	MIN	eP		46.6	c	
	CLS	eP		44.2	d	
	PRI	eP		23.3	c	
Apr. 24	MIN	iP	00 56	45.2	c	USCGS: 59°9 N, 147°1 W, 0 = 00 51 08.0.
						Alaska aftershock. h about 33 km.
Apr. 25	MIN	eP	05 49	32.1	c	USCGS: 6°7 S, 155°0 E, 0 = 05 36 42.2
						Solomon Islands. h about 72 km.
Apr. 25	MIN	eP	07 06	37.3	c	USCGS: 59°8 N, 145°3 W, 0 = 07 01 20.
						Alaska aftershock. h about 33 km.
Apr. 25	BKS	eP	09 49	05.2	Ec	USCGS: 59°9 N, 144°9 W, 0 = 09 43 30.7.
		eZ		56.0		Alaska aftershock. h about 30 km.
	MHC	eP	49	10.5	c	
	MIN	iP	48	47.0	d	
	CLS	eP		55.9	d	
	PRI	eP	49	25.1	c	
Apr. 25	MIN	eP	16 15	21.8	c	USCGS: 59°9 N, 146°1 W, 0 = 16 10 01.3.
						Alaska aftershock. h about 33 km.
Apr. 25	BKS	eP	18 51	03.1	d	USCGS: 24°4 N, 125°3 E, 0 = 18 37 58.1.
		iZ		16.5	c	Off Taiwan. h about 33 km.
		eGN	19	15.7		
		eRE		20.0		
	MHC	eP	18 51	06.8	c	
	MIN	eP		11.4	c	
	CLS	eP		00.4	c	
	PRI	eP		13.3	c	

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
Apr. 25	MIN	eP	19 32	58.6	c	
Apr. 25	MIN	eP	21 38	03.5	c	USCGS: 19°8 N, 71°2 W, 0 = 21 29 30.4.
						Near coast of Dominican Republic.
						h about 35 km.
Apr. 26	BKS	eP	14 18	25.0	c	USCGS: 5°8 S, 105°0 E, 0 = 13 59 27.7.
	MHC	eP		26.1	d	Southern Sumatra. h about 90 km.
	MIN	iP		22.2	d	
	CLS	eP		22.1	c	
	PRI	eP		28.7	d	
Apr. 26	BKS	eP	15 03	18.2	c	USCGS: 20°6 S, 178°0 W, 0 = 14 52 07.6.
		iZ		05 08.0	d	Fiji Islands. h about 490 km.
	MHC	eP		03 18.5	c	
	MIN	iP		28.1	d	
	CLS	eP		18.9	c	
	PRI	eP		18.0	c	
Apr. 27	MIN	eP	03 59	23.8	c	USCGS: 57°4 N, 152°4 W, 0 = 03 53 47.1.
						Alaska aftershock. h about 20 km.
Apr. 27	BKS	eZ	07 08	40	c	USCGS: 60°1 S, 151°0 E, 0 = 06 44 25.1.
		e		14 38	d	Balleny Islands. h about 33 km.
		eSSNE		21 20	NW	
		eSSSNE		25.2	SEd	
		eSKPP'NE		29.0	SEd	
		eL		32.2		
		eR		38.5		
	MIN	ez		03 29.7	c	
Apr. 27	MIN	iP	19 15	05.3	d	USCGS: 60°5 N, 146°5 W, 0 = 19 09 39.0.
						Alaska aftershock. h about 33 km.
Apr. 27	MIN	eP	20 30	34.6	c	USCGS: 59°8 N, 148°4 W, 0 = 20 25 04.
						Alaska aftershock. h about 33 km.
Apr. 28	MIN	eZ	08 11	50.4		USCGS: 44°6 N, 150°2 E, 0 = 08 01 17.9.
						Kurile Islands. h about 45 km.
Apr. 28	MIN	eZ	08 43	48.4	c	USCGS: 59°6 N, 149°9 W, 0 = 08 38 12.
						Alaska aftershock. h about 33 km.
Apr. 28	MIN	eP	10 56	50.9	d	
Apr. 28	BKS	iP	12 26	35.5	d	USCGS: 59°0 N, 138°7 W, 0 = 12 21 25.6.
		eZ		27 02.5		Near coast of southeastern Alaska.
	MHC	eP		26 40.5	c	h about 33 km.
	MIN	eP		12.9	c	
	CLS	eP		35.3	c	
	PRI	eP		54.4	c	
Apr. 28	MIN	eP	13 39	33.6	d	USCGS: 57°6 N, 150°0 W, 0 = 13 34 10.4.
						Alaska aftershock. h about 33 km.
Apr. 28	MIN	eP	14 00	06.5	d	
Apr. 29	MIN	iP	03 58	10.6	c	USCGS: 60°0 N, 147°4 W, 0 = 03 52 43.
						Alaska aftershock. h about 33 km.
Apr. 29	MIN	eZ	04 18	00.1	c	USCGS: 3°4 S, 77°7 W, 0 = 04 08 01.2.
						Peru-Ecuador border. h about 56 km.
Apr. 29	MIN	eP	04 34	26.0	c	USCGS: 39°3 N, 23°7 E, 0 = 04 21 06.7.
						Aegean Sea. h about 33 km.
						Extensive damage to property in
						Skopelas Islands.
Apr. 29	MIN	eP	08 24	13.1	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Apr. 30	MIN	eP	03 52 56.2	c	USCGS: 15°5 S, 174°7 W, 0 = 03 41 42.3. Tonga Islands. h about 224 km.
Apr. 30	BKS	eSE	03 59 32		USCGS: 58°9 N, 139°0 W, 0 = 03 49 57.6. Southeastern Alaska. h about 20 km.
		eNEZ	40		
		eSSE	04 01.2		
		eScSNE	05.4		
			mu sec		
		PZ	0.034 1.2		
	MHC	eP	03 55 16.5	d	
	MIN	eP	54 47.7	c	
	CLS	eP	55 01.5	d	
	PRI	eP	29.6	c	
Apr. 30	MIN	eP	04 05 22.6	c	
Apr. 30	MHC	eP	04 06 38.3	d	
	MIN	iP	10.5	c	
	CLS	eP	23.5	c	
	PRI	eP	51.8	c	
Apr. 30	MIN	iP	05 52 21.6	c	
Apr. 30	MIN	iP	08 25 12.1	c	
Apr. 30	MIN	eP	08 37 00.3	c	
Apr. 30	MIN	iP	11 08 20.8	c	
Apr. 30	MIN	iP	11 56 19.8	c	USCGS: 61°3 N, 147°0 W, 0 = 11 50 47.4. Alaska aftershock. h about 33 km.
Apr. 30	MIN	eP	17 31 38.5	c	USCGS: 60°1 N, 142°2 W, 0 = 17 26 30. Alaska aftershock. h about 33 km.
May 1	MIN	eP	00 22 47.9	c	USCGS: 56°6 N, 151°5 W, 0 = 00 17 22. Alaska aftershock. h about 30 km.
May 1	MIN	iP	03 18 26.5	c	USCGS: 57°4 N, 150°0 W, 0 = 03 13 03.5. Alaska aftershock. h about 30 km.
May 1	MIN	eP	03 46 40.0	d	USCGS: 59°7 N, 144°1 W, 0 = 03 40 36.2. Alaska aftershock. h about 20 km.
May 1	BKS	eP	06 07 37.4	d	USCGS: 60°5 N, 145°6 W, 0 = 06 01 55.4. Alaska aftershock. h about 20 km.
		iZ	46.2	d	
		eSNE	12 16.0	NE	
		eZ	40.0	d	
		eRNE	14.8		
			mu sec		
		PZ	1.25 12		
		SH	1.85 14		
		MaxH	4.75 20		
	MHC	eP	06 07 43.4	d	
	MIN	eP	19.6	d	
		ipP	36.1	c	
	CLS	eP	29.8	d	
	PRI	eP	56.3	d	
May 1	MIN	eP	07 13 39.4	c	USCGS: 57°5 N, 150°6 W, 0 = 07 08 12. Alaska aftershock. h about 20 km.
May 1	MIN	eP	07 50 08.0	c	USCGS: 59°7 N, 147°1 W, 0 = 07 44 44.9. Alaska aftershock. h about 35 km.
May 1	MIN	iP	14 45 18.8	c	USCGS: 60°4 N, 145°1 W, 0 = 14 39 58. Alaska aftershock. h about 33 km.
May 1	MIN	eP	17 14 21.3	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
May 2	MIN	eP	10 08 02.1	d	USCGS: 59°4 N, 146°5 W, 0 = 10 02 42. Alaska aftershock. h about 33 km.
May 2	BKS	eP	16 21 23.1	d	USCGS: 45°5 N, 150°3 E, 0 = 16 11 00.2. Kurile Islands. h about 35 km. Magnitude 6 1/2 (BKS).
		iZ	38.1	c	
		ePKiKP	28 36		
		eSNE	29 50	SEd	
		eSSE	33 44	Ed	
		eGNE	36.9		
		eRE	39.8		
			mu sec		
		PZ	4.86 10		
		SH	13.75 22		
		MaxH	40.8 40		
	MHC	eP	16 21 28.6	d	
	MIN	iP	15.3	c	
		ipP	30.7	d	
	PRI	eP	38.6	c	
		eP'P'	50 31.0	d	
May 3	MIN	eP	02 05 37.2	c	USCGS: 40°3 N, 141°9 E, 0 = 01 54 33.5. Near east coast of Honshu, Japan. h about 59 km.
May 3	MIN	eZ	08 04 16.3	d	USCGS: 58°1 N, 151°6 W, 0 = 07 58 45. Alaska aftershock. h about 33 km.
May 3	MIN	eP	13 43 11.1	c	USCGS: 23°9 S, 66°6 W, 0 = 13 31 14.1. Jujuy Prov., Argentina. h about 210 km.
May 3	MIN	iP	21 37 28.3	d	USCGS: 59°0 N, 148°5 W, 0 = 21 31 53. Alaska aftershock. h about 25 km.
May 3	MIN	eP	21 44 52.9	d	USCGS: 61°0 N, 145°8 W, 0 = 21 39 30. Alaska aftershock. h about 33 km.
May 4	BKS	iP	12 10 38.4	c	USCGS: 58°2 N, 152°3 W, 0 = 12 04 46.1. Alaska aftershock. h about 30 km.
		eZ	51.6	c	
		eRNE	17.8		
			mu sec		
		PZ	0.047 1.1		
	MHC	eP	12 10 44.5	c	
	MIN	iP	22.4	d	
		ipP	35.8	d	
	CLS	eP	30.3	d	
	PRI	eP	57.5	d	
May 4	MIN	eP	16 28 18.3	d	
May 5	MIN	eP	02 38 10.8	d	USCGS: 60°4 N, 147°1 W, 0 = 02 32 42. Alaska aftershock. h about 15 km.
May 5	MIN	eZ	03 38 28.5	c	USCGS: 17°7 S, 68°9 W, 0 = 03 26 46.1. Western Bolivia. h about 33 km.
May 5	MIN	eP	04 10 38.7	c	
May 5	MIN	eP	08 12 03.8	d	USCGS: 45°5 N, 150°1 E, 0 = 08 01 48.4. Kurile Islands. h about 40 km.
May 5	MIN	eP	01 05 15.3	c	USCGS: 59°6 N, 146°8 W, 0 = 00 59 53. Alaska aftershock. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 6	MIN	eP	04 46 14.1	c	USCGS: 60°7 S, 25°2 W, 0 = 04 27 02.4. Sandwich Islands. h about 33 km.
May 6	BKS	eP	08 23 24.0	d	USCGS: 11°1 S, 162°2 E, 0 = 08 10 47.5. Solomon Islands. h about 40 km.
		ePP	26 10.0	d	
		eSNE	33 56.0	SWc	
		ePPSE	35 00.0	Wd	
		eSSE	39 08.0	NEd	
		eGNE	45.8		
		eRE	48.8		
			mu sec		
		PZ	1.37 10		
		SH	1.98 22		
		MaxH	4.35 36		
	MHC	eP	08 23 25.7	d	
	MIN	eP	28.9	c	
	CLS	eP	21.5	c	
	PRI	eP	20.7	c	
May 6	MIN	eP	09 43 20.2	c	USCGS: 59°7 N, 142°8 W, 0 = 09 38 12. Alaska aftershock. h about 33 km.
May 6	BKS	iPNE	15 32 21	NWd	USCGS: 56°7 N, 152°1 W, 0 = 15 26 35.5. Alaska aftershock. h about 15 km.
		iNE	39 23	Nc	
		eSE	37 08	W	
		eLN	38.4		
		eR	39.4		
			mu sec		
		PZ	2.50 10		
		SH	4.17 9		
	MHC	eP	15 32 27.0	c	
	MIN	iP	06.7	d	
	CLS	eP	14.3	d	
	PRI	eP	40.2	c	
May 6	MIN	eP	15 39 13.9	d	
May 7	MIN	eP	00 21 07.9	d	USCGS: 60°1 N, 147°4 W, 0 = 00 15 48.9. Alaska aftershock. h about 33 km.
May 7	BKS	iP	00 46 11.0	d	USCGS: 18°2 S, 176°6 W, 0 = 00 34 57.2. Fiji Islands. h about 300 km.
	MHC	eP	11.8	d	
	MIN	iP	20.6	c	
	CLS	eP	12.0	d	
	PRI	eP	11.7	d	
May 7	BKS	eP	04 10 06.8	d	USCGS: 51°6 N, 177°3 W, 0 = 04 02 28.7. Andreanof Islands. h about 25 km.
		eSE	16 12.0	E	
		eEZ	21.0		
	MHC	eP	10 07	c	
	MIN	iP	09 58.9	d	
	CLS	eP	10 02.8	c	
	PRI	eP	24.6	c	
May 7	BKS	eP'	06 04 54.3	c	USCGS: 4°0 S, 34°9 E, 0 = 05 45 29.5. Tanganyika. h about 33 km.
		ePPNE	07 48	SWc	
		eSKSPNE	18 10	SE	
		ePPSNE	20 20	SWd	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 7		eP'P'E	06 26 00	Ec	
(cont.)		eSSN	28	N	
		eGNE	41.0		
		eRE	51.0		
			mu sec		
		PPZ	2.76 20		
		MaxH	16.3 20		
	MHC	eP'	06 04 57.3	c	
	MIN	eP'	48.0	c	
		ipP	07 44.1	d	
	CLS	eP'	04 55.0	c	
	PRI	eP'	05 01.4	c	
May 7	BKS	eP	08 09 39.0	c	USCGS: 40°4 N, 139°0 E, 0 = 07 58 14.3. Northern Honshu, Japan. h about 33 km.
		eZ	11 24.0	c	
		ePP	12 16.5	d	
		ePPP	13 53.5	d	
		eSNE	19 06	NE	
		eSSE	23 44	E	
		eGN	28.1		
		eR	31.6		
			mu sec		
		PZ	14.55 10		
		SH	13.26 10		
		MaxH	45.3 36		
	MHC	eP	08 09 43.8	c	
		eP'P'	36 33.7	c	
	MIN	iP	09 32.4	c	
		iP'P'	36 35.7	d	
	CLS	eP	09 35.4	c	
		eP'P'	36 33.8	c	
	PRI	eP	09 52.0	c	
		eP'P'	36 47.6	d	
May 7	MIN	iP	08 18 24.4	d	USCGS: 40°2 N, 139°4 E, 0 = 08 07 04.3. Off coast of northern Honshu, Japan. h about 15 km.
May 7	MIN	iP	09 38 48.6	d	USCGS: 40°3 N, 137°6 E, 0 = 09 27 27. Sea of Japan. h about 33 km.
May 7	MIN	eP	09 58 48.8	d	USCGS: 40°5 N, 138°2 E, 0 = 09 42 30. Off coast of northern Honshu, Japan. h about 25 km.
May 7	BKS	eP	11 22 20.7	Wd	USCGS: 30°6 N, 137°7 E, 0 = 11 11 04.9. Off coast of Honshu, Japan. h about 469 km.
		iZ	31.0	d	
	MHC	eP	24.6	d	
	MIN	eP	13.5	d	
	CLS	eP	17.5	d	
	PRI	eP	31.9	d	
May 7	MIN	eP	12 19 33.0	c	USCGS: 40°5 N, 138°9 E, 0 = 12 08 03.6. Off coast of Honshu, Japan. h about 33 km.
May 7	MIN	eP	13 00 30.4	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 7	BKS	iP	20 24 13.5	c	USCGS: 40°5 N, 139°0 E, 0 = 20 12 49.3.
		iZ	31.0	d	Off west coast of Honshu, Japan.
		eZ	25 25.2	c	h about 33 km.
		eSNE	33 40.0	NEd	Magnitude 6 1/2 (BKS).
		eScSNE	34 12.0	NW	
		eSSE	37.8		
		eGNE	42.0		
		eRE	45.6		
			mu sec		
		PZ	4.32 10		
		SH	3.71 25		
		MaxH	11.46 36		
	MHC	eP	20 24 18.2	c	
	MIN	iZ	18.8	c	
	CLS	eP	09.4	c	
	PRI	eP	26.3	c	
May 8	MIN	eP	06 02 19.6	c	USCGS: 59°2 N, 153°9 W, 0 = 05 56 14.
					Alaska aftershock. h about 25 km.
May 8	BKS	eP	10 32 05	c	USCGS: 24°0 N, 108°6 W, 0 = 10 27 54.3.
		eGNE	35.6		Gulf of Calif. h about 33 km.
		eR	37.2		
	MHC	eP	31 55.2	d	
	MIN	eP	32 21.9	c	
	PRI	eP	31 38.5	c	
May 8	BKS	eP	16 27 42.5	c	USCGS: 56°7 N, 154°0 W, 0 = 16 21 49.8.
		eNE	28 28	NWd	Alaska aftershock. h about 35 km.
		eSNE	32 28	NEc	
		eRNE	34.7		
			mu sec		
		PZ	1.635 16		
		SH	2.66 18		
		MaxII	7.68 12		
	MHC	eP	16 27 48.7	d	
	MIN	iP	28.4	d	
	CLS	eP	35.5	d	
	PRI	eP	02.3	d	
May 8	BKS	eP	20 48 53.2	c	USCGS: 24°2 S, 69°3 W, 0 = 20 36 54.1.
		eZ	49 48.4	d	Northern Chile. h about 78 km.
	MHC	eP	48 49.7	c	
	MIN	iP	58.9	c	
	CLS	eP	56.4	c	
	PRI	eP	41.5	d	
May 8	BKS	iP	21 40 17.3	d	USCGS: 60°8 N, 143°6 W, 0 = 21 34 40.6.
		eZ	32.3	c	Alaska aftershock. h about 35 km.
		iZ	47.5	c	
		eSNE	44 55.0	NWd	
		iN	46 26.0	N	
		eN	46.7		
		eRE	47.7		
			mu sec		
		PZ	0.625 12		
		SH	1.21 15		
		MaxH	5.37 16		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 8	MHC	eP	21 40 23.6	d	
(cont.)	MIN	iP	39 59.0	d	
	CLS	eP	40 10.5	c	
	PRI	eP	36.8	d	
May 8	BKS	eP	23 47 44.5	c	USCGS: 52°2 N, 169°5 W, 0 = 23 40 10.
		ePP	48 53	d	Andreanof Islands. h about 20 km.
		eSNE	52 50	NEd	
		eSSNE	53 20	NEd	
		eGNE	55.7		
		eRE	57.0		
			mu sec		
		MaxH	9.9 16		
	MHC	eP	23 47 46	d	
		eZ	48 07.9	d	
	MIN	iP	47 37.4	c	
	CLS	eP	37.8	c	
		epP	54.5	c	
	PRI	eP	48 03	c	
		epP	18.0	c	
May 9	MIN	eP	01 21 32.3	d	
May 9	BKS	eP	02 09 28.0	d	USCGS: 52°2 N, 169°6 W, 0 = 02 02 28.8.
		eZ	42.0	c	Andreanof Islands. h about 25 km.
		eZ	10 06.5	d	
		eSN	14 50	S	
		eSSNE	15 08	NEd	
		eGNE	17 32	SW	
		eRE	18.8		
			mu sec		
		MaxH	5.64 15		
	MHC	eP	02 09 33.9	c	
	MIN	eP	20.2	c	
		iZ	36.9	c	
	CLS	eP	23.1	c	
		eZ	38.1	d	
	PRI	eP	46.8	c	
		eZ	10 01.8	c	
May 9	MIN	eP	15 21 30.0	c	USCGS: 40°7 N, 139°0 E, 0 = 15 10 12.1.
					Sea of Japan. h about 25 km.
May 9	BKS	eN	18 51.0		USCGS: 13°7 S, 166°6 E, 0 = 18 16 17.5.
		eRNE	54.4		New Hebrides Islands. h about 41 km.
May 9	BKS	eP	21 12 25.0	d	USCGS: 61°7 N, 152°0 W, 0 = 21 06 12.2.
		eZ	13 22.5	d	Alaska aftershock. h about 25 km.
	MHC	eP	12 29.2	c	
	MIN	eP	06.0	c	
	CLS	eP	16.0	c	
	PRI	eP	42.5	c	
May 9	BKS	ePNE	21 19.2		USCGS: 9°2 S, 156°7 E, 0 = 21 07 41.6.
		eGNE	44.0	SWc	Solomon Islands. h about 26 km.
		eRE	47.6		
	MHC	eP	20 38.8	c	
	MIN	eZ	40.0	d	
	CLS	eP	35.3	d	
	PRI	eP	40.3	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 10	MIN	eZ	02 05 49.0	c	USCGS: 59°9 N, 146°5 W, 0 = 02 00 27. Alaska aftershock. h about 33 km.
May 10	MIN	eZ	04 17 06.7	c	
May 10	BKS	iP	05 51 32.7	c	USCGS: 29°0 N, 141°5 E, 0 = 05 39 42.6. Bonin Islands. h about 62 km.
		eSNE	06 01 18.0	NE	
		eGNE	13.2		
		eR	16.5		
			mu sec		
		PZ	.061 1.3		
	MHC	eP	05 51 36.2	d	
	MIN	eP	27.8	d	
	CLS	eP	28.9	d	
	PRI	eP	43.4	d	
May 10	MIN	eP	06 36 14.9	c	USCGS: 52°2 N, 169°5 W, 0 = 06 29 15. Andreanof Islands. h about 35 km.
May 10	MHC	eP	13 47 35.5	d	USCGS: 51°4 N, 129°2 W, 0 = 13 44 03. Vancouver Island region.
	MIN	eP	46 54.8	d	
	CLS	eP	47 28.3	d	
	PRI	eP	53.0	c	
May 10	MIN	eP	14 51 41.0	c	USCGS: 59°9 N, 147°1 W, 0 = 14 46 15. Alaska aftershock. h about 15 km.
May 10	MIN	eP	15 46 17.8	c	USCGS: 60°1 N, 146°3 W, 0 = 15 40 53. Alaska aftershock. h about 15 km.
May 10	MIN	eP	02 22 17.5	c	USCGS: 60°8 N, 142°2 W, 0 = 02 17 01.5. Southeastern Alaska. h about 33 km.
May 10	BKS	eP	05 40 47.3	d	USCGS: 24°6 S, 179°9 E, 0 = 05 29 16.6. Fiji Islands. h about 515 km.
	MHC	eP	47.2	c	
	MIN	eP	55.4	c	
	CLS	eP	47.7	c	
	PRI	eP	46.5	c	
May 11	BKS	eP	14 51 02.5	c	USCGS: 22°5 S, 175°8 W, 0 = 14 39 04.4. Tonga Islands. h about 50 km.
		eSE	15 01 00.0	c	
		eRNE	14.7		
	MHC	eP	14 51 02.8	c	
	MIN	eP	12.3	c	
	CLS	eP	03.7	c	
	PRI	eP	01.9	c	
May 11	MIN	iZ	20 16 00.2	d	USCGS: 60°3 N, 146°1 W, 0 = 20 10 36. Alaska aftershock. h about 33 km.
May 11	MIN	eP	01 49 40.6	c	USCGS: 26°2 S, 178°3 E, 0 = 01 37 54.5. Fiji Islands. h about 607 km.
May 11	BKS	eP	11 53 15	d	USCGS: 60°1 N, 147°0 W, 0 = 11 47 32.2. Alaska aftershock. h about 15 km.
		eSNE	58	SW	
		eGNE	59.5		
		eRE	12 00.5		
	MHC	eP	11 53 25.8	d	
	MIN	iP	02.0	c	
	CLS	eP	13.3	d	
	PRI	eP	43.8	c	
May 11	BKS	iP	17 01 19.2	c	USCGS: 59°5 N, 144°8 W, 0 = 16 55 46.9. Alaska aftershock. h about 33 km.
		iZ	03 19	d	
		eSNE	06 08	SE	
		eScSNE	12 40		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 11			mu sec		
(cont.)		PZ	0.948 8		
		SH	0.678 10		
	MHC	eP	17 01 25.2	d	
	MIN	iP	01.5	c	
	CLS	eP	11.2	d	
	PRI	eP	39.2	c	
May 12	BKS	eP	18 22 29	d	USCGS: 56°6 N, 152°4 W, 0 = 18 16 41.9. Alaska aftershock. h about 10 km. Magnitude 5 3/4 (BKS).
		iZ	51.8	d	
		eZ	24 44	Wc	
		eSNE	27 14	SE	
		eGN	28.6		
		eRNE	29.4		
			mu sec		
		PZ	5.13 18		
		SH	6.15 10		
	MHC	eP	18 22 36.5	d	
	MIN	iP	16.1	c	
	CLS	eP	23.5	c	
	PRI	eP	48.7	d	
May 12	MIN	iP	18 27 52.8	c	
May 12	MIN	eP	23 47 32.0	d	USCGS: 59°5 N, 143°1 W, 0 = 23 42 23.0. Alaska aftershock. h about 25 km.
May 13	BKS	eP	05 38 12.1	d	USCGS: 32°8 S, 178°3 W, 0 = 05 25 26.1. Kermadec Islands. h about 33 km.
		eZ	33.8	c	
		eNE	39 55	SWd	
		ePP	41 24	d	
		eSNE	48 24	NEd	
		ePPSNE	50 04	SWd	
		eSSNE	53 54	NEc	
		eGNE	06 01.0		
		eRNE	04.9		
			mu sec		
		PZ	0.73 9		
		PPZ	1.20 16		
		SH	2.63 18		
		MaxH	37.5 18		
	MHC	eP	05 38 12.3	d	
	MIN	eZ	20.0	c	
	CLS	eP	14.3	c	
	PRI	eP	10.9	d	
May 13	MIN	eP	11 17 37.7	d	USCGS: 21°8 S, 179°6 W, 0 = 11 06 16.4. Tonga Islands. h about 578 km.
May 13	BKS	iP	16 55 34.3	c	USCGS: 32°7 S, 178°6 W, 0 = 16 42 48.3. Kermadec Islands. h about 33 km.
		eSN	17 06 05		
		iSKSNE	24		
		eGNE	19 12		
		eNZ	22.0		
		eRN	22.8		
			mu sec		
		MaxH	2.1 20		

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
May 13	MHC	eP	16	55 36.8	c	
(cont.)	MIN	eP		50.5	c	
	CLS	eP		36.0	c	
	PRI	eP		32.7	d	
May 13	BKS	eP	20	50 36	d	USCGS: 32°.4 S, 178°.3 W, 0 = 20 37 54. Kermadec Islands. h about 70 km.
		eZ		51 12	c	
		eSE	21	01 00	W	
		eNEZ		21	NWd	
		eGNE		13.8		
		eRN		17.6		
	MHC	eP	20	50 30.7	d	
	CLS	eP		36.8	c	
	PRI	eP		29.2	c	
May 14	MIN	eP	01	18 12.8	d	USCGS: 32°.9 N, 178°.8 W, 0 = 01 05 47.6. Kermadec Islands. h about 309 km.
May 14	BKS	eP	12	01 47.0	c	USCGS: 62°.8 N, 152°.3 W, 0 = 11 55 28.2. Alaska aftershock. h about 15 km.
		eZ		55.3	c	
	MHC	eP		52.7	d	
	MIN	eP		28.0	c	
	CLS	eP		39.3	d	
	PRI	eP		02 06.0	d	
May 14	BKS	eZ	14	04.8		USCGS: 65°.3 N, 86°.5 W, 0 = 13 52 14.4. Melville Pen., Canada.
	MHC	eP	13	59 03.7	d	h about 33 km.
	CLS	eP		58 54.8	c	
	PRI	eP		59 11.9	c	
May 14	BKS	eP	14	24 31.3	c	USCGS: 59°.7 N, 144°.4 W, 0 = 14 19 05. Alaska aftershock. h about 33 km.
	MHC	eP		44.1	c	
	MIN	iP		19.4	c	
	CLS	eP		30.4	c	
	PRI	eP		57.2	d	
May 15	BKS	eZ	11	04 46	c	USCGS: 3°.5 S, 149°.1 E, 0 = 10 50 21. Bismarck Sea. h about 44 km.
		ePP		07 18	d	
		eSKSE		14 00	Wd	
		eSN		26		
		ePSE		15 28	Wd	
		eSSNE		20 26	Wd	
		eGN		27.0	NEd	
		eRE		31.5		
				mu sec		
		MaxH		2.55 36		
May 15	MIN	eP	11	03 26.6	c	
	BKS	eP	12	18 22.4	d	USCGS: 10°.5 N, 85°.7 W, 0 = 12 10 25.4. Near west coast of Costa Rica. h about 33 km.
		eZ		29.0	c	
	MHC	eP		16.7	c	
	MIN	eP		30.0	d	
	CLS	eP		26.8	c	
	PRI	eP		13.8	c	

Date	Sta.	Phase	Time (GCT)		Ground Motion	Remarks
			h	m s		
1964						
May 15	BKS	eP	19	42 40	c	USCGS: 31°.5 N, 113°.7 W, 0 = 19 40 35. Gulf of Calif. h about 33 km.
		iZ		43 25.3	d	
		eSN		44 52	S	
		eR		45 21.8	d	
				mu sec		
		MaxH		9.66 16	c	
	MHC	eP	19	42 22.5	c	
		eS		44 47.0	c	
	MIN	eZ		43 22.5	c	
		eS		45 49.8	d	
	CLS	eP		43 01.0	c	
	PRI	eP		42 21.4	d	
		eS		44 14.7	c	
May 15	PRI	eP	19	58 07	c	USCGS: 31°.6 N, 114°.1 W, 0 = 19 56 25. Gulf of Calif. h about 33 km.
May 16	BKS	iP	06	14 05.5	d	USCGS: 49°.9 N, 78°.3 E, 0 = 06 00 58.1. Kazakh, S.S.R. h about 0 km.
				mu sec		
		PZ		0.026 1.1		
	MHC	eP	06	14 08.2	c	
	MIN	eP		13 53.2	c	
	CLS	eP		14 01.5	c	
	PRI	eP		14.8	c	
May 16	MIN	eP	09	58 04.1	c	USCGS: 54°.0 N, 164°.1 W, 0 = 09 51 41.0. Unimak Island. h about 33 km.
May 16	MIN	eP	10	33 14.8	c	USCGS: 59°.3 N, 152°.0 W, 0 = 10 27 36. Alaska aftershock. h about 35 km.
May 16	BKS	eP	14	50 36.7	c	USCGS: 57°.6 N, 151°.0 W, 0 = 14 44 54. Alaska aftershock. h about 33 km.
		eZ		57.0		
				mu sec		
		PZ		0.125 1.2		
	MHC	eP	14	50 43.8	c	
	MIN	iP		21.6	c	
	CLS	eP		30.3	c	
	PRI	eP		57.6	c	
May 16	BKS	eP	16	20 31.5	d	USCGS: 32°.8 S, 178°.3 W, 0 = 16 07 46.2. Kermadec Islands. h about 33 km. Magnitude 5 1/2 - 6 (BKS).
		eZ		21 10.0	d	
		ePP		24 12.0	d	
		eSKSNE		30 52.0	SW	
		eGNE		44 08		
		eR		47.2		
				mu sec		
		PZ		0.78 8		
		SH		2.41 16		
		MaxH		9.8 18		
	MHC	eP	16	20 32.3	d	
	MIN	eP		43.4	c	
	CLS	eP		33.2	c	
	PRI	eP		33.5	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 17	BKS	eP	00 55 45	d	USCGS: 59°4 N, 142°7 W, 0 = 00 50 17.9.
		iZ	56 56	d	Alaska aftershock. h about 35 km.
		iSNE	01 00 16	SEd	Magnitude 6 1/4 (BKS).
		eGNE	01.0		
		eR	02.3		
			mu sec		
		PZ	10.85 10		
		SH	11.32 8		
		MaxH	19.8 24		
	MHC	eP	00 55 49.0	d	
	MIN	iP	24.2	c	
	CLS	eP	37.4	d	
	PRI	eP	02.5	c	
May 17	BKS	eP	04 47 54	Wd	USCGS: 53°9 N, 159°7 W, 0 = 04 41 44.
		eSNE	52 48	NEd	South of Alaska. h about 33 km.
		eGNE	54.4		
		eR	55.3		
			mu sec		
		MaxH	3.16 12		
	MHC	eP	04 47 58.7	c	
	MIN	iP	41.2	d	
	CLS	eP	46.7	d	
	PRI	eP	12.2	d	
May 17	MIN	eP	17 18 23.7	c	USCGS: 33°2 S, 178°4 W, 0 = 17 05 24.8.
					Kermadec Islands. h about 33 km.
May 17	BKS	iP	19 37 12.8	d	USCGS: 35°2 N, 35°9 W, 0 = 19 26 20.6.
		iZ	20.0	d	North Atlantic Ocean. h about 33 km.
		ePP	39 32.0	d	Magnitude 6 - 6 1/4 (BKS).
		ePPPNE	41 18.0	SWc	
		eSNE	46 10.0	NWc	
		eSSNE	50 16.0	SW	
		eGNE	53.6		
		eRE	57.9		
			mu sec		
		PZ	2.18 10		
		PPZ	0.81 12		
		SH	7.46 24		
		MaxH	18.15 18		
	MHC	eP	19 37 11.9	c	
	MIN	eP	01.3	c	
		ipP	10.8	d	
		iPP	39 22.5	d	
	CLS	eP	37 11.6	c	
	PRI	eP	12.2	d	
May 18	MIN	eP	05 17 58.3	d	USCGS: 60°4 N, 146°6 W, 0 = 05 12 32.
					Alaska aftershock. h about 33 km.
May 18	MIN	eP	13 52 39.3	d	USCGS: 59°6 N, 145°0 W, 0 = 13 47 22.7.
					Alaska aftershock. h about 20 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 18	BKS	iP	14 24 00.0	d	USCGS: 21°2 S, 174°5 W, 0 = 14 12 10.1.
		iZ	11.5	d	Tonga Islands. h about 33 km.
		eSNE	33 48.0	NW	
		eNE	43.6		
		eRE	47.5		
			mu sec		
		PZ	8		
		SH	14		
	MHC	eP	14 24 00.0	c	
	MIN	eP	09.2	c	
	CLS	eP	00.7	c	
	PRI	eP	58.8	c	
May 18	BKS	eP	17 50 35	d	USCGS: 18°2 N, 147°3 E, 0 = 17 38 25.5.
		eSE	18 00		Mariana Islands. h about 14 km.
		eN	10.4		
		eRE	14.3		
	MHC	eP	17 50 36.3	c	
	MIN	eP	32.2	d	
	CLS	eP	30.0	c	
	PRI	eP	41.8	c	
May 18	MIN	eP	18 20 05.6	d	USCGS: 59°7 N, 145°0 W, 0 = 18 14 49.
					Alaska aftershock. h about 33 km.
May 18	BKS	eP	21 17 44	d	USCGS: 54°5 N, 142°7 W, 0 = 21 12 46.2.
		eE	23 08	Ed	Alaska aftershock. h about 25 km.
		eZ	24 40	d	
	MHC	eP	18 22	c	
	MIN	iP	17 54.1	d	
	PRI	eP	18 40.5	d	
May 18	MIN	iP	01 50 03.6	d	USCGS: 60°4 N, 147°5 W, 0 = 01 44 34.
					Alaska aftershock. h about 15 km.
May 19	MIN	iP	02 29 03.1	d	USCGS: 59°4 N, 145°2 W, 0 = 02 23 45.2.
					Alaska aftershock. h about 20 km.
May 19	BKS	eE	06 38.8		USCGS: 77°7 N, 18°3 E, 0 = 06 09 04.1.
	MHC	eP	19 29.0	c	Svalbard region. h about 33 km.
	MIN	iP	06.9	d	
	CLS	eP	19.6	c	
	PRI	eP	36.1	d	
May 19	BKS	iP	10 49 48.5	d	USCGS: 45°5 N, 150°3 E, 0 = 10 39 24.8.
		eSNE	48 14	NEd	Kurile Islands. h about 33 km.
		eZ	11 02 10	d	
		eGNE	05.2		
		eRE	08.0		
	MHC	eP	10 49 52.6	c	
	MIN	iP	39.9	c	
	CLS	eP	31.6	c	
	PRI	eP	58.6	c	
May 19	MIN	eP	10 58 02.3	c	USCGS: 60°2 N, 146°3 W, 0 = 14 42 40.7.
May 19	MIN	eP	14 48 03.6	c	Alaska aftershock. h about 33 km.
May 19	BKS	ePNEZ	15 43 26	NWd	USCGS: 57°0 N, 152°8 W, 0 = 15 37 35.9.
		eSE	48 22.0	E	Alaska aftershock. h about 25 km.
		eGN	46.6		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 19	MHC	eRNE	15 51.2		
(cont.)	MHC	eP	43 33.9	c	
	MIN	iP	10.4	c	
	CLS	eP	17.2	c	
	PRI	eP	44.0	c	
May 19	BKS	iP	23 13 08.5	d	USCGS: 0°7 S, 80°2 W, 0 = 23 03 41.8. Near coast of Ecuador. h about 54 km.
		iZ	17.0		
		esP	47.0		
		ePPNE	15 20.0		
		eSNE	20 44.0		
		eScSNE	22 38.0		
		eSSNE	24 32.0		
		eGNE	26.8		
		eRE	30.6		
			mu sec		
		PZ	2.3 12		
		SH	1.04 16		
		MaxH	17.16 20		
	MHC	eP	23 13 01.0	c	
	MIN	eP	12.2	d	
	CLS	eP	10.3	c	
	PRI	eP	50.5	d	
May 20	MHC	eP	03 34 32.5	c	USCGS: 0°9 S, 80°4 W, 0 = 03 25 05.1. Near coast of Ecuador. h about 33 km.
	MIN	eP	43.0	c	
	CLS	eP	36.9	c	
	PRI	eP	14.3	c	
May 20	MIN	eP	05 37 38.8	d	USCGS: 58°0 N, 149°6 W, 0 = 05 32 13.7. Alaska aftershock. h about 20 km.
May 20	BKS	eP	05 06 11.4	d	USCGS: 31°4 S, 178°2 W, 0 = 05 53 30.3. Kermadec Islands. h about 33 km.
		eRE	31.8		
	MHC	eP	06 11.5	d	
	MIN	eP	20.1	d	
	CLS	eP	12.5	d	
	PRI	eP	10.5	d	
May 20	BKS	eP	06 14 45.2	c	USCGS: 2°7 S, 139°3 E, 0 = 06 01 14.8. Near north coast of New Guinea. h about 61 km.
		iZ	16 46	d	
		ePPE	18 50	Ec	
		eSKSNE	25 16	NW	
		eSP	27 08	c	
		ePPSE	54	E	
		eSSE	30.8		
		eLN	40.4		
		eRE	45.3		
			mu sec		
		MaxH	2.38 24		
	MHC	eP	06 14 49.5	d	
	MIN	iP	50.4	c	
	CLS	eP	46.2	c	
	PRI	eP	50.5	d	
May 20	MHC	eP	06 18 43.8	c	
	CLS	eP	31.3	c	
	PRI	eP	19 00.8	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 20	MIN	eP	06 30 43.4	d	
May 21	BKS	eP	01 17 07.6	c	USCGS: 60°4 N, 145°9 W, 0 = 01 11 23.4. Alaska aftershock. h about 15 km.
		eSNE	21 50	SE	
		eGN	23.8		
		eRE	24 20		
	MHC	eP	17	c	
	MIN	iP	16 49.5	c	
	CLS	eP	17 00.2	c	
	PRI	eP	27.3	c	
May 21	MIN	eP	13 37 16.8	c	USCGS: 60°2 N, 147°2 W, 0 = 13 31 50.9. Alaska aftershock. h about 33 km.
May 21	BKS	eP	15 42 04.5	d	USCGS: 59°0 N, 153°5 W, 0 = 15 36 01.5. Alaska aftershock. h about 15 km.
		iZ	13.3	c	
		eSNE	46 58	NWc	
		eGNE	48.6		
		eR	49.6		
		eScSEW	52 06		
			mu sec		
		PZ	0.935 6		
		SH	1.65 12		
		MaxH	4.8 40		
	MHC	eP	15 42 10.7	d	
	MIN	iP	48.9	d	
	CLS	eP	57.5	d	
	PRI	eP	24.3	d	
May 21	BKS	eP	22 39 58	c	USCGS: 17°5 N, 83°9 W, 0 = 22 32 33.9. Off coast of Honduras. h about 33 km.
		eSNE	46 00	SW	
		eNE	49 10	NEd	
		eGNE	49.6		
		eR	51.6		
	MHC	eP	39 56.8	d	
	MIN	eP	40 04.5	c	
	CLS	eP	01.5	c	
	PRI	eP	39 56.7	c	
May 22	BKS	eNE	00 50.6	SW	USCGS: 34°7 S, 179°6 W, 0 = 00 26 44.8. Kermadec Islands. h about 58 km.
		eGNE	01 03.4		
May 22	BKS	eE	12 55.8	d	
		eN	13 04.0		
		eR	07.4		
May 23	BKS	iP	11 33 55.1	SWc	USCGS: 28°6 N, 139°4 E, 0 = 11 22 33.3. Bonin Islands. h about 409 km.
		eZ	35 24.3	d	
	MHC	eP	33 58.7	c	
	MIN	iP	50.5	c	
	CLS	eP	51.1	d	
	PRI	eP	34 05.7	c	
May 23	MHC	eP	21 42 30.2	c	USCGS: 18°4 S, 69°2 W, 0 = 21 31 03.4. Chile-Bolivia border. h about 128 km.
	CLS	eP	37.0	d	
	PRI	eP	22.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 24	BKS	iP	00 46 11.5	d	USCGS: 60°2 N, 148°0 W, 0 = 00 40 21.9. Alaska aftershock. h about 15 km.
	MHC	eP	17.4	c	
	MIN	iP	45 53.6	c	
	CLS	eP	46 03.6	c	
	PRI	eP	30.6	c	
May 24	BKS	iP	04 24 59.5	c	USCGS: 22°6 S, 174°1 W, 0 = 04 13 05.3. Tonga Islands. h about 33 km.
		eSNE	34 52.0	NEc	
		eSSE	40.0		
		eR	48.2		
			mu sec		
		PZ	0.738 8		
		SH	1.10 18		
		MaxH	2.0 16		
	MHC	eP	04 24 59.4	d	
	MIN	eP	25 08.8	d	
	CLS	eP	00.4	d	
	PRI	eP	24 58.1	d	
May 24	MIN	eP	06 58 14.5	d	USCGS: 59°7 N, 148°5 W, 0 = 06 52 44.4. Alaska aftershock. h about 20 km.
May 24	MIN	eP	09 04 58.8	c	
May 24	MIN	eP	09 10 38.7	c	USCGS: 56°7 N, 152°9 W, 0 = 09 04 57.0 Alaska aftershock. h about 33 km.
May 24	MIN	eP	10 21 41.8	d	USCGS: 59°9 N, 145°5 W, 0 = 10 16 21.5. Alaska aftershock. h about 15 km.
May 24	BKS	iP	10 43 03.5	d	USCGS: 34°3 N, 141°1 E, 0 = 10 31 24.4. Near east coast of Honshu, Japan. h about 33 km.
		ipP	14.8	d	
		esP	42.1	c	
		eSNE	52	NEd	
		eSSNE	56		
		eGN	11 02.2		
		eRE	05.0		
			mu sec		
		MaxH	2.52 32		
	MHC	eP	10 43 05.1	c	
	MIN	eP	42 11.8	d	
	CLS	eP	58.2	d	
	PRI	eP	43 13.9	d	
May 24	BKS	eP	22 35 24.8	d	USCGS: 37°0 S, 177°8 E, 0 = 22 22 27.6. Near north New Zealand. h about 149 km.
	MHC	eP	23.7	c	
	CLS	eP	24.9	c	
	PRI	eP	22.2	c	
May 25	BKS	eP'	20 03 35.8	c	USCGS: 9°1 S, 88°9 E, 0 = 19 44 07.0. Indian Ocean. h about 33 km.
		ePP	06 28	c	
		ePPS	18 50	c	
		eSSNE	24.5	SW	
		eNE	25.3	SWd	
		eSSSNE	29.0	SEd	
		eGNE	43.0		
		eRE	48.3		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 25	MHC	eP'	20 03 37	c	(cont.)
	MIN	eP'	24.4	c	
	CLS	eP'	35.5	c	
	PRI	eP'	36.0	c	
May 26	BKS	ePP	09 53 07.0	d	USCGS: 16°5 N, 145°9 E, 0 = 09 40 57.9. Mariana Islands. h about 94 km. Magnitude 7 (BKS).
			mu sec		
		PPZ	0.045 0.8		
	MHC	ePP	09 53 10.4	d	
	MIN	iPP	05.7	d	
	CLS	ePP	04.6	d	
	PRI	ePP	16.2	d	
May 26	MIN	iP	10 14 04.0	d	USCGS: 56°2 S, 27°8 W, 0 = 10 59 12.3. Sandwich Islands. h about 120 km. Magnitude 7 1/2 - 7 3/4 (BKS).
May 26	BKS	ePNE	11 14 32	NWc	
		epP	15 02	d	
		eP'	17 54.0	d	
		ePPNE	19 39	NEd	
		epPPN	20 08	Sd	
		iNZ	21 20.0	Nc	
		ePKKP	27 50.3	?	
		eSSNE	35 28		
		eGN	48.3		
			mu sec		
		PPZ	20.2 8		
		MaxH	103 20		
	MHC	eP	11 14 53.5	d	
		eP'	17 53.0	d	
	MIN	eP	15 04	d	
		iP'	17 57.4	d	
	CLS	eP	14 47.4	c	
		eP'	17 55.3	c	
	PRI	eP	14 44.7	c	
		eP'	17 51.2	c	
May 26	MIN	eZ	12 00 58.0	c	
May 26	MIN	eP	13 07 12.6	c	
May 27	BKS	eP'	01 15 27.1	c	USCGS: 56°1 N, 27°6 W, 0 = 00 56 42.5. Sandwich Islands. h about 105 km. Magnitude 6 1/2 (BKS).
		ePPN	17 32	Nc	
		iZ	18 50.6	d	
		eZ	26 40	c	
		eSSNE	33 42	Wc	
		eNE	49		
			mu sec		
		PPZ	1.24 7		
	MHC	eP'	01 15 26.4	d	
		esP'	18 49.2	c	
	MIN	eP'	15 29.1	c	
		esP'	18 52.3	c	
	CLS	eP'	15 28.4	d	
		esP'	18 51.2	c	
	PRI	eP'	15 23.7	d	
		esP'	18 46.3	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks		
			h m s				
May 27	BKS	iP'	06 49 42.2	d	USCGS: 56°2 S, 27°4 W, 0 = 06 30 57.7. Sandwich Islands. h about 116 km.		
		iZ	50 08.7	c			
		eGNE	07 20.0				
		eNE	30.0				
		MHC	eP'	06 49 40.6		c	
May 27	MIN	eP'	43.5	c	USCGS: 55°9 S, 27°4 W, 0 = 09 50 03. Sandwich Islands. h about 52 km.		
		CLS	eP'	42.1		c	
		PRI	eP'	38.0		c	
May 27	MIN	eP	10 09 07.8	d	USCGS: 6°8 N, 73°1 W, 0 = 11 06 22.0. Northern Colombia. h about 139 km.		
May 27	BKS	iP	11 15 35.8	c	USCGS: 21°0 S, 174°5 W, 0 = 15 18 17.3. Tonga Islands. h about 33 km.		
		esP	16 15.0	d			
		eZ	26 28.0	d			
		MHC	eP	15 30.8		d	
		MIN	iP	50.2		c	
		CLS	eP	38.9		d	
		PRI	eP	22.3		d	
May 27	BKS	eZ	16 00 18	c	USCGS: 25°5 N, 122°0 E, 0 = 01 56 58.9. Near east coast of Taiwan. h about 41 km.		
		MHC	eP	05.9		c	
		CLS	eP	07.5		c	
		PRI	eP	04.6		c	
		May 28	BKS	eP		02 10 11.5	c
May 28	BKS	eNE	22.4		USCGS: 0°8 S, 24°7 W, 0 = 12 33 10.2. Mid-Atlantic Ocean. h about 33 km.		
		MHC	eP	10 15.5		d	
		MIN	eZ	07.6		c	
		CLS	eP	07.5		c	
		PRI	eP	22.5		c	
		May 28	BKS	ePP		13 00 46.0	d
		May 28	BKS	eGN		13.8	
eRE	19.2						
MHC	ePP			00 41.9	d		
MIN	ePP			52.4	d		
CLS	ePP			50.0	d		
PRI	ePP			32.7	d		
May 28	BKS			iP	16 23 50.5	d	
eZ	57.7			c			
eNE	30 10.0						
eRE	31.2						
May 28	BKS		mu sec		USCGS: 36°2 N, 141°1 E, 0 = 14 30 45.3. Near east coast of Honshu, Japan. h about 49 km. Magnitude 6 (BKS).		
		PZ	0.093 1.4				
		MHC	eP	16 23 57.8		d	
		MIN	iP	34.7		d	
			ipP	42.3		d	
		CLS	eP	43.5		d	
		PRI	eP	10.6		d	
		May 28	BKS	eRN		18 12 28	d
		MHC	eZ	17 59 04		d	
		PRI	eZ	58 59		d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks			
			h m s					
May 28	BKS	eS	21 23 48	c	USCGS: 3°6 S, 102°7 W, 0 = 21 09 09.5. 1,300 km west of Galapagos Islands. h about 33 km.			
		eRNE	30.6					
		MHC	eZ	17 20.6		c		
		CLS	eZ	31.2		c		
		PRI	eZ	08		c		
May 29	MIN	eP	03 40 17.1	c	USCGS: 60°1 N, 146°5 W, 0 = 03 34 51.8. Alaska aftershock. h about 15 km.			
May 29	MIN	eP	05 18 22.0	c	USCGS: 44°7 N, 149°4E, 0 = 05 08 02.2. Kurile Islands. h about 50 km.			
May 29	BKS	iP	09 23 20.1	c	USCGS: 56°2 S, 27°7 W, 0 = 09 04 27.1. Sandwich Islands. h about 33 km.			
		MHC	eP	18.7		d		
		MIN	eP	22.1		c		
		CLS	eP	20.7		d		
		PRI	eP	13.7		c		
		May 29	BKS	eP		10 23 20.0	c	USCGS: 60°2 N, 146°3 W, 0 = 10 17 34.5. Alaska aftershock. h about 5 km.
		eZ	28.8	c				
		eSNE	27.8					
		eRN	29.7					
			mu sec					
		PZ	0.79 8					
		MaxH	7.15 22					
May 29	BKS	MHC	eP	10 23 26.0	c			
		MIN	eP	02.4	c			
			ipP	06.4	c			
		CLS	eP	12.4	c			
		PRI	eP	39.5	c			
		May 29	BKS	eP	15 51 41	Nd		
		eSN	16 03 00	N				
eE	08 00	N						
		eGNE	17.0					
		eRNE	21.0					
May 30	BKS	iP	03 23 53.6	c	USCGS: 59°5 N, 148°5 W, 0 = 03 18 08.3. Alaska aftershock.			
		MHC	eP	24 00.8		c		
		MIN	iP	23 38.8		c		
			ipP	41.4		c		
May 30	BKS	CLS	eP	43.1	c			
		PRI	eP	24 11.4	c			
		May 30	BKS	iP	14 42 17.3	d		
		iZ	32.2	d				
		eZ	43 16.6	d				
		eSNE	51 41.0	SEd				
		eGN	15 01.1					
eR	04 12	N						
		mu sec						
		PZ	1.205 6					
		SH	2.53 9					
		MaxH	7.45 18					
MHC	eP	14 42 18.7	d					
MIN	eP	08.3	c					
CLS	eP	12.0	c					
PRI	eP	23.2	d					

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
May 30	MIN	eP	17 31 37.9	c	USCGS: 41°3 N, 141°9 E, 0 = 17 20 37.6. Near east coast of Honshu, Japan. h about 57 km.
May 30	BKS	eP	22 40 18	c	USCGS: 56°6 N, 152°3 W, 0 = 22 34 33.3. Alaska aftershock. h about 15 km.
		eN	46 24	N	
	MIN	eP	04.6	d	
	CLS	eP	40 12.2	c	
	PRI	eP	39.2	c	
May 31	BKS	iPE	00 51 18.7	Ec	USCGS: 43°5 N, 146°8 E, 0 = 00 40 36.4. Kurile Islands. h about 48 km. Magnitude 7 (BKS).
		ipP	30.0	d	
		iPcP	47.0	d	
		iPP	53 56.0	d	
		iSNE	01 00 00	SEd	
		iSSE	03 44	Wc	
		iLNE	07 28		
		iRE	10 20		
			mu sec		
		PZ	5.71 16		
		SH	39.5 20		
		MaxH	64.5 52		
	MHC	eP	00 51 22.9	c	
		eP'P'	01 19 48.6	d	
	MIN	iP	00 51 11.1	c	
		ipP	26.9	c	
	CLS	eP	13.8	c	
		eP'P'	01 19 56.6	d	
	PRI	eP	00 51 31.8	c	
		eP'P'	01 19 49.8	c	
May 31	MIN	eZ	01 19 33.4	c	
May 31	MIN	eP	01 28 08.5	c	
May 31	MIN	eZ	10 34 02.0	c	USCGS: 53°7 N, 158°7 E, 0 = 10 24 54. Southern Kamchatka Peninsula. h about 110 km.
May 31	BKS	eP	17 27 29.0	d	USCGS: 13°6 S, 172°1 E, 0 = 17 15 26.8. New Hebrides Islands. h about 73 km.
		eSNE	37 28.0	NEc	
		eNE	38 36.0	SWd	
		eSSE	42 12.0		
		eGN	48.0		
		eRNE	51.3		
			mu sec		
		PZ	1.0 10		
		SH	0.92 16		
		MaxH	4.27 52		
	MHC	eP	17 27 30.9	c	
	MIN	eZ	41.8	c	
	CLS	eP	32.4	c	
	PRI	eP	29.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 1	BKS	eP	06 17 20.2	c	USCGS: 14°6 S, 167°4 E, 0 = 06 05 07.6. New Hebrides Islands. h about 176 km.
	MHC	eP	21.6	c	
	MIN	eP	26.8	d	
	PRI	eP	22.8	c	
June 1	BKS	eP	13 29 12	c	USCGS: 21°0 S, 175°7 W, 0 = 13 17 20.7. Tonga Islands. h about 35 km.
		eSNE	39 04	SEd	
		eScSNE	44	NE	
		eRNE	52.5		
			mu sec		
		PZ	0.588 7		
		SH	0.366 12		
		MaxH	1.43 32		
	MHC	eP	13 29 13.0	c	
	MIN	eP	24.0	c	
	CLS	eP	15.3	c	
	PRI	eP	14.0	c	
June 2	BKS	eP	16 14 58.0	d	USCGS: 59°7 N, 144°4 W, 0 = 16 09 23.5. Alaska aftershock. h about 15 km.
		eSNE	19 44	SWd	
		eZ	20 00	d	
		eRE	21.8		
			mu sec		
		PZ	6.6 14		
	MHC	eP	16 15 03.8	d	
	MIN	iP	14 40.3	d	
	CLS	eP	50.5	d	
	PRI	eP	15 17.8	d	
June 2	BKS	iP	16 35 16.0	c	USCGS: 59°7 N, 144°2 W, 0 = 16 29 41.5. Alaska aftershock. h about 10 km.
	MHC	eP	22.0	c	
	MIN	iP	34 57.3	d	
	CLS	eP	35 07.6	d	
	PRI	eP	34.7	d	
June 3	BKS	eP	11 46 48	d	
		eSNE	50 58		
		eGE	51.6		
		eRN	52.8		
	MHC	eP	40.5	c	
	MIN	eP	47 04.7	c	
	CLS	eP	46 57.4	c	
	PRI	eP	25.0	c	
June 3	BKS	eP	14 09 15.0	d	
		eZ	54.0	c	
		eSNE	14 04	SW	
		eRN	16.6		
	MHC	eP	07 21.5	d	
	MIN	iP	08 57.2	d	
	CLS	eP	09 07.6	c	
	PRI	eP	35.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 4	BKS	ePNE eSE eGNE eRNE	04 34 43 39 28 41.5 42.3	NWc Ec	USCGS: 17°5 N, 100°8 W, 0 = 04 28 54.7. Near coast of Guerrero, Mexico. h about 22 km.
			mu sec		
		PZ SH MaxH	1.27 16 7.2 22 0.208 16		
	MHC	eP	04 34 26.7	c	
	MIN	eP	54.6		
	CLS	eP	59.8	d	
	PRI	eP	21.6	c	
June 4	BKS	eP	11 30 20	d	USCGS: 6°1 S, 149°9 E, 0 = 11 17 11.8. New Britain. h about 54 km.
		eSKSE	40 44	W	
		eSSNE	41.5	SW	
		eSSS	51 24	c	
		eGN	54.3		
		eRE	59.0		
June 4	BKS	eP	11 56 29.0	d	USCGS: 9°6 S, 76°1 W, 0 = 11 46 01.7. Central Peru. h about 124 km.
			mu sec		
		PZ	.089 1.5	d	
	MHC	eP	11 56 20.1	d	
	MIN	eP	31.2	c	
	CLS	eP	28.6	d	
	PRI	eP	10.9	d	
June 4	PRI	eP	21 26 09.0	c	
June 5	MHC	eP	04 55 34.5	d	USCGS: 47°8 N, 27°3 W, 0 = 04 44 48.6. North Atlantic Ocean. h about 33 km.
	MIN	eP	19.8	d	
	CLS	eP	31.9	d	
	PRI	eP	36.8	c	
June 5	BKS	eP	09 25 22.0	d	USCGS: 16°2 S, 177°3 E, 0 = 09 13 20.0. Fiji Islands. h about 25 km.
		eScSNE	36.0	SWd	
		eRNE	49.0		
	MHC	eP	25 18.2	d	
	MIN	eZ	29.3	d	
	CLS	eP	19.7	d	
	PRI	eP	19.0	d	
June 5	BKS	eP	09 56 19.0	d	USCGS: 60°4 N, 146°0 W, 0 = 09 50 35.0. Alaska aftershock. h about 15 km.
		eZ	23.0	d	
		eSN	10 00 56	N	
		eRE	03 32		
			mu sec		
		PZ	.106 1.5		
	MHC	eP	09 56 25.1	d	
	MIN	iP	00.7	d	
	CLS	eP	11.3	d	
	PRI	eP	38.5	d	
June 5	BKS	eP	22 12 59.5	d	USCGS: 58°1 N, 152°1 W, 0 = 22 06 53.0. Alaska aftershock. h about 15 km.
		eSE	17 28.0	Ec	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 5		eGE	22 18.9		
(cont.)		eRE	20.3		
	MHC	eP	12 52	c	
	CLS	eP	39.6	d	
	PRI	eP	13 06.8	d	
June 6	BKS	eN	02 49 08	N	
June 6	CLS	eP	19 10 02.2	c	
	PRI	eP	09 40.6	d	
June 6	BKS	eP	19 18 29.0	d	USCGS: 26°6 S, 114°4 W, 0 = 19 07 51.4. Easter Island. h about 33 km.
		eSE	26 12	E	
		eNE	28	Sd	
		eScSNE	27 00	SWd	
		esS	30 08	d	
		eG	34.7		
		eRN	37.6		
			mu sec		
		PZ	1.2 6		
		SH	0.662 32		
		MaxH	2.2 36		
	MHC	eP	19 18 24.1	d	
	MIN	eP	43.0	d	
	CLS	eP	33.0	c	
	PRI	eP	15.5	c	
June 7	BKS	eP	20 23 03.4	d	USCGS: 30°4 S, 67°6 W, 0 = 20 10 15.9. La Rioja Province, Argentina. h about 29 km.
		eNE	33		
	MHC	eP	23 01.2	c	
	CLS	eP	07.8	c	
	PRI	eP	52.5	c	
June 8	BKS	iPP	23 05 20.0	d	USCGS: 17°7 N, 145°7 E, 0 = 22 53 21.7. Mariana Islands. h about 163 km.
			mu sec		
		PPZ	0.116 1.4		
	MHC	ePP	23 05 23.4	d	
	MIN	iPP	18.7	d	
	CLS	ePP	17.4	d	
	PRI	ePP	29.4	d	
June 8	MIN	eP	23 14 25.5	d	
June 9	MIN	eP	09 29 33.4	c	USCGS: 59°6 N, 145°1 W, 0 = 09 24 18. Alaska aftershock. h about 33 km.
					USCGS: 0°2 S, 78°9 W, 0 = 18 16 13.7. Ecuador. h about 48 km.
June 9	BKS	eGE	18 40.0		
		eR	43.5		
	MIN	eP	25 48.8	c	
	CLS	eP	48.0	d	
	PRI	eP	30.5	d	
June 10	BKS	iP	19 26 29.0	d	
	MHC	eP	30.0	d	
	MIN	eP	35.6	c	
	CLS	eP	28.7	d	
	PRI	eP	31.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 10	MIN	eP	20 07 27.5	c	
June 10	BKS	eP	22 30 28.0	c	USCGS: 5°0 N, 127°4 E, 0 = 22 16 44.8.
		iPP	34 38.0	c	Jalaud Islands. h about 146 km.
		eS	44 52.0		
		eR	23 03.6	d	
	MIN	eZ	22 30 27.9	d	
	PRI	ePP	34 26.0	c	
June 10	MHC	eP	23 31 17.4	c	USCGS: 59°1 N, 153°8 W, 0 = 23 25 09.1.
	MIN	iP	30 55.7	c	Alaska aftershock. h about 33 km.
	PRI	eP	31 30.7	c	
June 11	MIN	iP	03 18 59.3	c	USCGS: 65°5 N, 168°1 W, 0 = 03 11 56.6.
	PRI	eP	19 33.9	c	Bering Strait. h about 33 km.
June 11	MIN	iP	11 14 00.7	d	USCGS: 56°0 S, 27°3 W, 0 = 10 55 06.2.
					Sandwich Islands. h about 33 km.
June 11	BKS	eP	17 15 20	d	USCGS: 2°0 S, 140°8 E, 0 = 17 01 48.5.
		ePP	19 28	d	Near north coast of Western New Guinea. h about 18 km.
		eSKSNE	25 44	NE	
		eSNE	26 36	NW	
		ePSNE	27 56	NW	
		eSSNE	33 28	SEd	
		eGNE	40.7		
		eRNE	45.4		
	CLS	eP	15 17.4	d	
	PRI	eP	28.7	d	
June 11	BKS	iP	18 43 39.5	c	USCGS: 33°1 N, 137°6 E, 0 = 18 32 17.9.
	MHC	eP	43.2	c	Near south coast of Honshu, Japan.
	CLS	eP	35.8	c	h about 336 km.
	PRI	eP	50.7	c	
June 11	BKS	eP	21 46 50.3	d	
		eZ	47 19.3	c	
	MHC	eP	46 48.7	c	
	CLS	eP	50.4	c	
	PRI	eP	46.7	c	
June 12	BKS	eP	18 23 50.5	d	USCGS: 26°5 S, 178°3 E, 0 = 18 12 20.5.
	MHC	eP	50.8	d	South of Fiji Islands.
	MIN	eP	58.6	d	h about 648 km.
	CLS	eP	51.4	d	
	PRI	eP	50.3	d	
June 13	BKS	eP	04 29 20	Ec	USCGS: 53°6 N, 172°1 E, 0 = 04 20 53.5.
		eSNE	36 10	NWc	Near Aleutian Islands.
		eNE	39 48		h about 33 km.
		eGNE	42.8		
	MHC	eP	29 25	c	
	MIN	iP	11.0	c	
	CLS	eP	05.8	c	
	PRI	eP	40.4	d	
June 13	MIN	eZ	08 11 51.9	d	
June 13	MIN	eP	08 38 40.4	d	USCGS: 10°0 N, 93°0 E, 0 = 08 23 45.6.
					Andaman Islands. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 13	MIN	eP	11 27 01.5	c	USCGS: 27°3 S, 178°0 W, 0 = 11 14 26.5.
					Kermadec Islands. h about 34 km.
June 13	MIN	eP	14 13 41.7	d	USCGS: 3°9 S, 154°3 E, 0 = 14 01 40.2.
					Solomon Islands. h about 474 km.
June 13	BKS	eP	22 44 16	c	USCGS: 27°6 S, 178°3 W, 0 = 22 31 53.5.
		eSNE	54 40	SE	Kermadec Islands. h about 94 km.
		ePSNE	55 32	SWd	
		eSSNE	23 00 02	SE	
		eGNE	05.7		
		eZ	07.0		
		eRNEZ	11.8		
			mu sec		
		MaxH	2.46 36		
	MHC	eP	22 44 17.9	c	
	MIN	eP	28.2	d	
	CLS	eP	16.6	c	
	PRI	eP	18.4	d	
June 13	MIN	eP	23 27 48.6	c	USCGS: 59°2 N, 136°8 W, 0 = 23 23 04.0.
					Southeastern Alaska.
					h about 33 km.
June 14	MIN	iP	01 49 14.1	d	USCGS: 48°8 N, 128°4 W, 0 = 01 46 52.4.
					Vancouver Island. h about 33 km.
June 14	MIN	eP	09 39 53.0	d	
June 14	BKS	eN	12 41 16	NW	USCGS: 38°0 N, 38°5 E, 0 = 12 15 31.3.
		eGE	57.6		Southeast of Turkey.
		eRNE	13 02.0		h about 8 km.
	MIN	eP	12 29 20.0	c	
		ePP	33 23.4	c	
June 15	BKS	ePPE	00 26 12	Ec	USCGS: 5°5 N, 97°0 E, 0 = 00 05 31.1.
		ePPP	28 22	c	Northern Sumatra. h about 33 km.
		eEZ	35 00	Ec	Magnitude 5 3/4 - 6 1/4 (BKS).
		eP'P'	42 06	d	
		eSSNE	43 12	NEd	
		eSSSNE	47 32	SEd	
		eGNE	57.4		
		eRNE	01 04.0		
			mu sec		
		PPZ	0.682 10		
		MaxH	6.1 20		
	MIN	eP	00 24 24.9	c	
June 15	MIN	iP	09 33 29.6	c	USCGS: 56°7 N, 151°6 W, 0 = 09 28 04.
					Alaska aftershock. h about 33 km.
June 15	MIN	eP	11 04 29.4	c	USCGS: 40°1 N, 138°5 E, 0 = 10 53 06.7.
					Sea of Japan. h about 15 km.
June 15	MIN	iP	16 05 17.4	d	
June 15	MIN	eZ	16 37 26.1	c	USCGS: 45°4 N, 149°8 E, 0 = 16 27 09.9.
					Kurile Islands. h about 81 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks	
1964			h m s			
June 16	BKS	eP	04 13 12.5	d	USCGS: 38°3 N, 139°1 E, 0 = 04 01 44.3. Near west coast of Honshu, Japan. h about 57 km. Magnitude 7 1/2 (BKS).	
		iZ	32.2	c		
		ePPNE	16 18.0	Nd		
		ePKIKPN	19 37.0	N		
		eSN	22 36.0	N		
		eZ	51	c		
		eSSSN	31.1			
		eGN	32.2			
		eR	34.9			
			mu sec			
		PZ	11.75 12			
		PPZ	23.2 12			
		SH	35.4 9			
		MaxH	74.7 12			
June 16	MHC	eP	04 13 18.4	d		
		MIN	iP	10.0	c	
			ipP	14.8	c	
		CLS	eP	10.4	d	
		PRI	eP	25.0	d	
June 16	BKS	eP	04 29 11.1	d	USCGS: 38°9 N, 139°1 E, 0 = 04 17 38.0. Near west coast of Honshu, Japan. h about 13 km.	
		iZ	17.1	d		
		MHC	eP	15.3		d
		MIN	iP	04.1		d
		CLS	eP	05.8		d
June 16	MIN	PRI	eP	23.4	d	
		eP	04 46 55.2	d	USCGS: 38°5 N, 138°7 E, 0 = 04 35 30.2. Near west coast of Honshu, Japan. h about 33 km.	
June 16	BKS	iP	04 58 07.4	d		USCGS: 39°0 N, 139°0 E, 0 = 04 50 33. Near west coast of Honshu, Japan. h about 33 km.
		MHC	eP	12	c	
		MIN	iP	00.6	d	
		CLS	eP	01.8	d	
		PRI	eP	19.9	d	
June 16	MIN	iP	05 10 10.3	d		
June 16	MHC	eP	05 50 54.5	d	USCGS: 38°8 N, 139°0 E, 0 = 05 39 24.5. Near west coast of Honshu, Japan. h about 35 km.	
		MIN	eP	47.2		c
		CLS	eP	48.6		d
		PRI	eP	12.1		d
June 16	MIN	eP	06 28 33.5	c	USCGS: 38°4 N, 138°9 E, 0 = 06 17 07.8. Near west coast of Honshu, Japan. h about 28 km.	
June 16	BKS	eP	07 04 38.1	c		USCGS: 38°7 N, 134°0 E, 0 = 06 53 05.0. Near west coast of Honshu, Japan. h about 15 km.
		eZ	52.2	c		
			mu sec			
	PZ	0.44 1.7				
June 16	MHC	eP	07 04 42.1	c		
		MIN	iP	43.1	d	
		CLS	eP	31.8	c	
		PRI	eP	49.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks				
1964			h m s						
June 16	BKS	eP	07 26 30.1	c	USCGS: 38°5 N, 139°2 E, 0 = 07 14 57.1. Japan aftershock. h about 16 km.				
			mu sec						
		PZ	.231 1.4						
		MaxH	6.8 1.30						
		MHC	eP	07 26 34.3		c			
			MIN	eP		23.2	c		
			CLS	eP		26.8	c		
			PRI	eP		43.0	c		
		June 16	BKS	ePZ		07 28 53.9	d	USCGS: 38°4 N, 134°0 E, 0 = 07 27 40.3. Japan aftershock. h about 15 km.	
				MHC		eP	58.0		d
				MIN		iP	47.2		d
				CLS		eP	49.7		d
		June 16	MIN	PRI		eP	29 06	d	
				eP		08 26 41.1	d	USCGS: 38°8 N, 138°8 E, 0 = 08 15 14.2. Japan aftershock. h about 15 km.	
June 16	MIN	eP	10 07 53.1	c	USCGS: 17°3 S, 178°7 W, 0 = 09 56 46.1. Fiji Islands. h about 502 km.				
		eP	10 28 09.6	d		USCGS: 61°2 N, 146°8 W, 0 = 10 23 39.7. Alaska aftershock. h about 40 km.			
June 16	MIN	iP	10 32 09.8	c	USCGS: 60°1 N, 149°5 W, 0 = 10 59 27. Alaska aftershock. h about 72 km.				
		June 17	MIN	eP		11 04 57.3	c	USCGS: 59°9 N, 147°2 W, 0 = 08 24 27. Alaska aftershock. h about 33 km.	
June 17	MIN	eZ	08 29 52.2	c	USCGS: 39°3 S, 74°7 W, 0 = 20 33 53.3. Off coast of central Chile. h about 26 km.				
June 18	BKS	iP	20 46 45.5	c					
		ePP	50 12	d					
		eSNE	57 34	SE					
		eGNE	10.4						
		eP'P'	13.0	d					
		eR	15.5						
MHC	eP	46 41.7	d						
	CLS	eP	48.2	d					
	PRI	eP	35.0	c					
June 19	MIN	iP	01 39 37.5	c	USCGS: 56°8 N, 151°5 W, 0 = 01 34 10.4. Alaska aftershock. h about 33 km.				
June 19	BKS	eP	10 17 05.9	SEc		USCGS: 38°8 N, 139°3 E, 0 = 10 05 36.4. Near west coast of Honshu, Japan. h about 30 km. Magnitude 5 1/2 (BKS).			
			mu sec						
	PZ	0.177 1.2							
MHC	eP	10 17 10.0	c						
	MIN	iP	16 59.3	c					
	CLS	eP	17 01.6	c					
	PRI	eP	18.1	c					
June 20	MIN	eZ	11 26 16.4	c	USCGS: 3°4 S, 134°7 E, 0 = 11 12 38. Western New Guinea. h about 33 km.				
June 20	BKS	eNE	17 22 09	SW		USCGS: 18°5 N, 105°5 W, 0 = 17 12 15.2. Near coast of Jalisco, Mexico. h about 28 km.			
		eRNE	24.1						
MHC	eP	17 25.2	d						
	MIN	eP	47.0	c					
	CLS	eP	35.5	c					
	PRI	eP	10.5	d					

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 20	BKS MIN	eN eZ	19 46.5 40 50.3	d	USCGS: 18°8 N, 105°4 W, 0 = 19 35 23. Near coast of Jalisco, Mexico. h about 33 km.
June 21	BKS MHC MIN CLS PRI	iP epP eZ eP epP iP ipP eP epP eP	01 42 49.5 43 02.6 45.3 42 54.0 43 08.2 42 40.2 53.7 42 44.1 58.2 43 04.0 18.6	d d c c c c d c c c c	
June 21	BKS	eP eEZ eGN eRE	02 50 38 54 56.9 59.2	Ed Wc	
June 21	BKS MHC MIN CLS PRI	eP eP eP eP eP	07 05 50.5 56.0 54.2 54.0 37.7	c d d d c	USCGS: 14°9 S, 73°3 W, 0 = 06 54 46.2. Peru. h about 80 km.
June 21	BKS	eP eScSNE eRNE	22 33 27.8 43 48 56.7	d NEd	USCGS: 16°3 S, 178°0 E, 0 = 22 21 22.7. Fiji Islands. h about 18 km.
		MaxH	mu sec 3.42 32		
June 22	MHC CLS PRI BKS	eP eP eP eP eZ epPP iZ eSNE eNEZ eSSE eGNE eRNE	22 33 28.2 27.7 27.9 00 27 47.1 28 04 31 36 34 44 37 10 37 46 41 28 45.9 48.8	c c c d c d c NWd SWd Ed	USCGS: 15°7 S, 172°8 W, 0 = 00 16 27.4. Samoa Islands. h about 33 km. Magnitude 5 1/2 - 6 (BKS).
		PZ SH MaxH	mu sec 0.80 6 2.87 20 3.96 16		
	MHC MIN CLS PRI	eP iP eP eP	00 27 47.5 58.5 48.1 46.9	d c d d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 22	BKS	iP epP eSNE ePSE eSSE eGN eRE	03 16 12.7 30.2 26 32 27 16 32.6 38.6 42.0	d d Wc Ed	USCGS: 10°4 S, 161°1 E, 0 = 03 03 37.9. Solomon Islands. h about 70 km.
			mu sec 0.545 10 4.11 24 2.87 40		
	MHC MIN CLS PRI	eP iP eP eP	03 16 12.5 17.8 08.7 17.0	c d c d	
June 23	BKS	iP ipP iNEZ iSNE iSSNE iGNE iR	01 37 19.5 38.5 38 07.0 46 05 50 00 53 38 56.5	SEc c NWd SEc NWd	USCGS: 43°3 N, 146°1 E, 0 = 01 26 37.0. Kurile Islands. h about 77 km. Magnitude 6 1/2 - 7 (BKS).
			mu sec 4.03 14 48.2 42 34 14		
	MHC MIN CLS PRI	eP iP eP'P' iP eP'P' iP eP'P'	01 37 24.0 12.0 02 06 12.9 01 37 15.1 02 06 05.5 01 37 32.9 02 06 03	c c c c c c c	
June 23	BKS	eP	02 14 18.6	c	USCGS: 2°7 S, 80°0 W, 0 = 02 04 41.8. Ecuador. h about 58 km.
			mu sec .043 1.1		
	MHC MIN CLS PRI	eP eP eP eP	02 14 13.7 24.9 23.0 04.0	c c c d	
June 23	MIN	eZ	05 31 55.9	d	USCGS: 53°9 N, 163°2 W, 0 = 05 25 36.8. Unimak Islands. h about 60 km.
June 23	MIN	eZ	08 48 13.3	d	USCGS: 60°5 N, 144°9 W, 0 = 08 42 53. Alaska aftershock. h about 23 km.
June 24	MIN	iP	10 10 19.1	c	
June 25	MIN	iP	11 28 31.1	c	USCGS: 60°3 N, 149°1 W, 0 = 11 23 00.6. Alaska aftershock. h about 70 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 26	MIN	eP	05 34 27.4	d	USCGS: 61.7 N, 148.3 W, 0 = 05 28 49. Alaska aftershock. h about 33 km.
June 26	BKS	iP	13 21 40.5	c	USCGS: 12.6 S, 169.4 E, 0 = 13 10 28.9. New Hebrides Islands. h about 648 km.
	MHC	eP	42.2	d	
	CLS	eP	40.8	c	
	PRI	eP	43.8	d	
June 26	BKS	eZ	14 12.0		USCGS: 9.2 S, 158.9 E, 0 = 13 32 52.3. Solomon Islands. h about 17 km.
	MHC	eP	13 45 40.3	d	
	MIN	eP	42.2	c	
	PRI	eP	42.2	c	
June 28	MIN	eZ	11 14 32.2	d	USCGS: 1.7 N, 149.6 E, 0 = 12 51 34.6. New Ireland. h about 7 km. Magnitude 5 3/4 - 6 (BKS).
June 28	BKS	eP	13 04 34.7	c	
		epP	48.2	c	
		eZ	05 14	d	
		iZ	06 38	d	
		iSE	15 10	W	
		ePSNE	30	SW	
		eSSNE	21 06	NEc	
		eLNE	28.0		
		eRE	31.7		
			mu sec		
		PZ	1.00 6		
		SH	4.24 22		
		MaxH	21.6 44		
	MHC	eP	13 04 37.9	d	
	MIN	iP	38.2	d	
	CLS	eP	34.0	d	
	PRI	eP	41.7	d	
June 28	MIN	iP	15 04 20.1	c	USCGS: 13.2 S, 167.1 E, 0 = 14 52 08.4. New Hebrides Island. h about 215 km.
June 28	BKS	eP	17 40 46	d	USCGS: 4.0 N, 32.4 W, 0 = 17 27 59.8. North Atlantic Ocean. h about 33 km.
		eE	48 32	Ec	
		eGN	18 06.0		
		eRE	09.0		
	MHC	eP	17 40 42	d	
	MIN	eZ	42.5	c	
	CLS	eP	38.6	c	
	PRI	eP	40.4	d	
June 28	BKS	iP	19 14 51.1	c	USCGS: 58.3 N, 150.2 W, 0 = 19 09 05.4. Alaska aftershock. h about 23 km.
		eSNE	19 32.0	NEc	
		eGNE	21.1		
		eRE	21.8		
			mu sec		
		PZ	0.68 10		
		MaxH	3.54 16		
	MHC	eP	19 14 55.3	c	
	MIN	iP	35.0	c	
	CLS	eP	42.3	c	
	PRI	eP	15 10.4	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
June 29	BKS	eZ	04 49 53.0	c	USCGS: 26.7 N, 110.8 W, 0 = 04 43 30. Gulf of Calif. h about 33 km.
		eGNE	49.9		
		eR	51.6		
	MHC	eP	46 45	c	
	MIN	eP	47 20.2	c	
	CLS	eP	46 38	c	
	PRI	eP	29.0	d	
June 29	MIN	eP	05 17 49.0	c	USCGS: 27.1 N, 110.5 W, 0 = 05 13 23. Gulf of Calif. h about 33 km.
June 29	BKS	ePNE	07 27 48.0	SEc	USCGS: 62.7 N, 152.0 W, 0 = 07 21 32.8. Southern Alaska. h about 33 km. Magnitude 5 1/4 - 5 1/2 (BKS).
		iZ	56.3	d	
		eZ	28 34.8	c	
		eSNE	32 40.0	NWd	
		eGNE	34.7		
		eRE	36.6		
			mu sec		
		PZ	1.16 8		
		SH	1.41 8		
		MaxH	2.88 16		
	MHC	eP	07 27 54.3	c	
	MIN	iP	24.6	c	
	CLS	eP	40.9	c	
	PRI	eP	07.4	c	
June 29	MIN	eP	07 34 17.1	d	
June 29	MIN	eP	10 48 11.4	d	USCGS: 56.7 N, 151.4 W, 0 = 10 42 46.1. Alaska aftershock. h about 33 km.
June 29	MIN	eZ	13 35 16.5	d	
June 30	MIN	eZ	05 52 41.6	d	USCGS: 59.1 N, 154.0 W, 0 = 05 46 53. Alaska aftershock. h about 33 km.
June 30	MIN	eP	10 26 40.6	c	USCGS: 19.8 S, 173.9 W, 0 = 10 14 45.8. Tonga Islands. h about 33 km.
June 30	MHC	eP	11 40 27.7	d	USCGS: 23.3 S, 66.6 W, 0 = 11 28 58. Jujuy Province, Argentina. h about 353 km.
	MIN	eP	38.1	c	
	CLS	eP	34.5	d	
	PRI	eP	19.8	d	
June 30	BKS	eP	14 04 56	d	USCGS: 0.8 S, 122.5 E, 0 = 13 46 21.6. Northern Celebes. h about 36 km. Magnitude 6 3/4 - 7 (BKS).
		ePP	05 26	d	
		eZ	07 30	d	
		eSKSNE	11 28	NW	
		ePSNE	14 50	NWd	
		eSSNE	20 40		
		eP'P'NE	24.0		
		eGNE	31.0		
		eRE	37.0		
			mu sec		
		PZ	1.38 20		
		PPZ	2.91 16		
		MaxH	25.2 26		
	MHC	ePP	14 05 02.5	d	

Date	Sta.	Phase	Time (GCT)			Ground	Remarks
			h	m	s	Motion	
1964							
June 30	MIN	eZ	14	04	54.9	c	
(cont.)		iPP		05	28.4	c	
	CLS	ePP		04	51.4	d	
	PRI	ePP		05	06.0	d	
June 30	MHC	eP	14	16	08.0	c	
	MIN	eZ			01.2	d	
	CLS	eP			12.4	c	
	PRI	eP			03.0	c	
June 30	BKS	eZ	14	20	02	d	
	MHC	eP		19	59	c	
	MIN	eZ		20	06.8	c	
	CLS	eP		19	56.0	c	
	PRI	eP			55.6	c	
June 30	BKS	eZ	15	59	16.5	d	
		iZ			27.3	c	
	MHC	eZ			19.2	c	
	MIN	iP		57	59.7	c	
	CLS	eZ		58	03.7	c	
	PRI	eZ		59	27.6	d	
June 30	BKS	iP	20	18	34.5	c	USCGS: 46°6 N, 144°6 E, 0 = 20 08 28.5.
		epP		19	54.0	c	Sea of Okhotsk. h about 383 km.
		esP		20	20.5	d	
		eSNE		26	52.0	NEc	
		esSNE		29	28.0	W	
		eSSSNE		34	32.0		
		eGN			36.3		
				mu	sec		
		PZ		0.737	8		
		SH		1.52	20		
		MaxH		1.58	32		
	MHC	eP	20	18	38.9	c	
	MIN	iP			27.2	d	
	CLS	eP			29.7	c	
	PRI	eP			47.9	c	

Beed
28 MAR 1967

ISRC

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ARCATA--BERKELEY--CALISTOGA--CONCORD
FRESNO--JAMESTOWN--LLANADA--MANZANITA LAKE
MINERAL--MOUNT HAMILTON--OROVILLE--PALO ALTO
PARAISO--POINT REYES--PRIEST--SAN FRANCISCO
SANTA CRUZ--SHASTA--VINEYARD

Earthquakes and the Registration of Earthquakes

From July 1, 1964 to September 30, 1964

by

Cinna Lomnitz,

Don Pershing

and

Kenneth Casaday

University of California

Berkeley

1966

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INTRODUCTION

Each quarterly issue of the Bulletin includes determinations of epicenters, origin times, magnitudes, and other information available at the time of writing, for earthquakes in northern California and adjoining areas. Recorded arrival times of seismic waves are tabulated only for the major earthquakes in the local area and for teleseisms.

Information items regarding the seismographic stations which comprise the Berkeley network are repeated in every issue. Information of a general nature, such as the Modified Mercalli Intensity Scale, will be found only in the first number of each volume.

PERSONNEL (November 1966)

Station Director	Bruce A. Bolt
Director Emeritus	Perry Byerly
Associate Research Seismologist	Cinna Lomnitz
Assistant Research Seismologist	Helen Freedman
Postgraduate Research Seismologist	David J. Sutton
Associate	Don Tocher (Earthquake Mechanism Laboratory, ESSA, San Francisco)
Associate Engineer	Walter Marion
Full-time Technical Staff	G. Mitchell, R. Sell, M. Hilger, D. Pershing
Research Assistants	W. Bakun, K. Casaday, J. Derr
Secretary	Loretta Martin

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Telephone:
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(Area Code 415)

THE BYERLY SEISMOGRAPHIC STATION (BKS)

Standardized equipment began operating in a newly constructed tunnel east of the main campus on June 8, 1962. The closest buildings, part of the Lawrence Radiation Laboratory, are about 0.8 km away. The tunnel was cut into the upper part of the Claremont Formation. Of Miocene age, this formation consists of thin layers of cherty material alternating with shale.

A plan of the tunnel is shown in the diagram. Piers are constructed of reinforced concrete with no isolation from floor and walls. The temperature is stable. A ventilating and dehumidifying system is connected to all rooms.

The short-period world-wide standard instruments are operated with an approximate magnification of 25,000 at 1 sec and the long-period standard instruments with 3,000 at 30 sec.

On March 20, 1964, the Regents of the University of California named this station the "Byerly Seismographic Station" in recognition of the work of Professor Perry Byerly.

HISTORY OF THE UNIVERSITY OF CALIFORNIA STATIONS

"The Seismographic Stations at Mount Hamilton and Berkeley present several items of interest in the history of earthquake science, one of which is that according to the available records they were the first seismographic stations set up in America. Furthermore, they have functioned continuously from their founding to the present day, with improvements in instrumental equipment from time to time as the development of the science and opportunity have permitted.

"Several outstanding figures in the seismology of the 1880's were impressed with the importance of these stations, and Ewing, Milne, and Gray each took a personal interest in aiding one or both stations to obtain their own best and most modern types of instruments."

The quotation is from "History of the University of California Seismographic Stations and Related Activities" by Professor George D. Louderback, published in the Bulletin of the Seismological Society of America, Vol. 32, No. 3, pp. 205-229, 1942. In this paper may be found a detailed account of the development of the Berkeley stations from the installation of the instruments (the first earthquake known recorded at Mount Hamilton was on April 24, 1887) to 1942.

Since 1942, the number of seismographic stations associated with the University of California has increased from six to nineteen in 1964. In 1950, Professor Perry Byerly was appointed Director by the Regents; he had been in charge of instruction and research since 1925. In 1960, the University entered into a contract with the Air Force Office of Scientific Research of the Research Projects Agency of the Department of Defense. Funds were made available under the Vela Uniform program to design and operate a telemetered network of eight new stations in central California and to construct a new seismic vault near the Berkeley campus.

STATIONS IN OPERATION: JULY - SEPTEMBER 1964

Station	North Latitude	West Longitude	Elev. Meters	Symbol	Present Auspices and Date Established
Berkeley (Haviland)	37° 52!4	122° 15!6	81	BRK, BRX	Univ. of California, 1887
Berkeley (Strawberry)	37° 52!6	122° 14!1	276	BKS	Univ. of California, 1962
Mt. Hamilton	37° 20!5	121° 38!5	1282	MHC	Lick Observatory, 1887
Palo Alto	37° 25!0	122° 10!9	83	PAC	Stanford University, 1927
San Francisco	37° 46!6	122° 27!1	100	SFB	Univ. of San Francisco, 1931
Fresno	36° 46!0	119° 47!8	88	FRE	Fresno City College, 1935
Mineral	40° 20!7	121° 36!3	1495	MIN	National Park Service, 1938
Arcata	40° 52!6	124° 04!5	59	ARC	Humboldt State College, 1948
Manzanita Lake	40° 32!2	121° 33!7	1800	MLC	National Park Service, 1956
Vineyard (local)	36° 45!0	121° 23!1	330	VIN	W. A. Taylor and Co., 1959
(telemeter)	36° 45!0	121° 23!3	380	VIT	
Concord	37° 58!1	122° 04!3	36	CNC	Diablo Valley College, 1960
Santa Cruz	37° 00!4	121° 59!8	128	SCC	City of Santa Cruz, 1961
Paraiso	36° 19!9	121° 22!2	363	PRS	Paraiso Hot Springs, 1961
Llanada	36° 37!0	120° 56!6	475	LLA	Charles McCullough Ranch, 1961
Calistoga	38° 38!2	122° 35!1	457	CLS	Terrance Kirk Ranch, 1961
Point Reyes	38° 04!8	122° 52!0	404	PRC	Federal Aviation Agency, 1961
Priest	36° 08!5	120° 39!9	1187	PRI	Federal Aviation Agency, 1961
Oroville*	39° 33!3	121° 30!0	1080	ORV	Department of Water Resources, 1963
Jamestown	37° 56!8	120° 26!3	457	JAS	Department of Water Resources, 1964

*Established by State of California Department of Water Resources, Sacramento.

STATION INSTRUMENTATION

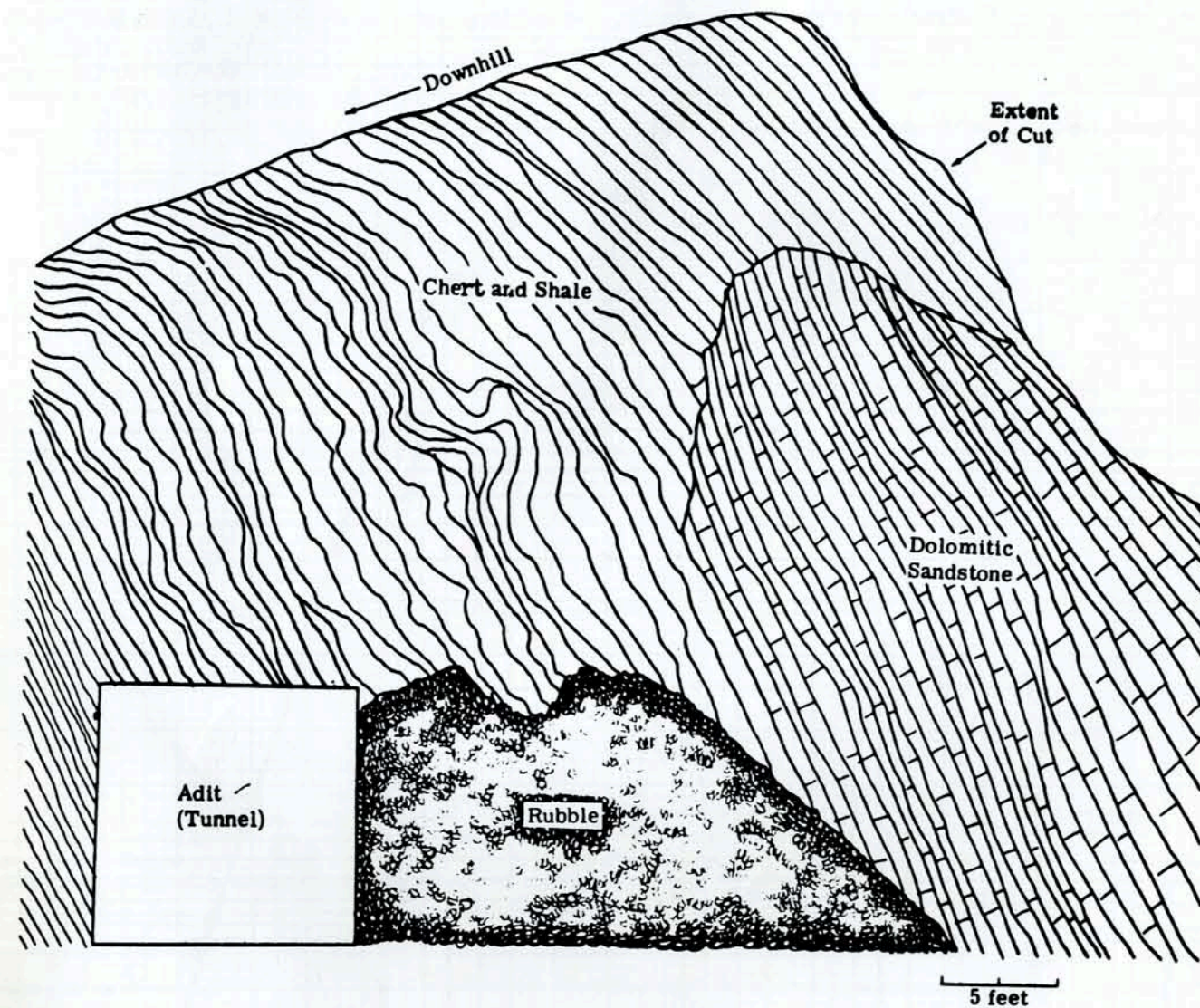
July-September 1964

Station	Type of Instrument	T _o sec	T _g sec	Component
BRK [△]	Benioff 100 kg	1.0	0.2	Z
BRK	Benioff 100 kg	1.0	8.0	Z
	100X torsion	0.8	-	N,W
BKS	Benioff 100 kg	1.0	0.75	N,E,Z
	Sprengnether	30	100	N,E,Z
	Wood-Anderson torsion	0.8	-	S,W
BRX	Galitzin-Wilip moving coil	12	12	N,E,Z
	Press-Ewing moving coil	30	90	N,E,Z
MHC	Benioff 100 kg	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	S,E
PAC	Benioff 100 kg	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	N,E
SFB	Lehner-Griffith moving coil	1.2	0.3	Z
	Wood-Anderson torsion	0.8	-	S,W
FRE	Sprengnether moving coil	2.0	2.0	N,E,Z
MIN	Benioff 100 kg	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	S,E
ARC	Marion-Slichter moving coil	1.1	0.2	Z
	Wood-Anderson torsion	0.8	-	N,E
MLC	Loucks-Omori	3½	-	S,E
VIN	Torsion 100X	0.8	-	N
	Wood-Anderson torsion	0.8	-	S,W
VIT [△]	Benioff 14 kg	1.0	0.2	Z
CNC [△]	Benioff 100 kg	1.0	0.2	Z
SCC [△]	Benioff 14 kg	1.0	0.2	Z
PRS [△]	Benioff 14 kg	1.0	0.2	Z
LLA [△]	Benioff 14 kg	1.0	0.2	Z
CLS [△]	Benioff 14 kg	1.0	0.2	Z
PRC [△]	Benioff 14 kg	1.0	0.2	Z
PRI [△]	Benioff 14 kg	1.0	0.2	Z
JAS	Benioff 100 kg	1.0	0.75	N,E,Z
ORV	Benioff 100 kg	1.0	0.75	N,E,Z
ORV	Geotech moving coil	20	100	N,E,Z

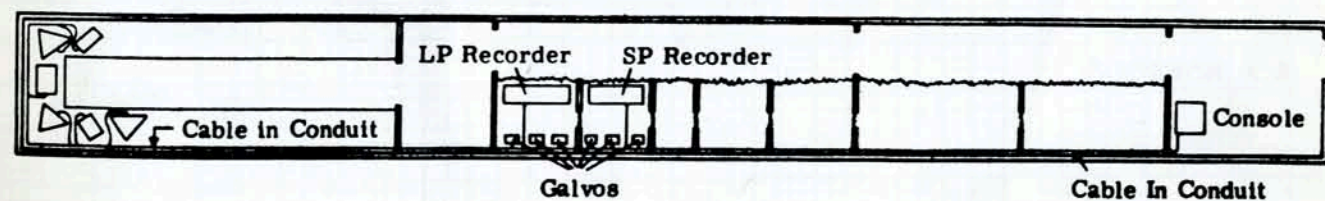
[△]Signals from these nine stations are transmitted via leased telephone lines to recorders at Berkeley.

Direction of Motion: In the "Component" column, each horizontal component seismograph is designated by the direction of ground motion corresponding to upward trace motion on the seismogram when it is oriented so that time increases from left to right. On all vertical component (Z) instruments, upward trace motion corresponds to upward ground motion.

Relative magnification curves of instruments recording through the tele-meter system are listed on the following pages. Absolute magnification may be obtained by use of calibration pulses recorded daily from each telemetered station.

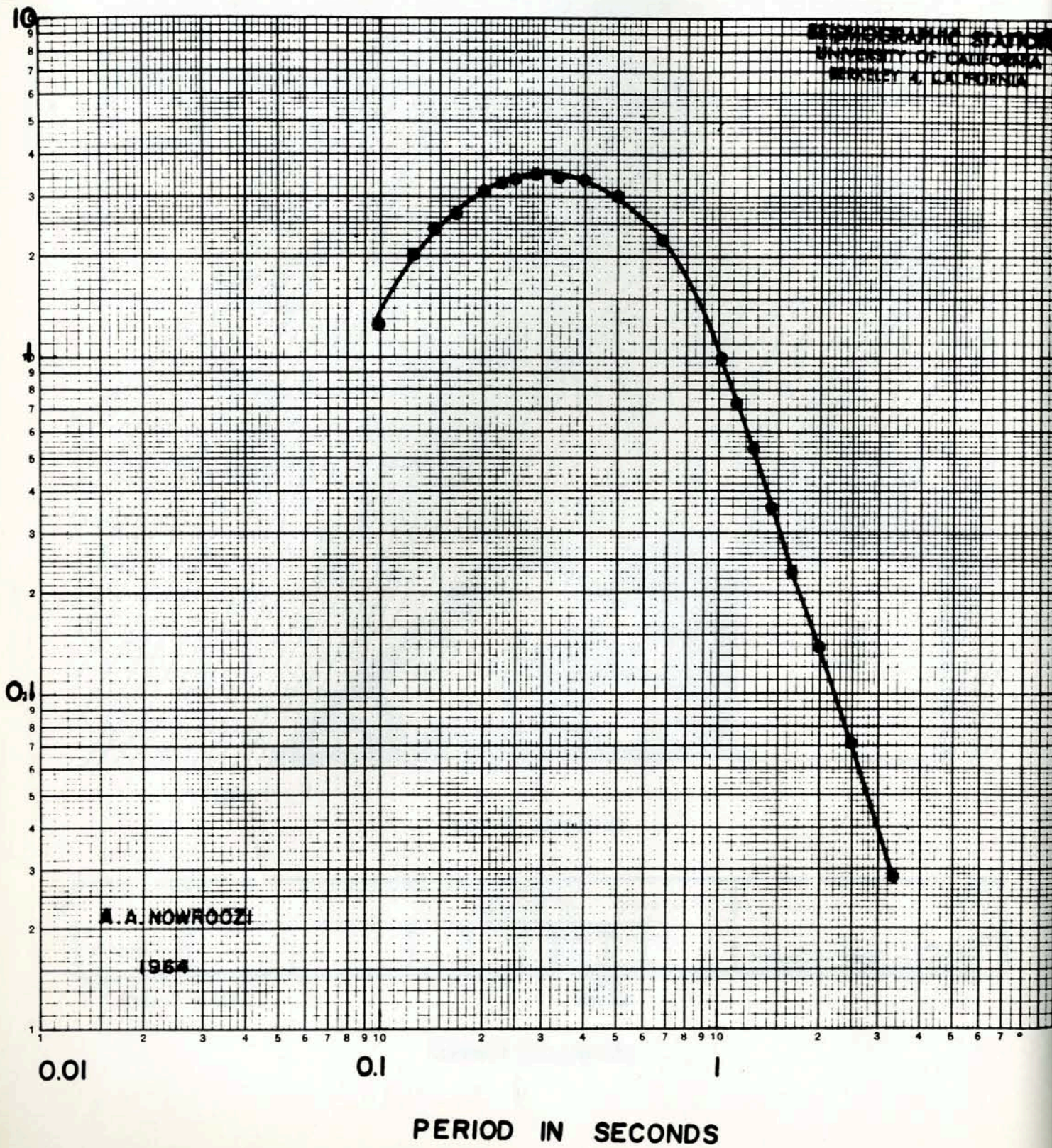


GEOLOGIC SECTION

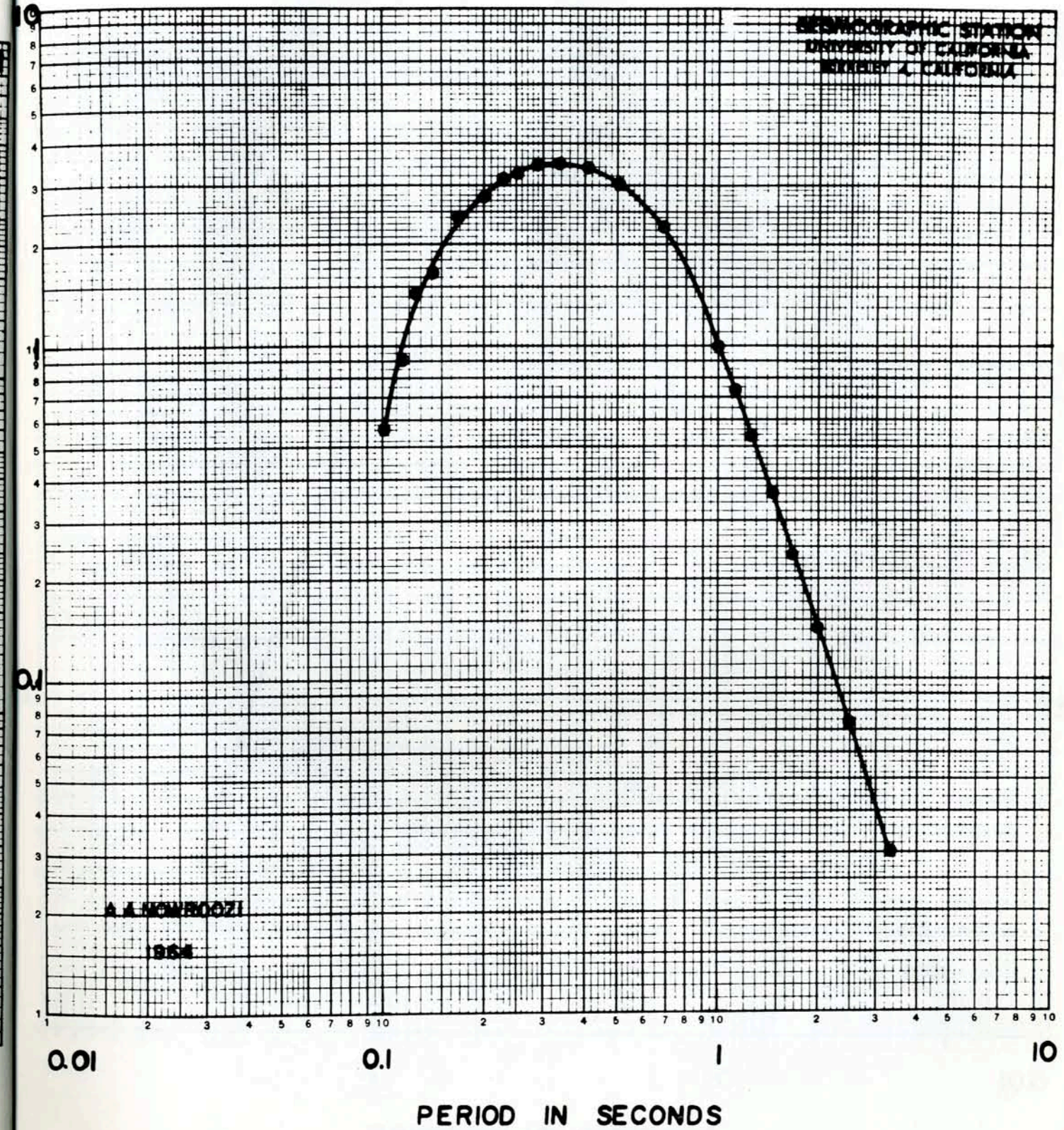


SEISMOLOGY TUNNEL

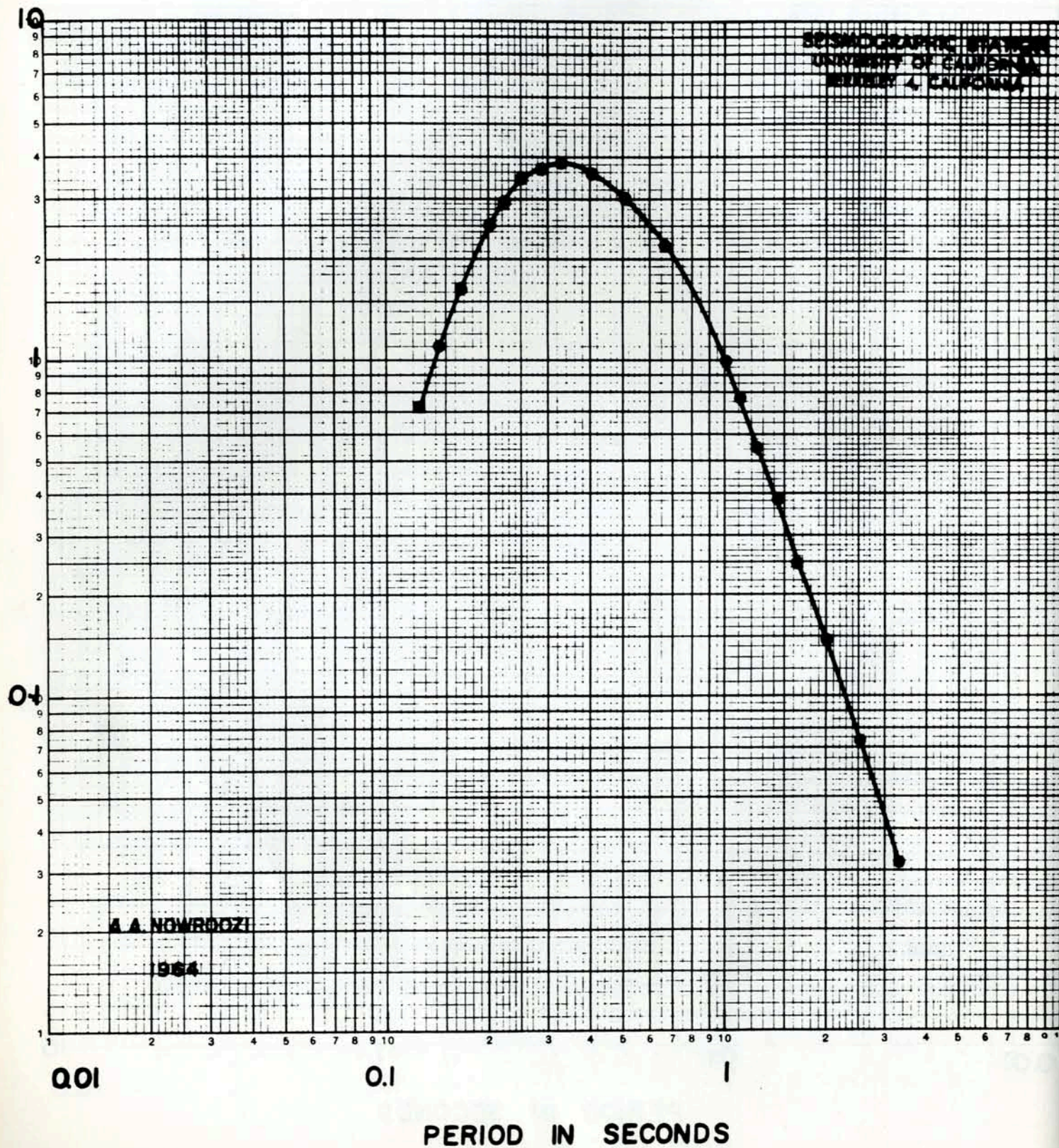
RESPONSE OF SEISMOMETER-DEVELOCORDER SYSTEM. 100KG. Z. S.P



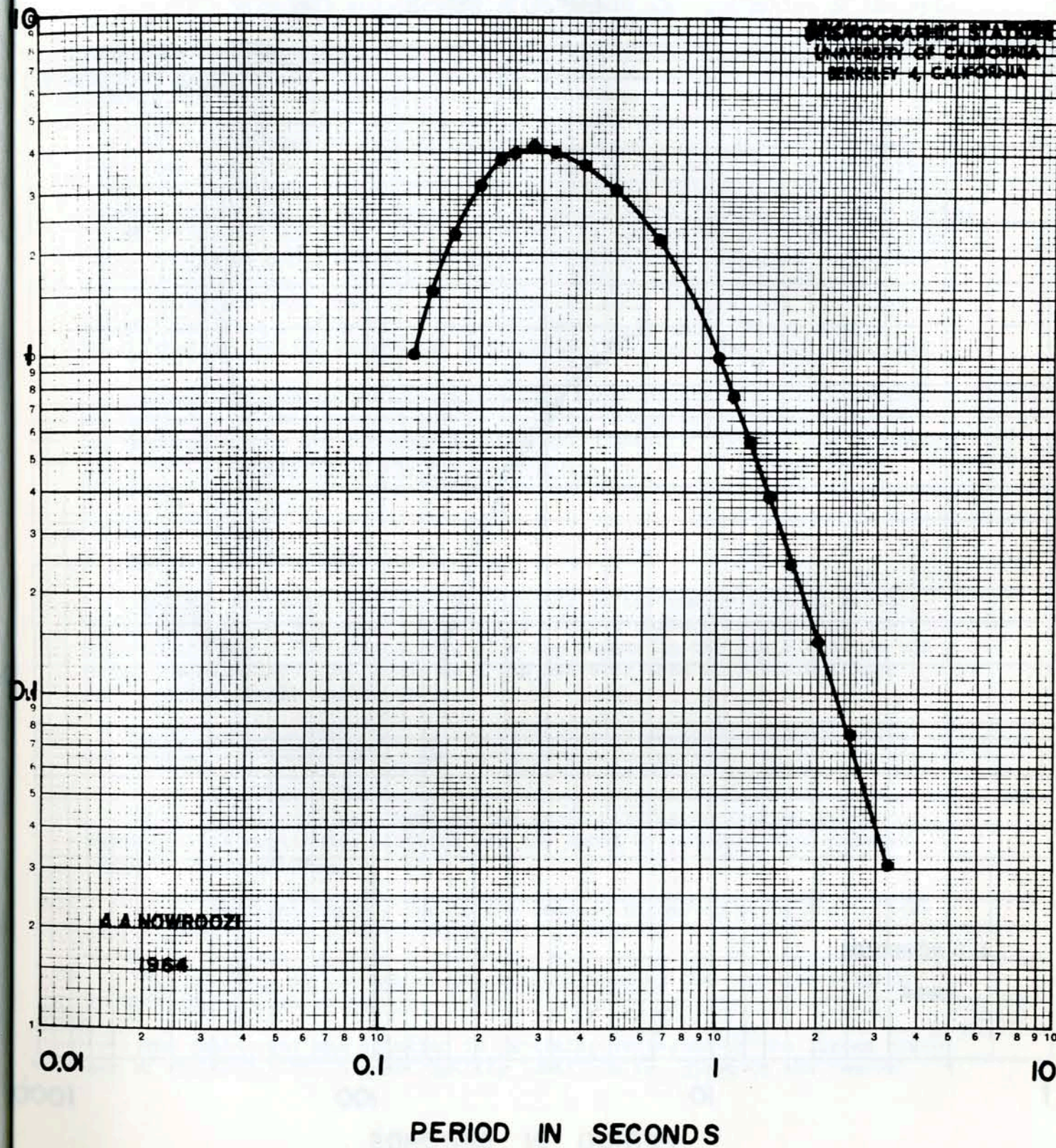
RESPONSE OF SEISMOMETER - HELICORDER SYSTEM. 100KG. Z. S.P



RESPONSE OF SEISMOMETER—HELICORDER SYSTEM. 14.7 KG. Z. S.P



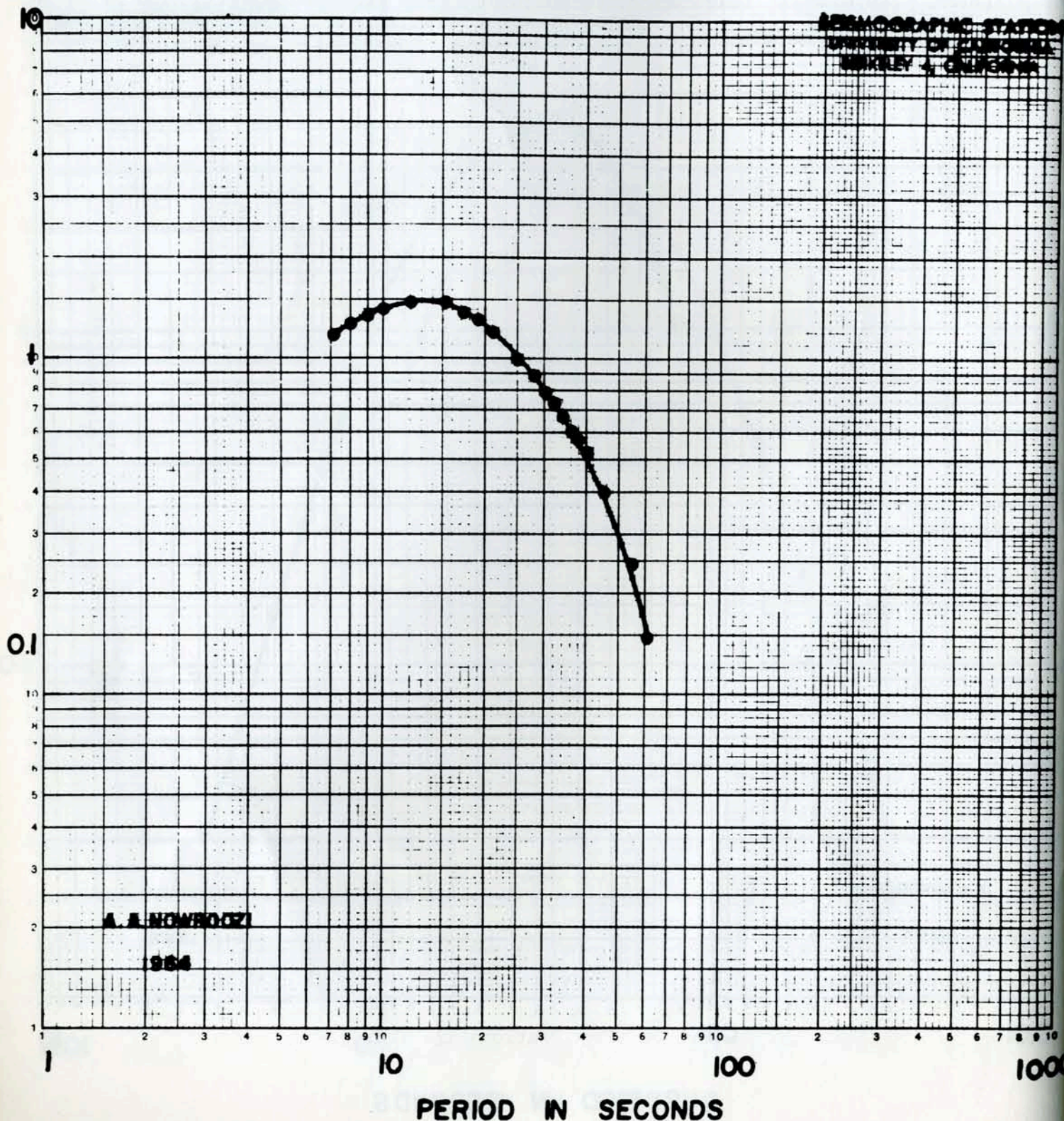
RESPONSE OF SEISMOMETER—DEVELOPORDER SYSTEM. 14.7 KG. Z. S.P



RESPONSE OF SEISMOMETER — HELICORDER

SYSTEM. PRESS-EWING.

Z. T.G=30S., T.S.=15S.



PART I. LOCAL EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

This section includes information on earthquakes in northern California (including adjacent offshore areas) and in adjoining sections of Nevada and Oregon which were well enough recorded to permit a determination of the epicenter. Latitude and longitude of each epicenter and the corresponding date and origin time are tabulated in the following list; epicenters are also plotted on one or both of the two maps immediately following the list.

For the entire northern California region, every effort is made to list all earthquakes of Richter magnitude 3.0 and above, but it is likely that some such shocks have been omitted because the available seismographic data were inadequate for epicenter determination. Within the limited region covered by the map of the central Coast Ranges of California, locatable shocks of magnitude 2.5 and over are included in the tabulation and plotted on the map. Shocks of magnitude 3.0 and over occurring in the limited region are plotted on both maps. Shocks of magnitude less than 3.0 in northern California (and less than 2.5 in the central Coast Ranges) are tabulated only if reported felt or if of special interest for some other reason. Identified artificial earthquake (explosions) ordinarily are not tabulated.

Epicenters are located by an IBM 7090 computer program. Information on Version I of this program may be found in "Computer Location of Local Earthquakes within the Berkeley Seismographic Network" by Bolt and Turcotte, published in *Computers in the Mineral Industries*, Part 2 (George Parks, Editor); Stanford University Publications, Geological Sciences, Vol. 9, No. 2, pp. 561-576, 1964.

Explanation of the table:

Map No. for each epicenter corresponds to the number plotted beside that epicenter on the maps. Epicenters without numbers lie outside the area of the map. The underlining of a map number in the table (and on the maps) indicates that one point on a map has been used to represent more than one earthquake in the table.

Date and Origin Time are given in Greenwich Civil Time (GCT). Subtract eight (8) hours to convert to Pacific Standard Time (PST).

M is the Richter magnitude of the earthquake as determined from the maximum trace amplitudes recorded for the shock by standard Wood-Anderson torsion seismographs.

h is the focal depth given to the nearest kilometer or by the following ranges: a, 0-5; b, 6-10; c, 11-15; d, 16-30 km.

No. of Stas. is the number of stations used by the computer program in locating the epicenter.

The quality of the solution is partially reflected by the listed number of stations. The highest quality locations are given to the nearest

minute of arc in latitude and longitude and to the tenth of a second origin time. Poorer quality locations are given to the nearest minute in latitude and longitude, to the nearest second in origin time and are denoted by an asterisk.

Under Remarks will be found a short descriptive location of the epicenter, usually relative to a point named on the map. Information on small foreshocks and aftershocks is sometimes included under Remarks, but when numerous foreshocks or aftershocks accompany a large earthquake, a separate tabulation may be included following the main list of local shocks.

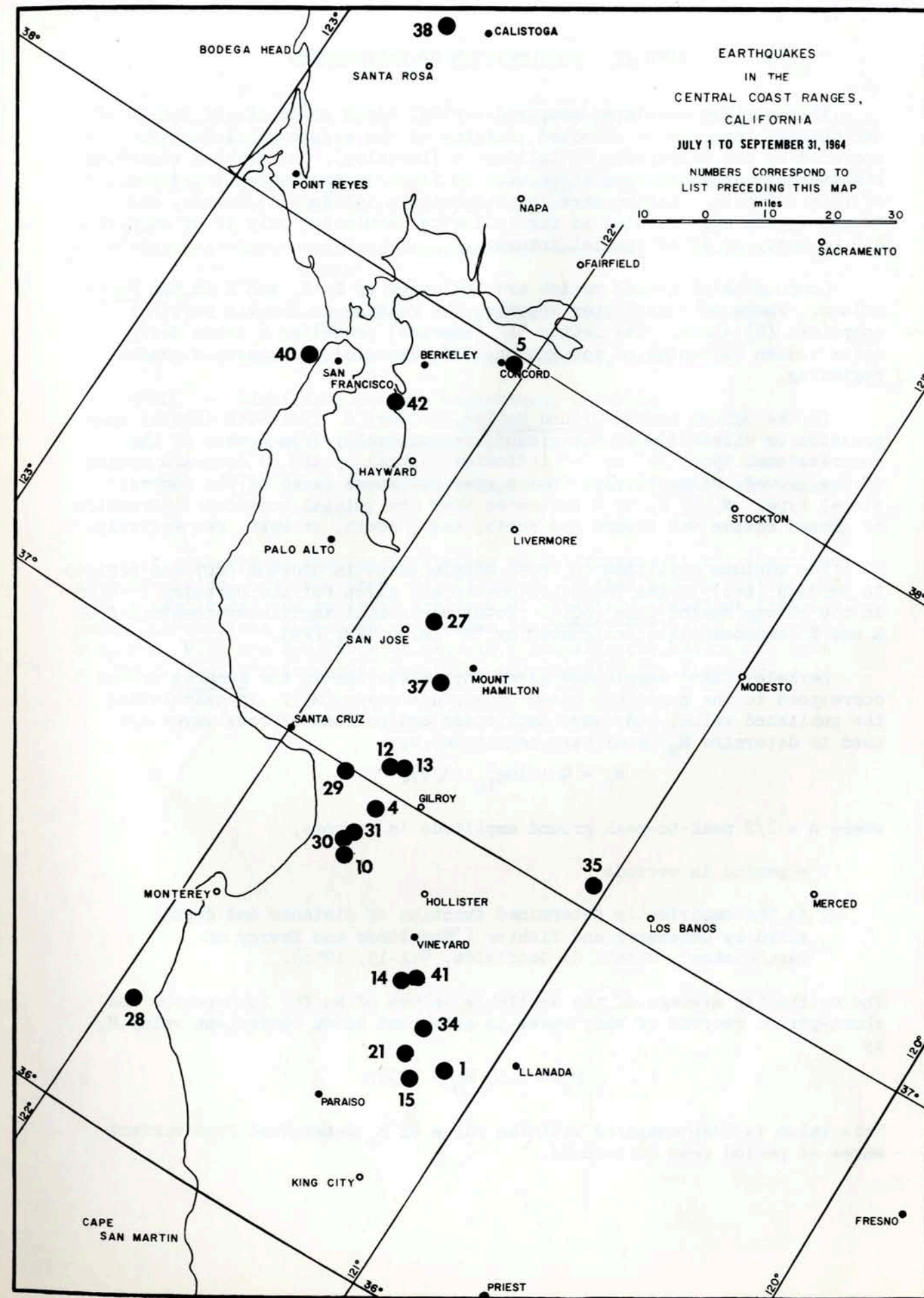
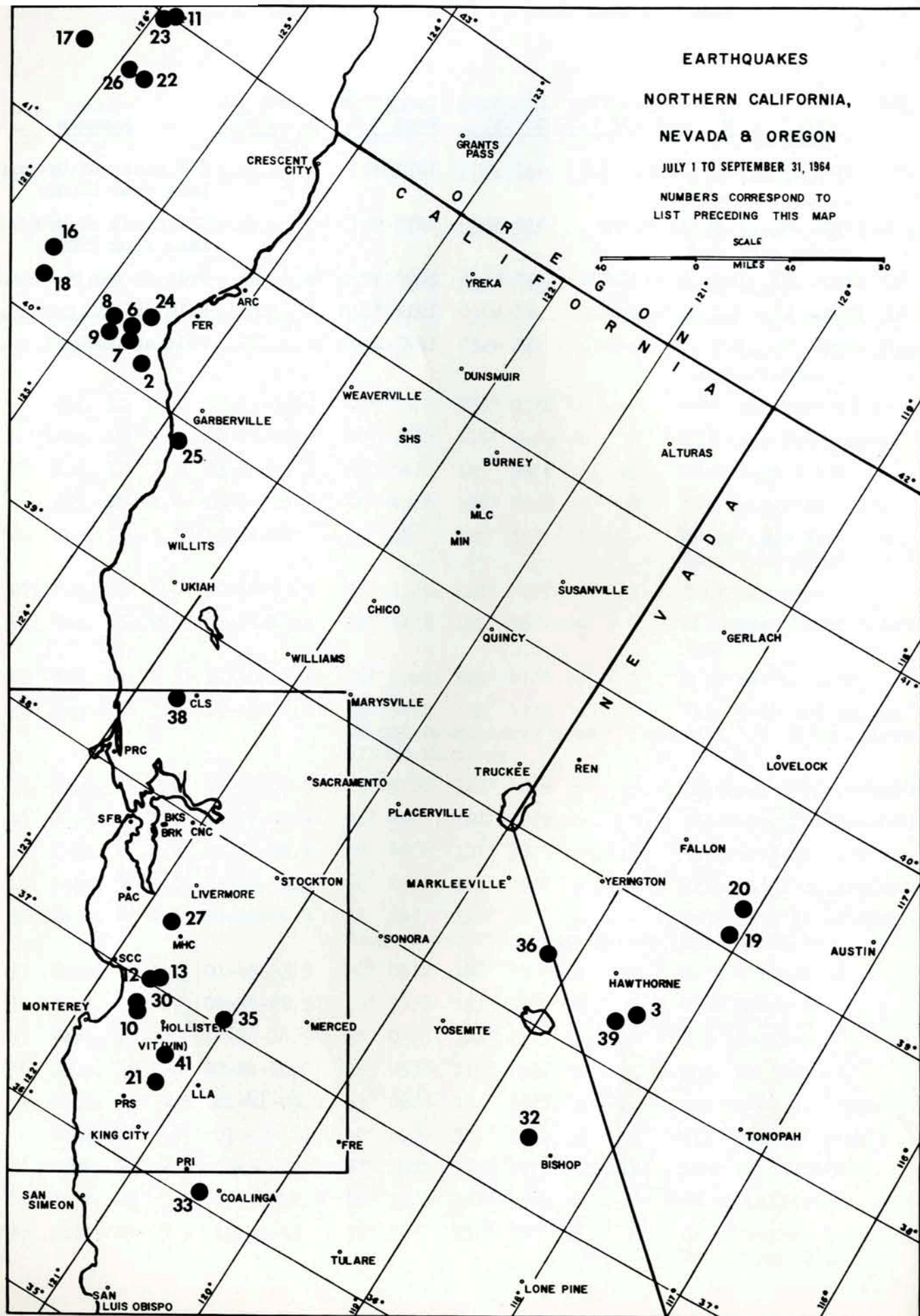
Information on maximum intensities of shocks reported felt is also included under Remarks. Reports on felt earthquakes may be obtained from the Seismological Field Survey of the U.S. Coast and Geodetic Survey, which publishes a more complete summary in "Abstracts of Earthquake Reports for the Pacific Coast and Western Mountain Region". This regular quarterly publication may be obtained from the District Officer, San Francisco District, Coast and Geodetic Survey, 121 Customhouse, San Francisco, California 94126, or from the Director, U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland 20852. Intensities given in Roman numerals are assigned by the Coast and Geodetic Survey and based on the Modified Mercalli Intensity Scale of 1931.

EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
1	July 2	2.7	09-29-52.6	36° 31!7	121° 06!6	a	6	W of Llanada.
1	July 2	2.8	12-31-15.9	36° 31!8	121° 06!2	a	7	Same area as preceding.
*2	July 3	3.1	17-19-05	40° 10'	124° 25'	0	3	Off Cape Mendocino.
3	July 8	4.4	05-55-42.2	38° 24'	118° 24'	d	-	SE of Walker Lake, Nev. Data from USCGS.
4	July 9	2.9	00-45-42.7	36° 56!5	121° 39!5	a	13	E of Watsonville.
5	July 11	2.8	13-48-21.3	37° 57!9	122° 02!3	c	11	Near Concord.
6	July 12	3.3	04-18-50.4	40° 19!2	124° 39!6	a	8	Off Cape Mendocino. Beginning of series.
6	July 12	3.0	07-18-06.4	40° 18!6	124° 39!6	a	7	Shock from same series as preceding.
7	July 12	3.1	11-58-54.1	40° 13!8	124° 36!0	a	11	Shock from same series as preceding.
6	July 12	3.7	12-18-26.9	40° 18!0	124° 38!4	a	14	Shock from same series as preceding.
8	July 12	3.4	13-48-05.8	40° 18!6	124° 48!6	a	9	Shock from same series as preceding.
9	July 12	3.3	15-19-44.1	40° 13!2	124° 45!6	a	7	Shock from same series as preceding.
6	July 12	3.1	18-23-13.6	40° 18!0	124° 42!0	a	7	Shock from same series as preceding.
-	July 13	3.9	11-54-49.7	42° 06!0	126° 34!2	a	14	Off coast of Oregon.
10	July 14	2.7	11-17-19.8	36° 48!6	121° 39!1	a	13	W of San Juan Bautista.
11	July 14	4.3	12-47-17.8	42° 01!2	125° 51!0	a	16	Off coast of Oregon.
12	July 16	3.2	08-05-02.5	37° 03!4	121° 40!9	a	14	W of Gilroy.
13	July 17	3.1	08-05-00.4	37° 04!2	121° 38!9	a	13	Same area as preceding.
-	July 23	4.5	08-46-26.6	41° 09!6	130° 50!4	a	10	Off Cape Mendocino.
14	July 23	2.7	21-02-55.1	36° 38!7	121° 19!7	b	6	S of Vineyard.
15	July 24	2.9	07-09-35.9	36° 27!9	121° 10!9	a	15	NE of Paraiso.
16	July 24	3.8	10-56-42.6	40° 27!0	125° 31!8	a	8	Off Cape Mendocino.
*17	July 27	3.7	18-40-50	41° 36'	126° 20'	0	3	NW of Cape Mendocino.
*18	July 31	3.7	01-13-11	40° 16'	125° 28'	0	6	Off Cape Mendocino.

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
19	Aug. 2	4.0	13-29-07.3	39° 06'	118° 06'	c	-	E of Rawhide, Nev. Data from USCGS.
20	Aug. 4	3.6	07-22-51.6	39° 18'	118° 06'	c	-	Same area as preceding. Data from USCGS.
21	Aug. 4	3.2	22-07-28.9	36° 30.9	121° 14.2	a	6	W of Llanada.
*22	Aug. 13	3.8	06-35-41.	41° 37'	125° 47'	0	6	NW of Cape Mendocino.
*23	Aug. 13	3.7	08-50-40	41° 59'	125° 55'	0	5	Off coast at California-Oregon border.
-	Aug. 18	4.1	02-13-32.0	40° 26.4	126° 01.2	a	16	Off Cape Mendocino.
24	Aug. 22	3.5	22-27-48.6	40° 25.2	124° 34.8	a	8	Off Cape Mendocino.
25	Aug. 22	3.1	23-45-43.2	39° 54.0	123° 50.4	a	11	N of Fort Bragg.
-	Aug. 27	4.4	03-33-25.2	40° 49.8	128° 40.8	a	8	Off Cape Mendocino.
*26	Aug. 28	3.1	10-51-28	41° 36'	125° 54'	d	-	NW of Cape Mendocino. Data from USCGS.
27	Aug. 29	3.0	00-39-50.5	37° 23.5	121° 47.7	b	11	E of San Jose.
28	Aug. 30	2.9	03-41-10.4	36° 17.8	121° 56.7	a	7	Off coast NW of Point Sur.
29	Aug. 31	2.5	17-10-19.1	36° 59.1	121° 47.0	c	6	N of Watsonville.
30	Sept. 1	3.8	19-49-16.5	36° 52.2	121° 41.1	a	16	Felt over 500 sq. mi. of Gilroy-Monterey area. Intensity III-IV at Gilroy, III at Monterey.
31	Sept. 1	2.6	19-52-06.3	36° 52.6	121° 40.4	a	7	Aftershock of preceding.
10	Sept. 1	3.0	22-33-29.4	36° 49.7	121° 38.9	b	15	Aftershock of preceding.
10	Sept. 2	2.7	01-58-06.4	36° 49.8	121° 38.6	b	13	Aftershock of preceding.
10	Sept. 3	3.0	13-56-59.3	36° 49.6	121° 39.7	b	14	Aftershock of preceding.
32	Sept. 4	4.1	20-20-24.8	37° 24'	118° 36'	d	-	Intensity IV at Control Gorge Power Plant near Bishop, California.
33	Sept. 12	3.1	01-45-53.5	36° 05.2	120° 29.6	d	10	SE of Priest.
34	Sept. 18	2.7	04-35-29.5	36° 34.8	121° 13.4	a	9	W of Llanada.
35	Sept. 18	3.0	14-35-14.9	37° 03.5	121° 02.5	a	9	S of Gustine.
36	Sept. 19	3.0	20-24-10.0	38° 25.8	119° 15.0	a	7	N of Bridgeport.
-	Sept. 20	4.6	01-41-09.2	43° 06.6	131° 22.8	a	11	Off coast of Oregon.
-	Sept. 20	4.5	07-42-11.0	42° 05.4	131° 10.8	a	9	Off coast of Oregon.
37	Sept. 23	2.9	00-36-00.3	37° 16.7	121° 42.1	a	11	Near Mt. Hamilton.
38	Sept. 23	3.0	16-30-12.9	38° 35.0	122° 43.1	a	7	SW of Calistoga.
*39	Sept. 24	3.5	12-51-33	38° 18'	118° 30'	d	-	SE of Walker Lake, Nev. Data from USCGS.

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
*-	Sept. 24	4.5	13-59-36.8	43° 30'	127° 30'	d	-	Off coast of Oregon. Data from USCGS.
-	Sept. 28	4.8	15-43-13	43° 30'	127° 06'	c	4	Off coast of Oregon. Data from USCGS.
40	Sept. 29	2.3	02-48-27.6	37° 44.6	122° 32.1	a	8	Felt in San Francisco.
41	Sept. 30	3.1	08-33-02.2	36° 40.6	121° 18.0	a	13	Felt at Hollister.
42	Sept. 30	2.9	16-11-44.0	37° 45.2	122° 15.1	a	10	Felt at Oakland.



PART II. REGISTRATION OF EARTHQUAKES

This section tabulates measured arrival times of prominent phases of earthquakes recorded at selected stations of the seismographic network operated by the University of California (Berkeley). Information regarding the stations and instrumentation will be found in the introductory section of this Bulletin. Earthquakes in the northern California, Nevada, and Oregon region are included in the following tabulation only if of magnitude 4.0 or over, or if of special interest.

Components of ground motion are indicated by N, E, and Z in the Phase column. Where no such letter appears, the reading is for the vertical component (Z) alone. The letter "i" (impetus) preceding a phase designates sudden beginning of the motion; "e" (emersio) designates a gradual beginning.

In the column headed Ground Motion, "c" or "d" indicates initial compression or dilatation of the ground, respectively, from a wave of the compressional type; "+" or "-" indicates initial upward or downward motion of the ground, respectively, from a wave not known to be of the compressional type. N, E, S, or W indicates that the initial horizontal direction of ground motion was toward the north, east, south, or west, respectively.

The maximum amplitude of earth displacement in microns (μ) and periods in seconds (sec) in the indicated phases are given for the Berkeley station in the column headed Time (GCT). Total horizontal amplitudes combined from N and E components are designated by "H" (e.g., PH, PPH).

Berkeley (BKS) magnitudes given for teleseisms in the Remarks column correspond to the magnitude based on surface waves (M_s). In calculating the published value, body wave amplitudes and periods of body waves are used to determine M_B (body wave magnitude) by:

$$M_B = Q + \log_{10} (A/T),$$

where $A = 1/2$ peak-to-peak ground amplitude in microns,

$T =$ period in seconds

Q is the empirically determined function of distance and depth given by Gutenberg and Richter ("Magnitude and Energy of Earthquakes", *Annali di Geofisica*, 9:1-15, 1956).

The arithmetic average of the available values of M_B for long-period and short-period records of body waves is converted to an equivalent value M_s by

$$M_s = 1.59 M_B - 3.97.$$

This value is then compared with the value of M_s determined from surface waves of period near 20 seconds.

Frequently quoted sources of information regarding epicenters, origin times, or shock magnitudes are as follows:

- USCGS - U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland
- BCIS - Bureau Central International de Seismologie, Strasbourg, France
- PAL - Lamont Geological Observatory, Palisades, New York
- PAS - Seismological Laboratory, Pasadena, California
- WMSO - Wichita Mountains Observatory, Oklahoma
- BKS - Byerly Seismographic Station, Berkeley
- BRK - indicates the average magnitude determined by the Berkeley network.

All measurement and interpretation of seismograms (i.e., identification of phases, arrival times, directions of initial ground motion, and ground amplitudes and periods) are done at Berkeley. Readings from the remaining stations in the network other than the five listed (BKS, CLS, MHC, PRI, MIN) are available on request. Requests for additional data or for copies of seismograms should be addressed to the Director.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964					
July 1	MIN	eP	02 43 54.3	d	
July 1	BKS	eP	02 58 08.5	d	USCGS: 46.3°N, 146.9°E, 0 = 02 42 33.4 Kurile Islands. h about 33 km.
		epP	17.4	c	
		iZ	59 21.2	c	
		eSE	03 06 36.0	Wc	
		eZ	10 52.0	Wd	
		eGNE	14.5		
	MHC	eP	02 58 12.5	c	
		epP	21.8	c	
	MIN	eP	00.0	c	
		ipP	09.4	c	
	CLS	eP	04.1	d	
		epP	12.7	c	
	PRI	eP	22.2	d	
		epP	37.5	d	
July 1	BKS	ePcP	09 57 43.8	d	USCGS: 45.2°N, 150.3°E, 0 = 09 46 49.6 Kurile Islands. h about 75 km.
		eZ	55.3	d	
		eP	10.0	d	
		eSNE	10 05 40.0	SEd	
		eSS	09 26.0	d	
		eGNE	13.2		
		eRE	16.2		
	MIN	eZ	09 57 03.0	d	
	CLS	eP	13.5	c	
		epP	26.5	c	
	PRI	eP	34.2	c	
		epP	45.8	c	
July 1	MIN	eP	10 02 53.4	c	USCGS: 44.6°N, 149.9°E, 0 = 09 52 31.8 Kurile Islands. h about 33 km.
July 1	BKS	iZ	13 38 07.5	c	USCGS: 52.7°N, 168.2°W, 13 31 06.2 Fox Islands. h about 33 km.
		eNE	46.0		
	MHC	eP	38 00.7	c	
		epP	13.8	c	
	MIN	eP	37 46.4	c	
	CLS	eP	50.5	c	
		epP	38 02.0	c	
	PRI	eP	14.5	c	
		epP	25.0	c	
July 1	MHC	eZ	20 20 08.5	d	USCGS: 30.9°N, 41.5°W, 0 = 20 09 31.2 North Atlantic Ocean. h about 33 km.
	CLS	eZ	08.4	d	
	PRI	eZ	09.1	d	
July 1	BKS	eP	20 32 19.0	c	USCGS: 17.1°S, 69.1°W, 0 = 20 20 56.6 Peru-Bolivia Border. h about 147 km.
		iZ	57.2	c	
		eSNE	41 44.0	c	
		eGE	54.0		
		eR	58.3		
	MHC	eP	32 14	d	
	CLS	eP	21.4	d	
	PRI	eP	05.9	d	
July 1	BKS	iP	23 00 18	c	USCGS: 14.3°S, 73.1°W, 0 = 22 49 23.4 Southern Peru. h about 139 km.
		iZ	51	c	
		eZ	03 20	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.)					
			h. m. s.		
July 1		eSE	23 09 11		
		eNEZ	14 12		
	MHC	eP	00 15.8	c	
	MIN	iP	45.8	c	
	CLS	eP	23.4	d	
	PRI	eP	08.8	c	
July 2	BKS	eP	01 24 44.7	c	USCGS: 60.1°N, 146.0°W, 0 = 01 19 02.7 Alaska aftershock. h about 14 km.
		eZ	53		
		eNEZ	29 30		
	MHC	eP	24 50.7	c	
	MIN	eP	26.8	c	
		ipP	31.8	d	
	CLS	eP	36.8	c	
	PRI	eP	25 05.4	c	
July 2	BKS	eP	06 42 07	d	USCGS: 53.4°N, 168.8°W, 0 = 06 35 18 Fox Islands. h about 45 km.
		eNE	50 10		
		eZ	53 17		
	MIN	eP	41 56.5	c	
July 2	BKS	eP	15 11 49.5	c	USCGS: 47.6°N, 128.7°W, 0 = 15 09 13.5 Off coast of Washington. h about 33 km.
		eSNE	13 59.0		
		eNE	14 20.0		
	MHC	eZ	11 59.7	c	
	MIN	iP	32.6	c	
	CLS	eZ	35.5	d	
July 2	BKS	iP	17 06 15.8	d	USCGS: 47.7°N, 128.3°W, 0 = 17 03 42.4 Off Coast of Washington. h about 33 km.
		iSNE	08 25.0		
		mu	sec		
		PZ	5.61 9		
	MHC	eP	17 06 25.6	d	
	MIN	iP	05 50.7	d	
	CLS	eP	06 05.4	d	
	PRI	eP	44.8	d	
July 2	MIN	iP	17 08 43.8	d	USCGS: 47.7°N, 128.8°W, 0 = 17 17 34.4 Off coast of Washington. h about 14 km.
July 2	BKS	eP	17 20 13.5	d	
		eSNE	22 24		
	MHC	eP	20 23.0	d	
	MIN	eP	19 50.0	d	
	CLS	eP	20 02.9	d	
	PRI	eP	43.2	c	
July 3	BKS	eP	05 10 40	c	USCGS: 19.4°N, 104.3°W, 0 = 05 05 33.8 Jalisco, Mexico. h about 102 km.
		eSNE	15 12	SW	
		eGNE	16.6		
		eR	17.8		
	MIN	eP	10 56.1	d	
	CLS	eZ	35.5	d	
	PRI	eP	24.2	c	
July 3	MIN	eP	08 27 59.4	c	USCGS: 38.2°N, 138.4°E, 0 = 08 16 33.7 Near west coast of Honshu, Japan. h about 33 km.
July 4	BKS	iP	11 02 05.5	d	USCGS: 11.7°N, 144.5°E, 0 = 10 49 28.8 Mariana Islands. h about 33 km. Magnitude 6.0 (CGS)
		iEZ	06.2	Ec	
		epP	05 24.0	d	
		eZ	15.5	Wd	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) July 4			h. m. s.		
		eSNE	11 12 20.0	SEd	
		eP'P'	28 32	c	
		eR	31.9		
			mu sec		
		PZ	0.828 9		
		PPZ	0.364 10		
	MHC	eP	11 02 08.5	d	
	MIN	eP	04.5	d	
		epP	05 24.3	c	
	CLS	eP	02 03.3	d	
	PRI	eP	13.9	d	
July 4	BKS	eP	12 24 58.5	d	USCGS: 15.5°S, 72.5°W, 0 = 12 13 56.9 Southern Peru. h about 148 km. Magnitude 4.5 (BKS)
			mu sec		
		PZ	0.096 1.1		
	MHC	eP	12 24 55.3	d	
	MIN	eP	25 05.7	d	
	CLS	eP	03.0	d	
	PRI	eP	24 46.5	d	
July 5	BKS	eP	03 20 13.8	c	USCGS: 60.8°N 144.9°W, 0 = 03 14 33.3 Alaska aftershock. h about 30 km.
		eSNE	24 52.0	NW	
		eRNE	27.5		
			mu sec		
		PZ	0.577 14		
		MaxH	2.54 26		
	MHC	eP	03 20 20.5	d	
	MIN	iP	19 55.8	d	
	CLS	eP	20 06.9	d	
	PRI	eP	33.0	c	
July 5	MIN	eZ	12 44 05.2	d	USCGS: 51.2°N, 179.1°E, 0 = 12 36 27.5 Rat Islands. h about 33 km.
July 5	MIN	eP	18 04 23.7	c	USCGS: 60.2°N, 146.2°W, 0 = 17 58 59.7 Alaska aftershock. h about 27 km.
July 5	BKS	eP	19 11 39.0	SEd	USCGS: 26.2°N, 110.2°W, 0 = 19 07 57.8 Gulf of California. h about 29 km.
		iZ	45.5	d	
		ipNE	35.0	SEd	
		iSNE	14 11.0		
		eSNE	33.0	SE	
		eGNE	15 12.5		
		eRZ	16 34.0		
			mu sec		
		PZ	5.82 16		
		MaxH	316 20		
	MHC	eP	19 11 25.2	c	
	MIN	iP	55.8	d	
	CLS	eP	45.5	c	
	PRI	eP	08.2	d	
July 5	BKS	eP	23 46 28.8	c	USCGS: 44.8°N, 149.6E, 0 = 23 36 01.5 Kurile Islands. h about 54 km.
		iZ	33.2	d	
		eZ	47 08.0	SEc	Magnitude 5 3/4 (BKS)

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) July 5			h. m. s.		
		eNE	23 46 48.0	SEc	
		eSNE	55 00.0	NEd	
		eGNE	00 02.0		
		eRE	03.8		
			mu sec		
		PZ	1.37 9		
		SH	6.8 26		
		MaxH	16 42		
	MHC	eP	23 46 33.9	d	
	MIN	eP	21.2	c	
		ipP	37.8	c	
		iSE	54 54.0		
	CLS	eP	46 28.8	d	
	PRI	eP	24.5	d	
July 5	MIN	eP	23 49 43.4	d	USCGS: 44.7°N, 149.6°E, 0 = 23 39 10.3 Kurile Islands. h about 48 km.
July 6	BKS	eP	02 12 02	d	USCGS: 26.5°N, 110.2°W, 0 = 02 08 19.2 Gulf of California h about 33 km.
	MHC	eP	11 46.2	c	
	MIN	eP	12 18.3	c	
	CLS	eP	01.9	c	
	PRI	eP	11 30.0	c	
July 6	BKS	eP	02 14 21.2	c	USCGS: 26.2°N, 110.2°W, 0 = 02 10 42.2 Gulf of California. h about 33 km.
	MHC	eP	13.6	c	
	MIN	eP	38.5	c	
	CLS	eP	31.0	d	
	PRI	eP	51.5	c	
July 6	BKS	eP	02 18 11.5	Sd	USCGS: 26.2°N, 110.4°W, 0 = 02 14 36.0 Gulf of California. h about 33 km.
		iEZ	19 26.0	Ec	
		iSNE	21 09		
		iGNE	21 42		
		eSNE	21 18	SW	
		eGNE	22.2		
			mu sec		
		PZ	29.9 6		
		SH	65.1 10		
		MaxH	630 13		
	MHC	eP	02 18 04.1	c	
	MIN	iP	32.1	d	
	CLS	eP	20.8	d	
	PRI	eP	17 43.0	c	
July 6	BKS	iP	02 29 16.8	d	USCGS: 26.2°N, 110.1°W, 0 = 02 25 36 Gulf of California. h about 33 km.
	MHC	eP	04	c	
	MIN	iP	36.1	d	
	CLS	eP	13.4	d	
	PRI	eP	28 45.0	c	
July 6	MIN	eZ	03 10 05.1	d	USCGS: 26.5°N, 110.3°W, 0 = 03 06 09.6 Gulf of California. h about 33 km.
July 6	MIN	iP	03 16 15.1	c	
July 6	MIN	iP	03 26 29.5	c	USCGS: 56.7°N, 152.3°W, 0 = 03 20 59.4 Alaska aftershock. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
July 6	BKS	eP iNEZ iSN eGN PZ SH MaxH	07 27 49.5 28 00.5 31 54.0 35 45.0 35.3 8 233 13 685 20	Sd NWd N	USCGS: 18.3°N, 100.4°W, 0 = 07 22 11.7 Guerrero, Mexico. (30 killed, many injured). h about 100 km. Magnitude 6 3/4 - 7 (BKS)
	MHC	eP	07 27 43.2	d	
	MIN	eP	28 00.3	d	
	CLS	iP	27 55.6	d	
	PRI	iP	30.7	d	
July 6	MIN	eP	08 00 20.4	c	
July 6	MIN	eP	09 59 07.9	c	USCGS: 18.0°S, 174.7°W, 0 = 09 47 26.0 Tonga Islands. h about 80 km.
July 6	MIN	eP	10 18 54.3	c	USCGS: 6.3°S, 154.7°E, 0 = 10 06 02.3 Solomon Islands. h about 49 km.
July 6	MIN	eP	10 27 31.4	d	USCGS: 37.1°N, 71.4°E, 0 = 10 13 45.2 Hindu Kush. h about 100 km.
July 6	MIN	eZ	10 31 08.8	c	USCGS: 18.3°N, 100.3°W, 0 = 10 24 33.8 Guerrero, Mexico. h about 111 km.
July 6	MHC	eP	10 44 07.9	d	USCGS: 18.7°N, 100.5°W, 0 = 10 38 41.0 Guerrero, Mexico. h about 108 km.
	MIN	eP	25.3	d	
	CLS	eP	22.3	c	
	PRI	eP	57.6	c	
July 6	MIN	eZ	14 05 51.5	d	USCGS: 26.4°N, 110.1°W, 0 = 14 01 57 Gulf of California. h about 33 km.
July 6	MIN	eZ	14 18 30.6	c	USCGS: 24.2°S, 69.7°W, 0 = 14 06 32.6 Northern Chile. h about 128 km.
July 6	BKS	eSNE eNEZ eGNE eRNE	20 13 44 18 06 25.7 28.9	SWc NEc	USCGS: 21.2°S, 173.8°E, 0 = 19 50 42.1 New Hebrides Islands. h about 22 km.
			mu sec		
	MaxH		2.60 20		
	MHC	eP	20 03 27.8	d	
	MIN	eP	38.1	d	
	CLS	eP	46.8	c	
	PRI	eP	27.7	d	
July 7	BKS	eP ePP epPP esPP eZ eSNE eGNE	07 50 35.2 53 24 55 22 56 16 59 16 00 06 11.9	NEc c d d d SWd	USCGS: 23.6°S, 179.9°W, 0 = 07 39 04.2 Fiji Islands. h about 462 km.
			mu sec		
	PZ		0.081 1.1		
	MHC	eP	07 50 35.5	c	
	MIN	iP	33.6	NEc	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
July 7	CLS	eP	07 50 36.2	c	
(cont.)	PRI	eP	35.2	c	
July 7	BKS	iP iNEZ eP eSNE eRZ	13 46 21.3 21.8 21.0 47 34.0 57.0	c SWc NWd NE	USCGS 43.4°N, 127.2°W, 0 = 13 44 40 Off coast of Oregon. h about 7 km.
	MHC	eP	46 31.5	d	
	MIN	iP	01.8	c	
		iS	47 03.1	c	
	CLS	eP	46 10.3	d	
	PRI	eP	51.7	d	
July 7	BKS	eREZ	17 07.0		USCGS: 11.2°S, 163.2° E, 0=16 28 42.9 Solomon Islands. h about 13 km.
	MHC	eP	16 41 24.5	c	
	CLS	eP	23.3	d	
	PRI	eP	21.0	d	
July 8	MIN	eZ	01 47 41.0		USCGS: 34.9°N, 21.7°E, 0=01 32 56.3 Eastern Mediterranean Sea, h about 18 km.
July 8	MIN	eZ	08 04 05		
July 8	MIN	eZ	10 20 04.9	d	USCGS: 51.4°N, 179.5°E, 0=10 12 22 Rat Islands. h about 33 km.
July 8	BKS	eP eZ	12 02 10.0 25.0	d d	USCGS: 6.4°S, 154.8°E, 0=11 49 23.7 New Britain. h about 73 km.
	MHC	eP	11.0	c	
	MIN	eP	13.5	c	
	CLS	eP	08.6	d	
	PRI	eP	18.0	c	
July 8	BKS	iP isPEZ iPP eSKSNE eSNE eSPNE eSSNE eGNE eRE	12 09 44.0 10 40.2 13 48.5 20 00.0 21 24.0 22 40.0 28 20.0 39.3 44.5	c c d SEc NWd SWd SEd	USCGS: 5.5°S, 129.8°E, 0=11 55 39 Banda Sea. h about 165 km. Magnitude 6.5 (CGS)
			mu sec		
	PZ		1.45 16		
	PPZ		3.83 26		
	SH		8.68 24		
	MaxH		24.9 22		
	MHC	eP	12 09 46.2	c	
		ePP	13 50.0	d	
	MIN	eP	09 41.2	c	
	CLS	eP	40.3	d	
		ePP	10 42.1	c	
	PRI	eP	09 47.7	c	
		ePP	13 52.2	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
July 9	MIN	iP	00 27 01.0	d	USCGS: 59.8°N, 150.7°W, 0 = 00 21 18 Alaska aftershock. h about 15 km.
July 9	BKS	iP	11 34 08.0	d	USCGS: 23.3°S, 175.7°W, 0 = 11 22 05.4 Tonga Islands. h about 43 km.
		eZ	16.8	d	
		eSNE	44 04.0	NWc	Magnitude 5 1/2 - 5 3/4 (BKS)
		eScSE	46.0	Ec	
		eSSNE	49 08	SEd	
		eGNE	54.0		
		eRNE	57.0		
			mu sec		
		PZ	0.85 20		
		SH	9.02 26		
		MaxH	14.16 35		
	MHC	eP	11 34 07.1	c	
	MIN	iP	18.2	d	
	CLS	eP	07.9	c	
	PRI	eP	06.0	c	
July 9	MIN	eP	12 01 02.7	d	
July 9	BKS	eP	12 13 50.3	d	USCGS: 34.2°N, 140.9°E, 0 = 12 02 11.9 Off coast of Honshu, Japan.
		iZ	14 01.3	d	h about 49 km.
	MHC	eP	13 54.3	d	
	MIN	eP	44.3	c	
	CLS	eP	46.2	c	
	PRI	eP	14.7	c	
July 9	BKS	eP	16 52 09.6	c	USCGS: 15.5°S, 167.6°E, 0 = 16 39 49.3 New Hebrides Islands.
		ePcPNE	11.7	NEc	h about 121 km.
		iPP	20.5	d	
		isP	44.3	c	
		eSNE	17 02 29.0		Magnitude 7 1/2 (BKS)
		eSPNE	03 26	NEd	
		eSSNE	08 56	SW	
		eGNE	14.5		
		eRE	18.4		
		ePKKP	17 10 23.5	c	
		eP'P'	18 33.1	c	
			mu sec		
		PZ	5.5 8		
		PPZ	12.7 10.8		
		SH	31.4 17.9		
		MaxH	76.3 18		
	MHC	eP	16 52 11	c	
		esP	45.4	c	
		ePKKP	17 10 25.4	d	
		eP'P'	18 24.0	c	
	MIN	eP	16 52 15.8	c	
		iPcP	18.7	c	
		eP'P'	17 18 15.5	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
(cont.)					
July 9	CLS	eP	16 52 09.5	c	
		esP	43.2	c	
		ePP	27.8	c	
		ePKKP	17 10 23.7	d	
		eP'P'	18 21.0	d	
	PRI	eP	16 52 12.8	c	
		esP	48.3	c	
		ePP	55 30.8	c	
		ePKKP	17 10 24.2	d	
		eP'P'	18 19.6	d	
July 10	BKS	eP	11 54 29.5	d	USCGS: 26.5°N, 109.7°W, 0 = 11 50 46.8 Gulf of California.
		eNE	58.0		h about 33 km.
		eRZ	58.3		
	MHC	eP	54 16.0	c	
	PRI	eP	53 57.0	c	
July 11	MIN	iP	04 56 28.5	d	USCGS: 41.6°N, 142.3°E, 0 = 04 45 28.6 Near east coast of Honshu, Japan.
					h about 50 km.
July 11	MIN	eP	08 24 21.7	c	USCGS: 2.6°S, 77.6°W, 0 = 08 15 39 Ecuador. h about 148 km.
July 11	BKS	eP	09 49 57.0	d	USCGS: 59.7°N, 146.1°W, 0 = 09 44 18.7 Alaska aftershock. h about 33 km.
		eSNE	55 08	SWd	
		eR	56.9		
			mu sec		
		PZ	0.086 1.3		
	MHC	eP	50 03.4	d	
	MIN	iP	49 39.2	c	
	CLS	eP	48.7	d	
	PRI	eP	50 16.5	c	
July 11	MHC	eP	14 36 11	d	USCGS: 49.3°N, 129.0°W, 0 = 14 33 06.9 Vancouver Island. h about 33 km.
	MIN	iP	35 36.3	c	
		ipP	41.5	c	
		eP	54.0	c	
		eP	30.7	c	
July 11	MHC	eP	17 54 48.0	c	USCGS: 66.4°N, 19.7°W, 0 = 17 44 29.8 Northern Iceland.
	MIN	iZ	36.5	c	h about 19 km.
	CLS	eP	39.0	c	
	PRI	eP	50.2	c	
July 11	BKS	eP	20 31 18.0	SWc	USCGS: 59.7°N, 146.2°W, 0 = 20 25 40.3 Alaska aftershock. h about 40 km.
		eZ	25.0	d	
		eSNE	36 05.0	NW	
		eRE	38.1		
	MHC	eP	31 24.0	c	
	MIN	iP	00.5	SEc	
	CLS	eP	10.3	c	
	PRI	eP	37.5	c	
July 11	BKS	eP	20 32 06.3	c	
		eZ	13.2	d	
			mu sec		
		PZ	0.104 1.0		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h. m. s.		
1964 (cont.)					
July 11	MHC	eP	20 32 13.0	d	
	MIN	iP	31 48.5	c	
	CLS	eP	58.6	c	
	PRI	eP	25.8	c	
July 11	MHC	eP	21 11 32.6	d	USCGS: 59.7°N, 146.5°W, 0 = 21 05 49.9
	MIN	eP	11.4	c	Alaska aftershock. h about 33 km.
	CLS	eP	20.9	d	
	PRI	eP	49.1	d	
July 11	MHC	eP	22 45 39.6	c	USCGS: 41.7°N, 29.9°W, 0 = 22 44 43.8
	MIN	eZ	27.4	c	Azores. h about 33 km.
	CLS	eP	38.3	c	
	PRI	eP	39.5	d	
July 12	MHC	eP	01 08 33.5	c	
	MIN	eP	23.4	c	
	CLS	eP	33.8	c	
	PRI	eP	31.5	c	
July 12	BKS	eP	01 56 59.3	c	USCGS: 38.6°N, 139.2°E, 0 = 01 45 25.6
		eZ	57 10.0	d	Near west coast of Honshu, Japan.
					h about 13 km.
		eSNE	06 26.0	SWc	
		eNE	11.0		Magnitude 5 3/4 - 6 (BKS)
		eGNE	16.5		
		eR	18.0		
			mu sec		
		PZ	1.84 8		
		SH	1.223 16		
		MaxH	1.23 36		
	MHC	eP	01 57 03.6	c	
	MIN	eP	56 52.0	c	
	CLS	eP	59.1	e	
	PRI	eP	55.2	c	
July 12	MIN	iP	09 06 02.1	d	USCGS: 60.1°N, 146.1°W, 0 = 09 00 40
					Alaska aftershock. h about 33 km.
July 12	BKS	iP	17 00 19.8	c	USCGS: 24.5°S, 66.9°W, 0 = 16 48 21.7
		iZ	26.0	c	Chile - Argentine Border.
			mu sec		h about 164 km.
		PZ	0.056 1.1		
	MHC	eP	17 00 16.2	d	
	MIN	iP	24.9	c	
	CLS	eP	22.8	d	
	PRI	eP	08.5	d	
July 12	BKS	eP	21 27 34.3	d	USCGS: 55.9°S, 27.6°W, 0 = 21 08 52.6
	MHC	eP	32.6	c	Sandwich Islands. h about 135 km.
	MIN	iP	36.4	c	
	CLS	eP	35.3	d	
	PRI	eP	30.1	c	
July 13	BKS	eP	01 25 39.8	d	USCGS: 20.7°S, 178.7°W, 0 = 01 14 33.5
	MHC	eP	38.9	d	Fiji Islands. h about 575 km.
	MIN	eP	48.6	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h. m. s.		
1964 (cont.)					
July 13	CLS	eP	01 25 39.2	d	
	PRI	eP	40.0	d	
July 13	MIN	eP	06 49 43.4	d	USCGS: 44.7°N, 129.9°W, 0 = 06 47 54
					Off coast of Oregon.
					h about 33 km.
July 13	MIN	iP	10 15 34.1	c	USCGS: 25.0°N, 179.9°W, 0 = 10 03 45.3
					Fiji Islands. h about 424 km.
July 13	BKS	eP	10 20 39.3	d	USCGS: 15.9°S, 167.9°E, 0 = 10 08 07.2
	MHC	eP	39.4	c	New Hebrides Islands.
	MIN	eP	45.3	c	h about 33 km.
	CLS	eP	38.2	c	
	PRI	eP	41.5	c	
July 13	BKS	eP	15 06 01.8	d	
	MHC	eP	03.0	c	
	MIN	eP	09.1	c	
	CLS	eP	01.9	d	
	PRI	eP	03.8	c	
July 13	MIN	iP	15 57 43.6	c	USCGS: 56.6°N, 154.0°W, 0 = 15 52 04.8
					Alaska aftershock. h about 25 km.
July 13	MIN	eZ	17 08 18.1	c	
July 13	BKS	eSNE	21 25.6	NEd	USCGS: 7.7°N, 34.7°W, 0 = 21 02 33.3
		eGN	37.0		North Atlantic Ocean.
		eRNE	41.5		h about 33 km.
	MHC	eP	14 56	c	
	CLS	eP	29.1	d	
	PRI	eP	52.3	c	
July 14	MIN	iP	04 12 39.9	d	USCGS: 53.6°W, 172.0°E, 0 = 04 04 18.2
					Near Aleutian Islands.
					h about 33 km.
July 14	MIN	iP	05 27 38.7	d	USCGS: 60.4°N, 142.9°W, 0 = 05 22 20.0
					Alaska aftershock. h about 10 km.
July 14	MIN	eP	10 04 26.9	c	USCGS: 19.0°N, 66.5°W, 0 = 09 55 24.4
					Puerto Rico. h about 46 km.
July 14	BKS	eRNE	14 24.0		
	MHC	eP	07 44.6	c	
	MIN	eP	41.4	c	
	CLS	eP	43.0	c	
	PRI	eP	56.6	c	
July 14	MIN	eZ	17 29 40.2	d	USCGS: 45.3°N, 150.2°E, 0 = 17 19 23.3
					Kuri Islands. h about 33 km.
July 14	BKS	eP	23 04 43.7	c	USCGS: 59.5°N, 144.8°W, 0 = 22 59 09.2
		eZ	05 07.5	d	Alaska aftershock. h about 20 km.
		eSNE	09 12.0	NEc	
	MHC	eP	04 49.0	d	
	MIN	eP	25.2	d	
	CLS	eP	35.6	d	
	PRI	eP	05 01.8	d	
July 14	MIN	eP	23 25 13.3	c	USCGS: 34.3°S, 179.1°E, 0 = 23 12 12.7
					Kermadec Islands. h about 75 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
July 15	BKS	ePcP eSE eGNE eZ eRE	07 35 52 38 47 41.2 41 34 42.5	d Ed	USCGS: 52.1°N, 170.6°W, 0 = 07 26 01.4 Fox Islands. h about 30 km.
	MHC	eP	33 15.5	c	
	MIN	eP	58.2	c	
	CLS	eP	08.5	c	
	PRI	eP	20.5	c	
July 15	MIN	iP	07 39 15.3	c	
July 15	MIN	iP	08 37 13.8	d	USCGS: 11.3°S, 166.1°E, 0 = 08 24 56.5 Santa Cruz Islands. h about 130 km.
July 16	MIN	eP	10 20 36.4	c	
July 16	MIN	eP	10 47 51.9	d	USCGS: 44.0°N, 148.3°E, 0 = 10 37 23.1 Kurile Islands. h about 33 km.
July 16	MIN	eP	11 38 07.2	d	USCGS: 17.9°S, 179.5°W, 0 = 11 27 05 Tonga Islands. h about 625 km.
July 17	BKS	iP	02 47 48.1	d	USCGS: 38.2°N, 23.7°E, 0 = 02 34 26.4 Southern Greece. h about 150 km. Magnitude 5 1/2 - 5 3/4 (BKS)
		eZ	51 50.0	c	
		eSNE	59 00.0	SW	
		iPKKP	03 04 17.5	d	
		eNE	05 26.0	NW	
		eGNE	13.9		
		eRNE	20.7		
			mu sec		
		PZ	0.035 1.0		
		SH	1.77 20		
		MaxH	4.95 24		
	MHC	eP	02 47 49.2	c	
	MIN	eP	36.1	c	
		ipP	48 13.3	d	
	CLS	eP	47 45.4	c	
	PRI	eP	53.1	c	
July 17	BKS	eP	04 50 41.0	d	USCGS: 49.3°N, 158.6°E, 0 = 04 41 05.1 Kurile Islands. h about 50 km. Magnitude 4 3/4 (BKS)
		ePPP	54 20	Sd	
		eSNE	58 20	SW	
		eN	05 04.2		
			mu sec		
		PZ	0.53 8		
	MHC	eP	04 50 46.1	d	
	MIN	iP	32.2	d	
		ipP	38.9	d	
	CLS	eP	36.0	d	
	PRI	eP	56.0	d	
July 17	MIN	eP	05 06 41.6	c	USCGS: 24.3°S, 179.6°E, 0 = 04 55 00 South of Fiji Islands. h about 445 km.
July 17	MIN	eP	11 17 29.2	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
July 17	MIN	eP	15 05 50.0	c	
July 17	MIN	eP	18 45 13.6	d	USCGS: 57.1°N, 150.9°W, 0 = 18 34 46 Alaska aftershock. h about 33 km.
July 18	MIN	iZ	03 17 23.6	d	USCGS: 60.5°N, 139.6°W, 0 = 03 12 20.1 Southeast Alaska. h about 33 km.
July 18	MIN	iP	07 03 13.3	c	
July 18	MIN	iP	13 05 09.8	c	USCGS: 0.2°N, 123.5°E, 0 = 12 45 47.7 Northern Celebes. h about 97 km.
July 20	BKS	eP	18 54 30.8	d	USCGS: 19.8°N, 109.0°W, 0 = 18 49 43.5 Revilla Gigedo Islands. h about 33 km.
		iZ	45.8	c	
		eZ	55 05.0	d	
		ePPNE	05.0	SWd	
		iSNE	58 36.0	SWd	
		eNEZ	59 20.0	SWc	
		eRN	19 00.2		
			mu sec		
		PZ	12		
		SH	20		
		MaxH	20		
	MHC	eP	18 54 22.2	c	
	MIN	eZ	48.0	c	
	CLS	eP	37.4	c	
	PRI	eP	05.0	c	
July 20	BKS	eP	23 08 44.4	d	USCGS: 34.4°S, 179.2°E, 0 = 22 56 01 Off north coast of New Zealand. h about 162 km.
		eR	24.0		
	MHC	eP	08 44.2	d	
	MIN	eP	53.2	c	
	CLS	eP	45.9	c	
	PRI	eP	43.4	d	
July 21	BKS	eP	01 12 44.8	c	USCGS: 19.8°N, 108.8°W, 0 = 01 09 25.8 Off coast of Jalisco, Mexico. h about 31 km.
		eZ	47.3	d	
	MHC	eP	37.0	c	
	MIN	eP	04.3	d	
	CLS	eP	51.7	d	
	PRI	eP	22.1	c	
July 21	BKS	iP	01 14 12.5	c	USCGS: 19.8°N, 108.8°W, 0 = 01 09 25.8 Off coast of Jalisco, Mexico. h about 31 km.
		iZ	21.0	c	
		eE	16 30.0	Wd	
		iSNE	18 18.0	SWd	
		eGNE	19.0		
		eRN	19.9		
			mu sec		
		PZ	1.62 20		
		SH	15.9 20		
		MaxH	16.5 20		
	MHC	eP	01 14 05	c	
	MIN	eP	13.1	c	
	CLS	eP	22.5	d	
	PRI	eP	13 44.3	c	
July 21	BKS	iP	04 00 57.7	c	USCGS: 26.0°S, 178.0°W, 0 = 03 48 59.1

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) July 21			h. m. s.		
		iZ	04 01 02.1	c	Fiji Islands. h about 222 km. Magnitude 5.8 (CGS)
		esP	46.0	d	
		ePP	03 50.0	d	
		eScSNE	10 58.0	SWd	
		eSSNE	15 56.0	SW	
		eSSSNE	19.6	NW	
		eGNE	22.4		
			mu sec		
		PZ	1.05 8		
		SH	4.07 16		
		MaxH	4.10 60		
	MHC	eP	04 00 57.9	c	
	MIN	iP	01 03.5	d	
	CLS	eP	00 58.7	c	
	PRI	eP	57.0	c	
July 21	MIN	iP	07 09 29.9	c	USCGS: 13.1°N, 88.4°W, 0 = 07 01 59.3 Near coast of El Salvador. h about 68 km. Magnitude 4.7
July 21	MIN	iP	07 45 02.6	c	USCGS: 20.0°S, 69.8°W, 0 = 07 33 19.6 Near coast of Chile. h about 84 km.
July 21	BKS	eP	10 06 19.5	c	USCGS: 72.1°N, 130.2°E, 0 = 09 56 16.6 Laptev Sea. h about 33 km.
		eZ	33.0	c	
		eSN	17 08.0	N	
		eRNE	25.0		
	MHC	eP	06 25	d	
	MIN	eP	03.4	d	
	PRI	eP	32	c	
July 21	BKS	eNE	13 45.9		
		eGNE	52.8		
	MIN	eP	27 06.7	c	
July 21	BKS	eP	21 14 34	d	USCGS: 4.6°S, 153.3°E, 0 = 21 01 49.5 New Britain. h about 60 km.
		eSE	25 22		
		ePSNE	26 16	NE	
		eNEZ	31 20	NWc	
		eGN	38.0		
		eRE	42.0		
			mu sec		
		MaxH	1.91 54		
	CLS	eP	21 14 55.0		
	PRI	eP	25.2	d	
July 22	BKS	eSN	10 38 30	N	USCGS: 31.7°N, 114.1°W, 0 = 10 34 11.9 Gulf of California. h about 33 km.
		eRE	38.9		
	MHC	eP	36 13.7	d	
	CLS	eP	33.4	c	
	PRI	eP	09.0	c	
July 23	MIN	eP	07 17 05.4	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks	
1964						
July 23	MIN	iP	14 24 25.0	c	USCGS: 57.1°N, 150.4°W, 0 = 14 19 01.1 Alaska aftershock. h about 33 km.	
July 23	BKS	iP	19 14 53.4	c	USCGS: 59.9°N, 149.2°W, 0 = 19 08 06.6 Alaska aftershock. h about 33 km.	
		eNEZ	18 40.0	SEd		
		eGNE	20 00.0			
		eRNE	21 16.0			
			mu sec			
		PZ	0.051 1.2			
	MHC	eP	19 13 58.6	c		
	MIN	iP	35.9	d		
	CLS	eP	46.1	d		
	PRI	eP	13.0	c		
July 24	BKS	eGNE	01 56.8		USCGS: 14.2°N, 91.6°W, 0 = 01 39 39.0 Near west coast of Guatemala. h about 65 km.	
		eR	58.9			
	MHC	eP	46 27	c		
	MIN	eP	44.1	d		
	CLS	eP	40.6	c		
	PRI	eP	16.5	c		
July 24	BKS	iP	07 00 57.9	d		USCGS: 46.9°N, 153.9°E, 0 = 06 50 52.8 Kurile Islands. h about 33 km. Magnitude 6 (BKS)
		iZ	01 07.0	d		
		ePPE	03 28.0	E		
		eEZ	04 22.0	Ed		
		eSNE	09 10.0	NEd		
		iScSN	10 48.0	N		
		eSSE	12 48.0	Wd		
		eGNE	15.6			
		eR	18.1			
			mu sec			
		PZ	1.04 10			
		SH	16.83 24			
		MaxH	23.00 32			
	MHC	eP	07 01 01.5	c		
	MIN	eP	00 48.6	c		
		ipP	01 04.3	c		
	CLS	eP	00 51.7	c		
	PRI	eP	01 11.4	d		
July 24	MIN	eZ	07 41 43.8	c	USCGS: 56.3°N, 157.8°W, 0 = 07 35 48.4 Near coast of Alaska Peninsula. h about 24 km. USCGS: 47.2°N, 153.8°E, 0 = 08 12 40.0 Kurile Islands. h about 33 km. Magnitude 6 3/4 (BKS)	
July 24	BKS	eP	08 22 42.3	d		
		eZ	57.7	c		
		ePcP	23 22.3	c		
		ePP	24 48	d		
		ePPP	26 22	c		
		eSNE	30 55	SEd		
		eNE	36 50	NW		
		eScS	32 52	N		
		eGNE	37.7			
		eR	40.2			
			mu sec			
		PZ	6.6 10			

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) July 24		PPZ	3.96 9		
		SH	18.5 15		
		MaxH	78.8 23		
	MHC	eP	08 22 48.2	d	
	MIN	iP	35.0	d	
	CLS	eP	38.6	d	
	PRI	eP	57.7	d	
July 24	MIN	eZ	09 26 56.2	c	USCGS: 46.8°N, 154.1°E, 0 = 09 17 00.5 Kurile Islands. h about 33 km.
July 24	MIN	eZ	09 45 13.5	c	USCGS: 46.8°N, 153.8°E, 0 = 09 35 18.4 Kurile Islands. h about 31 km.
July 24	MIN	eZ	10 12 13.1	c	USCGS: 46.8°N, 153.8°E, 0 = 10 02 16.4 Kurile Islands. h about 33 km.
July 24	BKS	iP	11 07 21.0	c	USCGS: 13.1°N, 145.0°E, 0 = 10 54 52.5 Mariana Islands. h about 43 km.
		iZ	31.2	d	
	MHC	eP	23.9	c	
	MIN	iP	19.8	c	
	CLS	eP	18.5	c	
	PRI	eP	29.4	c	
July 24	BKS	eSNE	12 54 18	NEc	USCGS: 46.9°N, 154.0°E, 0 = 12 35 59.5 Kurile Islands. h about 33 km.
		eGNE	13 01.1		
		eR	03.4		
	MIN	eZ	46 05.1	d	
July 24	BKS	eP	13 35 25	d	USCGS: 47.0°N, 153.7°E, 0 = 13 25 18.3 Kurile Islands. h about 33 km.
		eSNE	43 32	NEd	
		eEZ	47 28	SW	Magnitude 5 3/4 - 6 (BKS)
		eGNE	50.0		
		eR	52.5		
			mu sec		
		PZ	1.66 6		
		SH	3.36 22		
		MaxH	5.54 32		
	MHC	eP	13 35 27.8	d	
	MIN	eZ	04.4	c	
	CLS	eP	20.0	d	
	PRI	eP	36.7	c	
July 24	BKS	eP	14 00 37.5	d	USCGS: 6.6°S, 154.8°E, 0 = 13 47 48.6 Solomon Islands. h about 62 km.
	MHC	eP	37.7	c	
	MIN	eP	40.3	c	
	CLS	eP	35.4	c	
	PRI	eP	41.2	c	
July 24	BKS	eP	17 12 53.2	c	USCGS: 47.1°N, 153.6°E, 0 = 17 02 49.2 Kurile Islands. h about 33 km.
		ipP	13 06.5	d	
		eE	10.0	E	Magnitude 6 (BKS)
		eSNE	21 06.0	NEd	
		eSSNE	24 58	NEd	
		eGNE	27 36		
		eRE	30.2		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
July 24 (cont.)			mu sec		
		PZ	2.48 8		
		SH	15.65 24		
		MaxH	17.2 22		
	MHC	eP	17 12 57.2	c	
	MIN	eP	45.1	d	
	CLS	eP	49.2	c	
	PRI	eP	13 08.1	c	
July 24	MIN	eP	20 38 28.5	d	USCGS: 85.9°N, 20.6°E, 0=20 29 11.5 Svalbard region. h about 33 km.
July 24	MIN	iP	22 00 31.6	c	USCGS: 57.7°N, 152.2°W, 0=21 54 54.0 Alaska aftershock. h about 10 km.
July 25	BKS	eP	12 31 52.3	c	USCGS: 19.9°S, 176.2°W, 0=12 20 22.2 Tonga Islands. h about 205 km.
		eZ	32 00.8	d	
	MHC	eP	31 52.6	c	
	MIN	iP	02.3	d	
	CLS	eP	53.1	c	
	PRI	eP	52.2	c	
July 25	BKS	eP	19 43 22.5	c	USCGS: 27.9°S, 70.9°W, 0=19 31 07.0 Northern Chile. h about 26 km.
		esP	54.5	c	Magnitude 6 (BKS)
		eZ	44 18.7	c	
		ePP	46 24.0	d	
		eSNE	53 32	NEd	
		ePSNE	54 28	SEd	
		eSSNE	58 38	NW	
		eLNE	20 05.0		
		eRNE	09.0		
			mu sec		
		PZ	3.45 16		
		PPZ	1.48 18		
		SH	8.33 20		
		MaxH	7.28 34		
	MHC	eP	19 43 19.2	c	
	CLS	eP	25.9	c	
	PRI	eP	11.4	c	
July 25	MHC	eP	23 00 27.8	c	USCGS: 9.7°S, 159.8°E, 0=22 47 42.7 Solomon Islands. h about 21 km.
	CLS	eP	25.3	c	
	PRI	eP	29.8	c	
July 26	BKS	eP	06 39 54.5	c	USCGS: 23.4°S, 180.0°W, 0=06 28 32.7 Fiji Islands. h about 555 km.
	MHC	eP	55.0	c	
	CLS	eP	55.5	c	
	PRI	eP	54.5	c	
July 26	BKS	eP	11 52 09.5	c	USCGS: 52.3°N, 176.2°W, 0=11 44 45.0 Andreanof Islands. h about 100 km.
		eZ	31.0	d	
	MHC	eP	15.4	c	
	CLS	eP	03.9	c	
	PRI	eP	27.1	c	
July 26	BKS	eP	14 04 42.8	c	USCGS: 2.6°N, 78.5°W, 0=13 55 37.5 Ecuador. h about 38 km.
	MHC	eP	50.2	c	
	CLS	eP	59.1	c	
	PRI	eP	40.6	d	

Date	Sta.	Phase	Time (GCT) h m s	Ground Motion	Remarks
1964					
July 27	BKS	eP	23 10 40	d	USCGS: 46.8°N, 153.8°E, 0=23 00 36.3 Kurile Islands. h about 33 km.
		eSNE	18 52	SEd	
		eGNE	25.5		
		eR	27.8		
	MHC	eP	10 46.2	d	
	CLS	eP	36.9	c	
	PRI	eP	56.0	c	
July 28	MIN	iP	01 46 17.7	c	
July 28	MIN	eP	06 29 41		USCGS: 45.4°N, 151.3°E, 0=06 19 29.8 Kurile Islands. h about 33 km.
July 28	BKS	eP	08 12 13.2	c	
	MHC	eP	14.2	c	USCGS: 18.9°S, 169.4°E, 0=08 00 00.3 New Hebrides Islands. h about 237 km.
	MIN	eP	20.8	d	
	CLS	eP	13.2	c	
	PRI	eP	15.2	c	
July 28	BKS	eP	10 57 21.0	c	
	MHC	eP	21.0	d	USCGS: 16.0°S, 172.9°W, 0=10 46 00.6 Samoa Islands. h about 33 km.
	MIN	eP	32.3	d	
	CLS	eP	23.0	c	
	PRI	eP	21.4	d	
July 28	BKS	eP'	18 59 03	c	
		ePP	19 00 36	d	USCGS: 51.2°S, 139.0°E, 0=18 40 04.3 About 1000 km southwest of Tasmania. h about 33 km. Magnitude 5.3 (CGS).
		ePKKP	09 28	d	
		eNEZ	10 40	NEc	
		eSSNE	17 40	SWd	
		eSSSNE	21 52	NE	
		eLqNE	29.2		
		eGNE	31.0		
		eRE	35.0		
			mu sec		
		PPZ	0.437 16		
		MaxH	7.75 28		
	MHC	eP'	18 58 55.6	c	
	CLS	eP'	59 01.2	c	
	PRI	eP'	02	c	
July 28	BKS	eP'NE	21 58 40	NWd	USCGS: 14.3°N, 96.2°E, 0=21 38 43.5 Andaman Islands. h about 33 km.
		ePP	59 50	d	
		eSPE	22 08 18	Ec	
		eSSE	15 00		
		eSSSE	19 16		
		eGNE	28.1		
		eNE	32.1		
		eR	35.3		
			mu sec		
		MaxH	3.9 20		
	MHC	eP'	21 58 44.5	c	
	CLS	eP'	34.8	c	
	PRI	eP'	30.0	c	
July 29	MIN	eP	21 11 06.6	d	

Date	Sta.	Phase	Time (GCT) h. m. s.	Ground Motion	Remarks
1964					
July 30	BKS	ePNE	05 23 52.0	NWc	USCGS: 11.1°N, 86.2°W, 0 = 05 16 03.3 Near west coast of Costa Rica. h about 42 km. Magnitude 6 (BKS)
		iZ	24 06.0	d	
		ePP	25 49.0	d	
		ePcSNE	29 46.0	SE	
		eSNE	30 56.0	NWd	
		eScSNE	33 28.0	SE	
		eGNE	35.9		
		eR	38.7		
			mu sec		
		PZ	2.8 6		
		PPZ	0.79 12		
		MaxH	12.2 24		
	MHC	eP	05 23 47.0	c	
		ePP	25 46.9	d	
	MIN	eP	23 57.3	c	
	CLS	eP	57.1	c	
		epP	24 24.3	d	
		ePP	25 29.7	c	
	PRI	eP	23 35.9	c	
		ePP	25 42.7	d	
July 31	BKS	eP	04 15 25.0	d	USCGS: 44.6°N, 157.6°E, 0 = 04 05 06.2 Kurile Islands. h about 53 km.
			40.7	d	
	MHC	eP	29.5	d	
	MIN	eP	17.4	d	
	CLS	eP	20.3	d	
	PRI	eP	39.0	c	
July 31	BKS	iP	06 05 32.0	c	USCGS: 6.1°S, 149.4°E, 0 = 05 52 18.8 New Britain. h about 63 km. Magnitude 5 3/4 (BKS)
		eEZ	07 40	Wd	
		ePP	09 08	Ec	
		eSN	16 24	Sd	
		ePSNE	17 32	Ec	
		eSSE	22 12	Ed	
		eGN	29.6		
		eRE	34.2		
			mu sec		
		PZ	4.33 32		
		PPZ	3.23 30		
		SH	2.81 10		
		MaxH	2.77 18		
	MHC	eP	06 05 27.0	c	
	MIN	eP	27.4	c	
	CLS	eP	24.8	c	
	PRI	eP	29.8	d	
July 31	BKS	iP	06 38 17.5	d	USCGS: 25.7°S, 179.6°W, 0 = 06 26 36.7 Off coast of Costa Rica. h about 429 km.
	MHC	eP	17.1	c	
	MIN	eP	26.2	d	
	CLS	eP	17.9	c	
	PRI	eP	16.5	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964					
			h. m. s.		
July 31	BKS	eZ	21 48.9		USCGS: 86.4°N, 38.5°E, 0 = 21 22 24.3
	MHC	eP	31 57.9	c	Arctic Ocean.
	MIN	eP	41.0	d	h about 33 km.
	CLS	eP	51.2	d	
	PRI	eP	12.5	d	
July 31	BKS	eP	23 55 36	Sc	USCGS: 86.3°N, 40.5°E, 0 = 23 45 55.2
		eSNE	00 03 26	NWc	Arctic Ocean. h about 10 km.
		eN	05 34	N	
		eGE	09 50		
		eRE	12.3		
			mu sec		
		PZ	0.736	7	
		SH	1.12	20	
		MaxH	6.6	36	
	MHC	eP	23 55 38.8	c	
	CLS	eP	29.6	c	
	PRI	eP	47.8	c	
Aug. 2	BKS	eRNE	03 17.6		USCGS: 56.1°N, 156.1°W, 0 = 03 04 16.9
	MHC	eP	10 25.7	c	Alaska aftershock. h about 33 km.
	MIN	eP	01.5	d	
	CLS	eP	13.2	c	
	PRI	eP	41.5	c	
Aug. 2	BKS	eP	08 41 50.2	NWd	USCGS: 56.2°N, 149.9°W, 0 = 08 36 16.9
		eZ	59.6	d	Alaska aftershock. h about 31 km.
		eNE	42 26.0	Sc	
		eSNE	46 00.0	NW	
		iNE	20.0	SEc	
		eGNE	47 26.0		
		eRN	48 24.0		
			mu sec		
		PZ	2.59	13	
		SH	3.19	18	
		MaxH	18.7	28	
	MHC	eP	08 41 56.5	d	
	MIN	iP	33.9		
	CLS	eP	41.7	c	
	PRI	eP	08.8	c	
Aug. 2	MIN	eP	15 38 46.6	d	
Aug. 3	BKS	ePE	01 57 10	Ed	USCGS: 19.8°N, 70.7°W, 0 = 01 48 23.3
		ePP	59 06	d	Dominican Republic. h about 7 km.
		ePPP	02 00 12	Wc	
		eSNE	04 04	Wd	
		eScSN	07 00	S	
		eSSNE	56	SW	
		esSS	32	c	
		eGN	09.4		
		eRE	14.5		
			mu sec		
		PZ	0.685	8	
		SH	1.23	18	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964					
			h. m. s.		
(cont.)					
Aug. 3					
		MaxH	4.77	16	
	MHC	eP	01 57 01.3	c	
	MIN	eP	03.7	d	
	CLS	eP	05.3	c	
	PRI	eP	56 54.5	c	
Aug. 3	BKS	eSNE	08 09 30	SW	USCGS: 22.6°N, 121.3°E, 0 = 07 44 44.3
		eGN	24.6		Near south coast of Taiwan.
		eRE	29.0		h about 33 km.
Aug. 3	MIN	iP	18 58 32.2	d	USCGS: 53.8°N, 132.1°W, 0 = 18 54 54.9
	CLS	eP	44.0	d	Queen Charlotte Islands.
	PRI	eP	59 09.7	d	h about 33 km.
Aug. 4	BKS	iP	17 34 38.0	c	USCGS: 46.5°N, 151.1°E, 0 = 17 24 29.2
		iEZ	51.5	Ec	Kurile Islands. h about 101 km.
		eNEZ	35 04.0	NWc	
		ePPE	36 30.0	d	
		eSNE	42 58.0	SWd	
		eSSNE	47 04.0	NE	
		eGNE	50.0		
		eRNE	52.0		
			mu sec		
		PZ	0.58	8	
		SH	1.75	16	
		MaxH	3.46	40	
	MHC	eP	17 34 43.2	c	
	CLS	eP	33.7	c	
	PRI	eP	52.6	c	
Aug. 5	BKS	ePNEZ	11 18 28.5		USCGS: 32.1°S, 179.8°E, 0 = 11 06 02.6
		ipP	19 25.5	c	South of Kermadec Islands.
		ePP	21 40.0	Sd	h about 235 km.
		eNEZ	27 14.0	NWd	
		isNE	28 32.0	NWc	
		isSNE	30 00.0	SWd	
		eSSNE	34 50.0	SEd	
		eGNE	41.0		
			mu sec		
		PZ	1.05	8	
		PPZ	0.731	14	
		SH	5.26	14	
		MaxH	9.13	28	
	MHC	eP	11 18 28.2	d	
		epP	19 25.5	c	
	CLS	eP	18 29.4	d	
		epP	19 26.5	c	
		ePKKP	36 11.0	c	
	PRI	eP	18 27.2	d	
		epP	19 24.2	c	
		ePKKP	36 14.0	c	
		eP'P'	44 21.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Aug. 5	BKS	iP ipP ePPNE iSKSNE iSNE ePSNE eNEZ eGNE eRNE	22 36 10.5 20.0 39 44.0 46 40.0 47 08.0 48 08.0 52 36.0 59.9 23 05.4	d d SEd NW SE SEd SEd	USCGS: 41.1°S, 74.9°W, 0 = 22 23 13.0 Off coast of southern Chile. h about 33 km. Magnitude 6 1/2 (BKS)
			mu sec		
		PZ	5.05 7		
		PPZ	1.87 12		
		SH	4.07 20		
		MaxH	11.2 20		
	MHC	eP	22 36 07.6	d	
	CLS	eP	13.7	d	
	PRI	eP	00.5	d	
Aug. 6	BKS	eP	02 45 42.0	c	USCGS: 31.5°N, 129.9°E, 0 = 02 33 39.5 Southwest of Kyushu, Japan.
	MHC	eP	50.5	c	
	MIN	eP	42.1	c	
	CLS	eP	43.8	d	
	PRI	eP	57.7	d	
Aug. 6	MHC	eP	07 30 43.0	c	
	MIN	eP	41.5	d	
	CLS	eP	39.2	c	
	PRI	eP	45.5	c	
Aug. 6	BKS	eP	10 48 01.5	c	USCGS: 43.4°N, 126.7°W, 0 = 10 46 28.9 Off coast of Oregon. h about 33 km.
	epP		07.9	c	
	eSNE		49 26.0	NWd	
	ine		50 48.0		
	MHC	eP	48 12.6	d	
	MIN	eP	47 40.7	d	
	CLS	eP	51.5	c	
	PRI	eP	48 32.5	c	
Aug. 6	MIN	eP	13 16 54.3	c	USCGS: 60.4°N, 145.8°W, 0 = 13 11 31 Alaska aftershock. h about 33 km.
Aug. 6	BKS	iP	17 14 50.4	c	
	MHC	eP	50.7	c	
	CLS	eP	50.8	c	
	PRI	eP	50.2	c	
Aug. 6	BKS	eP	18 30 34.8	c	USCGS: 56.9°N, 152.1°W, 0 = 18 24 50.5 Alaska aftershock. h about 39 km.
	iZ		50.7	d	
	eZ		31 46.0	d	
	eSNE		35 12.0	NW	
	eGNE		36 44.0		
	eRE		37 36.0		
			mu sec		
		PZ	1.60 18		
		SH	2.24 16		
		MaxH	14.6 14		
	MHC	eP	18 30 40.8	c	
	MIN	eP	18.4	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
(cont.)					
Aug. 6	CLS	eP	18 30 23.5	c	
	PRI	eP	52.8	d	
Aug. 6	BKS	eP	23 55 28.3	c	USCGS: 19.2°S, 167.6°E, 0 = 23 42 45.7 New Hebrides Islands. h about 43 km.
		eZ	40.2	d	
		eR	00 22.5		
	MHC	eP	23 55 29.4	c	
	CLS	eP	28.3	c	
	PRI	eP	29.7	d	
Aug. 7	BKS	eP	05 43 13.2	c	USCGS: 56.8°N, 152.3°W, 0 = 05 37 25.1 Alaska aftershock. h about 33 km.
		eSNE	47 55.0	SE	
		eGNE	49.3		
		eRN	50.2		
	MHC	eP	43 21.3	d	
	MIN	eP	54.9	d	
	CLS	eP	02.2	d	
	PRI	eP	29.5	c	
Aug. 7	BKS	eP	15 38 04	d	USCGS: 14.0°N, 91.9°W, 0 = 15 31 18.0 Near south coast of Guatemala. h about 89 km.
		eZ	39 50	c	
		eSN	43 52	s	
		eEZ	44 16	Ec	
		eGNE	47.6		
		eR	50.5		
	MHC	eP	38 07.1	c	
	CLS	eP	17.9	c	
	PRI	eP	55.7	c	
Aug. 8	BKS	eP	15 11 21.8	d	USCGS: 31.7°S, 140.2°E, 0 = 14 59 41.2 South of Honshu, Japan. h about 110 km.
		eZ	30.0	c	
		eSNE	20 58.0	SW	
		eRE	34 36.0		
			mu sec		
		PZ	0.126 1.0		
		SH	0.706 22		
		MaxH	1.24 36		
	MHC	eP	15 11 25.5	d	
	MIN	eP	16.6	d	
	CLS	eP	08.6	d	
	PRI	eP	25.0	c	
Aug. 8	BKS	eP	15 52 40	Ed	USCGS: 87.8°W, 12.5°N, 0 = 15 45 10.9 Off west coast of Nicaragua. h about 63 km.
		ePP	53 47.3	c	
		iPcP	54 46.5	d	
		eScP	58 32.0	c	
		eSNE	40.0	NE	
		eNE	16 03.3		
		eGNE	06.5		
	MHC	eP	15 52 33.7	c	
		ePcP	54 44.5	d	
		eScP	58 30.2	c	
	MIN	eP	52 45.1	c	
	CLS	eP	44.0	c	
		ePcP	54 47.5	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Aug. 8			h. m. s.		
		eScP	16 58 32.8	c	
	PRI	eP	52 23.2	d	
		ePcP	54 40.7	d	
		eScP	58 23.7	c	
Aug. 8	BKS	eP	20 15 25.6	d	USCGS: 18.0°N, 74.0°W, 0 = 20 06 51 Near southeast Haiti. h about 10 km.
		eSE	22 12.0	Ec	
		eSSNE	26 16.0	SEd	
		eLE	29 12.0		
		eRN	33.1		
	MHC		15 17	c	
	MIN		24.8	d	
	CLS		28.5	d	
	PRI		11.3	d	
Aug. 9	MIN	eP	05 29 25.1	d	USCGS: 53.4°N, 153.4°E, 0 = 05 20 32.7 Sea of Okhotsk. h about 511 km.
Aug. 9	MIN	eP	10 30 16.5		
Aug. 10	BKS	eP	01 19 14.0	c	USCGS: 19.1°N, 67.3°W, 0 = 01 10 12.4 Mona Passage. h about 33 km.
		epP	40.5	c	
		ePP	21 16.0	c	
		eSE	26 28.0	c	Magnitude 4 1/2 (BKS)
		eSSN	30 30.0	S	
		eGN	32.6		
		eGNE	35.0		
			mu sec		
		PZ	0.5 12		
		SH	0.63 20		
		MaxH	2.25 20		
	MHC	eP	01 19 10.3	c	
		epP	39.1	c	
		eScP	24 23.5	d	
	CLS	eP	19 16.4	c	
		epP	44.7	c	
		eScP	24 23.0	d	
	PRI	eP	19 03.9	d	
		epP	32.8	c	
		eScP	24 19.0	d	
Aug. 10	BKS	eP	07 46 09.0	d	
	MHC	eP	07.0	d	
	CLS	eP	13.7	d	
	PRI	eP	45 58.8	c	
Aug. 10	BKS	iP	17 08 55.5	c	USCGS: 9.2°N, 62.0°W, 0 = 16 58 44.0 Near coast of Venezuela. h about 51 km.
		eR	28.5		
			mu sec		
		PZ	0.088 1.2		
	MHC	eP	17 08 51.5	d	
	MIN	eP	54.1	d	
	CLS	eP	57.4	d	
		epP	09 21.0	d	
	PRI	eP	08 43.2	d	
		epP	09 04.3	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Aug. 10	BKS	eP	21 52 51.7	c	USCGS: 6.2°S, 154.5°E, 0 = 21 40 10.4 Solomon Islands. h about 105 km.
		eSKS	22 03 18.0	E	
		ePS	04 36.0	d	
		eSS	09.5	c	
		eSSS	12.9	d	
		eRE	19.9		
	MHC	eP	21 52 54.7	c	
	CLS	eP	51.2	c	
		epP	53 24.3	c	
Aug. 12	BKS	eP	52 58.2	c	
		iP	07 01 39.5	c	
		eP	40.0	d	
		eSNE	09 32.0	SWd	
		eGNE	16.4		
		eRNE	19.6		
	MHC	eP	01 43.7		
	CLS	eP	32.2	c	
	PRI	eP	50.5	d	
Aug. 13	BKS	eP	00 43 24.2	Sd	USCGS: 5.4°S, 154.3°E, 0 = 00 31 14.1 Solomon Islands. h about 383 km.
		epP	44 53.0	d	
		ePP	47 42.6	d	
		ipPP	48 21.0	d	
		eSPP	38.5	c	
		eS	53 20.5	c	Magnitude 6 1/2 (BKS)
		eSKSNE	53 18.0	SEd	
		eSKKSNE	36.0	NW	
		eSP	55 29.0	d	
		eP'P'	01 08 16.0	d	
		eG	24.0		
			mu sec		
		PZ	3.58 8		
		SH	12.1 16		
		MaxH	22 10		
	MHC	eP	00 43 26.6	d	
		epP	44 56.4	d	
	MIN	iP	43 30.0	d	
		ipP	44 59.0	d	
	CLS	eP	43 23.6	d	
		epP	44 52.4	d	
	PRI	eP	43 30.3	d	
		epP	44 59.5	d	
Aug. 13	MIN	eP	03 43 26.6	d	
Aug. 13	BKS	eEZ	10 37.0		
	MHC	eP	32 50.8	d	
	MIN	eP	33 17.0	d	
	CLS	eP	06.6	c	
	PRI	eP	32 37.0	c	
Aug. 14	BKS	ePE	21 50 12	Wd	
		eSE	56 00	Wd	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Aug. 14 (cont.)		eGE eRE	22 03.0 06.3		
			mu sec		
		PZ	0.493 30		
		SH	1.01 36		
		MaxH	7.46 52		
Aug. 16	MHC	eP	19 51 47.0	d	USCGS: 15.0°S, 175.8°W, 0 = 19 40 53.9 Samoa Islands. h about 332 km.
	MIN	eP	59.0	c	
	CLS	eP	48.2	c	
	PRI	eP	48.3	d	
Aug. 17	MIN	eP	09 17 11.4	d	USCGS: 52.0°N, 30.0°W, 0 = 09 07 03.8 North of Atlantic Ridge. h about 42 km.
Aug. 17	MHC	eP	11 55 50.0	c	USCGS: 18.0°S, 178.3°W, 0 = 11 45 01.2 Fiji Islands. h about 648 km.
	MIN	eP	58.4	c	
	CLS	eP	50.6	d	
	PRI	eP	49.5	d	
Aug. 17	MIN	eP	12 01 24.7	d	USCGS: 46.3°N, 151.9°E, 0 = 11 51 19.3 Kurile Islands. h about 33 km.
Aug. 17	BKS	eP	15 25 50	c	
	eS		34 26	Nc	
	eSS		38 32	N	
	eRNE		44.6		
	eNZ		52.9		
Aug. 17	BKS	iP	16 46 47.0	Wd	USCGS: 51.5°N, 177.8°E, 0 = 16 38 44.4 Rat Islands. h about 42 km.
	ipP		58.2	c	
	eR		58.7		
		mu sec			
		PZ	0.065 1.0		
	MHC	eP	16 46 52.2	c	
	epP		47 03.5	c	
	CLS	eP	46 41.1	c	
	epP		52.6	c	
	PRI	eP	47 03.5	c	
	epP		16.2	d	
Aug. 17	MIN	eZ	22 37 43.7	c	USCGS: 33.3°N, 114.8°W, 0 = 22 33 58 California-Arizona border. h about 14 km.
Aug. 17	MHC	eP	22 57 55.0	c	
	MIN	iP	40.3	d	
	CLS	eP	52.1	c	
	PRI	eP	58.0	c	
Aug. 18	BKS	eP	00 37 06.0	d	USCGS: 7.2°S, 74.4°W, 0 = 00 26 51.8 Peru-Brazil border. h about 156 km.
	epP		41.7	c	
		mu sec			
		PZ	0.048 1.0		
	MHC	eP	00 37 01.6	d	Magnitude 4 3/4 (BKS)

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Aug. 18			h. m. s.		
	MIN	epP	00 37 38.7	c	
		iP	12.0	c	
		ipP	49.2	d	
	CLS	eP	05.9	d	
		epP	06.0	d	
	PRI	eP	10.0	d	
		epP	47.1	c	
Aug. 18	BKS	eP	04 57 08.0	c	USCGS: 26.4°S, 71.5°W, 0 = 04 44 58.0 Off coast of northern Chile. h about 8 km.
		ePcP	16.0	d	
		iZ	58 27.5	c	
		ePP	05 00 14.0	c	Magnitude 6.4 (CGS)
		eSNE	07 08.0	NWd	
		eSP	08 04.0	d	
		eSSNE	12 32.0	NWd	
		eSSSNE	16 00.0	NWd	
		eGNE	18 36.0		
		eRNE	22.8		
		mu sec			
		PZ	4.53 14		
		PPZ	2.04 10		
		SH	4.09 22		
		MaxH	10.8 30		
	MHC	eP	04 57 04.7	c	
		ePcP	14.1	c	
	MIN	iP	58 14.4	c	
	CLS	eP	58 11.7	c	
		ePcP	21.2	c	
	PRI	eP	56 56.9	c	
		ePcP	57 05.5	d	
Aug. 18	MIN	eZ	11 29 08.1	d	
Aug. 20	BKS	eNEZ	04 15.2		USCGS: 63.9°N, 20.5°W, 0 = 03 56 29.2 Iceland. h about 33 km.
		eRNE	25.5		
		mu sec			
		MaxH	5.2 20		
Aug. 20	BKS	eP	08 47 41.4	c	USCGS: 14.9°N, 60.4°W, 0 = 08 37 47.1 Windward Islands. h about 65 km.
	MHC	eP	38.1	c	
	CLS	eP	43.3	d	
	PRI	eP	31.7	c	
Aug. 20	BKS	eE	13 35.0		
Aug. 21	PRI	eP	16 38 26.3	d	
Aug. 21	BKS	eNZ	19 58.2		
	MHC	eP	55 50.5	c	
	PRI	eP	54.4	c	
Aug. 22	BKS	ePN	03 05 36	Nc	USCGS: 31.5°N, 114.3°W, 0 = 03 03 20.7 Gulf of California h about 15 km.
		eSE	07 40	Ed	
		eRNE	08.0		
		mu sec			
		MaxH	26.8 20		
	MHC	eP	03 05 25.6	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont).			h. m. s.		
Aug. 22	PRI	eP	03 05 05.8	d	
Aug. 22	BKS	eZ	05 30 33		USCGS: 31.4°N, 114.4°W, 0 = 05 26 05
	PRI	eP	27 48.7	c	Gulf of California. h about 33 km.
Aug. 22	MHC	eP	17 14 54.6	c	USCGS: 51.9°N, 30.0°W, 0 = 17 04 31.2
	CLS	eP	51.5	c	North of Atlantic Ridge.
	PRI	eP	56.9	c	h about 33 km.
Aug. 22	BKS	eZ	17 40 20	d	
Aug. 23	BKS	eNZ	05 16.4		USCGS: 59.4°N, 30.2°W, 0 = 04 47 46.4
	MHC	eP	04 57 48.5	c	North Atlantic Ocean.
	CLS	eP	43.8	c	h about 33 km.
	PRI	eP	52.9	c	
Aug. 23	BKS	eP	15 37 04	Ed	USCGS: 6.1°S, 149.4°E, 0 = 15 24 05.3
		ePPE	40 52	Ec	New Britain region.
		eSNE	48 00	SWd	h about 63 km.
		ePSE	49 20	Wd	
		eSSE	53.9	Ed	Magnitude 5 1/4 - 5 1/2 (BKS)
		eSSSE	57.9	Ed	
		eGN	16 01.9		
		eR	06.0		
			mu sec		
		PZ	1.34 20		
		PPZ	0.872 24		
		SH	1.42 20		
		MaxH	11.88 28		
Aug. 24	BKS	eP	10 46 50.7	d	USCGS: 1.5°S, 78.1°W, 0 = 10 37 23.4
				c	Ecuador. h about 173 km.
	MHC	eP	46.1	d	
	CLS	eP	54.9	d	
	PRI	eP	36.0	d	
Aug. 24	MHC	eP	21 34 34.6	c	
	CLS	eP	20.5	c	
	PRI	eP	37.6	c	
Aug. 24	BKS	eP	22 02 42.0	SEc	USCGS: 58.4°N, 150.3°W, 0 = 21 56 54.2
					Gulf of Alaska. h about 22 km.
		eSNE	07 20.0	d	
		eGE	08 36.0		
		eR	09.9		
			mu sec		
		PZ	0.808 14		
		SH	2.06 16		
		MaxH	7.83 16		
	MHC	eP	22 02 46.8	d	
	CLS	eP	33.5	d	
	PRI	eP	03 00.4	d	
Aug. 25	BKS	eE	11 58.6		
Aug. 25	BKS	eP	13 57 06.3	d	USCGS: 78.2°N, 126.6°E, 0 = 13 47 20.6
		eZ	24.3	c	East of Severnaya Zemlya, USSR.
		eSNE	14 05 08.0	NWd	h about 50 km.
		eGNE	13.0		
		eR	15.8		Magnitude 6 1/2 (BKS)

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.)			h. m. s.		
Aug. 25					
			mu sec		
		PZ	13.68 18		
		SH	12.40 11		
		MaxH	32.20 16		
	MHC	eP	13 57 10.8	d	
	CLS	eP	00.5	d	
	PRI	eP	20.5	d	
		eP'P'	14 26 52.5	c	
Aug. 26	BKS	eP	03 29 06.4	c	USCGS: 52.1°N, 30.1°W, 0 = 03 18 44.1
	MHC	eP	07.2	c	North Atlantic Ridge
	CLS	eP	03.8	c	
	PRI	eP	09.6	c	
Aug. 26	BKS	eP	05 50 22.5	d	USCGS: 47.2°W, 148.4°E, 0 = 05 40 27.1
		eZ	30.5	c	Northwest of Kurile Islands.
	MHC	eP	27.5	c	h about 308 km.
	CLS	eP	18.1	c	
	PRI	eP	36.8	c	
Aug. 27	BKS	eZ	02 10.5		USCGS: 23.7°N, 143.6°E, 0 = 01 34 26.7
	MHC	eP	01 46 27.5		Volcano Islands. h about 39 km.
	CLS	eP	25.7	c	
	PRI	eP	39.7	d	
Aug. 27	BKS	eP	08 05 23.8	c	USCGS: 17.5°S, 173.0°W, 0 = 07 53 54.8
		eSNE	14 50.0	c	Tonga Islands. h about 33 km.
		eGNE	23.9		
		eRNE	26.8		
			mu sec		
		PZ	0.60 13		
		SH	0.81 28		
		MaxH	1.93 18		
	MHC	eP	08 05 22.3	c	
	CLS	eP	25.0	c	
	PRI	eP	21.9	c	
Aug. 28	MHC	eP	00 00 17.8	c	
	CLS	eP	17.8	d	
	PRI	eP	16.6	c	
Aug. 28	BKS	eP	04 46 29.8	d	USCGS: 9.8°S, 178.2°W, 0 = 04 35 29.3
	MHC	eP	30.0	d	Fiji Islands. h about 58.0 km.
	CLS	eP	30.4	d	
	PRI	eP	29.8	d	
Aug. 29	JAS	eP	04 14 11.3	d	USCGS: 57.8°N, 156.0°W, 0 = 04 08 03.2
					Alaska Peninsula. h about 78 km.
Aug. 29	MHC	eP	06 16 53.3	c	USCGS: 19.3°S, 66.3°W, 0 = 06 05 24.2
	CLS	eP	17 00.0	c	South Bolivia. h about 232 km.
	PRI	eP	16 45.4	c	
Aug. 29	JAS	eP	10 45 53.7	d	
Aug. 29	JAS	eP	15 23 39.4	d	
Aug. 29	JAS	eP	21 45 23.3	d	USCGS: 14.9°S, 172.8°W, 0 = 21 36 50.8
					Samoa Islands. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964					
			h. m. s.		
Aug. 29	JAS	eP	22 20 54.0	d	
Aug. 29	JAS	eP	23 43 14.6	d	
Aug. 30	JAS	iP	02 07 28.6	c	
Aug. 30	JAS	eP	03 23 49.3	d	
Aug. 30	BKS	eP	08 22 42.0	d	USCGS: 15.8°S, 174.9°W, 0 = 08 11 42.5 Tonga Islands. h about 286 km.
	MHC	eP	42.2	d	
	CLS	eP	42.5	d	
	PRI	eP	41.9	d	
Aug. 30	JAS	eP	21 08 38.4	c	USCGS: 29.2°N, 114.4°W, 0 = 21 03 58 Baja California. h about 33 km.
Aug. 30	BKS	eP	21 56 22.0	c	USCGS: 19.9°S, 176.0°W, 0 = 21 44 56.9 Fiji Islands. h about 253 km.
	CLS	eP	22.8	c	
	PRI	eP	21.8	c	
Aug. 31	BKS	eNEZ	02 40 24	d	USCGS: 35.2°S, 106.0°W, 0 = 02 14 20.3 Easter Island. h about 33 km.
		eGE	45.7		
	MHC	eP	25 55.6	c	
	CLS	eP	49.2	d	
	PRI	eP	46.6	d	
Aug. 31	JAS	eP	04 48 15.3	s	
Aug. 31	JAS	eP	16 18 06.0	d	
Aug. 31	JAS	eP	19 42 18.9	d	USCGS: 59.5°N, 145.9°W, 0 = 19 36 38 Gulf of Alaska. h about 33 km.
Aug. 31	JAS	eP	22 35 20.4	S	
Aug. 31	JAS	eP	23 27 33.1	d	USCGS: 52.4°N, 170.7°W, 0 = 23 20 19.4 Fox Islands. h about 33 km.
Sept. 1	JAS	eP	12 55 29.4	d	USCGS: 76.1°N, 120.8°E, 0 = 12 45 24 Laptev Sea. h about 33 km.
Sept. 1	JAS	eP	13 40 28.8		USCGS: 27.2°N, 92.3°E, 0 = 13 22 36.6 India-China border. h about 33 km.
Sept. 1	BKS	ePNE	13 47 36	SEd	
		ePPN	50 44	Nc	
		eSSN	14 05.5		
		eGNE	10.8		
		eRN	15.8		
Sept. 1	JAS	eP	15 55 10.9	c	
Sept. 1	JAS	eP	16 48 52.0	c	
Sept. 1	BKS	eP	17 23 44.6	d	USCGS: 51.2°N, 170.6°W, 0 = 17 16 40.4 Fox Islands. h about 25 km.
		ePcP	26 03.5	c	
		eSNE	29 26.0	SWc	
		eGN	31 56.0		
		eR	33.4		
			mu sec		
		PZ	0.473 8		
		SH	0.523 14		
		MaxH	1.97 14		
	MHC	eP	17 23 50.8	c	
		ePcP	26 10.1	d	
	MIN	eP	23 35.4	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964					
			h. m. s.		
(cont.)					
Sept. 1					
	CLS	eP	17 23 39.1	d	
		ePcP	26 05.6	d	
	PRI	eP	24 02.8	d	
		epP	21.5	c	
		ePcP	26 14.8	d	
Sept. 2	JAS	eP	13 49 34.7	d	
Sept. 2	JAS	ePZ	15 54 20.6	d	
Sept. 2	BKS	eP	18 21 18.5	c	USCGS: 7.8°N, 73.3°W, 0 = 18 12 22.9 Northern Colombia. h about 112 km.
		eZ	37.0	c	
	MHC	eP	29.6	c	
	CLS	eP	37.5	c	
	PRI	eP	22.0	d	
Sept. 2	BKS	eP	21 44 51.7	c	
	MHC	eP	54.7	d	
	CLS	eP	54.1	d	
	PRI	eP	55.7	c	
Sept. 2	JAS	eP	22 44 09.4		
Sept. 3	BKS	ePNE	05 34 29.3		USCGS: 50.5°N, 129.5°W, 0 = 05 31 15.0 Vancouver Island. h about 29 km.
		eNEZ	37.1		
			mu sec		
		MaxH	2.24 22		Magnitude 5.0 (CGS)
	MHC	eP	05 34 36.5	d	
	CLS	eP	17.8	c	
	PRI	eP	58.2	c	
Sept. 3	BKS	eP	10 19 20.0	d	USCGS: 30.9°S, 68.4°W, 0 = 10 06 55.9 San Juan Province, Argentina. h about 113 km.
		eEZ	52		
	MHC	eP	19 16.9	d	
	CLS	eP	23.5	d	
	PRI	eP	09.6	d	
Sept. 3	BKS	eP	11 50 12.8	c	USCGS: 43.5°N, 127.1°W, 0 = 11 48 36.1 Off coast of Oregon. h about 33 km.
		eNZ	51 38.0		
	MHC	eP	50 23.1	d	
	PRI	eP	42.8	c	
Sept. 3	BKS	eP	17 10 14.2	c	USCG: 15.2°S, 173.5°W, 0 = 16 58 55.4 Tonga Islands. h about 33 km.
		eSNE	19 32.0	NEd	
		eRNE	31.0		
	MHC	eP	10 16.1	c	
	CLS	eP	16.0	d	
	PRI	eP	15.4	d	
Sept. 3	BKS	eP	17 42 26.5	c	USCGS: 19.6°N, 109.1°W, 0 = 17 38 11 Revilla Gigedo Islands. h about 33 km.
		eNE	47.0		
		eRN	48.7		
	MHC	eP	42 51.4	c	
	CLS	eP	43 07.5	c	
	PRI	eP	42 37.5	c	
Sept. 3	BKS	eP	21 18 46.0	c	USCGS: 24.6°N, 108.6°W, 0 = 21 14 43 Gulf of California. h about 33 km.
		eSNE	22 12.0	SWd	
		eGNE	52.0		
		eR	23 58.0		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Sept. 3			h. m. s.		
			mu sec		
		PZ	1.21 8		
		SH	3.72 22		
		MaxH	12.17 22		
	MHC	eP	21 18 42.0	c	
	CLS	eP	54.0	c	
	PRI	eP	32.0	d	
Sept. 3	MHC	eP	23 45 54.2	c	USCGS: 24.2°N, 108.8°W, 0 = 23 41 56.2 Gulf of California. h about 15 km.
	PRI	eP	47.7	c	
Sept. 4	BKS	eP	03 40 52.2	d	USCGS: 7.6°N, 36.9°W, 0 = 03 28 33.1 Central Mid-Atlantic Ridge. h about 22 km.
		ePPP	46 08.0	c	
		eSNE	51 08.0	SWd	
		eSSE	56.4	Wd	
		eLN	04 02.3		
		eGNE	03.5		
		eRE	06.8		
	MHC	eP	03 40 50.4	d	
	CLS	eP	52.5	c	
	PRI	eP	45.4	d	
Sept. 4	BKS	eP	09 48 31.5	d	USCGS: 18.3°S, 69.0°W, 0 = 09 36 58.7 Northern Chile. h about 101 km.
			mu sec		
		PZ	0.055 1.0		
	MHC	eP	09 48 28.0	d	
	CLS	eP	35.2	d	
	PRI	eP	19.3	c	
Sept. 4	BKS	eP	09 54 17.0	c	USCGS: 24.2°N, 108.6°W, 0 = 09 50 06.6 Gulf of California. h about 33 km.
		eSNE	57 44.0	SWd	
		eGNE	58 24.0		
		eR	59.0		
			mu sec		
		PZ	0.95 8		
		SH	1.07 20		
		MaxH	4.60 24		
	MHC	eP	09 54 11.5	c	
	CLS	eP	54 21.5	d	
	PRI	eP	53 51.8	c	
Sept. 4	BKS	eP	09 59 33.8	d	USCGS: 23.4°N, 108.8°W, 0 = 09 55 16 Gulf of California. h about 33 km.
	MHC	eP	29.3	c	
	PRI	eP	05.5	d	
Sept. 4	BKS	eP	10 48 22	d	USCGS: 4.0°S, 131.4°E, 0 = 10 34 13.1 Banda Sea. h about 33 km.
		ePKIKP	52 38	Ec	
		eNEZ	59 04	NWc	
		ePSNE	11 01 52	SEc	
		eSSE	07 54	Ec	Magnitude 5 1/2- 6 (BKS)
		eGN	17 44		
		eRE	22.0		
			mu sec		
		PZ	0.43 18		
		PPZ	0.503 24		
		MaxH	6.9 20		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Sept. 4			h. m. s.		
	MHC	eP	10 48 24	c	
	PRI	eP	34	c	
Sept. 4	MHC	eP	10 52 43.5	c	
	PRI	eP	53.2	d	
Sept. 5	BKS	eP	02 21 25.3	d	USCGS: 24.4°S, 68.2°W, 0 = 02 09 21.4 Chile - Argentina. h about 64 km.
			mu sec		
		PZ	0.039 1.0		
	MHC	eP	02 21 21.5	d	
	CLS	eP	29.2	d	
	PRI	eP	15.1	c	
Sept. 5	BKS	iP	02 29 33.9		USCGS: 32.2°S, 179.5°E, 0 = 02 17 14.4 South of Kermadec Island. h about 397 km.
	MHC	eP	23.7	d	
	CLS	eP	24.6	d	
	PRI	eP	22.6	d	
Sept. 5	BKS	eP	03 06 41.1	d	USCGS: 5.8°S, 154.0°E, 0 = 02 53 50.6 Solomon Islands, h about 69 km.
		iZ	45.6	d	
		iPPZ	10 05.0	d	
		eSNE	17 20.0	SWc	Magnitude 6.4 (CGS)
		eSSNE	22.0		
		eGNI	22.9		
		eRE	33.6		
			mu sec		
		PZ	4.19 18		
		FPZ	2.67 26		
		SH	7.02 32		
		MaxH	27.5 28		
	MHC	eP	03 06 40.8	c	
	CLS	eP	34.0	c	
	PRI	eP	43.5	c	
Sept. 5	MHC	eP	03 32 27.8	c	
	PRI	eP	20.2	d	
Sept. 5	BKS	eP	12 44 44	c	USCGS: 0.6°N, 25.9°W, 0 = 12 27 22.2 Central Mid-Atlantic Ridge. h about 33 km.
		eSE	53 12	Wd	
		eNEZ	58.0	SWd	
		eGN	13 07 24		
		eRE	12.0		
Sept. 6	BKS	eP	08 09 53.0	c	USCGS: 48.1°S, 104.1°E, 0 = 07 50 12.6 Southeast Indian Rise. h about 33 km.
	MHC	eP	52.3	c	
	CLS	eP	52.3	c	
	PRI	eP	53.3	c	
Sept. 6	BKS	eZ	16 07.0		USCGS: 58.7°N, 151.4°W, 0 = 15 58 15 Kodiak Island. h about 33 km.
		eR	13.9		
Sept. 6	MIN	eZ	16 24 58.2	d	USCGS: 21.5°S, 66.8°W, 0 = 16 13 23.2 Southern Bolivia. h about 233 km.
Sept. 6	MIN	eP	17 22 16.1	c	USCGS: 59.1°N, 147.4°W, 0 = 17 16 54.6 Gulf of Alaska. h about 33 km.
Sept. 6	BKS	eP	18 54 04.0	d	USCGS: 10.0°N, 140.2°E, 0 = 18 41 01.8 West Caroline Islands. h about 33 km.
		eSNE	19 04 52.0	NE	
		ePPSE	06 08	Ed	
		eGNE	17.5		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Sept. 6			h. m. s.		
		eRE	19 22.6		
	MHC	eP	18 54 04.1	d	
	MIN	iP	01.5	d	
	CLS	eP	10.7	c	
	PRI	eP	05.0	c	
Sept. 6	BKS	iP	21 14 08	c	USCGS: 6.0°S, 107.0°W, 0 = 21 05 48 Easter Island. h about 33 km.
		eZ	18 24	c	
		eSN	20 46	Nd	
		eGNE	24.3		
		eRNE	26.2		Magnitude 4 3/4 (BKS)
			mu sec		
		PZ	0.565 10		
		SH	2.0 20		
		MaxH	6.67 20		
	MHC	eP	21 14 04.6	d	
	MIN	eZ	27.1	c	
	CLS	eP	15.5	d	
	PRI	eP	13 53.5	d	
Sept. 7	JAS	eP	04 04 04		USCGS: 48.6°N, 153.9°E, 0 = 03 54 05.1 Kurile Island. h about 100 km.
Sept. 7	JAS	eP	07 48 00.1		USCGS: 58.3°N, 152.0°W, 0 = 07 42 02.3 Kodiak Island region. h about 33 km.
Sept. 7	BKS	eNZ	12 00 10	Nd	
		eGNE	21.5		
		eR	28.2		
Sept. 7	JAS	iP	16 05 09.7	c	USCGS: 37.1°N, 71.8°E, 0 = 15 52 11.5 Afghanistan-USSR border. h about 168 km.
Sept. 8	JAS	iP	11 27 11.0	c	USCGS: 17.4°S, 173.5°W, 0 = 11 15 35 Tonga Islands. h about 33 km.
Sept. 8	JAS	eP	12 33 13.1	c	
Sept. 8	JAS	iP	12 34 39.4	c	
Sept. 8	BKS	eP	13 51 47.5	d	USCGS: 29.6°N, 142.0°E, 0 = 13 40 03.5 South of Honshu, Japan. h about 77 km.
		eZ	52 00.7	d	
		eSNE	14 14 44.0		
		eRE	16 50.0		
	MHC	eP	13 51 51.2	d	
	JAS	eP	52.6	d	
	CLS	eP	43.3	d	
	PRI	eP	57.3	c	
Sept. 8	MHC	eP	14 21 06.8	d	USCGS: 23.8°S, 177.5°W, 0 = 14 09 19.2 South of Fiji Islands. h about 213 km.
	JAS	eP	20 57.3		
	PRI	eP	21 07.8	d	
Sept. 8	BKS	eP	14 24 32.0	d	
	MHC	eP	32.0	c	
	JAS	iP	38.3		
	PRI	eP	32.5	c	
Sept. 8	JAS	eS	17 04 29.4		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Sept. 8	JAS	iP	17 16 35.3	d	USCGS: 20.4°S, 178.3°W, 0 = 17 05 23.4 Fiji Islands. h about 539 km.
Sept. 9	BKS	eP	06 18 18	d	USCGS: 26.2°N, 143.7°E, 0 = 06 06 18.4 Bonin Islands. h about 33 km.
	MHC	eP	17.8	d	
	JAS	eP	17.2		
	CLS	eP	17 48.1	c	
	PRI	eP	18 21.0	c	
Sept. 9	JAS	eP	10 48 24.5		
Sept. 10	JAS	eP	09 21 24		USCGS: 16.4°N, 96.0°W, 0 = 09 15 47.0 Oaxaca, Mexico. h about 59 km.
Sept. 10	BKS	eP	17 49 42.3	d	USCGS: 33.0°S, 69.4°W, 0 = 17 37 08.7 Mendoza Province, Argentina. h about 80 km.
	MHC	eP	38.2	d	
	JAS	iP	36.6	SEd	
	CLS	eP	44.8	d	
	PRI	eP	31.2	d	
Sept. 11	JAS	eP	00 32 17.3	Nd	USCGS: 60.3°N, 146.6°W, 0 = 00 26 29.9 Southern Alaska. h about 38 km.
Sept. 11	BKS	eP	04 35 48.7	d	USCGS: 23.9°S, 66.6°W 0 = 04 23 56.0 Jujuy Province, Argentina. h about 195 km.
		ePP	39 32.0	d	
		eSNE	45 38.0	NWd	
			mu sec		
		PZ	0.114 1.5		
	MHC	eP	04 35 45.7	d	
	MIN	iP	53.7	d	
	JAS	iP	43.2	SEd	
	CLS	eP	52.2	d	
	PRI	eP	38.2	d	
Sept. 12	BKS	eP	15 30 20.0	d	USCGS: 17.4°S, 179.9°W, 0 = 15 19 22.3 Fiji Islands. h about 561 km.
		ePcP	32.3	d	
		epP	32 16.0	d	
		esP	33 16.0	c	
		eSNE	39 26.0	SWc	
		esSNE	42.5		
		eNEZ	51.0		
			mu sec		
		PZ	1.68 8		
		SH	1.51 20		
	MHC	eP	15 30 20.7	c	
	JAS	iP	26.1	c	
		ipP	44.9		
	MIN	iP	28.2	d	
		iPcP	37.4	c	
	CLS	eP	20.6	c	
	PRI	eP	20.9	c	
Sept. 12	BKS	ePNE	12 56 32.3	NEc	USCGS: 4.4S, 144.0°E, 0 = 12 43 19.0 Northeast of New Guinea. h about 120 km.
		iZ	47.1	c	
		eZ	57 29.9	c	
		ePP	13 00 22.8	d	
		eSKSNE	07 00.0	SE	
		ePSE	09 00.0	SW	Magnitude 6 1/4 - 6 1/2 (BKS)

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (Cont.) Sept. 12			h. m. s.		
		eSSNE	13 14.4		
		eGN	22 44		
		eRE	26.0		
			mu sec		
		PZ	0.67 12		
		PPZ	1.8 6		
		SH	1.98 28		
		MaxH	8.31 40		
MHC		eP	12 56 34.9	c	
		ePP	13 00 29.0	c	
JAS		iP	12 56 39.0	c	
MIN		iP	34.5	c	
CLS		eP	31.6	c	
		ePP	13 00 22.0	c	
PRI		eP	12 56 38.7	c	
		ePP	13 00 34.0	c	
Sept. 12 BKS		eP	22 21 24.0	c	
		eP'	25 29.3	d	USCGS: 49.1°S, 164.2°E, 0 = 22 07 03.2
		ePP	43.0	c	Auckland Islands. h about 33 km.
		esPP	26 53.4	c	Magnitude 7 1/2 (BKS)
		iSKSNE	32 12.0	SWd	
		iPSNE	35 20.0	NEd	
		eGNE	51.3		
		eR	55.4		
			mu sec		
		PZ	3.83 20		
		PPZ	16.92 18		
		SH	34.7 20		
		MaxH	57.7 16		
MHC		eP'	22 25 30	c	
		ePP	52	c	
MIN		eP'	35.2	c	
CLS		eP'	31.3	c	
		ePP	50.0	d	
PRI		eP'	28.0	c	
		ePP	47.3	c	
Sept. 13 JAS		iP	19 46 50.6	Sc	USCGS: 58.8°N, 154.9°W, 0 = 19 40 44
					Alaska Peninsula. h about 0 km.
Sept. 14 MHC		eP	10 23 54.5	c	USCGS: 56.7°N, 157.4°W, 0 = 10 17 46.6
MIN		iP	36.8	d	Alaska Peninsula. h about 61 km.
CLS		eP	44.3	c	
PRI		eP	24 09.5	d	
Sept. 14 JAS		iP	10 38 58.7	Nd	
Sept. 14 BKS		eP	13 40 27	d	USCGS: 15.0°N, 92.2°W, 0 = 13 33 33.7
		eSNE	45 46	NWd	Near coast of Chiapas, Mexico.
		eNEZ	48 28	NEc	h about 64 km.
		eGNE	49.1		
		eRNE	50.0		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.) Sept. 14			h. m. s.		
			mu sec		
		PZ	1.055 8		
		SH	1.13 20		
		MaxH	5.5 20		
MHC		eP	13 40 03.2	c	
JAS		iP	06.5	Sc	
MIN		eP	27.2	d	
CLS		eP	22.0	c	
PRI		eP	39 59.0	c	
Sept. 14 JAS		eP	14 31 04.5		
Sept. 14 JAS		eP	15 52 06.9		USCGS: 15.5°N, 90.8°W, 0 = 15 45 22.2
		i	11.5	c	Guatemala, Mexico. h about 38 km.
Sept. 14 JAS		iP	22 47 10.8	c	USCGS: 16.0°N, 99.9°W, 0 = 22 41 17.2
					Near coast of Guerrero, Mexico.
					h about 33 km.
Sept. 15 BKS		eP	12 55 33.4	c	USCGS: 16.0°N, 172.9°W, 0 = 12 44 12.2
		eSE	13 04 52.0	W	Samoa Islands. h about 33 km.
		eGNE	13.8		
		eRE	17.7		
MHC		eP	12 55 33.6	d	
CLS		eP	33.5	d	
PRI		eP	33.0	d	
Sept. 15 BKS		iP'	15 48 27.7	d	USCGS: 8.9°N, 93.1°E, 0 = 15 29 32.2
		ipP'	43.0	c	Nicobar Islands. h about 37 km.
		iPP	50 01.3	d	
		INEZ	54 28.0	N	
		eSKSE	55 24.0	E	
		ePSNE	59 54.0	Sc	
		eSSNE	16 06 41.0	E	
		eSSSNE	10 16.0	SE	
		eEZ	18.3		
		eGNE	21.0		
		eRNE	28.3		
			mu sec		
		PPZ	6.75 11		
		MaxH	16.15 44		
MHC		eP'	15 48 29.1	c	
JAS		iP	28.7	Ec	
MIN		iP'	24.9	d	
CLS		eP'	25.8	c	
PRI		eP'	32.2	c	
Sept. 15 JAS		iZ	16 26 30		
Sept. 16 BKS		eP	01 56 17.2	d	USCGS: 60.0°N, 147.1°W, 0 = 01 50 33.9
		iZ	33.0	c	Gulf of Alaska. h about 29 km.
		eSNE	02 01 00.0	NED	
		eGNE	04.3		
		eRNE	05.6		
			mu sec		
		PZ	4.85 12		
		SH	5.5 16		
		MaxH	21.9 18		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.)			h. m. s.		
Sept. 16	MHC	eP	01 56 21.4	c	
	JAS	e P	21.0	c	
	MIN	eP	55 59.7	d	
	CLS	eP	56 09.8	d	
	PRI	eP	36.6	d	
Sept. 16	BKS	eRNE	06 06.0		USCGS: 5.9°S, 152.0°E, 0 - 05 20 46.1 New Britain region. h about 29 km.
	MIN	eP	05 33 54.3	c	
	CLS	eZ	34 46.0	d	
	PRI	eZ	00.0	d	
Sept. 16	BKS	eP	22 34 27.4	d	USCGS: 22.9°N, 45.1°W, 0 = 22 23 36.3 North Atlantic Ridge. h about 33 km.
		eGN	51.2		
		eRNE	54.2		
			mu sec		
		MaxH	4.57 20		Magnitude 5 1/2 (BKS)
	MHC	eP	22 34 23.6	d	
	JAS	iP	16.1	Ed	
	MIN	eZ	13.5	d	
	CLS	eP	13.3	c	
	PRI	eP	20.2	c	
Sept. 17	MHC	eP	07 11 56.2	c	USCGS: 26.5°S, 176.4°W, 0 = 07 59 37.8 South of Fiji Islands. h about 33 km.
	JAS	e P	12 01.7	c	
	MIN	iP	06.5	c	
	CLS	eP	57.0	c	
	PRI	eP	55.0	c	
Sept. 17	JAS	iP	07 52 12.8	d	USCGS: 15.6°S, 72.9°W, - = 07 41 13.9 Southern Peru. h about 118 km.
Sept. 17	BKS	eP	15 12 43.7	d	USCGS: 44.5°N, 31.3°W, 0 = 15 02 00.9 North Atlantic Ridge. h about 24 km.
		iZ	51.0	c	
		eZ	17 22.0	c	
		eSNE	21 28.0	NEc	
		eGNE	28.6		
		eRE	32.3		
			mu sec		
		PZ	0.812 8		
		SH	1.86 44		
		MaxH	4.2 20		
	MHC	eP	15 12 44.0	d	
	JAS	iP	35.7	NEd	
	CLS	eP	42.2	d	
	PRI	eP	44.3	d	
Sept. 13	MHC	eP	10 32 14.5	d	USCGS: 19.4°N, 155.3°W, 0 = 10 25 28.1 Hawaii region. h about 10 km.
	JAS	iP	27.5	c	
	MIN	iP	28.9	d	
	CLS	eP	06.8	c	
	PRI	eP	19.4	d	
Sept. 13	MIN	eZ	12 17 05.7	d	
Sept. 13	MIN	eP	12 29 56.2	d	USCGS: 51.4°N, 179.9°W, 0 = 12 22 13.3 Gulf of Alaska. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h. m. s.		
Sept. 18	BKS	eP	13 23 46	c	USCGS: 39.8°N, 29.7°W, 0 = 13 12 42.3 Azores islands. h about 20 km.
		eSNE	32 52	NEc	
		eGNE	41.0		
		eRNE	44.5		
			mu sec		
		MaxH	3.8 16		
	MHC	eP	13 23 45	c	
	MIN	eP	34.8		
		iS	32 39.0		
		eG	40 05.0		
		eR	44.5		
	CLS	eP	23 45.1	d	
	PRI	eP	45.4	d	
Sept. 19	BKS	ePE	05 14 54	Wc	USCGS: 15.3°N, 94.0°W, 0 = 05 03 15.1 Near coast of Oaxaca, Mexico. h about 42 km.
		eEZ	16 10	Ec	
		eSNE	20 22	NWd	
		eGNE	23 40		
		eR	25.0		
			mu sec		Magnitude 5.3 (CGS)
		PZ	1.82 10		
		SH	3.6 20		
		MaxH	34.2 20		
	MHC	eP	05 14 47.1	c	
	JAS	iP	42.6	c	
		iPP	15 43.1		
		iPcP	17 28.0		
	MIN	eP	15 02.0	c	
	CLS	eP	14 58.7	c	
	PRI	eP	34.7	c	
Sept. 20	BKS	eSNE	04 56 56	NW	USCGS: 49.6°S, 116.0°W, 0 = 04 33 29.4 Easter Islands. h about 33 km.
		eGE	09.5		
		eRNE	13.6		
			mu sec		
		SH	1.33 20		
		MaxH	4.45 27		
	MHC	eP	04 46 04.0	d	
	JAS	eP	20.7		
	PRI	eP	07.0	c	
Sept. 20	BKS	iP	14 47 23.5	d	USCGS: 30.0°N, 138.1°E, - = 14 36 05.3 South of Honshu, Japan. h about 454 km.
	MHC	eP	27.1	d	
	JAS	iP	29.4	c	
	MIN	iP	13.7	d	
	CLS	eP	20.0	d	
	PRI	eP	34.4	d	
Sept. 20	JAS	eP	20 56 32.3	c	USCGS: 24.0°N, 121.8°E, 0 = 20 43 10.9 Taiwan Island region. h about 37 km.
Sept. 21	BKS	iP	04 34 30.0	d	USCGS: 21.8°S, 179.6°W, 0 = 04 23 19.7 Fiji Islands. h about 609 km.
		eZ	46.2	d	
	MHC	eP	30.6	c	
	JAS	iP	35.4	c	
		ipP	36 43.0		
	MIN	iP	34 39.2	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.)			h. m. s.		
Sept. 21	CLS	eP	04 34 31.2	d	
	PRI	eP	29.6	d	
Sept. 21	JAS	iP	12 14 33.0	d	USCGS: 17.8°S, 167.3°E, 0 = 12 01 46.6 New Hebrides Islands. h about 33 km.
Sept. 21	JAS	iP	13 37 41.1	d	USCGS: 7.2°S, 74.3°W, 0 = 13 27 32.9 Peru-Brazil border. h about 150 km.
Sept. 21	MHC	eP	14 29 39	c	USCGS: 36.2°S, 100.2°W, 0 = 14 12 54.4 South Pacific Ocean.
	JAS	iP	40.8	d	
	PRI	eP	31.8	d	h about 33 km.
Sept. 21	JAS	iP	18 23 04.3	d	USCGS: 30.1°S, 179.5°W, 0 = 18 10 51.6 Kermadec Islands. h about 319 km.
Sept. 22	MHC	eP	09 16 51.7	d	USCGS: 23.9°S, 70.7°W, 0 = 09 05 06.4 Near coast of northern Chile.
	JAS	iP	59.7	d	h about 33 km.
	MIN	iZ	17 22.9	d	
	PRI	eP	16 53.7	d	
Sept. 23	BKS	eP	05 06 21.7	c	USCGS: 53.6°N, 163.9°W, 0 = 04 59 47.4 Unimak Island region.
		iZ	34.2	d	h about 29 km.
		eZ	07 42.0	d	
		eSNE	11 14.0	NW	
		eGNE	13 28.0		
		eRE	14.8		
			mu sec		
		PZ	0.0084 0.7		
		SH	4.85 14		
	MaxH		16.1 14		
	MHC	eP	05 06 23.3	d	
	JAS	eP	25.2	c	
	MIN	eP	06.1	c	
		iSE	11 16.0		
		iGNE	13 04.0		
		iR	14 56.0		
	PRI	eP	06 33.4	c	
Sept. 23	MHC	eP	06 26 03.6	d	USCGS: 53.7°N, 163.6°W, 0 = 06 18 57.4 Unimak Island region.
	JAS	eP	25 39.3	d	h about 13 km.
	MIN	cZ	28.1	c	
	PRI	cZ	26 04.3	d	
Sept. 24	JAS	iP	14 46 49.3	c	USCGS: 20.7°N, 144.6°E, 0 = 14 34 48.0 Mariana Islands. h about 146 km.
Sept. 25	JAS	eP	05 00 43.6	d	USCGS: 57.5°N, 144.5°W, 0 = 04 55 22 Gulf of Alaska. h about 33 km.
Sept. 25	BKS	eGE	14 54.3		
		eRN	56.5		
	MHC	eP	42 04.8	c	
	PRI	eP	05.0	c	
Sept. 25	BKS	iP	15 50 28.2	d	USCGS: 50.3°N, 176.6°E, 0 = 15 42 17.9 Rat Islands. h about 30 km.
		ipP	38.0	d	
		eR	16 02.5		
	MHC	iP	15 50 34.2	d	
	JAS	iP	36.7	d	
	MIN	iP	19.8	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964 (cont.)			h. m. s.		
Sept. 25		ipP	15 50 29.0	c	
		isP	35.3	d	
	PRI	eP	45.1	d	
Sept. 25	JAS	iP	23 39 55.0	c	USCGS: 30.7°S, 179.9°W, 0 = 23 27 49.7 Kermadec Islands. h about 424 km.
Sept. 26	MIN	eZ	01 04 02.4	c	
	PRI	eP	34.2	c	
Sept. 26	BKS	eP	03 49 44.3	d	
	MHC	eP	50 03.1	c	
	JAS	iP	08.6	d	
	MIN	iP	14.1	d	
	PRI	eP	03.4	c	
Sept. 26	BKS	eR	23 35.0		USCGS: 4.9°S, 153.5°E, 0 = 22 55 14.8 New Ireland region. h about 34 km.
Sept. 27	BKS	eP	15 56 37.5		USCGS: 56.6°N, 152.0°W, 0 = 15 50 54.7 Kodiak Islands region. h about 27 km.
		iP	38.4	d	
		eS	16 01 22		
		iQ	02 47		
		iR	03 39		
	MHC	eP	15 56 45.0		
	JAS	iP	46.2	d	
	MIN	iP	23.9	d	
	PRI	eP	58.3		
Sept. 27	MIN	eZ	16 03 31.1	d	
Sept. 27	BKS	iP	23 09 13.7	c	USCGS: 21.4°S, 68.7°W, 0 = 22 58 29.3 Chile-Bolivia border. h about 132 km.
	MHC	eP	10 09.6		
	JAS	iP	09.2	d	
	MIN	iP	18.9	c	
	PRI	eP	02.2	c	
Sept. 28	MIN	eZ	01 15 48.7	c	USCGS: 10.5°N, 60.1°W, 0 = 01 05 35.2 Trinidad. h about 63 km.
Sept. 28	BKS	eR	05 51		
	MIN	eZ	18 55.3	c	
Sept. 28	MHC	iP	18 31 47.0		
Sept. 28	JAS	iP	18 36 18.5	Sd	USCGS: 61.0°N, 147.4°W, 0 = 18 30 20.2 Southern Alaska. h about 89 km.
	MIN	eP	35 45.2	d	
Sept. 29	MIN	eZ	04 30 26.3	c	
Sept. 29	JAS	eP	13 59 08.5		USCGS: 33.3°N, 141.9°E, 0 = 13 47 24.3 Off east coast of Honshu, Japan. h about 41 km.
Sept. 29	BKS	eP	14 12 00.0	c	USCGS: 20.4°S, 174.4°W, 0 = 14 00 14.9 Tonga Islands. h about 29 km.
		eR	34 52.0		
			mu sec		
		MaxH	5.0 20		
	MHC	eP	12 01.0		
	MIN	eP	09.9	c	
	PRI	eP	00.1	c	
Sept. 29	JAS	eP	15 23 35.4		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Sept. 30	BKS	eP	17 52 24.2		USCGS: 35.3° N, 118.0° W, 0 = 17 51 34.8 Southern California. h about 33 km. Magnitude 4.2 (CGS)
		eSNE	53 07.9		
	MHC	iP	52 14.0	d	
	MIN	eP	52 58.0	c	
	PRI	iP	51 55.6	c	
Sept. 30	MIN	eP	20 34 01.9		USCGS: 58.4° N, 151.3° W, 0 = 20 27 24.1 Kodiak Island region. h about 17 km.

Berkeley

OCT - DEC 1964

Lead - via Kew
17 MAY 1967

Bulletin of the Seismographic Stations

Vol. 34, No. 4, pp. 185 - 241

ARCATA--BERKELEY--CALISTOGA--CONCORD
FRESNO--JAMESTOWN--LLANADA--MANZANITA LAKE
MINERAL--MOUNT HAMILTON--OROVILLE--PALO ALTO
PARAISO--POINT REYES--PRIEST--SAN FRANCISCO
SANTA CRUZ--SHASTA--VINEYARD

Earthquakes and the Registration of Earthquakes

From October 1, 1964 to December 31, 1964

by

Cinna Lomnitz,

Don Pershing

and

William Bakun

University of California

Berkeley

1967

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INTRODUCTION

Each quarterly issue of the Bulletin includes determination of epicenters, origin times, magnitudes, and other information available at the time of writing, for earthquakes in northern California and adjoining areas. Recorded arrival times of seismic waves are tabulated only for the major earthquakes in the local area and for teleseisms.

Information items regarding the seismographic stations which comprise the Berkeley network are repeated in every issue. Information of a general nature, such as the Modified Mercalli Intensity Scale, will be found only in the first number of each volume.

PERSONNEL (February 1967)

Station Director	Bruce A. Bolt
Director Emeritus	Perry Byerly
Associate Research Seismologist	Cinna Lomnitz
Assistant Research Seismologist	Helen Freedman
Associate	Don Tocher (Earthquake Mechanism Laboratory, ESSA, San Francisco)
Associate Engineer	Walter Marion
Full-time Technical Staff	G. Mitchell, R. Sell, M. Hilger, D. Pershing
Research Assistants	W. Bakun, K. Casaday, J. Derr, A. Qamar, J. Zanetti
Secretary	Loretta Martin

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THE BYERLY SEISMOGRAPHIC STATION (BKS)

Standardized equipment began operating in a newly constructed tunnel east of the main campus on June 8, 1962. The closest buildings, part of the Lawrence Radiation Laboratory, are about 0.8 km away. The tunnel was cut into the upper part of the Claremont Formation. Of Miocene age, this formation consists of thin layers of cherty material alternating with shale.

A plan of the tunnel is shown in the diagram. Piers are constructed of reinforced concrete with no isolation from floor and walls. The temperature is stable. A ventilating and dehumidifying system is connected to all rooms.

The short-period world-wide standard instruments are operated with an approximate magnification of 25,000 at 1 sec and the long-period standard instruments with 3,000 at 30 sec.

On March 20, 1964, the Regents of the University of California named this station the "Byerly Seismographic Station" in recognition of the work of Professor Perry Byerly.

HISTORY OF THE UNIVERSITY OF CALIFORNIA STATIONS

"The Seismographic Stations at Mount Hamilton and Berkeley present several items of interest in the history of earthquake science, one of which is that according to the available records they were the first seismographic stations set up in America. Furthermore, they have functioned continuously from their founding to the present day, with improvements in instrumental equipment from time to time as the development of the science and opportunity have permitted.

"Several outstanding figures in the seismology of the 1880's were impressed with the importance of these stations, and Ewing, Milne, and Gray each took a personal interest in aiding one or both stations to obtain their own best and most modern types of instruments."

The quotation is from "History of the University of California Seismographic Stations and Related Activities" by Professor George D. Louderback, published in the Bulletin of the Seismological Society of America, Vol. 32, No. 3, pp. 205-229, 1942. In this paper may be found a detailed account of the development of the Berkeley stations from the installation of the instruments (the first earthquake known recorded at Mount Hamilton was on April 24, 1887) to 1942.

Since 1942, the number of seismographic stations associated with the University of California has increased from six to nineteen in 1964. In 1950, Professor Perry Byerly was appointed Director by the Regents; he had been in charge of instruction and research since 1925. In 1960, the University entered into a contract with the Air Force Office of Scientific Research of the Research Projects Agency of the Department of Defense. Funds were made available under the Vela Uniform program to design and operate a telemetered network of eight new stations in central California and to construct a new seismic vault near the Berkeley campus.

STATIONS IN OPERATION: OCTOBER-DECEMBER 1964

Station	North Latitude	West Longitude	Elev. Meters	Symbol	Present Auspices and Date Established
Berkeley (Haviland)	37° 52!4	122° 15!6	81	BRK, BRX	Univ. of California, 1887
Berkeley (Strawberry)	37° 52!6	122° 14!1	276	BKS	Univ. of California, 1962
Mt. Hamilton	37° 20!5	121° 38!5	1282	MHC	Lick Observatory, 1887
Palo Alto	37° 25!0	122° 10!9	83	PAC	Stanford University, 1927
San Francisco	37° 46!6	122° 27!1	100	SFB	Univ. of San Francisco, 1931
Fresno	36° 46!0	119° 47!8	88	FRE	Fresno City College, 1935
Mineral	40° 20!7	121° 36!3	1495	MIN	National Park Service, 1938
Arcata	40° 52!6	124° 04!5	59	ARC	Humboldt State College, 1948
Manzanita Lake	40° 32!2	121° 33!7	1800	MLC	National Park Service, 1956
Vineyard (local)	36° 45!0	121° 23!1	330	VIN	W. A. Taylor and Co., 1959
(telemeter)	36° 45!0	121° 23!3	380	VIT	
Concord	37° 58!1	122° 04!3	36	CNC	Diablo Valley College, 1960
Santa Cruz	37° 00!4	121° 59!8	128	SCC	City of Santa Cruz, 1961
Paraiso	36° 19!9	121° 22!2	363	PRS	Paraiso Hot Springs, 1961
Llanada	36° 37!0	120° 56!6	475	LLA	Charles McCullough Ranch, 1961
Calistoga	38° 38!2	122° 35!1	457	CLS	Terrance Kirk Ranch, 1961
Point Reyes	38° 04!8	122° 52!0	404	PRC	Federal Aviation Agency, 1961
Priest	36° 08!5	120° 39!9	1187	PRI	Federal Aviation Agency, 1961
Oroville*	39° 33!3	121° 30!0	1080	ORV	Department of Water Resources, 1963
Jamestown	37° 56!8	120° 26!3	457	JAS	Department of Water Resources, 1964

*Established by State of California Department of Water Resources, Sacramento.

STATION INSTRUMENTATION

October-December 1964

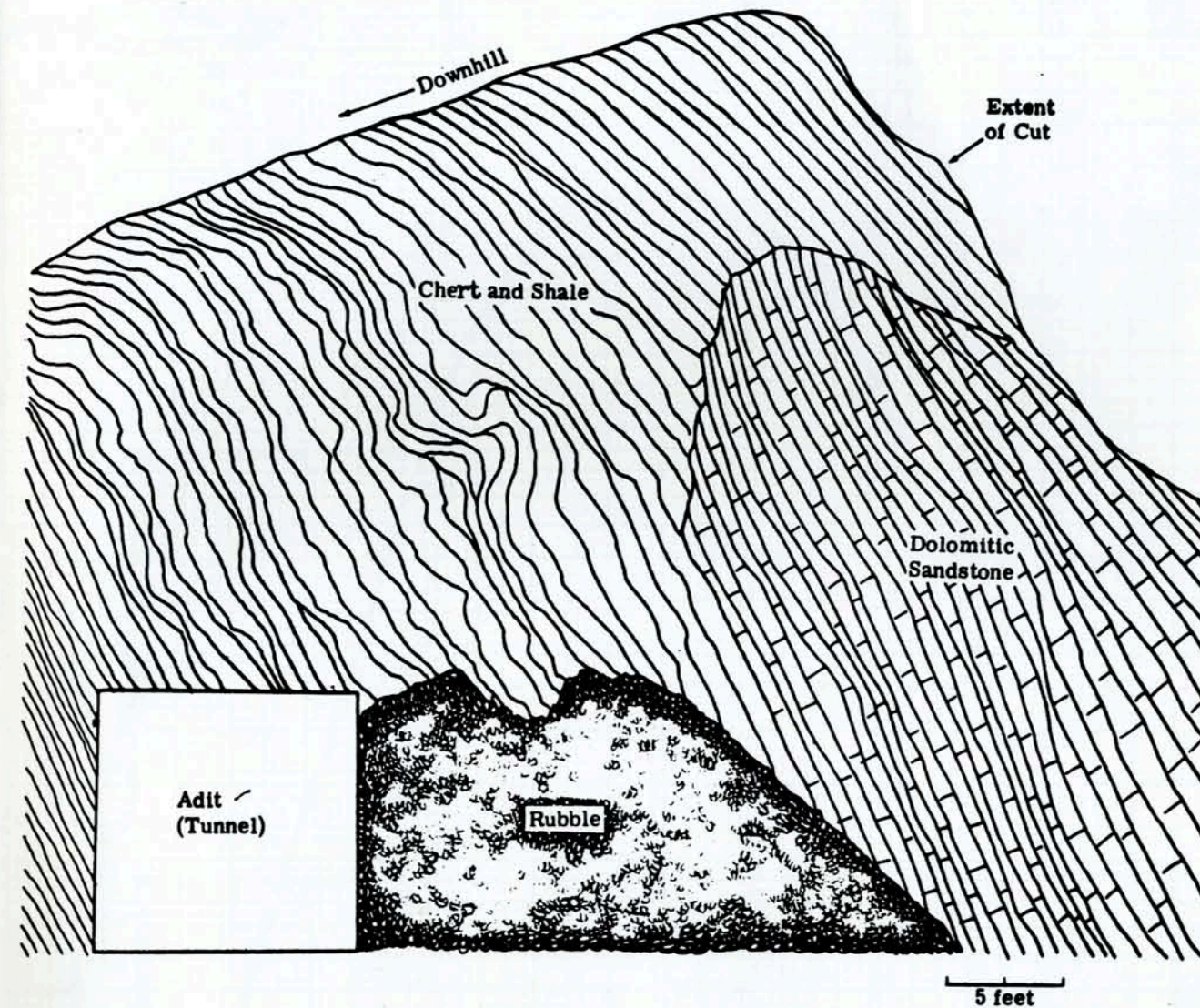
Station	Type of Instrument	T _o sec	T _g sec	Component
BRK [△]	Benioff 100 kg	1.0	0.2	Z
BRK	Benioff 100 kg	1.0	8.0	Z
	100X torsion	0.8	-	N,W
BKS	Benioff 100 kg	1.0	0.75	N,E,Z
	Sprengnether	30	100	N,E,Z
	Wood-Anderson torsion	0.8	-	S,W
BRX	Galitzin-Wilip moving coil	12	12	N,E,Z
	Press-Ewing moving coil	30	*	N,E,Z
MHC	Benioff 100 kg	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	S,E
PAC	Benioff 100 kg	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	N,E
SFB	Lehner-Griffith moving coil	1.2	0.3	Z
	Wood-Anderson torsion	0.8	-	S,W
FRE	Sprengnether moving coil	2.0	2.0	N,E,Z
MIN	Benioff 100 kg	1.0	0.4	Z
	Wood-Anderson torsion	0.8	-	S,E
ARC	Benioff 14 kg	1.0	0.2	Z
	Wood-Anderson torsion	0.8	-	N,E
MLC	Loucks-Omori	3½	-	S,E
VIN	Torsion 100X	0.8	-	N
	Wood-Anderson torsion	0.8	-	S,W
VIT [△]	Benioff 14 kg	1.0	0.2	Z
CNC [△]	Benioff 100 kg	1.0	0.2	Z
SCC [△]	Benioff 14 kg	1.0	0.2	Z
PRS [△]	Benioff 14 kg	1.0	0.2	Z
LLA [△]	Benioff 14 kg	1.0	0.2	Z
CLS [△]	Benioff 14 kg	1.0	0.2	Z
PRC [△]	Benioff 14 kg	1.0	0.2	Z
PRI [△]	Benioff 14 kg	1.0	0.2	Z
JAS	Benioff 100 kg	1.0	0.75	N,E,Z
ORV	Benioff 100 kg	1.0	0.75	N,E,Z
ORV	Geotech moving coil	20	100	N,E,Z

[△]Signals from these nine stations are transmitted via leased telephone lines to recorders at Berkeley.

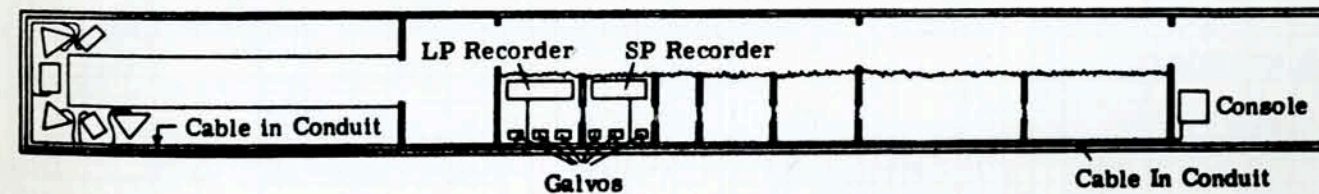
*Broad-band recording on magnetic tape.

Direction of Motion: In the "Component" column, each horizontal component seismograph is designated by the direction of ground motion corresponding to upward trace motion on the seismogram when it is oriented so that time increases from left to right. On all vertical component (Z) instruments, upward trace motion corresponds to upward ground motion.

Relative magnification curves of instruments recording through the tele-meter system are listed on the following pages. Absolute magnification may be obtained by use of calibration pulses recorded daily from each telemetered station.

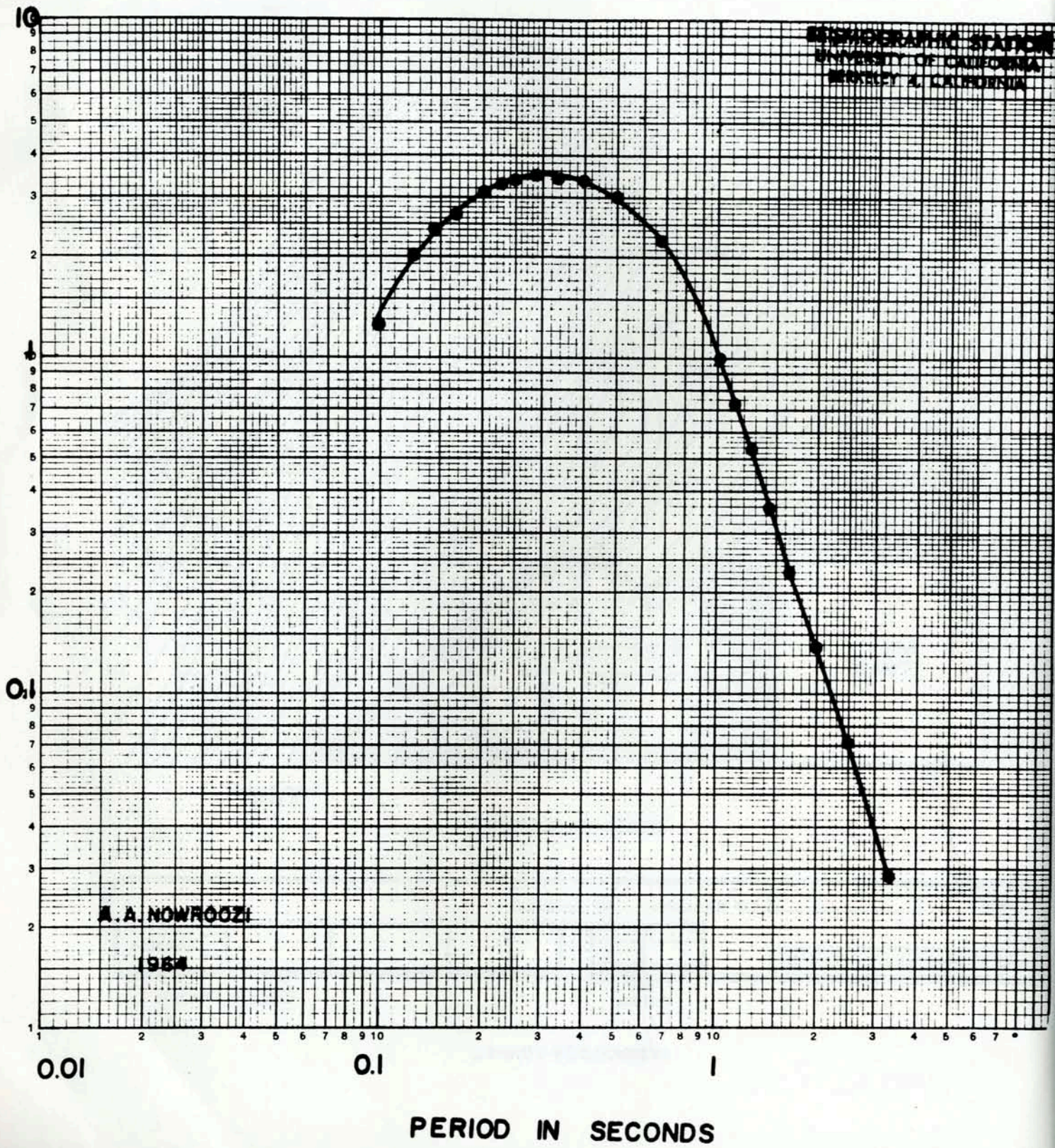


GEOLOGIC SECTION

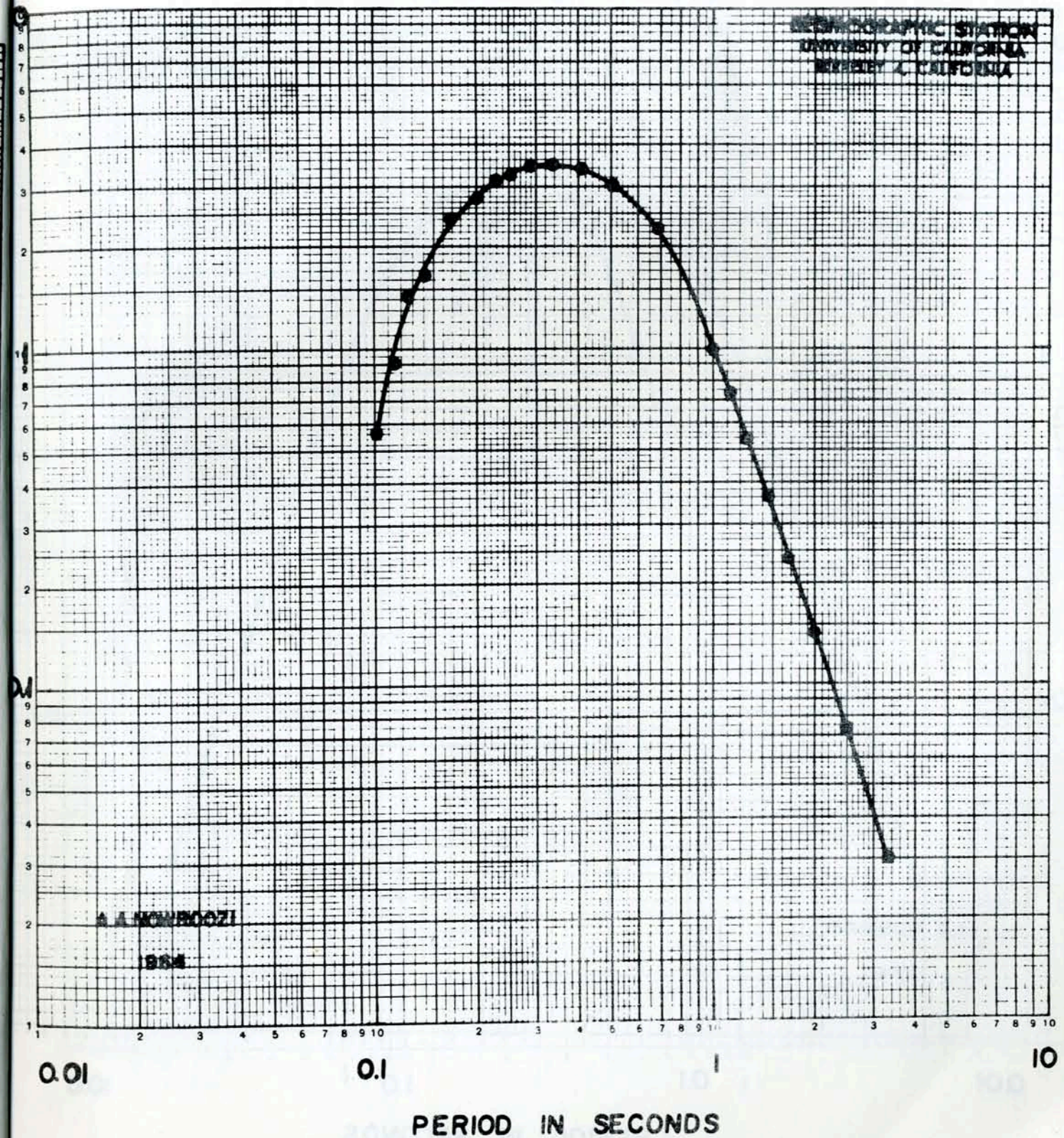


SEISMOLOGY TUNNEL

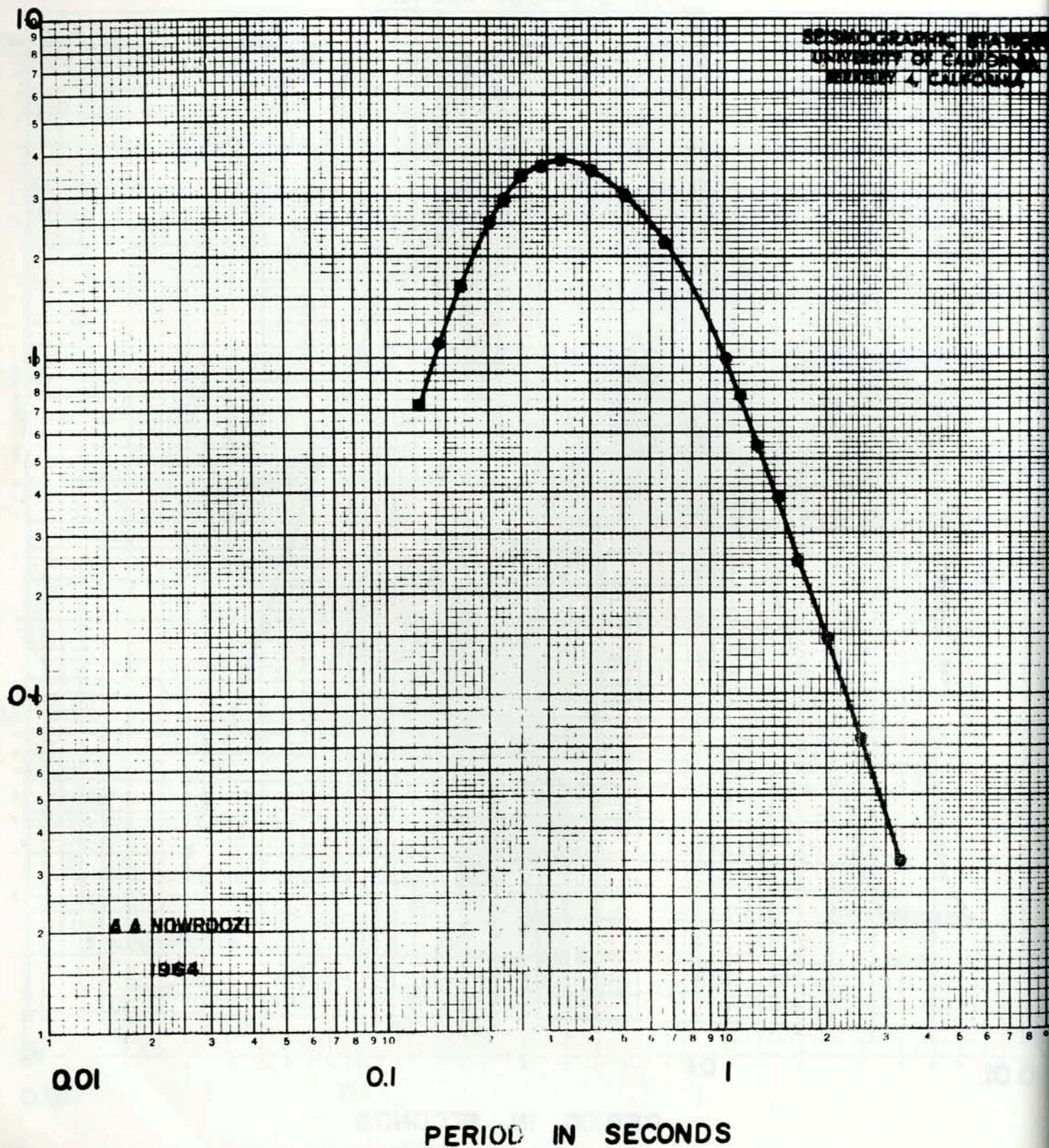
RESPONSE OF SEISMOMETER-DEVELOCORDER SYSTEM. 100KG. Z. S.P



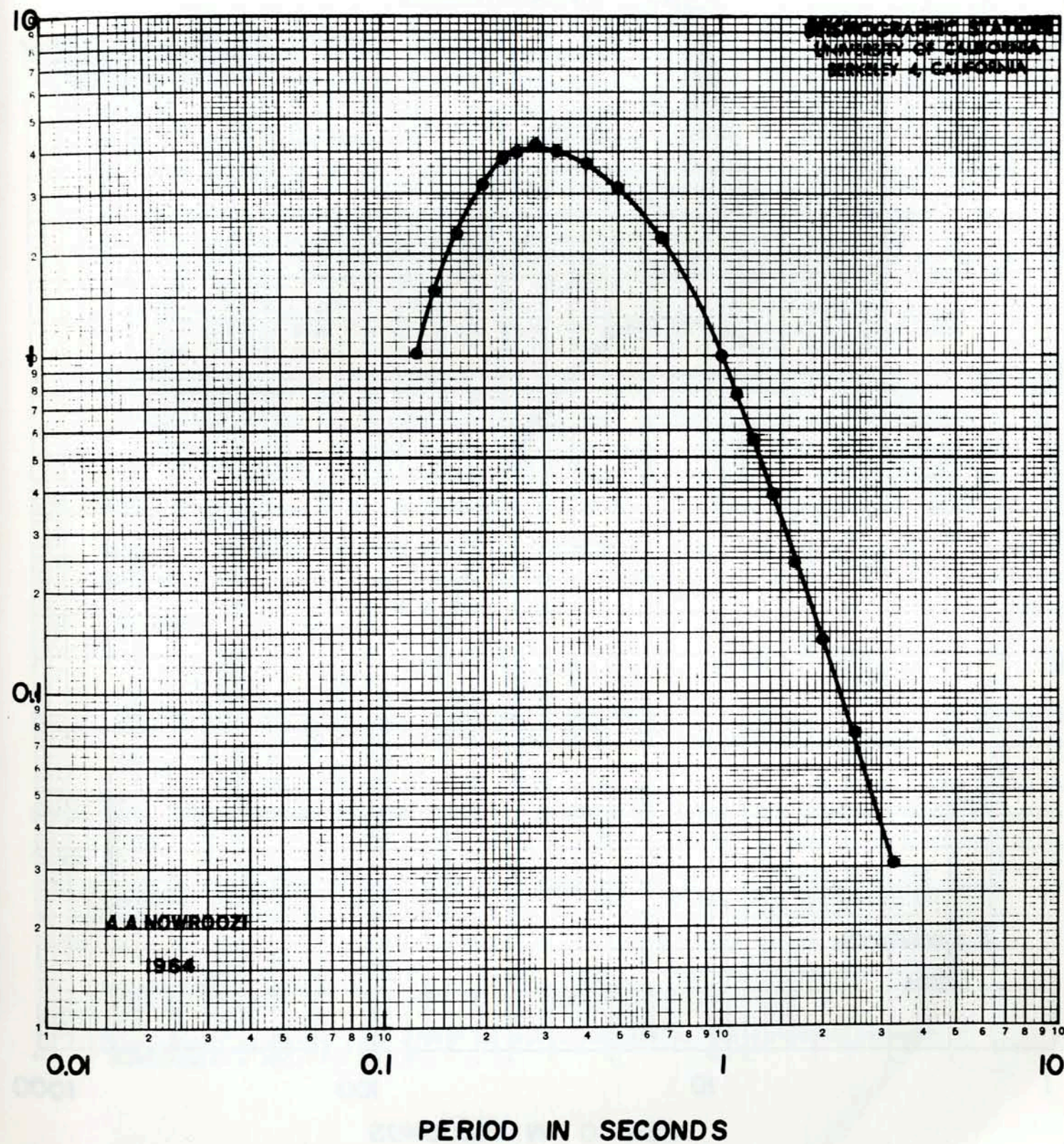
RESPONSE OF SEISMOMETER - HELICORDER SYSTEM. 100KG. Z. S.P



RESPONSE OF SEISMOMETER—HELICORDER SYSTEM. 14.7 KG. Z. S.P.



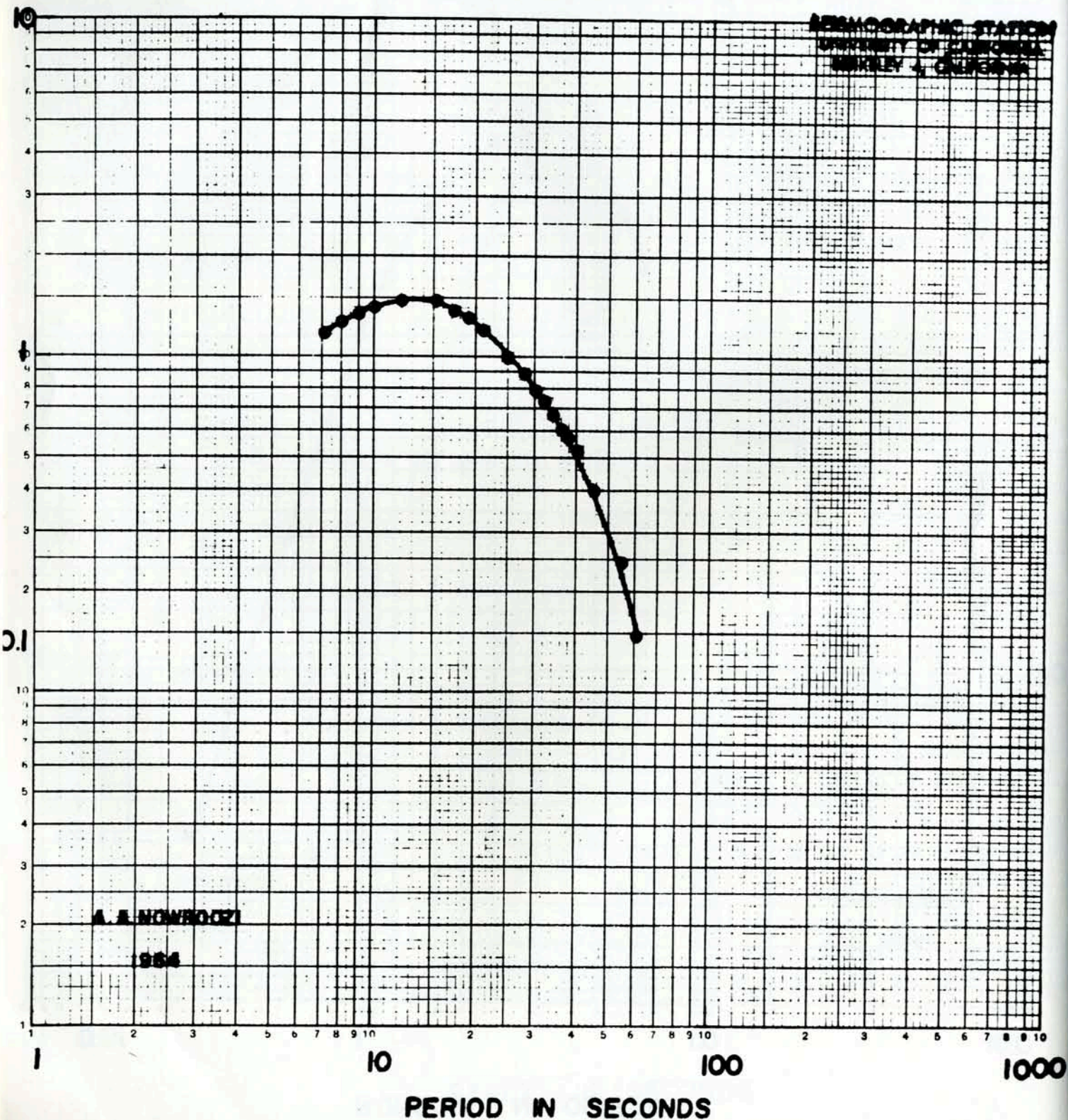
RESPONSE OF SEISMOMETER—DEVELOCORDER SYSTEM. 14.7 KG. Z. S.P.



RESPONSE OF SEISMOMETER - HELICORDER

SYSTEM. PRESS-EWING.

Z. T.G=30S., T.S=15S.



PART I. LOCAL EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

This section includes information on earthquakes in northern California (including adjacent offshore areas) and in adjoining sections of Nevada and Oregon which were well enough recorded at the U.C. stations (sometimes complemented by data from neighboring stations such as Reno) to permit determination of the epicenter. For the sake of completeness, in cases where this data are not sufficient to determine acceptable epicenters the preliminary epicentral data of the USCGS is quoted. Latitude and longitude of each epicenter and the corresponding date and origin time are tabulated in the following list; epicenters are also plotted on one or both of the two maps immediately following the list.

For the entire northern California region, every effort is made to list all earthquakes of Richter magnitude 3.0 and above, but it is likely that some such shocks have been omitted because the available seismographic data were inadequate for epicenter determination. Within the limited region covered by the map of the central Coast Ranges of California, locatable shocks of magnitude 2.5 and over are included in the tabulation and plotted on the map. Shocks of magnitude 3.0 and over occurring in the limited region are plotted on both maps. Shocks of magnitude less than 3.0 in northern California (and less than 2.5 in the central Coast Ranges) are tabulated only if reported felt or if of special interest for some other reason. Identified artificial earthquakes (explosions) ordinarily are not tabulated.

Epicenters are located by an IBM 7090 computer program. Information on Version I of this program may be found in "Computer Location of Local Earthquakes within the Berkeley Seismographic Network" by Bolt and Turcotte, published in *Computers in the Mineral Industries*, Part 2 (George Parks, Editor); Stanford University Publications, Geological Sciences, Vol. 9, No. 2, pp. 561-576, 1964.

Explanation of the table:

Map No. for each epicenter corresponds to the number plotted beside that epicenter on the maps. Epicenters without numbers lie outside the area of the map. The underlining of a map number in the table indicates that one point on a map has been used to represent more than one earthquake in the table.

Date and Origin Time are given in Greenwich Civil Time (GCT). Subtract eight (8) hours to convert to Pacific Standard Time (PST).

M is the Richter magnitude of the earthquake as determined from the maximum trace amplitudes recorded for the shock by standard Wood-Anderson torsion seismographs.

h is the focal depth given to the nearest kilometer or by the following ranges: a, 0-5; b, 6-10; c, 11-15; d, 16-30 km.

No. of Stas. is the number of stations used by the computer program in locating the epicenter.

The quality of the solution is partially reflected by the listed number of stations. The highest quality locations are given to the nearest minute of arc in latitude and longitude and to the tenth of a second origin time. Poorer quality locations are given to the nearest minute in latitude and longitude, to the nearest second in origin time and are denoted by an asterisk.

Under Remarks will be found a short descriptive location of the epicenter, usually relative to a point named on the map. Information on small foreshocks and aftershocks is sometimes included under Remarks but when numerous foreshocks or aftershocks accompany a large earthquake, a separate tabulation may be included following the main list of local shocks.

Information on maximum intensities of shocks reported felt is also included under Remarks. Reports on felt earthquakes may be obtained from the Seismological Field Survey of the U.S. Coast and Geodetic Survey, which publishes a more complete summary in "Abstracts of Earthquake Reports for the Pacific Coast and Western Mountain Region". This regular quarterly publication may be obtained from the District Officer, San Francisco District, Coast and Geodetic Survey, 121 Customhouse, San Francisco, California 94126, or from the Director, U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland 20852. Intensities given in Roman numerals are assigned by the Coast and Geodetic Survey and based on the Modified Mercalli Intensity Scale of 1931.

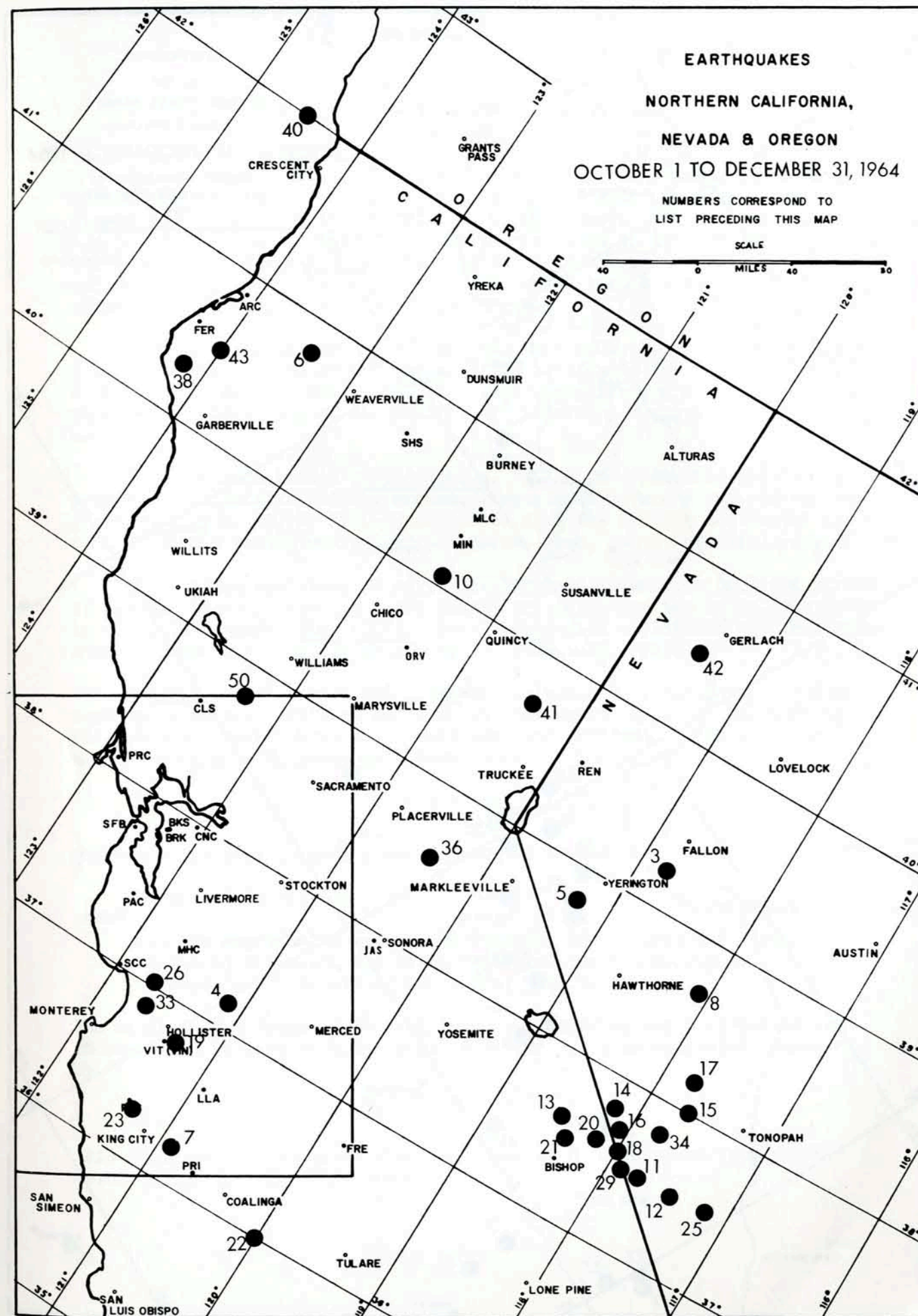
EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

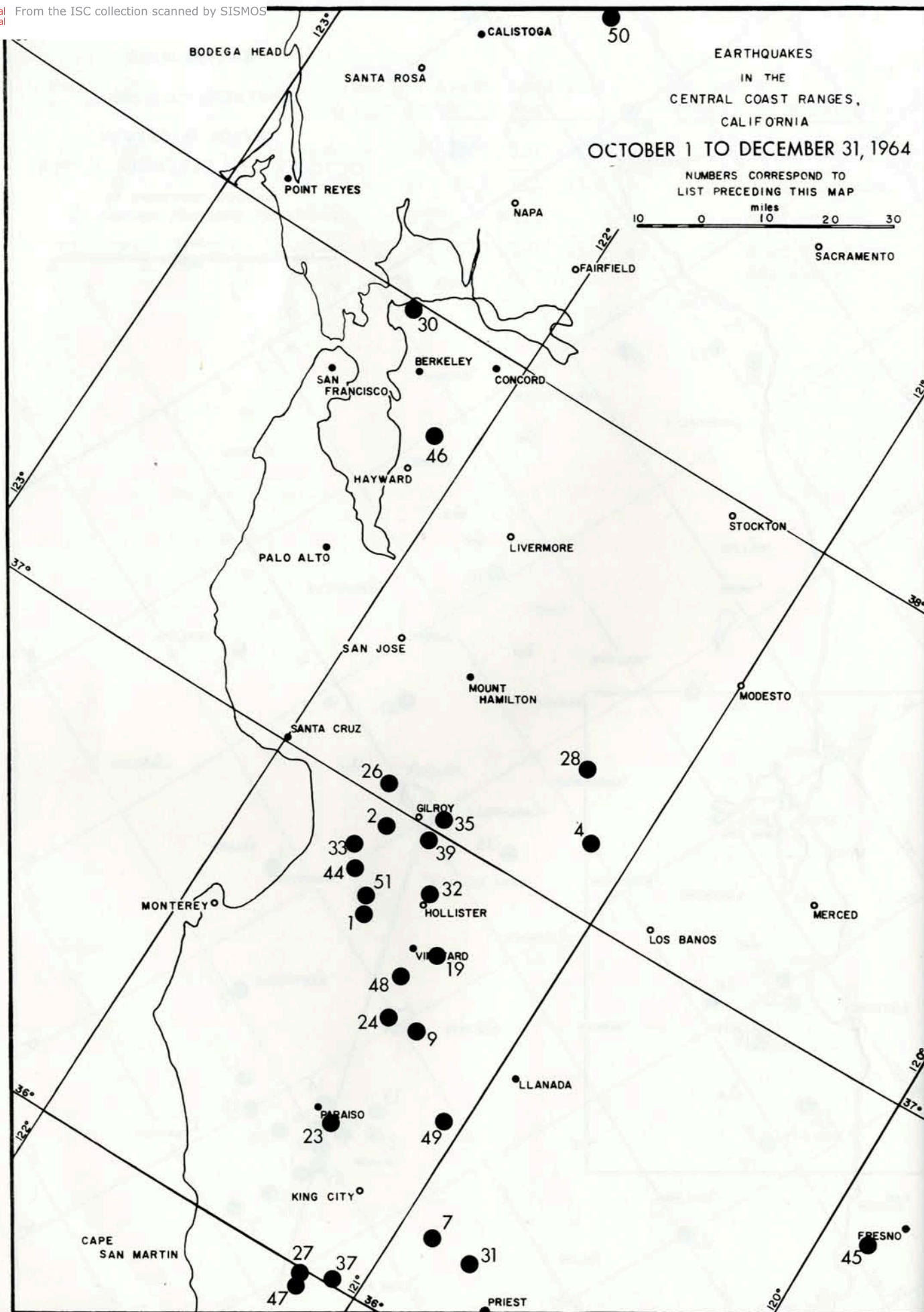
Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	No. of Stas.	h	Remarks
-	Oct. 1	6.0	11-00-48.3	43°5	126°9	33	-	Off Oregon coast. Felt in Washington State. Data from USCGS.
1	Oct. 1	2.7	12-30-16.8	36° 45'1	121° 32'7	a	12	Felt at Hollister.
* -	Oct. 1	5.3	12-31-24.6	45°7	122°8	33	-	Washington-Oregon border region. Felt in Portland-Vancouver areas. Data from USCGS.
2	Oct. 2	2.6	16-34-39.5	36° 57'1	121° 37'9	b	8	SW of Gilroy.
* 3	Oct. 7	3.4	07-37-07.1	39°2	118°8	33	10	N of Walker Lake, Nev. Depth fixed.
4	Oct. 8	3.2	15-32-24.2	37° 09'5	121° 07'7	b	14	SW of Gustine.
* 5	Oct. 9	3.6	07-55-37.3	38°8	119°3	33	14	SW of Yerington, Nev.
* 6	Oct. 9	3.2	22-23-02	40°8	123°4	2	4	E of Eureka, Calif.
* -	Oct. 11	4.6	06-10-09.0	43°8	129°3	33	-	Off coast of Oregon. Data from USCGS.
7	Oct. 17	3.3	23-43-22.6	36° 12'5	120° 55'0	a	14	NW of Priest.
* 8	Oct. 23	5.3	13-57-05	38°7	118°1	d	15	E of Hawthorne, Nev. USCGS: 38°5 N, 118°4 W, O = 13-57-10.6, M = 5.0, h = 26 km.
* -	Oct. 24	4.5	06-37-45.7	44°5	129°5	33	-	Off coast of Oregon. Data from USCGS.
9	Oct. 24	2.5	10-50-27.4	36° 35'9	121° 15'0	b	9	E of Gonzales.
10	Oct. 27	3.5	00-32-23.2	40° 04'2	121° 33'2	a	10	S of Mineral.
*11	Oct. 30	3.5	17-44-47	37° 30'	117° 48'	33	6	W of Goldfield, Nev. Foreshock of following events. Depth fixed.
*12	Oct. 30	4.1	17-50-38	37°5	117°5	d	14	SW of Goldfield, Nev. USCGS: 37°7 N, 118°2 W, O = 17-50-47.4, M = 4.1, h = 20 km.
13	Oct. 30	3.8	18-18-06.7	37°6	118°5	20	-	W of Goldfield, Nev. Data from USCGS.
14	Oct. 30	3 3/4	19-01-45.7	37°8	118.2	20	-	W of Goldfield, Nev. Data from USCGS.
*11	Oct. 30	4.5	19-03-09.3	37° 30'	117° 48'	d	14	SW of Goldfield, Nev. Main shock. Felt at Dyer, Nev. and Oasis, Calif. USCGS: 37°7 N, 118°0 W, O=19-03-12.3, M=4.4, h=20 km.
15	Oct. 30	3 1/2	19-40-30.2	38°0	117°7	20	-	Goldfield, Nev. Aftershock. Data from USCGS.
16	Oct. 30	4.1	23-02-59.5	37°7	118°1	20	-	Goldfield, Nev. Aftershock. Data from USCGS.

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	No. of h Stas.	Remarks
17	Oct. 31	3.7	11-57-31.7	38°2	117°8	20 -	Goldfield, Nev. Aftershock. Data from USCGS.
<u>15</u>	Oct. 31	4.0	19-35-24.7	38°0	117°8	20 -	Goldfield, Nev. Aftershock.
<u>15</u>	Nov. 1	3.9	20-41-07.7	38°0	117°7	33 -	Goldfield, Nev. Aftershock. Data from USCGS.
18	Nov. 2	4.4	11-38-55.7	37°6	118°0	32 -	Felt at Dyer, Nev. and Oasis, Calif. Data from USCGS.
19	Nov. 3	3.1	02-23-56.8	36° 46:5	121° 19:7	c 17	SE of Hollister.
<u>18</u>	Nov. 3	4.1	18-58-44.0	37°6	118°0	33 -	Goldfield, Nev. Aftershock. Data from USCGS.
20	Nov. 4	3.6	11-50-32.1	37°6	118°2	33 -	Goldfield, Nev. Aftershock. Data from USCGS.
21	Nov. 4	3 3/4-4	11-53-56.2	37°5	118°4	33 -	Goldfield, Nev. Aftershock. Data from USCGS.
* -	Nov. 6	4.6	12-14-29.8	43°5	126°6	33 -	Off coast of Oregon. Data from USCGS.
22	Nov. 8	4.0	01-19-19.0	36° 00:0	120° 00:1	c 15	E of Avenal. USCGS: 35°8 N, 120°2 W, O=01-19-17.2, M=4.4, h=14 km.
23	Nov. 8	3.1	13-45-51.1	36° 20:8	121° 19:2	a 16	Near Paraiso.
24	Nov. 9	2.9	10-43-23.8	36° 36:7	121° 19:9	a 7	NE of Gonzales.
<u>18</u>	Nov. 12	3.8	20-07-25.4	37°7	118°0	20 -	Goldfield, Nev. Aftershock. Data from USCGS.
*25	Nov. 13	4.1	05-04-59.6	37° 32'	117° 12'	d 14	S of Goldfield, Nev. USCGS: 37°6 N, 118°0 W, O=05-05-10.8, M=4.2, h=20 km.
26	Nov. 16	5.0	02-46-41.7	37° 03:3	121° 41:5	c 17	Near Corralitos. Felt over central California. Aftershocks with M ≥ 2.5 are listed below. For a complete description of this sequence, see McEvilly, T.V. (1966), "The Earthquake Sequence of November 1964 near Corralitos, California", Bull. Seism. Soc. Am., <u>56</u> , 755.
<u>26</u>	Nov. 16	2.7	02-55-40.5	37° 03:9	121° 40:5	c **	Corralitos aftershock.
<u>26</u>	Nov. 16	2.5	05-09-13.6	37° 03:8	121° 40:3	c **	Corralitos aftershock.
27	Nov. 18	2.7	01-47-34.0	35° 59:1	121° 11:2	a 8	SW of King City.
<u>26</u>	Nov. 19	3.2	20-47-40.1	37° 02:3	121° 42:1	c **	Corralitos aftershock.
28	Nov. 23	2.7	04-08-13.3	37° 17:5	121° 14:0	a 13	Near Mt. Hamilton.
<u>26</u>	Nov. 23	3.5	09-05-08.0	37° 02:4	121° 42:9	c **	Corralitos aftershock.

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	No. of h Stas.	Remarks
29	Nov. 23	4.4	23-52-29.5	37°5	117°9	20 13	Goldfield, Nev. Aftershock. Data from USCGS.
30	Nov. 24	2.3	08-50-53.3	37° 58:1	122° 22:2	b 10	Felt in Richmond.
31	Nov. 25	2.8	12-49-41.8	36° 12:6	120° 46:9	a 15	NW of Priest.
* -	Nov. 25	4.3	23-14-11	44°7	119°8	33 3	Central Oregon. Depth fixed.
32	Nov. 28	2.7	15-07-49.7	36° 52:6	121° 25:2	a 14	Near Hollister.
33	Nov. 30	3.0	20-44-48.9	36° 53:2	121° 40:3	b 12	SE of Watsonville.
33	Nov. 30	3.7	21-16-18.2	36° 52:2	121° 42:2	b 14	SE of Watsonville.
34	Dec. 1	3.7	15-28-20.9	37°8	117°8	33 -	Goldfield, Nev. Aftershock. Data from USCGS.
<u>26</u>	Dec. 2	2.7	07-50-35.3	37° 04:6	121° 40:7	c **	Corralitos aftershock.
<u>11</u>	Dec. 2	3.9	09-17-50.8	37°5	117°9	33 -	Goldfield, Nev. Aftershock. Data from USCGS.
35	Dec. 3	2.7	07-20-45.9	37° 03:8	121° 29:8	b 15	Near Gilroy.
36	Dec. 4	3.0	04-31-59.2	38° 34'	120° 25'	c 3	SW of Lake Tahoe.
*37	Dec. 5	2.6	13-55-57.5	36° 01:0	121° 04:8	2 12	W of San Ardo.
*38	Dec. 7	3.1	14-15-12.9	40°3	124°2	33 4	Cape Mendocino. Depth fixed.
39	Dec. 8	2.9	15-49-16.2	36° 58:4	121° 29:8	c 14	SE of Gilroy.
*40	Dec. 9	4.3	07-36-17	42°	124½°	33 4	Off-California-Oregon coast. Depth fixed.
*41	Dec. 10	3.1	10-52-40	39°7	120°4	33 3	S of Honey Lake.
*42	Dec. 11	3.1	04-23.8	40½°	119½°	33 12	S of Gerlach, Nev. Depth fixed.
* -	Dec. 12	4.5	21-17-00	40°6	126°8	33 19	Off Cape Mendocino. USCGS: 40°3 N, 125°1 W, O=21-17-21.0, h=33 km.
*43	Dec. 16	3.6	05-24-48.1	40°5	124°0	33 5	NE of Petrolia. Depth fixed.
* -	Dec. 17	4.2	11-25-11.0	40° 54'	128° 50'	33 14	Off N California coast. Depth fixed.
44	Dec. 22	2.5	19-56-09.8	36° 49:8	121° 38:0	a 10	W of San Juan Bautista.
45	Dec. 23	2.8	23-13-53.8	36° 41:4	119° 53:3	c 5	W of Fresno.
46	Dec. 24	2.6	03-11-56.7	37° 46:0	122° 07:4	b 7	Near San Leandro. Felt in Oakland and Berkeley.
<u>46</u>	Dec. 24	2.9	03-13-14.3	37° 43:2	122° 11:6	a 6	Near San Leandro. Felt in Oakland and Berkeley.
*47	Dec. 25	2.6	11-21-16.2	35° 57:9	121° 10:7	2 5	N of Lake Nacimiento.

Map No.	Date 1964	M	Origin Time (G.C.T.)	Latitude North	Longitude West	h	No. of Stas.	Remarks
48	Dec. 27	2.7	12-45-45.2	36° 41.2	121° 22.3	a	11	NE of Gonzales.
49	Dec. 27	2.6	18-58-59.4	36° 27.8	121° 03.6	b	7	SW of Llanada.
50	Dec. 29	3.1	15-48-40	38° 8	122° 3	a	5	S of Rumsey.
51	Dec. 30	2.6	16-35-49.5	36° 47.0	121° 33.0	a	10	S of San Juan Bautista.





PART II. REGISTRATION OF EARTHQUAKES

This section tabulates measured arrival times of prominent phases of earthquakes recorded at selected stations of the seismographic network operated by the University of California (Berkeley). Information regarding the stations and instrumentation will be found in the introductory section of this Bulletin. Earthquakes in the northern California, Nevada, and Oregon region are included in the following tabulation only if of magnitude 4.0 or over, or if of special interest.

Components of ground motion are indicated by N, E, and Z in the Phase column. Where no such letter appears, the reading is for the vertical component (Z) alone. The letter "i" (impetus) preceding a phase designates sudden beginning of the motion; "e" (emersio) designates a gradual beginning.

In the column headed Ground Motion, "c" or "d" indicates initial compression or dilatation of the ground, respectively, from a wave of the compressional type. N, E, S, or W indicates that the initial horizontal direction of ground motion was toward the north, east, south, or west, respectively.

The maximum amplitude of earth displacement in microns (μ) and periods in seconds (sec) in the indicated phases are given for the Berkeley station in the column headed Time (GCT). Total horizontal amplitudes combined from N and E components are designated by "H" (e.g., PH, PPH).

Berkeley (BKS) magnitudes given for teleseisms in the Remarks column correspond to the magnitude based on surface waves (M_S). In calculating the published value, body wave amplitudes and periods of body waves are used to determine M_B (body wave magnitude) by:

$$M_B = Q + \log_{10} (A/T),$$

where $A = 1/2$ peak-to-peak ground amplitude in microns,

$T =$ period in seconds

Q is the empirically determined function of distance and depth given by Gutenberg and Richter ("Magnitude and Energy of Earthquakes", *Annali di Geofisica*, 9:1-15, 1956).

The arithmetic average of the available values of M_B for long-period and short-period records of body waves is converted to an equivalent value M_S by

$$M_S = 1.59 M_B - 3.97.$$

This value is then compared with the value of M_S determined from surface waves of period near 20 seconds.

Frequently quoted sources of information regarding epicenters, origin times, or shock magnitudes are as follows:

- USCGS - U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Maryland
- BCIS - Bureau Central International de Seismologie, Strasbourg, France
- PAL - Lamont Geological Observatory, Palisades, New York
- PAS - Seismological Laboratory, Pasadena, California
- WMSO - Wichita Mountains Observatory, Oklahoma
- BKS - Byerly Seismographic Station, Berkeley
- BRK - indicates the average magnitude determined by the Berkeley network.

All measurement and interpretation of seismograms (i.e., identification of phases, arrival times, directions of initial ground motion, and ground amplitudes and periods) are done at Berkeley. Readings from the remaining stations in the network other than the five listed (BKS, CLS, MHC, PRI, MIN) are available on request. Requests for additional data or for copies of seismograms should be addressed to the Director.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Oct. 1	MIN	eZ	08 58 17.7	c	USCGS: 19.7°S, 68.8°W, 0 = 08 46 36.9. Chile-Bolivia border. h about 138 km.
Oct. 1	BKS	eP	11 02 21.5	c	USCGS: 43.5°N, 126.9°W, 0 = 11 00 48.3. Off coast of Oregon. h about 33 km. Magnitude 5½ (BKS). Felt in Washington State.
		iP	23.8		
		eS	03 48.0		
		eRNE	52.0		
			mu sec		
		PZ	0.10 1.0		
	MHC	eP	11 02 34.3	d	
	JAS	ePNEZ	37.7	NWd	
	MIN	eP	01.0	c	
Oct. 1	JAS	iZ	12 07 51.3	c	USCGS: 31.2°N, 114.2°W, 0 = 12 05 39. Gulf of California. h about 33 km.
Oct. 1	JAS	iP	12 33 26.9	d	USCGS: 45.7°N, 122.8°W, 0 = 12 31 24.6. Washington-Oregon border. h about 33 km. Felt: Portland and Vancouver areas.
	MIN	iP	32 46.5	c	
Oct. 1	JAS	iP	14 18 19.8	d	USCGS: 49.3°N, 128.8°W, 0 = 18 30 01.9. Vancouver Island region. h about 7 km.
Oct. 1	JAS	iP	18 26 43.2	c	
Oct. 1	JAS	iP	18 29 16.1	c	
Oct. 1	BKS	iP	18 32 55.6	c	
			mu sec		
		PZ	0.03 1		
	JAS	iP	18 33 04.2	d	
	MIN	iP	32 30.6	d	
	PRI	eP	33 25.6	c	
Oct. 2	BKS	eP	01 09 13.0	c	
	MHC	eP	16.0	c	
	JAS	iP	16.4	c	
	MIN	eP	10 11.6	c	
	PRI	eP	09 25.6	c	
Oct. 2	JAS	iZ	01 38 47.2	c	
Oct. 2	JAS	iP	10 00 03.2	d	
	MIN	eP	10.5	c	
Oct. 2	BKS	iP	13 13 10.7	c	USCGS: 10.5°S, 162.4°E, 0 = 13 00 39.7. Solomon Islands. h about 68 km. Magnitude 5¾ (BKS).
		ipP	18.2		
			mu sec		
		PZ	0.10 1		
		MaxH	3.30 20		
	MHC	iP	13 13 12.4	c	
	JAS	iP	17.0	c	
		ipP	28.0	d	
	MIN	eP	15.0	d	
		ipP	24.4	c	
	PRI	iP	14.8	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Oct. 2	JAS	iP	17 03 57.4	d	USCGS: 21.7°S, 67.7°W, 0 = 16 52 06.4.
	MIN	iP	04 06.9	d	Chile-Bolivia border. h about 49 km.
Oct. 2	JAS	iP	20 43 00.9	c	
Oct. 2	BKS	eP	22 29 06.0	d	USCGS: 50.7°N, 144.5°W, 0 = 22 23 32.4.
					Gulf of Alaska. h about 22 km.
	MHC	eP	13.0		
	JAS	iP	11.2	NWd	
		iSN	50.8		
	PRI	eP	26.1		
Oct. 3	BKS	iP	13 45 29.5	d	
		eR	51 12.0		
			mu sec		
		PZ	0.07 1		
	MHC	eP	13 45 36.2	d	
	JAS	iP	34.2	d	
		eSNE	46 07.2		
	MIN	iP	45 12.6	d	
		ipP	22.6	d	
Oct. 3	MIN	eP	15 11 05.0	c	USCGS: 59.1°N, 153.2°W, 0 = 15 05 20.
					Southern Alaska. h about 60 km.
Oct. 3	JAS	eP	17 13 39.5	c	USCGS: 18.1°S, 178.8°W, 0 = 17 02 48.0.
	MIN	iP	45.7	d	Fiji Islands. h about 673 km.
Oct. 3	BKS	eP	22 13 22.0		USCGS: 10.3°S, 164.5°E, 0 = 22 00 53.8.
	MHC	eP	23.9		Santa Cruz Islands. h about 66 km.
	JAS	iP	21.8	d	
	MIN	eP	23.3	d	
	PRI	eP	19.8		
Oct. 3	JAS	eP	22 52 44.9	d	
	MIN	eZ	54 13.3	c	
Oct. 4	BKS	eR	01 22 50		
Oct. 5	JAS	eP	01 22 40.8	c	
	MIN	eZ	25 43.5		
Oct. 5	MIN	iP	01 27 36.5	c	USCGS: 32.9°N, 115.8°W, 0 = 01 24 55.
					California-Mexico border.
					h about 33 km.
Oct. 5	JAS	eP	01 56 14.4	d	
	MIN	eZ	46.3	c	
Oct. 5	JAS	iP	03 46 16.4	d	USCGS: 42.6°N, 142.6°E, 0 = 03 35 08.4.
	MIN	iP	03.8	d	Hokkaido, Japan. h about 38 km.
Oct. 5	MIN	eP	06 35 26.0	d	USCGS: 18.2°S, 177.7°W, 0 = 06 24 01.0.
					Fiji Islands. h about 334 km.
Oct. 5	BKS	eP	08 41 18.0	d	USCGS: 16.7°S, 173.7°W, 0 = 08 30 15.7.
		eR	09 03 10.0		Tonga Islands. h about 33 km.
	JAS	iP	08 41 49.4	d	
	MIN	eP	54.3	c	
Oct. 5	JAS	iP	12 35 35.7	c	USCGS: 16.6°S, 174.2°W, 0 = 12 24 06.4.
					Tonga Islands. h about 84 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Oct. 5	BKS	iP	13 24 42.8		USCGS: 22.3°S, 171.6°E, 0 = 13 12 15.5.
	MHC	eP	43.7		Loyalty Islands. h about 145 km.
	JAS	eP	48.0	c	
	MIN	eP	50.7	d	
	PRI	eP	44.2		
Oct. 5	JAS	iP	14 11 01.6	c	USCGS: 22.2°S, 175.8°W, 0 = 13 58 56.9.
	MIN	eP	06.4	c	Tonga Islands. h about 33 km.
Oct. 5	MIN	iP	22 21 49.9	c	USCGS: 36.0°N, 141.2°E, 0 = 22 10 16.5.
					Hokkaido, Japan. h about 62 km.
Oct. 6	MIN	iZ	01 38 41.9	d	
Oct. 6	JAS	iP	01 43 13.4	Nd	USCGS: 56.5°N, 152.7°W, 0 = 01 37 21.
	MIN	eP	42 51.1	d	Kodiak Island region.
					h about 33 km.
Oct. 6	BKS	iP	07 29 45.9	c	USCGS: 36.2°S, 100.9°W, 0 = 07 17 57.1
		eS	39 30		Southern Pacific Ocean.
		eSS	44 34		h about 33 km.
		eGE	50 22		Magnitude 5½ (BKS).
		eR	53 50		
			mu sec		
		PZ	0.04 1		
		SH	3.00 8		
		MaxH	5.00 20		
	JAS	iP	07 29 40.6	d	
	MIN	eP	58.1	d	
Oct. 6	JAS	iZ	10 14 14.6	c	USCGS: 2.6°N, 95.3°W, 0 = 10 06 17.9.
					Galapagos Islands. h about 33 km.
Oct. 6	JAS	iP	14 43 30.6	c	
	MIN	iP	20.8	c	
Oct. 6	BKS	eP	14 44 58.2		USCGS: 40.3°N, 28.2°E, 0 = 14 31 19.2.
		ipP	45 05.0		Turkey. h about 10 km.
		ePP	48 55.5		Magnitude 6.8 (BKS). 19 killed.
		eSNE	56 24.0		Extensive property damage.
		ePS	57 57.0		
		eSSNE	15 03 12.0		
		eSSS	07 30.0		
		eE	10 48.0		
		eQNE	12 35.0		
		eRNE	17 40.0		
			mu sec		
		PZ	3.3 12		
		PPZ	6.2 12		
		SH	10 32		
		MaxH	35 20		
	JAS	iP	14 44 52.4	c	
	MIN	eP	43.7	d	
		iPP	48 38.9		
Oct. 6	JAS	iP	15 02 31.6	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 6	JAS	iP	18 29 58.2	d	USCGS: 70.9°N, 5.7°W, 0 = 18 24 57.0. Jan Mayen Islands. h about 33 km.
Oct. 6	JAS	iP	18 35 21.1	c	
Oct. 6	BKS	eP	19 24 43.2		
	MHC	eP	44.8		
	JAS	iP	50.1	c	
	MIN	eP	50.5	c	
	PRI	eP	46.2	c	
Oct. 6	JAS	iP	20 51 57.2	d	
Oct. 6	JAS	iP	22 40 12.8	c	
Oct. 7	JAS	iP	01 04 06.2	c	USCGS: 53.0°N, 36.2°W, 0 = 00 54 18.0. North Atlantic Ocean. h about 33 km.
Oct. 7	MIN	iP	01 36 20.1	c	USCGS: 20.7°S, 177.8°W, 0 = 01 24 45.2. Fiji Islands. h about 328 km.
Oct. 7	MIN	iP	04 05 01.1	d	USCGS: 6.8°S, 155.2°E, 0 = 03 52 11.3. Solomon Islands. h about 70 km.
Oct. 7	JAS	iP	17 28 07.0	d	USCGS: 59.0°N, 148.8°W, 0 = 17 20 05.37. Kenai Peninsula, Alaska. h about 33 km.
Oct. 7	JAS	iP	20 10 26.7	c	USCGS: 59.0°N, 148.8°W, 0 = 20 05 37. Kenai Peninsula, Alaska. h about 33 km.
Oct. 8	MIN	eP	12 39 18.2	c	USCGS: 27.3°N, 110.9°W, 0 = 12 35 35. Gulf of California. h about 33 km.
Oct. 8	JAS	iP	14 44 43.5	d	USCGS: 43.9°N, 127.4°W, 0 = 14 12 54. Off coast of Oregon. h about 33 km.
Oct. 8	JAS	iP	14 49 54.9		USCGS: 22.6°S, 69.4°W, 0 = 14 38 02. Northern Chile. h about 33 km.
Oct. 8	JAS	iP	17 00 21.6	d	USCGS: 52.8°N, 168.0°W, 0 = 16 53 23.0. Fox Island. h about 33 km.
	MIN	iP	02.8	c	
Oct. 8	JAS	eP	22 34 17.1	c	
Oct. 9	JAS	iP	00 28 25.5		USCGS: 35.0°S, 115.0°W, 0 = 00 14 22. Easter Island. h about 33 km.
Oct. 9	MIN	eP	09 17 05.5	d	USCGS: 60.0°N, 143.7°W, 0 = 09 11 54. Southern Alaska. h about 33 km.
Oct. 9	JAS	iP	17 55 07.4	d	
	PRI	eP	13.0		
Oct. 9	BKS	iP	19 35 51.6	d	USCGS: 6.8°N, 73.0°W, 0 = 19 26 39.7. Northern Colombia. h about 157 km.
			mu sec		
		PZ	0.05 0.7		
	MHC	iP	19 35 47.8		
	JAS	iP	41.8	c	
	MIN		54.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 9	JAS	iP	20 01 27.4	d	USCGS: 57.0°N, 151.9°W, 0 = 19 55 34.7. Kodiak Island. h about 17 km.
	MIN	eP	05.2	d	
Oct. 9	BKS	iP	21 45 26.5	d	USCGS: 16.2°S, 171.9°W, 0 = 21 34 09.2. Samoa Islands. h about 33 km.
		eS	54 54.0		
		eLQ	22 03 26.0		
		eR	06 17.0		
			mu sec		
		PZ	0.08 1.0		
		MaxH	2.00 20		
	MHC	eP	21 45 24.3	d	
	JAS	eP	19.9	d	
	MIN	eP	36.9	d	
	PRI	eP	26.4	d	
Oct. 10	MIN	eP	11 35 42.5	c	
Oct. 10	BKS	iP	19 44 28.6	c	USCGS: 60.4°N, 146.1°W, 0 = 19 38 47.7. Southern Alaska. h about 44 km.
		eZ	46 15.0		
		eS	49 08.0		
		eRNE	51 48.0		
			mu sec		
		PZ	0.08 1.0		
		MaxH	1.70 20		
	MHC	eP	19 44 28.3	d	
	JAS	iP	34.8	c	
	MIN	eP	10.0	d	
	PRI	iP	47.9	d	
Oct. 10	BKS	iP	20 12 21.1	c	USCGS: 60.5°N, 145.4°W, 0 = 20 06 39.8. Southern Alaska. h about 31 km.
		eN	16 58.0		
		eR	19 42.0		
	MHC	iP	12 27.2	c	
	JAS	iP	25.3	c	
	MIN	eP	02.2	d	
		ipP	11.6	d	
	PRI	eP	40.7		
Oct. 11	JAS	eP	00 10 53.4	c	
Oct. 11	JAS	iP	01 01 17.2	c	
Oct. 11	JAS	eP	03 11 13.6	d	USCGS: 50.0°N, 160.0°E, 0 = 03 01 56. Kurile Islands. h about 34 km.
	MIN	eP	14.2	c	
Oct. 11	JAS	eP	06 12 19.0	c	USCGS: 43.8°N, 129.3°W, 0 = 06 10 09.0. Off coast of Oregon. h about 33 km.
	MIN	eP	11 47.4	c	
Oct. 11	BKS	eiP	10 13 39.5	c	USCGS: 19.1°N, 156.6°W, 0 = 10 06 44.9. Hawaii region. h about 33 km. Felt throughout Hawaiian Islands.
		ipP	45.2		
		eR	22 39.0		
			mu sec		
		PZ	0.075 0.8		
		MaxH	2.5 20		
	MHC	iP	10 13 42.2	c	
	JAS	iP	51.8	NE	
	MIN	eP	52.1	c	
	PRI	iP	45.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 11	BKS	eR	11 48 28.0		USCGS: 13.6°S, 166.6°E, 0 = 11 10 33.6.
	MIN	eZ	23 04.0	c	New Hebrides Islands. h about 68 km.
Oct. 11	BKS	eP	14 30 35.0		USCGS: 17.9°S, 71.5°W, 0 = 14 19 11.5.
	JAS	eP	35.5		Near coast of Peru. h about 35 km.
	MIN	eZ	47.6	c	
	PRI	eP	30.3		
Oct. 11	BKS	e(P')	21 32 31		USCGS: 0.6°S, 121.7°E, 0 = 21 15 03.9.
		eSE	40 12		Northern Celebes. h about 33 km.
		ePSNE	43 30		Magnitude $6\frac{1}{4}$ (BKS).
		eSSN	49 44		
		eGNE	22 00 20		
		eRE	06 00		
			mu sec		
		MaxH	10 20		
	MIN	e(P')	21 33 40	c	
Oct. 11	JAS	eZ	21 44 30.7		
	MIN	eZ	39.7	c	
Oct. 12	JAS	iP	00 04 29.1	c	
	MIN	eP	33.7	c	
Oct. 12	JAS	eP	06 08 16.8	c	
	MIN	eZ	07 25.0	c	
Oct. 12	MIN	eP	06 11 38.4	d	USCGS: 56.6°N, 152.6°W, 0 = 06 06 08.0. Kodiak Island. h about 33 km.
Oct. 12	BKS	iP	08 48 52.2	c	
	MIN	eZ	54.8	c	
Oct. 12	BKS	eR	09 58 44.0		USCGS: 55.9°S, 144.1°W, 0 = 09 14 52.2.
	MIN	eZ	55 26.2	c	South Pacific. h about 33 km.
Oct. 12	MIN	eZ	16 01 14.2	c	USCGS: 3.0°N, 126.7°E, 0 = 15 42 54.7. Talaud Islands. h about 59 km.
Oct. 12	BKS	iP	22 06 43.0	d	USCGS: 31.3°S, 110.8°W, 0 = 21 55 33.2.
		iPcP	07 32.5	d	Easter Island region.
		eS	15 58.0	W	h about 25 km.
		eSS	20 40.0	E	Magnitude 6.2 (BKS).
		eG	23 54.0	E	
		eR	25 24.0	W	
			mu sec		
		PZ	0.26 1.5		
		SH	7.5 20		
		MaxH	12 20		
	MHC	iP	22 06 40.0	d	
	MIN	iP	56.9	d	
	PRI	iP	31.8	d	
Oct. 13	BKS	iP	02 32 11.2	c	USCGS: 44.4°N, 151.6°E, 0 = 02 20 49.3.
	JAS	iP	31 18.1	d	Kurile Island region.
	MIN	iP	03.3	d	h about 33 km.
Oct. 13	MIN	eZ	10 51 59.2	c	USCGS: 3.3°S, 149.9°E, 0 = 10 38 59.3. Bismarck Sea. h about 59 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 13	MIN	eZ	11 07 28.6	c	
Oct. 13	MIN	eP	14 05 45.2	c	USCGS: 58.5°N, 151.4°W, 0 = 14 00 12.3. Kodiak Island region. h about 33 km.
Oct. 14	BKS	eP	03 15 39		USCGS: 33.4°N, 141.8°E, 0 = 03 04 59.6.
	MIN	iZ	16 31.3	c	Off east coast of Honshu, Japan. h about 33 km.
Oct. 15	BKS	eiP	20 37 20.0		USCGS: 44.7°N, 149.8°E, 0 = 20 26 53.5.
		iSE	45 53.0		Kurile Islands. h about 49 km.
		eGE	53 20.0		Magnitude $5\frac{1}{2}$ - 6 (BKS).
		eR	57 00.0		
	MIN	iP	37 12.7	c	
	PRI	eP	34.8		
Oct. 15	MIN	iZ	20 46 05.1	c	USCGS: 44.8°N, 149.6°E, 0 = 20 35 33. Kurile Islands. h about 33 km.
Oct. 15	BKS	eP	23 05 52.0		
	MIN	iP	11.8	d	
	PRI	eP	46.5		
Oct. 15	BKS	eP	23 15 16.0		USCGS: 56.9°N, 151.7°W, 0 = 23 09 25.1.
	MIN	iP	14 53.0	c	Kodiak Island region. h about 33 km.
	PRI	eP	15 28.0		
Oct. 16	MIN	eP	01 47 11.8	c	USCGS: 44.3°N, 149.6°E, 0 = 01 36 43.9. Kurile Islands. h about 44 km.
Oct. 16	MIN	iP	04 11 54.3	c	USCGS: 57.1°N, 151.0°W, 0 = 04 06 31. Gulf of Alaska. h about 33 km.
Oct. 16	BKS	iP	06 27 25.3		USCGS: 23.6°S, 177.6°W, 0 = 06 15 31.5.
	MHC	eP	24.7		South of Fiji Islands.
	MIN	iP	35.5	d	h about 178 km.
	PRI	eP	24.0		
Oct. 16	BKS	iP	07 10 08.5	c	USCGS: 44.3°N, 149.5°E, 0 = 06 59 38.6.
		iEZ	25.8		Kurile Islands. h about 33 km.
		eZ	13 13.0		Magnitude 6.6 (BKS).
		iS	18 41.0		
		iGNE	26 15.0		
		eR	30 00.0		
			mu sec		
		PZ	3.4 10		
		SH	14 19		
		MaxH	16 20		
	MIN	iP	07 10 00.2	c	
		ipP	18.9	c	
Oct. 16	MIN	eP	07 32 07.0	c	USCGS: 44.2°N, 149.4°E, 0 = 07 21 42.7. Kurile Islands. h about 33 km.
Oct. 16	MIN	eP	07 38 49.0	c	USCGS: 44.3°N, 149.5°E, 0 = 07 28 28.3. Kurile Islands. h about 52 km.
Oct. 16	BKS	eP	08 28 51.0		USCGS: 44.6°N, 149.4°E, 0 = 08 18 28.3.
	MIN	iP	50.9	c	Kurile Islands. h about 33 km.
	PRI	eP	29 13.0		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 16	MIN	eP	08 43 54.2	c	USCGS: 44.2°N, 149.4°E, 0 = 08 33 29.8. Kurile Islands. h about 33 km.
Oct. 16	MIN	eP	09 09 23.7	d	
Oct. 16	BKS	eP	09 28 41.0	c	USCGS: 44.5°N, 149.1°E, 0 = 09 18 16.6. Kurile Islands. h about 33 km.
	MIN	eP	39.6	c	
Oct. 16	MIN	eZ	10 04 54.0	d	USCGS: 44.1°N, 149.3°E, 0 = 09 54 30.9. Kurile Islands. h about 33 km.
Oct. 16	MIN	eZ	12 14 33.1	c	USCGS: 44.6°N, 149.5°E, 0 = 12 04 05.3. Kurile Islands. h about 33 km.
Oct. 16	MIN	eP	12 29 16.7	c	USCGS: 44.6°N, 149.5°E, 0 = 12 18 54.4. Kurile Islands. h about 33 km.
Oct. 16	MIN	eP	12 47 58.5	c	USCGS: 44.3°N, 149.4°E, 0 = 12 37 26.8. Kurile Islands. h about 33 km.
Oct. 17	BKS	iP	02 05 37.5	d	USCGS: 59.5°N, 145.5°W, 0 = 02 00 03.3. Gulf of Alaska. h about 33 km.
		eGN	14 32.0		
		eR	18 00.0		
			mu sec		
		PZ	0.10 1.0		
		MaxH	2.0 20		
	MIN	iP	02 05 19.8	d	
Oct. 17	MIN	iP	03 35 58.4	c	
Oct. 17	MIN	eP	06 08 34.3	c	USCGS: 22.3°S, 171.5°E, 0 = 05 55 54.4 Loyalty Islands region. h about 116 km.
Oct. 17	MIN	iP	06 45 37.4	d	
Oct. 17	MIN	eP	12 18 54.7	d	USCGS: 35.8°N, 141.3°E, 0 = 12 07 30.6. Near coast of Honshu, Japan. h about 45 km.
Oct. 17	MIN	eP	14 35 00.1	c	USCGS: 28.1°N, 45.3°W, 0 = 14 24 39. North Atlantic Ridge. h about 33 km.
Oct. 17	MIN	eP	17 01 24.1	c	
Oct. 17	MIN	eZ	23 20 24.9	c	
Oct. 18	MIN	eP	02 58 39.1	c	USCGS: 2.8°N, 78.0°W, 0 = 02 49 16.8. Near west coast of Colombia. h about 68 km.
Oct. 18	MIN	iP	06 26 55.6	c	USCGS: 44.4°N, 149.7°E, 0 = 06 16 35.2. Kurile Islands. h about 33 km.
Oct. 18	BKS	eP'	09 28 48.0		
		eRNE	10 13 00.0		
	MIN	eZ	09 28 47.6	c	
Oct. 18	BKS	eP	12 46 10.5	d	USCGS: 7.0°S, 124.0°E, 0 = 12 32 24.1. Banda Sea. h about 574 km.
		iP'	50 00.0	d	
		i(PP)	52.0		
		eSP	59 39		
		iPSEZ	13 00 48		
	MHC	eP'	12 50 00.8	d	
	MIN	eZ	45 58.9	d	
		iP'	50 10.6	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 18	CLS	iP'	58.7	d	
(Cont.)	PRI	iP'	03.1	d	
Oct. 18	BKS	iP	13 00 48.7		
Oct. 18	MIN	eP	18 35 13.9	c	USCGS: 41.9°N, 111.8°W, 0 = 18 33 19.9. Utah. Felt.
Oct. 18	BKS	iP	22 42 32.2	d	USCGS: 19.4°S, 179.1°W, 0 = 22 31 37.7. Fiji Islands. h about 666 km.
	MIN	iP	41.2	d	
	CLS	eP	32.5		
Oct. 18	MIN	iZ	22 53 21.1	d	USCGS: 29.7°N, 51.0°E, 0 = 22 35 45.5. Southern Iran. h about 36 km.
Oct. 19	MIN	iP	00 11 29.2	c	
Oct. 19	MIN	eP	09 02 03.8	c	USCGS: 6.5°S, 80.7°W, 0 = 08 34 06. Near coast of Northern Peru. h about 100 km.
Oct. 19	PRI	iP	21 30 30	c	
Oct. 20	BKS	iP	01 00 49.5	c	
	MIN	eP	01 00.6	c	
	PRI	eP	00 49.4	c	
Oct. 20	MIN	eP	05 58 47.3	d	
Oct. 20	MIN	eP	06 29 40.9	c	USCGS: 56.9°N, 152.6°W, 0 = 06 24 12. Kodiak Islands. h about 48 km.
Oct. 21	BKS	eiP	07 41 07.4	d	USCGS: 44.8°N, 111.6°W, 0 = 07 38 31.0. Hebgen Lake region, Montana. h about 33 km.
		eSNE	43 10.0		
		eGNE	23.0		
			mu sec		
		MaxH	38 20		
	MHC	eP	07 41 05.0		
	JAS	ePNE	40 49.8	d	
		eSNE	43 13.6		
	MIN	eP	40 37.8	d	
		iS	42 12.6		
	PRI	eP	41 12.5		
Oct. 21	MIN	eP	14 38 35.2	d	USCGS: 58.2°N, 151.9°W, 0 = 14 32 57.6. Kodiak Island region. h about 33 km.
Oct. 21	JAS	eP	14 47 18.6	c	
Oct. 21	BKS	eP	23 23 32.0	c	USCGS: 28.1°N, 93.8°E, 0 = 23 09 18.8. India-China border. h about 37 km. Magnitude 6/4 (BKS).
		eP'	27 48.0		
		eSSNE	42 55.0		
		eSKSNE	34 13		
		ePSE	37 10.0		
		ePPS	38 18.0		
		eGNE	51 08.0		
		eRNE	53 20.0		
			mu sec		
		PPZ	3 12		
		MaxH	19 20		
	JAS	eP	23 23 44.1	d	
		eP'	27 48.4	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 22	JAS	eP	10 04 24.2	c	USCGS: 36.7°N, 141.1°E, 0 = 09 54 36.9. Near east coast of Honshu, Japan. h about 40 km.
Oct. 22	BKS	eP	16 09 09.7	c	USCGS: 31.14°N, 89.57°W, 0 = 16 00 00.0 h less than 1 km. Salmon Event, Mississippi.
		eSE	14 11.0		
			mu sec		
		PZ	0.019 1.0		
		MaxH	1.13 16		
	MHC	iP	16 09 07.6	c	
	PRI	eiP	08 52.8	c	
Oct. 23	BKS	iP	02 06 07.0	c	USCGS: 19.8°N, 56.0°W, 0 = 01 56 03.2. North Atlantic Ocean. h about 31 km.
		ipP	19.4		
		ePP	08 10.0		
		ePPP	09 48.0		
		isNE	14 20.0		Magnitude $6\frac{3}{4}$ (BKS).
		eNE	20 12.0		
		eR	42.0		Felt on S.S. Chain Oceanographic Vessel at 19°57'N, 55°31'W, at 01 56 GCT.
			mu sec		
		PZ	8 12		
		PPZ	5.5 12		
		SH	0.4 25		
		MaxH	48 20		
	MHC	eP	02 06 03.6		
	JAS	iP	05 56.2	c	
	MIN	eP	06 01.6	c	
	CLS	eP	07.8		
	PRI	eP	05 56.8		
Oct. 23	MIN	eZ	09 51 38.3	d	USCGS: 28.2°S, 177.3°W, 0 = 09 39 06.2. Kermadec Islands. h about 68 km.
Oct. 23	BKS	iP	21 17 02.3	c	USCGS: 44.0°N, 147.5°E, 0 = 21 06 24.2. Kurile Islands. h about 45 km.
		eSE	25 40.0		
		eSS	29 42.0		
		eG	33 14.0		
		eR	36 00.0		
			mu sec		
		PZ	0.05 0.7		
		MaxH	1.5 20		
	MHC	eP	21 17 06.7		
	JAS	iP	08.3	d	
	MIN	iP	16 54.2	c	
	CLS	eP	57.8	c	
	PRI	eP	17 15.6	d	
Oct. 24	MIN	eZ	00 50 41.1	c	USCGS: 44.2°N, 149.3°E, 0 = 00 40 09.4. Kurile Islands. h about 33 km.
Oct. 24	BKS	eP	06 46 42		USCGS: 44.5°N, 129.5°W, 0 = 06 37 46. Off coast of Oregon. h about 33 km.
		eSNE	48 12		Magnitude $5\frac{3}{4}$ (BKS).
		iR	35		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 24			mu sec		
(Cont.)		PZ	1.0 8		
		MaxH	5.8 14		
	MIN	eP	06 46 26.4	d	
	CLS	iP	32.0		
Oct. 24	MIN	eP	07 56 59.9	d	USCGS: 60.9°N, 146.7°W, 0 = 07 51 31. Southern Alaska. h about 33 km.
Oct. 24	BKS	iP	08 59 35.0		USCGS: 24.8°N, 122.1°E, 0 = 08 46 25.0. Taiwan. Felt. h about 63 km.
	MHC	eP	41.4		
	MIN	eP	09 00 29.7	c	
	CLS	eP	08 59 31.5		
	PRI	eP	44.2		
Oct. 24	BKS	eP	18 48 04.4		USCGS: 66.0°W, 145.5°E, 0 = 18 38 25.7. Eastern Siberia. h about 33 km.
	MHC	eP	17.6		
	MIN	eP	47 55.9	d	
	CLS	eP	48 04.0		
	PRI	eP	25.5		
Oct. 25	BKS	eZ	03 59 33.5		USCGS: 5.0°N, 82.5°W, 0 = 03 43 20.0. South of Panama. h about 33 km.
		eR	04 07 30.0		
	JAS	iP	03 51 56.0	c	
	MIN	eP	52 10.0	c	
Oct. 25	BKS	iP	06 35 23.5	c	
	MHC	eP	18.6		
	MIN	eP	29.2	c	
	CLS	eP	27.4		
	PRI	eP	09.0		
Oct. 25	MIN	eZ	07 58 01.5	c	
Oct. 25	MIN	iP	10 13 18.1	d	USCGS: 15.3°S, 173.3°W, 0 = 10 01 48. Tonga Islands. h about 33 km.
Oct. 25	BKS	eiP	12 20 01.5	d	USCGS: 21.7°S, 179.2°W, 0 = 12 08 46.9. Fiji Islands. h about 534 km.
			mu sec		
		PZ	0.04 1.0		
	MHC	iP	12 20 02.1	d	
	MIN	eP	10.2	d	
	CLS	iP	02.5	d	
	PRI	iP	01.6	d	
Oct. 25	BKS	eP	23 06 09.8		USCGS: 2.0°S, 79.0°W, 0 = 22 56 32.8. Ecuador. h about 57 km.
	MHC	eP	05.8	c	
	MIN	iZ	17.0	d	
	CLS	eP	14.7		
	PRI	iP	05 56.3		
Oct. 26	BKS	eP	01 03 29.3		USCGS: 8.9°N, 83.9°W, 0 = 00 55 22.3. Costa Rica. h about 33 km.
	MHC	eP	31.7		
	MIN	iP	43.2	d	
	CLS	eP	41.5		
	PRI	eP	21.3		
Oct. 26	MIN	iP	14 38 19.7	c	USCGS: 56.8°N, 152.3°W, 0 = 14 32 49.3. Kodiak Islands. h about 33 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Oct. 26	MIN	eZ	15 29 55.9	c	
Oct. 27	BKS	eZ	20 24.5		
Oct. 27	BKS	eP'	21 44 20.7	c	USCGS: 45.6°S, 96.1°E, 0 = 21 24 31.2.
		eSKS	51 24.0	c	Southeast Indian Rise. h about 33 km.
		eSSE	22 08 00.0	W	
		eSSSE	13 28	Ed	
		eGE	25.7		
		eRE	34.0		
			mu sec		
		MaxH	5.65 36		
	MHC	eP'	21 44 21.4	c	
	JAS	eP'	24.9	d	
	MIN	eP'	26.3	c	
	CLS	eP'	20.7	c	
	PRI	eP'	22.7	d	
Oct. 28	BKS	iP	00 34 27.3	c	USCGS: 29.6°S, 70.7°W, 0 = 00 22 07.3.
	MHC	eP	24.0	d	Central Chile. h about 45 km.
	JAS	iP	22.6	c	
	CLS	eP	31.0	d	
	PRI	eP	16.7	d	
Oct. 28	MIN	iZ	08 22 51.6	c	USCGS: 60.8°N, 146.9°W, 0 = 08 17 21.
					Southern Alaska. h about 33 km.
Oct. 29	JAS	iP	07 04 20.7	c	
Oct. 29	JAS	iP	13 51 29.1	c	
	MIN	eP	18.2	c	
Oct. 29	JAS	eZ	21 36 13.0	d	
Oct. 30	JAS	iP	00 35 37.3	c	USCGS: 38.9°S, 74.1°W, 0 = 00 22 48.8.
					Off coast of Central Chile.
					h about 33 km.
Oct. 30	BKS	eSNE	02 31 45	NEd	USCGS: 35.0°S, 107.3°W, 0 = 02 10 37.6.
		eScSN	32 28	Sd	Easter Island. h about 33 km.
		eSSNE	36 28	Wd	
		eSSSE	40.4		
		iGE	42.0		
		eRN	45.1		
	JAS	iP	22 08	d	
	MIN	eP	42.5	d	
Oct. 30	JAS	iP	03 13 49	c	
	MIN	eP	35.3	c	
Oct. 30	MIN	eZ	04 55 59.2	c	
Oct. 30	MIN	eZ	06 33 22.8	d	
Oct. 30	MIN	eZ	16 57 09.0	c	USCGS: 6.8°N, 73.0°W, 0 = 16 47 52.7.
					Northern Colombia. h about 146 km.
Oct. 30	MIN	eP	17 18 32.4	d	
Oct. 31	MIN	eZ	22 32 17.2	c	
Nov. 1	MIN	eZ	03 08 26.4	d	USCGS: 25.1°S, 179.7°W, 0 = 02 56 41.4.
					South of Fiji Islands.
					h about 459 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 1	MIN	eZ	04 11 20.3	c	
Nov. 1	BKS	iP	04 59 25.8	c	
		iSE	05 02 09.0		
	MHC	eP	04 59 33.3	c	
	JAS	eP	25.0	d	
	MIN	eP	52.2	c	
	CLS	eP	20.2	c	
	PRI	eP	49.3	d	
Nov. 1	BKS	eS	12 50 40	W	USCGS: 3.1°N, 128.1°E, 0 = 12 26 06.2.
		eEZ	13 09.2		North of Halmahera Island.
		eRE	13.0		h about 65 km.
Nov. 1	MIN	iP	17 01 43.2	d	
		iS	50.2		
Nov. 2	BKS	eP	07 00 52.5	d	USCGS: 4.1°S, 76.9°W, 0 = 06 50 58.2.
		iZ	01 32.0	c	Northern Peru. h about 91 km.
		eSNE	08 56.0	SEc	
	MHC	eP	00 48.1	d	
	JAS	iP	42.8		
	MIN	iP	58.5	d	
		ipP	01 20.3	c	
	CLS	eP	00 56.7	d	
	PRI	eP	38.3	d	
Nov. 3	BKS	iP	02 17 14.2	d	
	MHC	eP	18.4	d	
	JAS	iP	20.4	d	
	MIN	eP	08.7	d	
	CLS	eP	18.0	d	
	PRI	eP	22.7	d	
Nov. 3	MIN	eP	08 24 10.8	d	
Nov. 3	MIN	iP	09 10 03.4	c	
Nov. 3	MIN	eP	11 21 17.1	c	
Nov. 3	MIN	eZ	13 01 11.7	c	
Nov. 4	BKS	ePE	02 23 03.0	Ec	USCGS: 19.7°S, 69.2°W, 0 = 02 11 24.9.
		iZ	29.0	c	Chile-Bolivia border.
	MHC	eP	22 59.6	d	h about 102 km.
	JAS	iP	56.8	SEd	
		ipP	23 23.3	c	
	MIN	eP	08.9	c	
		epP	34.6	d	
	MHC	eP	22 59.6	d	
	CLS	eP	23 06.7	d	
	PRI	eP	22 51.1	d	
Nov. 4	JAS	iP	03 46 49.8	NEd	
	MIN	eP	31.0	d	
Nov. 5	JAS	iP	04 32 43.5	Ec	USCGS: 5.5°S, 147.2°E, 0 = 04 19 39.5
	MIN	iP	39.5	c	East New Guinea region.
					h about 197 km.

Date	Sta.	Phase	Time (GCT)			Ground Motion	Remarks
			h	m	s		
1964							
Nov. 5	JAS MIN	iP eZ	07 14	16.0	c	USCGS: 9.2°N, 142.0°E, 0 = 07 01 15.3. West Caroline Islands. h about 33 km.	
Nov. 6	BKS MHC JAS MIN CLS PRI	eP eP iP iP eP eP	10 03	51.4 55.5 57.9 44.9 46.3	d d d c d	USCGS: 44.4°N, 149.0°E, 0 = 09 53 22.4. Kurile Islands. h about 60 km.	
Nov. 6	JAS	eP	10 36	12.0	c	USCGS: 44.5°N, 148.9°E, 0 = 10 25 31.8. Kurile Islands. h about 33 km.	
Nov. 6	JAS MIN	eP eP	12 24	34.4 13.0	d c	USCGS: 59.7°N, 148.9°W, 0 = 12 18 42. Kenai Peninsula, Alaska. h about 33 km.	
Nov. 7	JAS MIN	iP eZ	04 16	00.9 15 52.5	d c	USCGS: 14.0°N, 144.7°E, 0 = 04 03 38.7. Mariana Islands. h about 155 km.	
Nov. 7	JAS MIN	iP eZ	09 23	46.3 27.0	c d	USCGS: 19.3°N, 147.1°E, 0 = 09 11 28.8. Mariana Islands. h about 57 km.	
Nov. 7	BKS MHC JAS	eP eP iP	14 59	36.5 41.6 44.3	c c c	USCGS: 45.5°N, 150.3°E, 0 = 14 49 13.4. Kurile Islands. h about 33 km.	
		ipP		51.3	c		
	MIN	iP		29.4	d		
	CLS	eP		32.0	c		
	PRI	eP		50.7	c		
Nov. 7	JAS	eP	18 56	39.1	d	USCGS: 0.4°N, 100.1°E, 0 = 18 37 43.7. Northern Sumatra. h about 107 km.	
Nov. 7	JAS MIN	ePE eZ	20 14	06.7 24.2	Wd c	USCGS: 13.1°N, 89.9°W, 0 = 20 07 04. El Salvador. h about 82 km.	
Nov. 8	BKS	ePP eZ ePS eNE eSS eG eRE	03 02	50 04 06 12 03 23 18 04 28.5 35.7	c d c	USCGS: 49.0°S, 163.7°E, 0 = 02 43 57. Auckland Islands. h about 33 km. Magnitude $6\frac{3}{4}$ (BKS).	
			mu	sec			
		PPZ	1.55	8			
		MaxH	19.4	16			
Nov. 8	JAS JAS MIN	iP iP eP	03 02 18 08	57.5 40.4 24.2	d d c	USCGS: 34.8°N, 133.0°E, 0 = 18 56 31.1. Near south coast of Honshu, Japan. h about 42 km.	
Nov. 9	MIN	iP	04 24	25.9	d		
Nov. 10	MHC JAS	eP iP	06 13	25.9 23.9	c Nd	USCGS: 59.8°N, 144.3°W, 0 = 06 07 49.6. Gulf of Alaska. h about 42 km.	
		ipP		33.4	d		
	MIN	iP		01.7	c		

Date	Sta.	Phase	Time (GCT)			Ground Motion	Remarks
			h	m	s		
1964							
Nov. 10		ipP		07.5	c		
(Cont.)	CLS	eP		11.4	d		
	PRI	eP		35.8	d		
Nov. 11	MHC	eP	08 07	08.8	c	USCGS: 59.4°N, 144.6°W, 0 = 08 01 26.1. Gulf of Alaska. h about 10 km.	
	JAS	iP		06.4	Nd		
		ipP		30.1	d		
	MIN	iP		06 42.4	c		
		ipP		07 10.4	c		
	CLS	eP		06 53.3	d		
	PRI	eP		07 20.8	d		
Nov. 11	MHC	eP	13 26	52	c	USCGS: 56.6°N, 161.4°E, 0 = 13 17 37.5. Near east coast of Kamchatka. h about 33 km.	
	JAS	iP		55.3	c		
	MIN	eZ		35.8	c		
Nov. 11	MHC	eP	16 49	44.5	c	USCGS: 20.0°N, 108.9°W, 0 = 16 45 09. Revilla Gigedo Islands. h about 33 km.	
	JAS	iP		45.0	d		
	MIN	eP		50 14.4	c		
	CLS	eP		01.0	c		
	PRI	eP		49 31.0	c		
Nov. 11	MHC	eZ	19 16	13.5	d	USCGS: 56.5°N, 161.3°E, 0 = 19 06 57.1. Near east coast of Kamchatka. h about 33 km.	
	JAS	iP		15.5	Sc		
	MIN	eZ		15 55.0	c		
	CLS	eZ		16 02.5	d		
	PRI	eZ		25.0	d		
Nov. 11	JAS	iP	19 23	07.9	d	USCGS: 56.6°N, 161.3°E, 0 = 19 13 39.3. Near east coast of Kamchatka. h about 33 km.	
	MIN	eZ		22 39.7	c		
Nov. 12	MHC	eP	05 44	38	c	USCGS: 18.2°S, 176.4°W, 0 = 05 33 29. Fiji Islands. h about 107 km.	
	JAS	iP		06.8	c		
	MIN	iP		13.2	c		
	CLS	eP		23.4	c		
	PRI	eP		56.1	d		
Nov. 12	JAS	iP	09 37	13.8	Wc	USCGS: 16.7°S, 174.6°W, 0 = 09 25 54.1. Tonga Islands. h about 190 km.	
		ipP		38 05.9	d		
	MIN	iP		37 12.2	d		
		ipP		38 10.6	c		
Nov. 13	JAS	iP	15 26	27.9	Wc	USCGS: 18.1°S, 178.4°W, 0 = 15 15 27.4. Fiji Islands. h about 574 km.	
	MIN	iP		31.1	d		
Nov. 13	JAS	iP	22 10	27.8	d	USCGS: 29.2°S, 178.1°W, 0 = 21 57 30. Kermadec Islands. h about 77 km.	
Nov. 14	JAS	iP	01 45	52.0	d		
	MIN	eP		48.6	d		
Nov. 14	BKS	eP	02 13	17.0	d		
	JAS	iP		33.3	c		
	PRI	eP		11.5	d		
Nov. 14	BKS	iP	04 08	34.1	c	USCGS: 33.6°N, 131.6°E, 0 = 03 56 06.0. Kyushu, Japan. h about 60 km.	
	MHC	eP		37.8	c		
	JAS	iP		22.9	d		
		ipP		39.6	SEc		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 14	MIN	iP	10.6	d	
(Cont.)		ipP	28.2	c	
	CLS	eP	30.5	c	
	PRI	eP	45.4	c	
Nov. 14	BKS		12 58 00.0	c	USCGS: 18.2°N, 105.5°W, 0 = 12 52 46.3.
	MHC	eP	57 56.0	d	Off coast of Jalisco, Mexico.
	JAS	iP	54.0	c	h about 33 km.
	MIN	eP	58 18.6	c	
	CLS	eP	57 59.5	d	
	PRI	eP	43.3	c	
Nov. 15	BKS	eP	00 16 56.4	c	
	PRI	eP	17 01.4	c	
Nov. 15	MIN	eP	07 33 08.4	d	USCGS: 18.0°S, 176.3°W, 0 = 07 22 08.0.
					Fiji Islands. h about 608 km.
Nov. 15	MIN	iP	20 16 34.0	d	USCGS: 34.9°N, 5.2°W, 0 = 20 03 49.6.
					Morocco. h about 3 km. Felt.
Nov. 16	MIN	iP	00 07 14.8	d	USCGS: 47.2°N, 147.3°E, 0 = 23 57 20.
					Northwest of Kurile Islands.
					h about 297 km.
Nov. 16	JAS	iP	06 12 48.3	d	USCGS: 49.7°N, 78.0°E, 0 = 05 59 57.4.
					Eastern Kazakh. h about 0 km. Blast.
Nov. 16	JAS	eP	09 43 14.8	d	
Nov. 16	MIN	iP	22 19 32.9	c	USCGS: 85.8°N, 88.3°E, 0 = 22 09 48.
					North of Severnaya Zemlya.
					h about 33 km.
Nov. 17	BKS	eP	00 12 42.2	c	USCGS: 16.3°S, 173.7°W, 0 = 00 01 17.1.
	MHC	eP	43.4	d	Tonga Islands. Felt. h about 33 km.
	JAS	iP	13 06.8	d	
	MIN	iP	12 53.2	d	
	CLS	eP	43.7	d	
	PRI	eP	42.9	d	
Nov. 17	MIN	eP	08 20 35.4	d	USCGS: 23.5°S, 175.7°W, 0 = 08 08 56.7.
					Tonga Islands. h about 320 km.
Nov. 17	BKS	eP	08 28 41.5	Ec	USCGS: 5.7°S, 150.7°E, 0 = 08 15 39.3.
	iZ		29 17.5	c	New Britain region. h about 45 km.
	ePP		32 11.3	d	Magnitude 7 - 7 $\frac{1}{4}$ (BKS).
	eSNE		39 12.0	SW	
	ePSE		40 47.0	W	
	eGN		52.8		
	eRE		57.0		
			mu sec		
	PZ		0.63 2.2		
	PPZ		0.50 3.0		
	SH		10.0 10		
	MaxH		236 22		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 17	MHC	eP	08 28 43.8	c	
(Cont.)	JAS	eP	47.9	c	
		eS	39 20.3		
	MIN	eP	28 44.4		
		eS	39 42.8		
	CLS	eP	40.5	c	
	PRI	eP	47.5	c	
Nov. 17	MIN	eP	08 54 10.2	d	
Nov. 17	BKS	ePNE	11 14 29.1	NEc	USCGS: 23.4°S, 179.9°W, 0 = 11 03 06.8.
	MHC	eP	28.3	c	South of Fiji Islands.
	JAS	iP	34.4	c	h about 549 km.
		ePP	16 56.7		
	MIN	iP	11 37.7	c	
		iPP	16 37.5	c	
	CLS	eP	11 30.2	d	
	PRI	eP	29.0	c	
		ePP	16 27.3	c	
Nov. 17	MIN	eP	14 50 56.0	c	USCGS: 3.5°S, 150.1°E, 0 = 14 37 53.
					New Ireland region. h about 33 km.
Nov. 17	JAS	eP	19 12 43.0	c	USCGS: 12.7°N, 144.9°E, 0 = 19 00 10.4.
					South of Mariana Islands.
					h about 43 km.
Nov. 18	JAS	eP	04 14 55.1	c	USCGS: 13.1°S, 75.0°W, 0 = 04 03 58.0.
	MIN	eP	15 00.3	c	Peru. h about 80 km.
Nov. 18	BKS	iP	05 14 22.5	d	USCGS: 31.2°S, 67.6°W, 0 = 05 01 41.4.
	MHC	eP	18.6	d	San Juan Province, Argentina.
	JAS	iP	16.6	c	h about 8 km.
	MIN	eP	27.3	c	
	CLS	eP	25.8	d	
	PRI	eP	11.7	c	
Nov. 18	MIN	eP	13 29 15.8	d	USCGS: 51.7°N, 174.2°W, 0 = 13 21 47.2.
					Andreanof Islands. h about 12 km.
Nov. 18	BKS	eP	14 48 06.0	c	USCGS: 6.0°S, 148.2°E, 0 = 14 34 54.5.
		eS	15 00.6		New Britain region. h about 49 km.
		eG	13.5		
		eR	17.3		
			mu sec		
		PZ	0.035 1.0		
		MaxH	5.4 16		
	MHC	eP	14 48 08.5	c	
	JAS	eP	11.4	d	
	MIN	iP	08.8	c	
	CLS	eP	04.2	d	
	PRI	eP	12.0	c	
Nov. 18	MHC	eP	19 12 50.5	d	
	CLS	eP	44.0	c	
	PRI	eP	52.6	d	
Nov. 18	BKS	eP	22 32 48	c	USCGS: 20.2°S, 174.1°W, 0 = 22 21 01.9.
		eZ	33 24	d	Tonga Islands. h about 33 km.
		eSNE	42 32		
		eGN	52.2		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 18			mu sec		
(Cont.)		MaxH	3.7 11		
	MHC	eP	22 32 46.4	d	
	JAS	iP	44.0	c	
		ipP	33 05.4		
	MIN	eP	32 57.0	c	
	CLS	eP	47.9	c	
	PRI	eP	45.8	d	
Nov. 18	JAS	eP	23 46 51.6	d	USCGS: 20.1°S, 174.3°W, 0 = 23 35 03.9. Tonga Islands. h about 33 km.
	CLS	eP	30.2	c	
	PRI	eP	37.4	c	
Nov. 19	JAS	eZ	03 42 48.8	c	USCGS: 19.2°S, 169.3°E, 0 = 03 30 25.9. New Hebrides Is. h about 147 km.
Nov. 19	JAS	iZ	05 53 25.9	d	
Nov. 19	JAS	eP	15 58 37.5	c	USCGS: 3.4°S, 150.1°E, 0 = 15 45 31.2. New Ireland region.
	CLS	eP	34.2	c	
	PRI	eP	35.0	c	
Nov. 19	JAS	iP	16 27 38.8	c	USCGS: 10.8°S, 166.3°E, 0 = 16 15 26.2. Santa Cruz Is. h about 166 km.
Nov. 19	BKS	eP	23 48 15	c	USCGS: 6.0°S, 150.8°E, 0 = 23 35 06.0. New Britain region. Damage at Walindi. h about 3 km.
		ePPP	54 20	c	
		eSN	58 38	N	
		eG	00 12.0		
		eR	17.2		Magnitude $6\frac{3}{4}$ (BKS).
			mu sec		
		PZ	2.26 8		
		SH	9.32 12		
		MaxH	45 19		
	MHC	eP	23 48 17.7	d	
	MIN	iP	20.4	c	
	CLS	eP	14.6	d	
	PRI	eP	19.5	c	
Nov. 20	CLS	eP	00 08 16.2	c	USCGS: 6.9°S, 149.9°E, 0 = 23 55 06.8. New Britain region. h about 33 km.
	PRI	eP	22.9	c	
Nov. 20	JAS	eP	01 36 43.4	c	USCGS: 6.2°S, 150.4°E, 0 = 01 23 40.6. New Britain region. h about 61 km.
	MIN	eP	47.0	c	
Nov. 20	JAS	eP	02 42 56.6	d	
	MIN	eP	53.9	d	
Nov. 20	JAS	iP	03 15 02.3	c	USCGS: 6.2°S, 150.5°E, 0 = 03 01 52.3. New Britain region. h about 44 km.
	MIN	eP	10.3	d	
Nov. 20	JAS	iP	04 56 44.7	c	USCGS: 59.6°N, 148.2°W, 0 = 04 50 55.3. Kenai Peninsula, Alaska.
	MIN	iP	22.4	c	
		ipP	25.2	c	
Nov. 20	MIN	eZ	07 33 04.6	c	
Nov. 20	MHC	eP	23 43 45.4	d	USCGS: 44.6°N, 149.7°E, 0 = 23 33 08.9. Kurile Islands. h about 33 km.
	JAS	iP	43.6	c	
		ipP	44 06.3	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 20	MIN	iP	43 30.0	d	
(Cont.)		ipP	45.3	d	
	CLS	eP	33.9	c	
	PRI	eP	52.9	c	
Nov. 21	JAS	eP	00 02 25.2	d	USCGS: 44.6°N, 149.5°E, 0 = 23 51 35.4. Kurile Islands. h about 33 km.
	MIN	iP	12.0	d	
Nov. 21	MIN	eZ	02 34 45.7	c	USCGS: 1.0°N, 124.0°E, 0 = 02 16 44.5. Northern Celebes. h about 248 km.
Nov. 21	JAS	eP	02 45 52.6	c	
Nov. 21	MIN	eP	04 19 57.7	d	USCGS: 1.9°N, 96.8°E, 0 = 04 01 02.0. Off west coast of Northern Sumatra. h about 33 km.
Nov. 21	JAS	eP	12 40 38.6	c	
Nov. 21	BKS	eP	12 54 51.8	c	
		eZ	55 22.8	d	
		eR	53 44.0	NWd	
			mu sec		
		MaxH	1.58 26		
	JAS	eP	12 54 57.5	c	
	MIN	eZ	54.6	c	
	CLS	eP	51.2	c	
	PRI	eP	58.1	d	
Nov. 21	JAS	eP	14 43 45.8	c	USCGS: 13.1°N, 144.4°E, 0 = 14 31 13.9. Mariana Islands. h about 61 km.
	MIN	eP	50.7	d	
Nov. 21	JAS	eP	15 42 06.6	d	
	MIN	eP	41 44.5	d	
Nov. 21	BKS	iP	15 46 46.8	d	USCGS: 12.8°N, 145.2°E, 0 = 15 34 13.2. South of Mariana Islands.
		eZ	47 07.4	d	
		eSNE	57 08.0		
		eGN	16 08.5		
		eRE	14.2		
	MHC	eP	15 46 56.3	d	
	JAS	eP	49.3	c	
	MIN	eP	44.3	c	
	CLS	eP	41.5	d	
	PRI	eP	52.0	c	
Nov. 21	JAS	eP	15 53 58.3	c	
	MIN	eP	54 18.2	c	
Nov. 21	JAS	eP	17 37 03.0	c	
		eS	38 36.0		
	MIN	eZ	39 31.1	c	
Nov. 22	MIN	eP	00 13 09.9	c	USCGS: 24.0°N, 45.4°W, 0 = 00 02 33.3. North Atlantic Ridge. h about 33 km.
Nov. 22	BKS	eP	02 49 27	c	USCGS: 17.9°S, 178.5°W, 0 = 02 38 29.0. Fiji Islands. h about 563 km.
	MHC	eP	24.6	c	
	JAS	iP	39.9	c	
	MIN	iP	33.2	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 22	CLS	eP		24.6	c
(Cont.)	PRI	eP		24.5	c
Nov. 22	BKS	eP	02 53	56.0	c USCGS: 22.1°S, 171.1°E, 0 = 02 40 55.9. Loyalty Islands. h about 106 km.
	JAS	eP		34.0	c
	MIN	eZ		55.4	c
	CLS	eP		47.2	c
	PRI	eP		53.1	c
Nov. 22	BKS	eP	05 59	42	d USCGS: 6.2°S, 150.4°E, 0 = 05 46 33.3. New Britain region. h about 47 km.
	CLS	eP		41.8	d
	PRI	eP		43.3	d
Nov. 22	JAS	eP	18 53	37.3	d USCGS: 4.9°S, 151.9°E, 0 = 18 40 41.8. New Britain region. h about 86 km.
Nov. 22	JAS	eZ	21 58	43.1	c USCGS: 30.8°N, 140.7°E, 0 = 21 46 32.0. South of Honshu, Japan. h about 82 km.
Nov. 23	JAS	eP	07 11	35.7	c USCGS: 41.9°N, 86.1°E, 0 = 06 52 58.5. Southern Sinkiang Province, China. h about 33 km.
	MIN	eP		17.6	d
Nov. 23	JAS	eP	09 14	20.8	d USCGS: 6.5°S, 150.7°E, 0 = 09 01 11.0. New Britain region. h about 63 km.
Nov. 23	JAS	eP	10 59	33.6	c USCGS: 31.5°S, 72.0°W, 0 = 10 47 16.6. Near coast of Central Chile. h about 68 km.
Nov. 23	JAS	iP	19 07	06.1	c USCGS: 36.7°N, 140.7°E, 0 = 18 55 35.3. Near east coast of Honshu, Japan. h about 81 km.
Nov. 24	BKS	eP	01 51	56.3	d USCGS: 6.3°S, 150.7°E, 0 = 01 38 49.6. New Britain region. h about 33 km.
	e E		02 02	21.0	
	MHC	eP	01 51	57.5	c
	JAS	eP		52 00.5	c
	MIN	iP		51 57.7	d
	CLS	eP		54.1	c
	PRI	eP		52 01.5	c
Nov. 24	JAS	iP	06 46	22.1	c USCGS: 20.2°S, 179.2°W, 0 = 06 35 14.5. Fiji Islands. h about 660 km.
	MIN	eP		22.5	c
Nov. 24	JAS	iP	09 28	22.9	c USCGS: 51.9°N, 157.5°E, 0 = 09 18 46. Near east coast of Kamchatka. h about 87 km.
	MIN	iP		07.1	d
Nov. 24	BKS	eP	11 00	23.3	d USCGS: 6.8°S, 107.4°E, 0 = 10 41 33.5. Java. h about 125 km.
	iZ			51.8	c
	MHC	eP		24.9	d
	JAS	iP		25.3	d
	ipP			53.9	d
	MIN	iP		21.8	d
	ipP			50.7	d
	CLS	eP		22.2	d
	PRI	eP		27.7	d
Nov. 24	JAS	eP	11 13	00.5	c

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 24	BKS	eP	12 54	40.0	d USCGS: 31.1°N, 124.7°E, 0 = 12 40 51.4. Luzon, Philippine Islands. h about 5 km.
	iZ			55 07.5	c
	ePP			58 36.0	c
	eSNE		13 05	14.0	NWc Magnitude $5\frac{1}{2}$ - 6 (BKS).
	eGNE			19.4	
	eRNE			26.0	
			mu	sec	
	PZ			0.99 18	
	SH			6.51 20	
	MaxH			13.6 20	
	MHC	eP	12 54	49.2	c
	JAS	iP		43.7	c
	MIN	eZ		36.4	c
	CLS	eP		38.5	c
	PRI	eP		51.8	c
Nov. 24	JAS	iP	15 00	30.5	d USCGS: 24.6°S, 179.5°W, 0 = 14 48 47. South of Fiji Islands. h about 406 km.
Nov. 25	JAS	iP	00 03	28.1	c USCGS: 23.2°S, 176.0°W, 0 = 23 51 20. South of Fiji Islands. h about 33 km.
Nov. 25	BKS	eP	08 42	33.0	c USCGS: 16.1°S, 175.1°W, 0 = 08 31 32.9. Tonga Islands. h about 302 km.
	MHC	eP		33.8	c
	JAS	eP		37.7	c
	MIN	iP		43.6	c
	CLS	eP		33.8	d
	PRI	eP		32.5	c
Nov. 25	BKS	eP	09 42	38.0	c USCGS: 4.3°S, 122.2°E, 0 = 09 24 08.9. Celebes Islands. h about 610 km.
	MHC	eP		42.8	c
	JAS	iP		47.7	c
	MIN	eP		16.4	d
	CLS	eP		35.1	c
	PRI	eP		49.0	c
Nov. 25	BKS	eP	09 52	30.0	c
	eZ			39.0	d
	MHC	eP		37.1	d
	JAS	iP		24.8	c
	ipP			32.9	d
	MIN	iP		39.1	d
	CLS	eP		30.4	c
	PRI	eP		24.5	d
Nov. 26	MIN	eP	03 19	52.9	d
Nov. 26	BKS	eP	10 34	18	d USCGS: 24.9°N, 122.0°E, 0 = 10 21 07.2. Taiwan region. h about 33 km.
	eSE			45 20	c
	eGNE			11 00.0	
	eRE			04.2	
	MHC	eP	10 34	24.7	d
	MIN	eP		14.0	c

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 26		epP	23.4	d	
(Cont.)	CLS	eP	15.5	c	
	PRI	eP	25.8	d	
Nov. 26	JAS	eP	16 42 49.8	d	USCGS: 58.7°N, 152.0°W, 0 = 16 36 50.6. Kodiak Islands. h about 33 km.
	MIN	iP	31.1	d	
Nov. 26	JAS	iP	19 50 41.7	c	
Nov. 27	JAS	iP	05 46 31.1	c	USCGS: 45.2°N, 150.9°E, 0 = 05 36 01.5. Kurile Islands. h about 33 km.
Nov. 27	BKS	eP	07 53 12.2	d	USCGS: 62.6°N, 151.5°W, 0 = 07 47 07.6. Central Alaska. h about 113 km.
	eNEZ		34.7	c	
			mu sec		
		PZ	0.078 1		
	MHC	eP	07 53 17.6	c	
	JAS	eP	16.9	d	
	MHC	eP	17.6	c	
	MIN	iP	52 54.8	d	
	CLS	eP	53 04.8	d	
	PRI	eP	31.0	d	
Nov. 27	JAS	iP	07 59 42.9	c	
	MIN	eP	33.8	c	
Nov. 27	JAS	iP	11 10 53.8	c	
Nov. 27	BKS	eP	13 59 18.4	d	USCGS: 37.9°N, 138.3°E, 0 = 13 47 42.7. Near west coast of Japan. h about 36 km.
	iZ		38.5	d	
	MHC	eP	22.3	c	
	JAS	iP	24.5	c	
	ipP		14 00 10.0	c	
	MIN	iP	13 59 12.7	c	
	ipP		14 00 02.3	d	
	CLS	eP	13 59 15.1	c	
	PRI	eP	31.3	c	
Nov. 27	JAS	iP	14 40 01.3	d	
	MIN	iP	18.4	c	
Nov. 27	JAS	iP	18 47 10.7	c	
Nov. 27	JAS	iP	18 55 00.3	c	USCGS: 29.7°N, 42.0°W, 0 = 18 44 27.1. North Atlantic Ridge. h about 33 km.
Nov. 28	JAS	eP	13 02 38.4	d	USCGS: 35.5°N, 140.7°E, 0 = 12 51 07.1. Near east coast of Honshu, Japan. h about 72 km.
Nov. 28	BKS	eP	16 51 19.5	d	USCGS: 7.7°S, 72.2°W, 0 = 16 41 33.4. Western Brazil. h about 626 km.
	eZ		37.2	c	
			mu sec		
		PZ	0.183 1		Magnitude 5 (BKS).
	MHC	eP	16 51 15.7	d	
	JAS	iP	11.8	d	
	MIN	eP	24.3	d	
	CLS	eP	23.3	d	
	PRI	eP	07.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 28	BKS	iP	16 59 15.5	d	USCGS: 8.0°S, 71.4°W, 0 = 16 49 30.3. Western Brazil. h about 655 km.
		epPPNE	17 02 54.0	NE	Magnitude 5 $\frac{1}{4}$ (BKS).
		eSNE	07 12.0	SEc	
		eSSNE	11.7		
		eGE	18.0		
			mu sec		
		PZ	1.42 8		
		SH	1.80 10		
	MHC	eP	16 59 11.3	d	
	JAS	eP	07.7	d	
	CLS	eP	19.0	d	
	PRI	eP	02.8	d	
Nov. 29	JAS	eZ	02 49 15.4	d	
Nov. 29	JAS	iP	03 34 02.5	c	USCGS: 3.6°S, 80.6°W, 0 = 03 24 28.8. Peru-Ecuador border region. h about 33 km.
Nov. 29	BKS	eP	06 32 15.5	d	USCGS: 19.4°S, 169.2°E, 0 = 06 20 10. New Hebrides Islands. h about 329 km.
	MHC	eP	15.6	c	
	JAS	eP	20.4	c	
	CLS	eP	17.0	d	
	PRI	eP	17.1	c	
Nov. 29	BKS	iP	09 20 16.0	c	USCGS: 6.8°N, 73.2°W, 0 = 09 11 05.8. Northern Colombia. h about 171 km.
	MHC	eP	11.1	d	
	JAS	iP	05.9	c	
	MIN	eP	08.2	d	
	CLS	eP	19.1	d	
	PRI	eP	01.5	d	
Nov. 29	JAS	iP	09 33 39.5	c	
	MIN	eP	35 24.4	c	
Nov. 29	JAS	iP	12 48 36.8	c	
Nov. 29	BKS	eP	14 27 28.5	c	USCGS: 32.9°N, 115.6°W, 0 = 14 25 24. California-Mexico border. h about 14 km.
	eSNE		29 34.0		
	MHC	eP	27 14.3	d	
	JAS	iP	03.9	d	
	MIN	eZ	50.7	c	
	PRI	eP	26 55.5	d	
	eS		28 27.0		
Nov. 29	JAS	iP	21 08 33.9	d	USCGS: 31.0°N, 141.2°W, 0 = 20 56 39.2. South of Honshu, Japan. h about 33 km.
	MIN	eZ	24.3	c	
Nov. 30	JAS	eP	00 28 40.7	d	USCGS: 38.9°S, 72.4°W, 0 = 00 15 57.0. Central Chile. h about 87 km.
Nov. 30	JAS	eP	07 15 49.0	c	
	MIN	iP	16.7	c	
Nov. 30	BKS	eP'	12 46 37.8	c	USCGS: 6.8°N, 94.8°E, 0 = 12 27 38.6. Nicobar Islands region. h about 33 km.
	eZ		43.2	c	
	ePP		48 27.0	d	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Nov. 30		epPP	54.0	d	
(Cont.)		ePS	58 18.0	d	
		eSSNE	13 05 04.0	NWc	
		eSSSNE	09 56.0	NWc	
		eGNE	19.0		
		eR	28.4		
	MHC	eP'	12 46 38.6	d	
		ePP	48 30.2	c	
	JAS	eP'	46 36.2	c	
	MIN	eP	43 15.1	c	
		eP'	46 29.6	c	
		ePP	48 17.4	d	
	CLS	eP'	46 35.5	d	
		ePP	48 21.0	c	
	PRI	eP'	46 40.3	d	
		ePP	48 41.7	d	
Nov. 30	MIN	eP	12 56 35.9	c	
Nov. 30	JAS	eP	12 59 53.1	c	
Nov. 30	BKS	iP	19 04 36.0	d	USCGS: 24.0°S, 179.9°E, 0 = 18 53 11.4. South of Fiji Islands. h about 550 km.
	MHC	eP	36.0	c	
	MIN	iP	45.0	d	
	CLS	eP	36.5	c	
	PRI	eP	35.3	c	
Dec. 1	BKS	eP	05 04 44.7	d	USCGS: 18.9°S, 175.8°W, 0 = 04 53 23.9. Tonga Islands. h about 232 km.
	MHC	eP	45.6	d	
	JAS	eP	51.8	c	
		ipP	05 46.1	c	
	MIN	eP	04 54.8	c	
		epP	05 51.8	d	
	PRI	eP	04 45.4	d	
Dec. 1	BKS	eP	11 59 40.3	c	USCGS: 30.4°S, 177.9°W, 0 = 11 47 02.4. Kermadec Islands. h about 33 km.
	MHC	eP	40.5	c	
	JAS	iP	43.1	c	
	PRI	eP	36.0	c	
Dec. 1	JAS	iP	15 38 51.1	c	
Dec. 2	BKS	eG	08 47.0		USCGS: 30.6°N, 42.0°W, 0 = 08 20 45.6. North Atlantic Ridge. h about 33 km.
		eR	50.9		
	MHC	eP	31 24.1	c	
	JAS	eZ	14.6	c	
	MIN	eZ	15.9	d	
	CLS	eP	27.0	c	
	PRI	eP	22.8	c	
Dec. 2	JAS	eP	10 21 36.9	c	USCGS: 9.1°S, 158.0°E, 0 = 10 08 39.6. Solomon Islands. h about 42 km.
	MIN	eZ	35.1	c	
Dec. 2	JAS	eP	11 45 40.9	c	USCGS: 21.9°S, 175.2°W, 0 = 11 33 36.6. Tonga Islands. h about 33 km.
	MIN	eP	39.5	c	
Dec. 2	BKS	eP	13 25 08.8	c	USCGS: 53.8°N, 165.4°W, 0 = 13 18 29.0. Fox Islands. h about 35 km.
		eGNE	32.5		
		eR	33.5		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Dec. 2	MHC	eP	25 08.8	d	
(Cont.)	JAS	iP	17.8	c	
	MIN	iP	24 58.6	d	
		ipP	25 03.0	d	
	CLS	eP	02.8	c	
	PRI	eP	26.9	c	
Dec. 2	JAS	eP	13 31 31.9	d	
	MIN	eP	24.3	c	
Dec. 2	JAS	iP	14 42 04.1	d	
Dec. 3	BKS	eP	01 01 53.0	c	
	MHC	eP	52.6	d	
	PRI	eP	52.0	c	
Dec. 3	BKS	eP'	04 10 10	c	USCGS: 15.0°S, 66.8°E, 0 = 03 50 01.2. Mid-Indian rise. h about 46 km.
		eSNE	35 12		
		eNE	40		
		eGNE	54		
		eRNE	05 05.0		
	MHC	eZ	04 10 21.0	c	
	JAS	eP'	09 52.8	c	
	MIN	eZ	49.1	c	
	CLS	eZ	51.0	c	
	PRI	eZ	56.0	c	
Dec. 3	JAS	eP	08 35 35.7	c	USCGS: 19.4°N, 155.5°W, 0 = 08 28 38.5. Hawaii region. h about 24 km.
	MIN	eP	37.9	d	
Dec. 3	MIN	eP	09 48 46.1	c	USCGS: 24.4°N, 109.2°W, 0 = 09 44 16. Gulf of California. h about 33 km.
Dec. 3	JAS	eP	19 44 50.9	d	
Dec. 4	JAS	eP	00 50 27.7	d	USCGS: 15.4°S, 173.9°W, 0 = 00 38 54.7. Tonga Islands. h about 33 km.
Dec. 4	BKS	eSNE	02 07 06	Nd	USCGS: 7.8°N, 102.7°W, 0 = 01 54 49.3. Off coast of Mexico. h about 33 km.
		eGNE	09.0		
		eR	11.4		
	MHC	e(P)	01 16.7	d	
	JAS	eP	29.5	c	
	MIN	eP	54.2	c	
	CLS	e(P)	37.5	c	
	PRI	e(P)	18	c	
Dec. 4	JAS	iP	07 53 55.7	c	
	MIN	iP	41.8	d	
Dec. 4	JAS	eP	09 33 03.0	d	USCGS: 21.3°S, 67.4°W, 0 = 09 21 14.2. Chile-Bolivia border. h about 60 km.
Dec. 4	BKS	eP	16 01 56	c	USCGS: 6.4°S, 150.7°E, 0 = 15 48 43.4. New Britain region. h about 19 km.
		eSNE	13 52	NEd	
		eNEZ	18 52	SWd	
		eGNE	25.0		
		eRN	29.5		
	MHC	eP	01 55.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Dec. 4	MIN	eZ	53.5	c	
(Cont.)	JAS	eP	56.2	c	
	CLS	eP	02 01.0	c	
	PRI	eP	01 57.0	c	
Dec. 4	JAS	eP	21 24 39.0	c	
Dec. 5	JAS	iP	05 25 55.1	d	USCGS: 20.9°S, 178.5°W, 0 = 05 14 39.6. Fiji Islands. h about 529 km.
	MIN	iP	58.1	c	
Dec. 5	JAS	eZ	10 45 30.4	d	USCGS: 17.8°S, 167.8°E, 0 = 10 32 39.2. New Hebrides Islands. h about 33 km.
Dec. 5	BKS	eP	19 55 24.8	c	USCGS: 59.4°N, 144.8°W, 0 = 19 50 01.6. Gulf of Alaska. h about 33 km.
		eGE	20 01 08.0		
		eRZ	02.2		
	JAS	eP	19 55 37.4	d	
	MIN	iP	14.7	d	
		ipP	26.3	c	
	CLS	eP	24.7	d	
	PRI	eP	50.5	d	
Dec. 5	BKS	eP	22 40 57.4	d	USCGS: 54.0°N, 161.5°E, 0 = 22 31 44.3. Near east coast of Kamchatka.
	MHC	eP	41 03.0	d	
	JAS	eP	05.0	d	h about 38 km.
		ipP	16.1	c	
	MIN	iP	40 47.8	c	
	CLS	eP	52.3	d	
	PRI	eP	41 14.0	c	
Dec. 5	BKS	eP	00 00 52.0	d	USCGS: 53.9°N, 161.0°E, 0 = 23 51 38.8. Near east coast of Kamchatka.
	MHC	eP	57.5	d	
	JAS	eP	59.7	d	h about 38 km.
	MIN	eP	42.1	d	
	CLS	eP	47.1	d	
	PRI	eP	01 09.0	c	
Dec. 6	BKS	eP	00 05 12.0	d	USCGS: 54.0°N, 161.5°E, 0 = 23 55 59.2. Near east coast of Kamchatka.
		eE	08 32		
		eNEZ	12.8		h about 39 km.
	MHC	eP	05 18.0	d	
	JAS	iP	20.2	d	
		epP	31.7	c	
	MIN	eP	02.5	d	
		ipP	13.8	c	
	CLS	eP	07.3	d	
	PRI	eP	28.2	c	
Dec. 6	JAS	eP	03 26 38.6	c	USCGS: 15.4°S, 70.5°W, 0 = 03 15 37.7. Southern Peru. h about 164 km.
Dec. 6	JAS	eP	04 41 00.7	c	
Dec. 6	JAS	eP	05 16 29.2	c	USCGS: 17.9°N, 145.5°E, 0 = 05 03 57.5. Mariana Islands. h about 13 km.
Dec. 6	JAS	eP	05 52 09.0	c	USCGS: 18.0°S, 178.5°W, 0 = 05 41 06.9. Fiji Islands. h about 551 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Dec. 6	JAS	iP	08 24 39.7	c	
Dec. 6	JAS	iP	11 21 56.0	d	USCGS: 17.8°N, 146.5°E, 0 = 11 09 37. Mariana Islands. h about 16 km.
Dec. 7	JAS	eZ	03 53 15.2	d	USCGS: 12.0°N, 122.3°E, 0 = 03 39 04.1. Philippine Islands. h about 50 km.
Dec. 7	JAS	eP	05 46 53.9	c	
Dec. 7	JAS	eP	06 12 03.0	d	USCGS: 5.5°S, 80.3°W, 0 = 06 02 21.5. Near coast of Northern Peru. h about 345 km.
Dec. 7	BKS	eP	09 11 41.3	c	USCGS: 5.4°S, 151.3°E, 0 = 08 58 43.8. New Britain region. h about 54 km.
		eSKSNE	22 08	SW	
		ePSE	23 40	W	Magnitude $5\frac{1}{2} - 5\frac{3}{4}$ (BKS).
		eSSNE	28 40		
		eGN	36.0		
		eRE	39.5		
			mu sec		
		PZ	0.104 1.0		
		MaxH	6.67 28		
	MHC	eP	09 11 43.5	c	
	JAS	iP	47.6	Ec	
	MIN	eP	43.9	c	
	CLS	eP	40.3	c	
	PRI	eP	47.3	c	
Dec. 7	JAS	eP	09 29 06.1	c	
Dec. 7	JAS	iP	16 05 49.7	c	
Dec. 7	JAS	iP	18 39 56.3	c	USCGS: 51.7°N, 158.0°E, 0 = 18 30 17. Near east coast of Kamchatka Peninsula. h about 50 km.
Dec. 7	BKS	eP	19 01 24	c	USCGS: 6.7°N, 82.2°W, 0 = 18 52 47.6. South of Panama. h about 20 km.
		eSNE	08 22	NEc	
		eGNE	14 32		
		eR	15.6		
			mu sec		
		PZ	0.042 1.0		
		SH	2.33 20		
		MaxH	4.10 28		
	MHC	eP	19 01 19.4	c	
	JAS	eP	14.3	c	
	CLS	eP	28.8	c	
	PRI	eP	09.0	c	
Dec. 8	JAS	eP	04 19 31.8	c	USCGS: 11.5°N, 87.0°W, 0 = 04 11 53.7. Near coast of Nicaragua. h about 48 km.
	MIN	eP	41.8	d	
Dec. 8	JAS	iP	09 25 35.5	c	USCGS: 21.3°S, 81.8°W, 0 = 09 14 29. Southeast Central Pacific Ocean. h about 33 km.
Dec. 8	BKS	iP	18 01 31.5	d	
		eSNE	11 12.0	NE	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Dec. 8 (Cont.)		eGNE	21.2		
		eRE	24.0		
			mu sec		
		PZ	0.061 0.7		
		MaxH	3.9 32		
	MHC	eP	18 01 34.6	c	
	JAS	iP	37.3	c	
		ePP	04 28.5	c	
	CLS	eP	01 27.3	c	
	PRI	eP	43.2	d	
Dec. 8	JAS	iP	21 05 03.6	c	USCGS: 19.0°N, 64.0°W, 0 = 20 55 55.3. Leeward Islands. h about 55 km.
Dec. 9	MHC	eP	11 33 50.5	c	USCGS: 35.1°S, 109.7°W, 0 = 11 22 22. Easter Islands. h about 33 km.
	JAS	iP	51.5	c	
	MIN	eP	34 16.1	c	
	CLS	eP	33 58.0	c	
	PRI	eP	43.0	c	
Dec. 9	BKS	eP	13 47 20.0	c	USCGS: 27.5°S, 63.2°W, 0 = 13 35 42.4. Santiago del Estero Province, Argentina. h about 586 km.
		ePcP	33.8	d	
		epP	49 26.0	d	
		eSKSNE	56 48.0	NWd	Magnitude 5 - 5 $\frac{1}{4}$ (BKS).
		iSP	57 52.0	d	
		esSSNE	11 05.8		
		eGNE	09.4		
			mu sec		
		PZ	0.167 1.0		
	MHC	eP	13 47 16.9	c	
		epP	49 22.6	d	
		eSKS	56 36.0	c	
	JAS	iP	47 14.3	c	
		ipP	49 19.2	d	
	MIN	iP	47 24.8	d	
		eS	57 02.7		
	CLS	eP	47 23.0	c	
		epP	49 29.0		
		eSKS	56 55.7	c	
	PRI	eP	47 09.8	c	
		epP	49 15.0	d	
		eSKS	56 33.8	d	
Dec. 9	BKS	eP	16 55 49.0	c	USCGS: 20.4°S, 68.0°W, 0 = 16 44 02.2. Southern Bolivia. h about 83 km.
	MHC	eP	45.3	d	
	JAS	iP	42.5	d	
		ipP	56 12.3	c	
	CLS	eP	55 52.2	d	
	PRI	eP	36.9	d	
Dec. 9	JAS	eP	19 21 31.6	c	USCGS: 1.1°S, 77.4°W, 0 = 19 12 21. Ecuador. h about 242 km.
	MIN		47.7	c	
Dec. 10	JAS	eP	02 44 44.2	d	USCGS: 1.9°N, 76.7°W, 0 = 02 35 40. Colombia. h about 191 km.

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Dec. 10	BKS	eT	12 35 21.3	c	USCGS: 19.5°N, 155.3°W, 0 = 11 53 45.2. Hawaii region. h about 10 km.
	MHC	eT	36.2	c	
	CLS	eT	23.2	c	
	PRI	eT	36 03.6	c	
Dec. 10	BKS	eP	15 22 05.5	d	USCGS: 36.5°S, 110.5°W, 0 = 15 10 25.6. Easter Island. h about 33 km.
		iZ	19.5	d	
	MHC	eP	21 56.5	c	
	JAS	eP	22 03.4	d	
	CLS	eP	06.2	d	
	PRI	eP	21 53.5	d	
Dec. 10	BKS	iP	15 22 31.4	d	USCGS: 40.4°N, 138.9°E, 0 = 15 11 05.5. Eastern Sea of Japan. h about 33 km.
		ipP	40.0	c	
		eSNE	31 42.0	NWd	
		eSSNE	36 20.0	SWd	Magnitude 5 $\frac{3}{4}$ - 6 (BKS).
		eNEZ	40.0	SWd	
			mu sec		
		PZ	2.88 14		
		SH	2.76 14		
	MHC	eP	15 22 34.4	c	
	JAS	eP	37.0	d	
	CLS	eP	27.0	d	
	PRI	eP	42.8	c	
Dec. 10	BKS	eP	23 42 20.3	c	
	MHC	eP	20.7	d	
	JAS	eP	22.9	d	
		ipP	30.2	c	
	CLS	eP	12.4	d	
	PRI	eP	29.2	d	
Dec. 11	MHC	eP	16 48 09.0	d	
	JAS	eP	13.1	d	
	CLS	eP	05.0	d	
	PRI	eP	09.5	d	
Dec. 12	JAS	eP	02 31 22.0	d	USCGS: 15.0°S, 173.8°W, 0 = 02 19 52.2. Tonga Islands. h about 33 km.
Dec. 12	BKS	eP	07 33 09.0	d	USCGS: 6.9°S, 150.6°E, 0 = 07 20 00.0. New Britain. h about 33 km.
		eRE	08 02.3		
	MHC	eP	07 33 11.5	c	
	JAS	iP	14.7	d	
	CLS	eP	10.8	c	
	PRI	eP	14.1	c	
Dec. 12	JAS	eP	09 34 16.1	d	USCGS: 19.0°S, 199.5°E, 0 = 09 22 16.3. New Hebrides Islands. h about 261 km.
Dec. 12	JAS	eP	10 17 30.5	c	USCGS: 52.6°N, 169.3°W, 0 = 10 10 17.0. Fox Islands. h about 33 km.
Dec. 12	JAS	iP	19 57 08.4	c	USCGS: 26.1°S, 175.9°W, 0 = 19 44 55.7. South of Tonga Islands. h about 85 km.

Date	Sta.	Phase	Time (GCT) h m s	Ground Motion	Remarks
1964					
Dec. 13	JAS	iP	00 39 21.2	c	USCGS: 65.2°N, 164.9°W, 0 = 00 32 09.4. Alaska. h about 33 km.
Dec. 13	BKS	eP eSN eLNE eR	00 40 35.5 46 32.0 49.0 51.0	c	USCGS: 64.9°N, 165.7°W, 0 = 00 33 24.7. Alaska. h about 15 km. Felt in Nome.
		PZ	mu sec 0.095 15		
		MaxH	3.700 18		
	MHC	eP	00 40 40.2	d	
	JAS	iP	41.1	c	
	CLS	eP	29.0	c	
	PRI	eP	53.9	d	
Dec. 13	JAS	eP	06 49 59.2	c	USCGS: 15.0°S, 167.2°E, 0 = 06 37 07.3. New Hebrides Islands. h about 131 km.
Dec. 13	BKS	eREZ	14 00.0		USCGS: 20.1°N, 122.0°E, 0 = 13 15 49.8. Philippine Islands. h about 33 km.
Dec. 13	JAS	iP	14 36 47.2	d	USCGS: 45.2°N, 150.4°E, 0 = 14 26 15. Kurile Islands. h about 33 km.
Dec. 13	JAS	eP	17 14 16.8	d	
Dec. 13	JAS	iP	19 25 27.2	c	USCGS: 10.7°S, 165.0°E, 0 = 19 12 57.1. Santa Cruz Islands. h about 33 km
Dec. 14	BKS	eP' epPP eSP eSSNE esSSE eGNE eRZ	02 18 31 21 40 31 20 38 48 44 38 55.0 03 04.7	d d c	
	MHC	eP'	02 18 30.0	d	
	JAS	eP'	27.5	c	
	CLS	eP'	34.0	d	
	PRI	eP'	20.7	c	
Dec. 14	BKS	eP	06 53 11.8	c	USCGS: 28.2°N, 140.8°E, 0 = 06 41 23.1. Bonin Islands. h about 115 km.
	MHC	eP	11.9	c	
	JAS	iP	18.2	c	
	CLS	eP	08.6	c	
	PRI	eP	22.8	c	
Dec. 14	JAS	iP	13 28 36.0	c	
Dec. 14	JAS	iP	16 04 16.9	c	USCGS: 33.4°N, 142.0°E, 0 = 15 52 34.2. Off east coast of Honshu, Japan. h about 33 km.
Dec. 14	JAS	eP	21 36 16.1	d	USCGS: 13.9°N, 90.5°W, 0 = 21 29 06. Near coast of Guatemala. h about 33 km.

Date	Sta.	Phase	Time (GCT) h m s	Ground Motion	Remarks
1964					
Dec. 15	BKS	ePNE eSN	03 45 06.5 49 26.0	Sd	USCGS: 20.8°N, 106.6°W, 0 = 03 40 16.5. Off coast of Jalisco, Mexico. h about 33 km.
		PZ	mu sec 0.154 1.3		
	MHC	eP	03 44 59.0	d	
	JAS	iP	56.5	d	
	CLS	eP	45 14.1	d	
	PRI	eP	44 44.2	d	
Dec. 15	BKS	eP	12 20 13.8	d	USCGS: 14.7°N, 91.7°W, 0 = 12 13 25.8. Guatemala. h about 118 km.
		eSNEZ eGNE eRZ	25 47.0 29.9 31.1	NWd	
		SH	mu sec 3.13 20		
		MaxH	10.00 30		
	MHC	eP	12 20 08.7	c	
	JAS	iP	03.9	c	
	CLS	eP	19.7	c	
	PRI	eP	19 57.0	c	
Dec. 15	JAS	eP	12 26 17.4	c	
Dec. 15	BKS	eP	22 41 03.3	d	USCGS: 51.0°N, 169.6°W, 0 = 22 34 07.7. Fox Islands. h about 33 km.
	MHC	eP	10.4	d	
	JAS	eP	13.8	d	
	CLS	eP	40 59.1	c	
	PRI	eP	41 22.8	c	
Dec. 16	JAS	eP	19 32 28.0	c	USCGS: 21.8°S, 175.3°W, 0 = 19 20 26.3. Tonga Islands. h about 33 km.
Dec. 16	JAS	eP	19 42 03.1	d	USCGS: 24.8°N, 122.4°E, 0 = 19 28 50.0. Taiwan region. h about 61 km.
Dec. 17	JAS	eP	00 38 37.3	d	
Dec. 17	JAS	eP	03 34 37.5	d	
Dec. 17	BKS	iP	04 15 02.7	c	USCGS: 27.6°N, 140.0°E, 0 = 04 03 45.7. Bonin Islands. h about 468 km.
	MHC	eP	05.7	d	
	JAS	iP	08.3	c	
	CLS	eP	14 59.3	d	
	PRI	eP	15 13.1	d	
Dec. 17	JAS	eP	04 52 45.4	d	USCGS: 1.8°N, 84.6°W, 0 = 04 43 56.8. Off coast of Ecuador. h about 33 km.
Dec. 17	BKS	eP	05 29 02.2	c	USCGS: 45.4°N, 150.1°E, 0 = 05 18 34.8. Kurile Islands. h about 47 km.
		iZ	17.2	d	
		eSE	37 40.0	S	
		eGNE	44.9		
		eRE	47.4		
	MHC	eP	29 07.1	d	
	JAS	iP	08.9	c	
		ipP	23.9	d	
	CLS	eP	28 57.7	d	
	PRI	eP	29 16.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Dec. 17	JAS	eP	14 05 33.2	c	USCGS: 16.0°N, 96.9°W, 0 = 13 59 25.3. Oaxaca, Mexico. h about 36 km.
Dec. 17	JAS	iP	18 59 28.5	c	USCGS: 31.6°N, 138.0°E, 0 = 18 48 02.4. South of Honshu, Japan. h about 376 km.
Dec. 17	BKS	eP	23 52 25.0	d	USCGS: 51.4°N, 177.9°W, 0 = 23 44 46.2. Andreanof Islands. h about 57 km.
		eSNE	58 42.0	NW	
		eR	00 03.4		
			mu sec		
		PZ	0.076 1.5		
		SH	3.45 18		
		MaxH	5.4 36		
	MHC	eP	23 52 30.9	d	
	JAS	eP	33.5	c	
	CLS	eP	19.8	d	
	PRI	eP	42.1	d	
Dec. 18	JAS	iP	06 16 49.1	d	USCGS: 37.3°N, 142.0°E, 0 = 06 05 18.8. Off east coast of Honshu, Japan. h about 33 km.
Dec. 18	JAS	iP	19 02 03.9	c	USCGS: 29.5°N, 114.2°W, 0 = 18 59 34. Baja California. h about 33 km.
	PRI	eP	01 37.5	c	
		eS	04 16.0		
Dec. 19	JAS	eP	04 09 01.3	d	USCGS: 29.8°N, 114.1°W, 0 = 04 07 38. Baja California. h about 33 km.
	PRI	eP	08.7		
		eS	12 14.0		
Dec. 20	JAS	eP	13 43 33.3	c	USCGS: 37.5°N, 141.6°E, 0 = 13 31 54.7. Near east coast of Honshu, Japan. h about 40 km.
Dec. 21	JAS	iP	17 42 16.9	d	USCGS: 60.5°N, 146.8°W, 0 = 17 36 29.0. Southern Alaska. h about 43 km.
Dec. 21	BKS	eZ	18 38 31	c	USCGS: 63.1°N, 150.3°W, 0 = 18 32 03.0. Central Alaska. h about 111 km.
	JAS	iP	10.4	d	
	CLS	eZ	42.2	c	
	PRI	eP	25.0	d	
Dec. 22	BKS	eP	00 34 44.4	d	USCGS: 9.5°S, 71.3°W, 0 = 00 24 48.7. Peru-Brazil border. h about 614 km.
	MHC	eP	40.6	d	
	JAS	eP	35.7	SEd	
	CLS	eP	48.1	d	
	PRI	eP	31.7	d	
		epP	35 15.5		
Dec. 22	BKS	eLZ	05 32.0		
Dec. 22	BKS	eP	08 10 00.2	c	USCGS: 18.4°N, 68.8°W, 0 = 08 01 12.6. Mona Passage. h about 115 km.
		epP	27.3	c	
		eLE	25.0		
			mu sec		
		PZ	0.076 1.1		
	MHC	eP	08 09 56.9	d	
		epP	10 22.6	d	
		ePPP	15 01.0	c	

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
1964			h m s		
Dec. 22	MIN	iP	09 58.0	c	
(Cont.)		ipP	10 14.9	c	
	CLS	eP	09 57.1	d	
	PRI	eP	48.8	d	
		epP	10 15.5	c	
		ePPP	14 56.6	c	
Dec. 22	MHC	eP	12 09 22.8	c	USCGS: 22.2°S, 179.7°W, 0 = 11 58 10.1. South of Fiji Islands. h about 600 km.
	PRI	eP	22.5	c	
Dec. 24	BKS	eGN	19 22.5		
		eRE	25.5		
Dec. 25	MHC	eP	09 00 06	c	USCGS: 18.8°S, 69.0°W, 0 = 08 48 37.7. Northern Chile. h about 117 km.
	JAS	iP	36.5	d	
	MIN	eZ	48.8	c	
	PRI	eP	08 59 58.7	d	
Dec. 25	JAS	eP	14 02 38.1	d	USCGS: 35.2°N, 139.1°E, 0 = 13 50 50. Near south coast of Honshu, Japan. h about 104 km.
	MIN	eP	18.8	d	
Dec. 25	BKS	eZ	16 40 56		USCGS: 18.0°N, 101.2°W, 0 = 16 30 01.9. Near coast of Guerrero, Mexico. h about 81 km.
		eNE	42.3		
		eRZ	44.2		
	MHC	eP	35 32.2	c	
	JAS	iP	27.6	d	
	PRI	eP	20.0	d	
Dec. 25	BKS	eP	17 13 16.5	d	USCGS: 34.8°N, 139.3°E, 0 = 17 01 32.2. Near south coast of Honshu, Japan. h about 33 km.
		eGNE	32.9		
		eR	36.0		
	MHC	eP	13 21	d	
	JAS	iP	22	c	
	PRI	eP	26	c	
Dec. 25	JAS	iP	18 08 36.9	d	USCGS: 25.3°S, 68.1°W, 0 = 17 56 40.1. Chile-Argentina border. h about 101 km.
	MIN	eP	49.7	c	
Dec. 26	BKS	eP	08 22 28.5	c	USCGS: 16.7°N, 99.6°W, 0 = 08 16 28.9. Near coast of Guerrero, Mexico. h about 33 km.
		eSNE	27 24.0		
		eGNE	29.3		
		eR	30.9		
			mu sec		
		PZ	0.038 1.0		
		SH	2.08 24		
		MaxH	6.2 26		
	MHC	eP	08 22 22.1	c	
	JAS	eP	15.4	c	
	MIN	eP	42.9	d	
	PRI	eP	10.3	d	
Dec. 26	BKS	eP	14 39 56.8	Ec	USCGS: 51.8°N, 156.8°E, 0 = 14 30 29.1. Kamchatka Peninsula. h about 136 km.
		epP	40 19.0	c	
		ePcP	50.7	d	Magnitude 6 (BKS).

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Dec. 26		iPP	42 07.0	d	
(Cont.)		ePPP	43 49.0	d	
		iSNE	47 36.0	SW	
		eSSE	51.3	W	
		eGNE	54 04.0	NW	
		eRNE	56.0		
			mu sec		
		PZ	1.84 8		
		PPZ	0.177 1.7		
		SH	3.50 22		
		MaxH	4.55 28		
	MHC	eP	14 39 56.8	c	
	JAS	iP	40 01.4	SEc	
		ipP	32.4	c	
	MIN	iP	39 57.5	c	
		ipP	40 15.1	c	
	PRI	eP	11.9	c	
Dec. 28	MHC	eP	16 27 22.5	c	USCGS: 22.1°S, 179.6°W, 0 = 16 16 11.0.
	JAS	iP	25.8	c	South of Fiji Islands.
		iPP	29 32.7	d	h about 611 km.
	MIN	eP	27 31.6	c	
		ePP	29 40.4	c	
		eS	37 04.6		
	PRI	eP	27 22.5	c	
Dec. 28	MIN	eZ	16 54 05.7	c	
Dec. 28	BKS	eP	17 14 26.2	c	USCGS: 86.7°N, 68.7°E, 0 = 17 04 57.0.
		iZ	40.0	c	North of Franz Josef Land.
	MHC	eP	32.5	d	h about 33 km.
	JAS	iP	37.8	d	
	MIN	eP	13.8	d	
	PRI	eP	36.0	c	
Dec. 29	JAS	eP	01 47 43.9	c	USCGS: 51.5°N, 175.0°W, 0 = 01 40 08.4.
	MIN	eZ	42.0	c	Andreanof Islands. h about 38 km.
Dec. 29	JAS	iP	02 12 40.7	d	USCGS: 59.6°N, 145.3°W, 0 = 02 07 03.4.
	MIN	iP	19.8	c	Gulf of Alaska. h about 33 km.
Dec. 29	JAS	eP	06 42 48.7	c	USCGS: 51.4°N, 174.9°W, 0 = 06 35 02.2.
	MIN	eP	29.5	d	Andreanof Islands. h about 22 km.
Dec. 30	BKS	eGNE	10 19.5		USCGS: 8.7°S, 109.3°W, 0 = 09 58 01.
		eR	20.2		North of Easter Island.
	JAS	iP	06 34.4	c	h about 33 km.
Dec. 30	JAS	iP	11 21 31.5	c	
Dec. 30	MIN	eP	13 21 24.9	c	USCGS: 12.4°N, 142.0°E, 0 = 13 08 50.2.
					South of Mariana Islands.
					h about 100 km.
Dec. 30	BKS	eR	14 11.8		

Date	Sta.	Phase	Time (GCT)	Ground Motion	Remarks
			h m s		
1964					
Dec. 30	BKS	iP	15 38 56.3	c	USCGS: 31.1°N, 138.8°E, 0 = 15 27 25.8.
		iZ	39 05.5		South of Honshu, Japan.
	MHC	eP	00.1	c	h about 261 km.
	JAS	iZ	00.2	c	
	MIN	iP	38 51.1	c	
	PRI	eP	39 06.8	d	
Dec. 30	BKS	iP	21 42 20.8	d	USCGS: 23.3°S, 179.9°W, 0 = 21 30 58.8.
		eZ	29.5	c	South of Fiji Islands.
	MHC	eP	21.0	c	h about 547 km.
	JAS	iP	25.0	d	
	PRI	eP	20.9	d	
Dec. 31	MHC	eP	01 09 30.0	c	USCGS: 18.9°N, 107.9°W, 0 = 01 04 38.
	JAS		27.6	d	Off coast of Jalisco, Mexico.
	MIN		56.5	c	h about 33 km.
	PRI		16.0	d	
Dec. 31	JAS	iP	01 58 37.3	d	USCGS: 28.7°N, 139.4°E, 0 = 01 47 13.
					Bonin Islands. h about 426 km.