

KONINKLIJK NEDERLANDS
METEOROLOGISCH INSTITUUT

Seismic Records
at De Bilt

Jaargang 39-1951

De Bilt 1957

P R E F A C E

This seismic Yearbook was composed under the supervision of Dr. J. Veldkamp director of the Geophysical Section. The records have been reduced by Mr. J. Oldeman, scientific assistant.

The Director in Chief of the Royal
Netherlands Meteorological Institute,
Ir. C.J. Warners.

De Bilt, December 1955

INTRODUCTION

SEISMOLOGICAL STATION DE BILT

The geographic coordinates of the seismological station are: $52^{\circ}6'1''$ N and $5^{\circ}10'6''$ E. The instruments are placed at a height of 3 m above mean sea-level on a subsoil consisting of sand (pleistocene).

The instruments are:

a set of seismographs (two horizontal and one vertical) with galvanometric recording according to GALITZIN, one astatic horizontal seismograph according to WIECHERT, $M = 200$ kg, two horizontal pendulums according to Bosch, $M = 25$ kg.

THE GALITZIN SEISMOGRAPHS AT DE BILT. Below are given: the period of the galvanometer T_1 , the reduced pendulum length l , the distance A_1 between the mirror of the galvanometer and the rough values for the natural period T of the undamped pendulum, of the damping constant μ and of the multiplying factor k for the year 1951.

	NS comp.	EW comp.	Z comp.
Period of galvanometer T_1	24.43 sec	24.96 sec	12.0 sec
Reduced length of pendulum l	123 mm	123 mm	406 mm
Distance A_1	1380 mm	1380 mm	1380 mm
Period of pendulum T	25 sec	25 sec	12 sec
Damping constant μ	0.0	0.0	0.0
Multiplying factor k	11.0	11.0	175

THE WIECHERT AND BOSCH SEISMOGRAPHS AT DE BILT. The mean values of the natural period of the undamped pendulum T , of the damping ratio ε and of the static magnification V for the year 1951 are:

	T	ε	V
WIECHERT (NS comp.)	5.0 sec	4	170
,, (EW comp.)	5.0 sec	4	170
BOSCH (NS comp.)	18.0 sec	4	20
,, (EW comp.)	18.0 sec	4	20

SEISMOLOGICAL STATION HEERLEN

The geographic coordinates of the seismological station are: $50^{\circ}53'0''$ N and $5^{\circ}59'0''$ E.

The instrument, a horizontal seismograph, $M = 450$ kg, is placed at a height of 100 m above mean sea-level on a subsoil consisting of loess.

The mean values of the constants for the year 1951 are:

T	ε	V	V max.	T max.
2	3	400	600	2

SEISMOLOGICAL STATION WITTEVEEN

The geographic coordinates of the seismological station are: $52^{\circ}48'8''$ N and $6^{\circ}40'1''$ E.

The instrument, a GRENET vertical seismograph with galvanometric record, is placed at a height of 2 m above mean sea-level on a subsoil consisting of pleistocene sand.

Recording started in April 1951.

The period of the seismograph is 2,3 sec, the period of the galvanometer is 0.8 sec. The maximum amplification is 6500 for a period of about 1 sec.

EXPLANATION OF THE TABLES

The data given in this Yearbook have mostly been obtained from the GALITZIN records. The velocity of the recording paper is 30 mm per minute, allowing a good time-accuracy. Only when the earthquake was extraordinarily severe, so that the GALITZIN records could not be analyzed, the records of the WIECHERT and BOSCH seismographs were used. The velocity of the paper of these seismographs is 10 mm and 15 mm per minute respectively. Whenever the WIECHERT and BOSCH records were used, this has been mentioned in the column 'remarks'.

In a few cases the data from the seismograph at Heerlen are mentioned. The time is Greenwich mean time.

In the column 'direction' + means an upward movement of the soil (compression), - means a downward movement (dilatation). Uncertain data have been given in parantheses. The following symbols were used for the phases.

P	=	normal first phase, or first longitudinal tremor.
PP	=	P-wave once reflected at the earth's surface near the epicentre.
PP	=	P-wave reflected halfway between epicentre and station.
PPP	=	P-wave two times reflected at the earth's surface.
PPPP	=	P-wave three times reflected.
S	=	second phase, arrival of the transversal tremor.
SS	=	S-wave reflected at the earth's surface near the epicentre.
PS	=	wave changed from longitudinal to transversal oscillation through reflection at the earth's surface.
PPS	=	wave twice reflected, having been transversal on one branch of the path.
SS	=	S-wave reflected halfway between epicentre and station.
SSS	=	S-wave two times reflected at the earth's surface.
SSSS	=	S-wave three times reflected at the earth's surface.
PcP	=	P-wave reflected at the core boundary.
ScS	=	S-wave reflected at the core boundary.
P' = PKP	=	wave having penetrated the core.
S' = SKS	=	transversal wave, having been longitudinal within the core.
PKS	=	alternating wave having penetrated the core.
PP'	=	P'-wave reflected near the epicentre.
SS'	=	S'-wave reflected near the epicentre.
SKKS	=	Alternating wave which has been reflected within the core.
L	=	long waves or surface waves.
M	=	maximum of the surface waves.
L'	=	surface waves travelling around the major arc.
M'	=	maximum of these waves.
i	=	sudden beginning of the phase.
e	=	gradual beginning of the phase.
F	=	end of discernable movement.
H	=	time of the shock at point of origin.
h	=	depth of the origin.
Δ	=	distance of epicentre.

The indices H, N, E, and Z refer to the horizontal, north-south, east-west and vertical components of the movement.

The distance of the epicentre and the depth of origin have been calculated by means of curves constructed with the aid of the time tables of Jeffreys and Bullen (1940).

The data given in the column 'amplitude' are the maximal amplitudes measured from the medium line. The amplitudes have been calculated by means of the formula:

$$V = \frac{A l k T_b}{\pi l} \cdot \frac{1}{\left\{ 1 + \left(\frac{T_b}{T} \right)^2 \right\}^2}$$

In this formula $A l$ is the distance between galvanometer mirror and recording paper, k is the multiplying factor, T_b the period of the wave, l the reduced length of the pendulum, T the free period of the undamped seismograph, and V the magnification. The period of the galvanometer is assumed to be equal to the free period of the undamped seismograph.

For the horizontal components of the Galitzin records the following mean values were used: $k = 11.0$ and $T = 24.5$ sec, and for the vertical component $k = 175$ and $T = 12.0$ sec.

Whenever it was possible the amplitudes and periods of the first P- and S-waves have been given. As the movement of these waves is irregular in general, the accuracy of these data is small. The amplitudes of the maxima of L-waves have been calculated in case of very strong earthquakes.



The amplitudes have been omitted when the oscillations were very irregular.

The seismological bulletins of the following stations were available: Algeria, Alicante, Almeria, Athens, Azores, BCIS (Bureau Central International de Seismologie), Beograd, Bogota, Brisbane, CMO (Japan), Coimbra, Columbia University (Palisades N.Y. and Bermuda), Djakarta, Dublin, Firenze, Geophysics Division (New Zealand), Granada, Harvard University, Helsinki, Helwan, Hermanus, Huancayo, Istanbul, Jena, John Carroll University (Cleveland), JSA (Jesuit Seismological Association), Kew, Ksara, La Paz, Lisboa, Manila, Nanking, Paris Pasadena, Perth, Poona, Potsdam, Praha, Prato, Reykjavik, Riverview N.S.W., Roma, Santiago (Chile), Seismographic Stations of the University of California, Seismological Service of Canada, Stuttgart, Tacubaya, Taiwan, Tananarive, Toledo, Trieste, Uppsala, USCGS (United States Coast and Geodetic Survey), Western Samoa, Weston (Mass.), Wien, Zürich.

THE MICROSEISMIC ACTIVITY

The table on page VIII shows the character of the microseismic activity (see also 1915 p. 101 and 1916 p. 101). The numbers 0, 1, 2 and 3 mean:

- 0 very weak and weak
- 1 moderate
- 2 strong
- 3 very strong

For measuring the microseismic activity the records of the GALITZIN seismograph were used. The table below gives the amplitudes of the oscillations (measured from the medium line) and the corresponding amplitudes of the movement of the surface.

Character	Ampl. record	Ampl. surface
0	0 - 1/2 mm	0 - 1 1/4 mm
1	1/2 - 2 ,,	1 1/4 - 5 ,,
2	2 - 4 ,,	5 - 10 ,,
3	4 ,,	10 ,,

CHARACTER OF THE MICROSEISMIC MOVEMENT

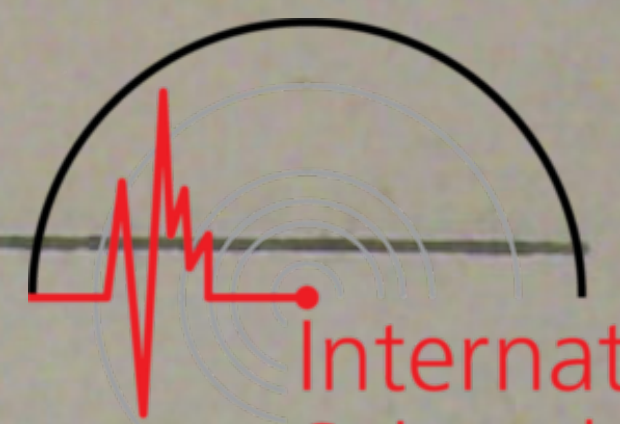
Date 1951	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1	2	1	2 1	0 1	0	0	1	0 1 0	1 0	0 1	2
2	1	2	1	1	1 0	0	0	1 0	0 1 0	0	1	2 1
3	1	2	1	1	0	0	0	0 1	0 1 0	0	1	2 1 2
4	1 2 1	2 3	1	1	0	0	0 1 0	1 0	0 1	0	2 3	2
5	1	3	1	1	0	0	0 1 0	0 1 0	1 0	0	3 2	2 3
6	1	3	1	1	0	0	0 1 0	0	0 1	0	2 1	3 2
7	1 2 1	3 2	1	1	0	0 1	0 1 0	0 1 0	1 0 1	0 1	1	2
8	1	2	1 2	1	0 1	1	0 1 0	0 1	1 1	1 2	1	2 3
'9	1	2	2 1	1	1 0 1	1 0	0 1 0	1 1	0 2	1 1	3 2	
10	1	2 2	1	1	1 2 1	1 0	0 1 0	1	0	1	1 2	2
11	2	3 1	0	1	1	0	0	0 1	2 0	1 1	2 1	2 1
12	3	2 0	1	1	1 3 2	0	0 1	0 2	1 1	2 1	1	1 0
13	2	1 1	0	1	2 1	0 1 0	1	0 1	0 2	1 0	1	0 1
14	1	0 1 0	1	2	1	0 1 0	1	0	0 1 0	2 0	1	1
15	1	0	1 2	1	1	0	1	0	0	2 1	1 3	1 2
16	1	1	2 1	2 1	2	0	1 0	0	0 2	1 1	3 2	2
17	1	2	2	2 1	2 1	0	0	0 0	1 1	0 1	2 2	2 3
18	2	2	1 3 2	1	0 1 0	0	0	0 1	0 1	2 1	2 1	3
19	2	1	2	2 1	1 0 1	0	0	0 1	1 0	1	1	3
20	1	2	1	1	0 0	1	0	0 1	0	1 2	1 2	3
21	1	2	2	1	0 1 0	1 0	0	0 1	0 0	2	2	3 2 3
22	2	2	1	1	0 1 0	1	0	0 0	1 0	2 0	2 1	3 2
23	2	1	1	2 1	2 1	0	0	0 1	0 0	1 0	1 2	2
24	1	1	2 1	2 1	1	0	0 1	0 1	1 0	1 2	3 2	2
25	1	2	1	1	0 1	0	0 1	0 1	2 1	1 2	2	2
26	2	1	1	0	0	0	0	0 2	1 0	2 1	2	2 3
27	2	1 0 1	1 3 1	0	0 2 0	0	0	0 2	1 0	1	2 3	3
28	2	1	1	0	0	0	0 1	1 0	0 0	1 0	3 2	3
29	1	0	0	1	0	0	0 1	0 0	1 0	0	2	3 2
30	0	1	1	0	0 1	0	0	0 1 0	1	0	2	2 3 2
31	1	2	1 2	1	0	0	1	0	0	0		2

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Jan. 1 (1)	eL F	3	42					(1) Disturbed by microseisms. BCIS 46°N 110°E, H. 3h 07m 40s. Eastern Mongolia.
Jan. 1 (2)	eL F	21	34					(2) Disturbed by microseisms. BCIS and USCGS: 18°S 169°E, H. 20h 16m 20s. New Hebrides Islands region.
Jan. 3 (3)	eL F	3	45					(3) Disturbed by microseisms. Wellington, N.Z.: 33½°S 178°W, H. 2h 11.1m.
Jan. 3 (4)	eL	13	05					(4) Disturbed by microseisms. F in next shock. USCGS: 18°N 106°W, H. 12h 21m 31s. Off coast of Colima, Mexico.
Jan. 3 (5)	eL F	13	48					(5) Disturbed by microseisms. USCGS: aftershock of (4), H. 13h 04m 24s.
Jan. 3 (6)	eL F	18	26					(6) Disturbed by microseisms. BCIS 39°S 73°W, H. 17h 27m 13s. Chile.
Jan. 5 (7)	eS eL F	1	15					(7) Disturbed by microseisms. USCGS: 7°N 81°W, H. 0h 52m 40s, h = about 100 km. Near southern coast of Panama.
Jan. 6 (8)	1P 1pP 1sP 1PP 1PPP 1S 1sS eSS F	5	25	39	+	5	13	(8) Disturbed by microseisms. BCIS and USCGS: 36½°N 70½°E, H. 5h 17m 19s, h = about 250 km. Hindu Kush region, northeastern Afghanistan.
Jan. 6 (9)	eP eS ePS eSS eL F	8	03	47				(9) Disturbed by microseisms. BCIS and USCGS: 7½°N 81°W, H. 7h 51m 31s, h = about 100 km. Southern Panama.
Jan. 6 (10)	eL F	19	34					(10) Disturbed by microseisms. Wellington, N.Z.: 4½°S 166½°E, H. 18h 12.3m.
Jan. 8 (11)	eL F	19	14					(11) Disturbed by microseisms. BCIS and USCGS: 35°N 140°E, H. 18h 32m 18s. Off southeast coast of Honshu, Japan.
Jan. 9 (12)	eL F	0	32					(12) Disturbed by microseisms. BCIS: 38°7'N 20°4'E, H. 0h 27m 57s. Off west coast of Greece.
Jan. 9 (13)	eL F	16	26					(13) Disturbed by microseisms. USCGS: 81°N 122°E, H. 16h 00m 24s. 250 miles northeast of Lenin Island.
Jan. 10 (14)	eL F	10	00					(14) Disturbed by microseisms. USCGS: 23°S 176°W, H. 8h 26m 56s, h = about 100 km. Tonga Islands region.

Seismic Records at De Bilt



International
Seismological
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Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Jan. 10 (15)	eL F	20	45					(15) Disturbed by microseisms. Wellington, N.Z.: $42^{\circ}8' S$ $173^{\circ}2' E$, H. 19h 15.3m. South Island, New Zealand.
Jan. 14 (16)	eL F	11	29					(16) Disturbed by microseisms. USCGS: $23^{\circ} S$ $176^{\circ} W$, H. 10h 19m 24s h = about 100 km. Tonga Islands region.
Jan. 15 (17)	iP ePKS ePPP eN eSS eL F	4	34	52	(-)	8	15	(17) Disturbed by microseisms. BCIS and USCGS: $15^{\circ} S$ $167^{\circ} E$, H. 4h 12m 14s; h = about 150 km. New Hebrides Islands.
		4	35	42				
		4	37	53				
		4	48.5					
		4	52	50				
		5	13					
		6	30					
Jan. 15 (18)	eL F	11	33					(18) Disturbed by microseisms. No z record.
		11	55					
Jan. 16 (19)	eL F	12	46					(19) Disturbed by microseisms. BCIS: $38^{\circ}1' N$ $20^{\circ}1/4' E$, H. 12h 36m 05s. Off west coast of Greece.
		12	53					
Jan. 18 (20)	eL F	21	50					(20) Disturbed by microseisms. BCIS and USCGS: $52^{\circ} N$ $177^{\circ} W$, H. 21h 15m 50s, h = about 60 km. Aleutian Islands.
		22	40					
Jan. 21 (21)	e F	19	02					(21) Disturbed by microseisms. BCIS: $39^{\circ} N$ $23^{\circ}1/4' E$, H. 18h 51.2m Greece.
		19	05					
Jan. 22 (22)	eL F	13	00					(22) Disturbed by microseisms. BCIS and USCGS: $17^{\circ}1/2' S$ $41^{\circ} E$, H. 12h 16m 02s. Mozambique Channel.
		13	25					
Jan. 23 (23)	eSS eL F	7	40					(23) Disturbed by microseisms. USCGS: $55^{\circ} S$ $136^{\circ} W$, H. 6h 52m 42s. South Pacific Ocean.
		8	03					
		9	00					
Jan. 24 (24)	eL F	5	45					(24) Disturbed by microseisms. BCIS and USCGS: $60^{\circ}1/2' S$ $22^{\circ} W$, H. 4h 49m 28s. Sandwich Islands.
		6	10					
Jan. 24 (25)	eL F	7	59					(25) Disturbed by microseisms. USCGS: $33^{\circ} N$ $115^{\circ}3/4' W$, H. 7h 17m 01s. Imperial Valley, California.
		8	20					
Jan. 25 (26)	eL F	17	20					(26) Disturbed by microseisms.
		17	46					
Jan. 26 (27)	eL F	4	22					(27) Disturbed by microseisms. No records* from Jan. 27 17h 07m till Jan. 28 9h 57m. No records from Jan. 28 10h 50m till Jan. 28 16h 25m.
		4	36					
Jan. 29 (28)	eL F	6	16					(28) Disturbed by microseisms. USCGS: $43^{\circ} N$ $128^{\circ} W$, H. 5h 43m 47s. Off Cape Mendocino, California.
		6	45					
Jan. 30 (29)	eL F	23	18					(29) Disturbed by microseisms. No z-record. BCIS: $32^{\circ}4' N$ $33^{\circ}4' E$, H. 23h 07m 23s. USCGS: $34^{\circ} N$ $33^{\circ} E$, H. 23h 07m 40s, h = about 100 km. Eastern Mediterranean Sea.
		23	50					

Seismic Records at De Bilt



Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
Febr. 10 (30)	eL F	5 00 5 30				(30) Wellington, N.Z.: 40°2 S 177°0 E, H. 3h 27.9m. Off south- east coast of North Island, New Zealand.
Febr. 10 (31)	eL F	22 50 23 10				(31) USCGS: H. 21h 52m 19s. Off north coast of New Guinea.
Febr. 12 (32)	eL F	4 04 4 45				(32) BCIS and USCGS: 52° N 179° E, H. 3h 31m 50s, h = about 200 km. Near Rat Island, Aleutian Islands.
Febr. 12 (33)	iP ePPP iS eL F	17 31 49 17 35 08 17 39 53 17 47 19 35				(33) BCIS: 65°6 N 137°0 E, H. 17h 22m 01s. USCGS: 66° N 136° E, H. 17h 22m 02s. Poona: 65° N 135° E, H. 17h 22m 08s. Near Verkhoyanski Mountains, Siberia.
Febr. 13 (34)	eP eL F	1 11 1 40 2 07				
Febr. 13 (35)	iPKP ipPKP iPP eSS F	12 14 53 12 15 59 12 18 21 12 36.5 14 00	- -			(35) BCIS and USCGS: 15° S 175° W, H. 11h 55m 50s, h = about 250km. Samoa Islands region
Febr. 13 (36)	iP ePP ePPP iS eSS eSSS eL F	22 24 21 22 26 52 22 28 45 22 33 41 22 38 26 22 41.5 22 47 2 30	+ +	7	10	(36) BCIS and USCGS: 56° N 155½° W, H. 22h 12m 58s. About 150 miles east of Alaska Peninsula.
Febr. 17 (37)	iPP iPPP iSS eL F	21 27 45 21 30 29 21 44 29 21 58 23 00				(37) Disturbed by microseisms. BCIS: 21h 07m 09s, h = about 200 km. USCGS: 7° S 146° E, H. 21h 06m 58s, h = about 100 km. Southeastern New Guinea.
Febr. 19 (38)	eL F	23 15 23 35				(38) Disturbed by microseisms. BCIS and USCGS: 25° S 117° W, H. 22h 11m 54s. About 500 miles west of Easter Islands.
Febr. 20 (39)	e F	1 28 1 55				(39) Disturbed by microseisms.
Febr. 22 (40)	eL F	2 45 3 05				(40) Disturbed by microseisms. BCIS: 3½° S 143° E, H. 1h 45m 46s. USCGS: H. 1h 45m 41s. North Central New Guinea.
Febr. 25 (41)	e F	13 40 13 55				(41) Disturbed by microseisms. BCIS: 37° N 142° E, H. 12h 51m 11s. USCGS: H. 12h 51m 09s. Off east coast of Honshu, Japan.
March 2 (42)	eP eS eL F	1 38.0 1 42 25 1 45 2 10				(42) Disturbed by microseisms. BCIS and USCGS: 53° N 35° W, H. 1h 32m 39s. North Atlantic Ocean.
March 2 (43)	e F	5 55 6 10				(43) Disturbed by microseisms.

Seismic Records at De Bilt



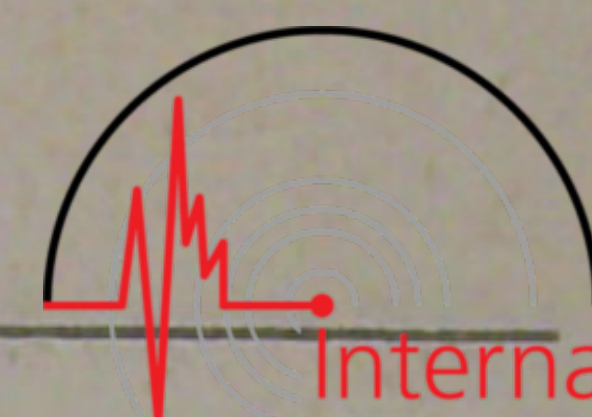
Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
March 4	eS	11 41.4				(44) Disturbed by microseisms.
(44)	eL	12 04				USCGS: 16° S 74° W, H. 11h 17m 33s
	F	12 30				h = about 150 km. Near coast of southern Peru.
March 4	e	16 05				(45) Disturbed by microseisms.
(45)	F	16 25				
March 5	eL	11 42				(46) Disturbed by microseisms.
(46)	F	12 00				BCIS: 0° 27° 4 W, H. 11h 14m 38 s.
						East of St. Paul Rocks.
March 5	1P	20 24 08	(-)	5 6		(47) BCIS and USCGS: 29° N 128° E,
(47)	1pP	20 25 06	(-)			H. 20h 11m 45s, h = about 150 km.
	1PP	20 27 30				Ryukyu Islands.
	1pPP	20 28 23				
	eS	20 34 28				
	ePS	20 35 25				
	ess	20 36 23				
	eL	20 52				
	F	21 40				
March 6	eL	19 35				(48) Disturbed by microseisms.
(48)	F	19 50				BCIS: 28.8 N 95.2 E, H. 18h 58m 14s.
						Poona: 29.3 N 94.8 E, H. 18h 58m 11s.
						Assam.
March 7	e	19 20				(49) Disturbed by microseisms.
(49)	F	19 40				USCGS: H. 18h 31m 58s. Off east coast of Honshu, Japan.
March 8	e	16 22				(50) Disturbed by microseisms.
(50)	F	16 30				BCIS and USCGS: 6° S 154° E, H. 15h 12m 11s, h = about 60 km. Solomon Islands region.
March 9	1PP	20 04 05				(51) Disturbed by microseisms.
(51)	ePS	20 13 50				BCIS and USCGS: 8° S 124½° E, H.
	eSS	20 20.0				19h 44m 16s. Flores Sea.
	eL	20 40				
	F	22 25				
March 10	eL	10 45 30				(52) Disturbed by microseisms.
(52)	F	11 00				BCIS: 38.2 N 4.3 W, H. 10h 38m 36s.
						Malaga: 38.2 N 3.7 W, H. 10h 37m 57s. South central Spain.
March 10	ePKP	22 16 43				(53) BCIS and USCGS: 15½° S 167½° E,
(53)	1z	22 16 50	+			H. 21h 57m 37s, h = about 200 km.
	epPKP	22 17 16				New Hebrides Islands.
	1PP	22 19 48				
	1pPP	22 20 15				
	eSS	22 38.0				
	eSSS	22 42.5				
	eL	23 02				
	F	24 45				
March 12	e	9 10				(54) Disturbed by microseisms.
(54)	F	9 17				BCIS: 42° N 31.7° E, H. 8h 56m 38s.
						Black Sea.
March 12	eP	15 03 20				(55) Disturbed by microseisms.
(55)	eH	15 12.2				BCIS: H. 14h 52m 09s. USCGS: H. 14h 52m 16s. Probably aftershock of Aug. 15 195
	eL	15 23				Assam.
	F	15 55				
March 14	1Pn	9 47 27				(56) He: 1Pg 9h 47m 10s, 1Pn 9h 47m 12s, 1Sg 9h 47m 19s, F 10h 00m. BCIS:
(56)	1Pg	9 47 32				50° 40' N 6° 50' E, H. 9h 46m 58s.
	1Sn	9 47 49				Stuttgart: 50° 36.5 N 6° 43.2 E, H. 9h 47m 00s. Near Euskirchen, Rhine, Germany.
	1Sg	9 47 52				
	F	10 00				

Seismic Records at De Bilt



Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
March 16 (57)	e F	14 24 14 45				(57) Disturbed by microseisms. BCIS: H. 13h 56m 45s. Poona: 31°4' N, 96°7' E, H. 13h 56m 50s. Eastern Tibet.
March 17 (58)	e eL F	4 55 5 05 5 40				(58) Disturbed by microseisms. BCIS and USCGS: 32° N 97° E, H. 4h 27m 35s. Poona: 32° N 96°5' E, H. 4h 27m 26s. Eastern Tibet.
March 19 (59)	eL F	10 12 10 25				(59) Disturbed by microseisms. BCIS and USCGS: 21½° S 33° E, H. 9h 29m 35s. South Mozambique.
March 19 (60)	eL F	21 05 21 40				(60) Disturbed by microseisms. BCIS and USCGS: 57° N 160° E, H. 20h 28m 55s. Northern Kamchatka.
March 23 (61)	ePKP1 ePKP2 ePP ez eSS F	21 58 20 21 59 00 22 02 36 22 04 00 22 22.5 23 30				(61) Disturbed by microseisms. BCIS and USCGS: 31° S 180°, H. 21h 38m 54s, h = about 300 km. Kermadec Islands.
March 24 (62)	eL F	21 31 21 45				(62) Disturbed by microseisms. USCGS: 13° N 88° W, H. 20h 52m 36s h = about 100 km. Off southern coast of El Salvador.
March 28 (63)	e F	2 40 3 20				(63) Disturbed by microseisms. BCIS: 34°8' S 177°5' E, H. 1h 54m 53s. Off northern coast of North Islands, New Zealand.
April 1 (64)	eL F	21 48 22 05				(64) Disturbed by microseisms. BCIS and USCGS: 42° S 76½° W, H. 20h 45m 28s. Off coast of Chile.
April 2 (65)	eP eS eL F	0 26.0 0 36.5 0 53 1 40				(65) Disturbed by microseisms. USCGS: 13° N 90° W. h. 0h 13m 34s. Off coast of El Salvador.
April 2 (66)	e F	15 00 15 04				(66) Disturbed by microseisms. BCIS: 31½° 37½° W, H. 14h 42.2m. Atlantic Ocean
April 2 (67)	ePP eSS eL F	22 30 23 22 47.0 23 15 23 55				(67) Disturbed by microseisms. W1: ePKP 22h 28m 35s. BCIS: 6° S 149° E, H. 22h 09m 49s, h = 150 km. USCGS: H. 22h 09m 29s. Near west coast of New Britain.
April 5 (68)	1P 1PP eS eL F	3 19 40 3 20 00 3 23 05 3 25.0 3 50				(68) W1: eP 3h 19m 44s. BCIS: 37°5' N 22°2' E, H. 3h 15m 30s, h = 100 km. Off southwest coast of Greece.
April 6 (69)	eL F	2 08 2 30				(69) Disturbed by microseisms. BCIS: probably Sea of Japan.
April 6 (70)	e F	20 42 20 48				(70) Disturbed by microseisms. BCIS: 40° N 27½° W, H. 20h 29m 53s. USCGS: H. 20h 29m 51s. North Atlantic Ocean.
April 7 (71)	e F	0 31 0 45				(71) Disturbed by microseisms. BCIS: Probably aftershock of Aug. 15, 1950 (Tibet - Assam), H. 23h 52.9m

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		h m s		s	μ	
April 8 (72)	1P 1S eL F	21 43 49 21 48 50 21 52 40 22 20	(+)			(72) W1: 1P 21h 43m 44s+. BCIS: 36°4' N 37°5' E, H. 21h 38.0m, h = about 100 km. USCGS: 37° N 35° E, H. 21h 38m 20s, h = about 100 km. Istanbul: 36°6' N 36.3 E. Near south-central coast of Turkey.
April 9 (73)	e F	17 43 18 10				(73) Disturbed by microseisms.
April 10 (74)	e	0 03 0 20				(74) Disturbed by microseisms.
April 10 (75)	eL F	12 07 12 30				(75) Disturbed by microseisms. BCIS and USCGS: 15° S 173½° W, H. 10h 55m 41s. Samoa Islands region.
April 11 (76)	eL F	5 07 5 20				(76) Disturbed by microseisms.
April 11 (77)	eL F	20 30 20 42				(77) Disturbed by microseisms.
April 13 (78)	eL F	11 04 11 50				(78) Disturbed by microseisms. BCIS and USCGS: 10° S 119° E, H. 10h 14m 38s. About 300 miles east of Java.
April 14 (79)	epP 1SKS 1S eH F	0 59 28 1 09 03 1 09 51 1 25 2 15				(79) Disturbed by microseisms. W1: 1P 0h 58m 46s, +; 1pP 0h 59m 34s,+. BCIS and USCGS: 24° S 66½° W, H. 0h 45m 28s, h = about 250 km. Northern Argentina.
April 14 (80)	eP ePP eS eSS eL F	4 18 36 4 20 28 4 25 28 4 29 10 4 35 5 30				(80) Disturbed by microseisms. W1: eP 4h 18m 27s. BCIS: 39 1/4° N 72° E, H. 4h 10m 04s. Poona: 40°0' N 74° E, H. 4h 10m 00s. Southeastern Turkistan.
April 14 (81)	1S 1SS eL F	13 51 30 13 55 25 14 01 15 40				(81) Disturbed by microseisms. W1: eP 13h 43m 08s. BCIS: 62 1/4° N 136½° E, H. 13h 33m 01s. USCGS: 61° N 136° E, H. 13h 32m 59s. Eastern Siberia.
April 15 (82)	1P eH eS eL F	23 51 55 0 00 46 0 01 55 0 16 1 10				(82) Disturbed by microseisms. BCIS and USCGS: 28½° N 94° E, H. 23h 40m 51s. Poona: 30°5' N 93°5' E, H. 23h 40m 39s. Assam.
April 16 (83)						(83) W1: eP 15h 48m 05s. (Aftershock of (56)). BCIS: H. 15h 47.3m. Euskirchen.
April 20 (84)	eL F	4 25.5 4 39				(84) Disturbed by microseisms. BCIS: 39°2' N 23.6 E, H. 4h 15m 02s. Greece.
April 20 (85)	1PKP	21 23 18				(85) W1: 1PKP 21h 23m 15s, -. BCIS and USCGS: 17° S 177° W, H. 21h 03m 50s, h = about 100 km. Tonga Islands region.
April 22 (86)	e F	4 13 4 40				(86) Disturbed by microseisms. W1: 1P 3h 48m 32s, -. BCIS: 29° N 94 3/4° E, H. 3h 37m 39s. Poona: 28°7' N 94°4' E, H. 3h 37m 38s. Southeastern Tibet.
April 22 (87)	eL F	12 53 13 20				(87) Disturbed by microseisms. W1: eP 12h 43m 33s. BCIS and USCGS: 76° N 73° W, H. 12h 36m 16s. Baffin Bay.

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Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
April 23 (88)	e F	12 55 13 10				(88) Disturbed by microseisms. BCIS: 4° S 127° E, H. 11h 57.4m. USCGS: H. 11h 57m 21s. Banda Sea.
April 25 (89)						(89) W1: 18h 42m 11s, -.
April 28 (90)	e F	22 25 22 50				(90) BCIS and USCGS: 5½° S 151° E, H. 21h 19m 38s. New Britain.
April 29 (91)	1P eL F	7 43 50 8 00 8 30				(91) Change of papers from 7h 46m till 7h.52m. BCIS and USCGS: 80½° N 121° E, H. 7h 35m 46s. Arctic Ocean.
April 29 (92)	eP eL F	22 07 40 22 25 22 40				(92) Aftershock of (91). BCIS: H. 21h 59.5m. USCGS: H. 21h 59m 35s.
April 30 (93)	ePKP 1PP ePPS eSS eL F	15 47.4 15 49 32 16 01.0 16 06.6 16 25 18 20				(93) W1: ePKP 15h 47m 19s. BCIS: 8 1/4° S 154 1/4° E, H. 15h 28m 06s. USCGS: 8° S 153° E, H. 15h 28m 00s. Solomon Islands region.
May 1 (94)	1PKP1 1PKP2 ePP eSKKS eSS eSSS eL F	5 22 39 5 23 11 5 26 43 5 33 32 5 46 50 5 53 6 07 8 00				(94) BCIS and USCGS: 50½° S 149° E H. 5h 02m 41s. About 400 miles south of Tasmania.
May 1 (95)	e F	23 16 24 00				(95) BCIS: Probably aftershock of (94), H. 21h 54.8m.
May 2 (96)	ePP eSS eSSS eL F	16 37.0 16 52 20 16 56 40 17 14 18 40				(96) BCIS and USCGS: 42° S 80° E, H. 16h 17m 01s. Indian Ocean.
May 3 (97)						(97) W1: ez 1h 41m 18s; ez 1h 41m 44s. F 1h 42m 30s. BCIS: Probably aftershock of (56). Euskirchen.
May 3 (98)	eS eL F	4 27 35 4 40 4 50				(98) W1: eP 4h 19m 18s; 1 4h 20m 12s. BCIS: 15°1 N 61.0 W, H. 4h 08m 48s, h = about 150 km. USCGS: 15½° N 61° W, H. 4h 08m 49s, h = about 150 km. Leeward Islands.
May 4 (99)	eP ePP epPP 1S ePS eSS eE F	12 04 32 12 05 30 12 08 29 12 14 08 12 14 35 12 14 50 12 30 13 10				(99) W1: 1P 12h 04m 37s; epP 12h 05m 32s. BCIS: 44°8 N 142°5 E, H. 11h 53m 09s, h = 200 km. USCGS: 44° N 142° E, H. 11h 53m 05s, h = about 200 km. Hokkaido, Japan.
May 4 (100)	eS eL F	19 44 45 19 51 20 15				(100) BCIS and USCGS: 7°0 N 34°0 W, H. 19h 27m 15s. Mid Atlantic Ocean.
May 6 (101)	eL F	22 23 22 50				(101) BCIS: 10°7 N 85.3 W, H. 21h 42m 24s. USCGS: 11° N 85½° W, H. 21h 42m 20s. Near northwest coast of Costa Rica.
May 6 (102)	ez ez eL F	23 20.0 23 31 23 46 1 10				(102) W1: 1 23h 20m 17s, dilatation BCIS: 13°5 N 88°4 W, H. 22h 03m 36s, h = 150 km. USCGS: 13½° N 88° W, H. 22h 03m 35s, h = about 150 km. Eastern El Salvador.

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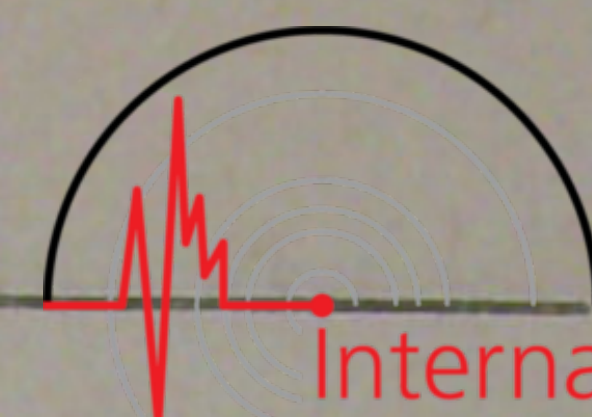
Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
May 7 (103)	e F	21	05 40					(103) USCGS: Aftershock of (102), H. 20h 22m 37s.
May 8 (104)	e F	19	19 25					(104) Disturbed by microseisms. BCIS: Probably 39.5° N 19° E. Greece.
May 8 (105)	eL F	20 21	46 10					(105) Disturbed by microseisms. BCIS and USCGS: 7½° S 80° W, H. 20h 01m 08s, h = about 200 km. Near coast of northern Peru.
May 10 (106)	1P 1z ePP eS eSSS eL F	9 9 9 9 9 9 11	30 30 33 40 48 54 00	22 32 12 12 40	+	3	5	(106) W1: 1P 9h 30m 23s; 1PP 9h 33m 07s. BCIS: 19.7° S 34.0° E, H. 9h 18m 36s. USCGS: 21° S 33° E, H. 9h 18m 25s. Southern Mozambique.
May 10 (107)	eL F	15 15	36 50					
May 10 (108)	eL F	20 20	28 39					(108) W1: 1P 19h 56m 38s. BCIS and USCGS: 51° N 180°, H. 19h 44m 52s, h = 60 km. Aleutian Islands.
May 10 (109)	e(PS) eL F	22 22 23	01.3 27 06					(109) BCIS and USCGS: 34° S 72° W, H. 21h 33m 02s, h = about 100 km. Near coast of central Chile.
May 11 (110)	e F	2 3	55 10					(110) USCGS: 13° N 87½° W, H. 2h 15m 51s, h = about 100 km. Near coast of Nicaragua.
May 12 (111)	e(PP) eS eSS eL F	22 22 22 22 23	18 23 26 32 15	39 10 20				(111) W1: 1P 22h 16m 16s; 1PP 22h 18m 19s. BCIS: 42° N 72° E, H. 22h 07.9m. Turkestan.
May 14 (112)	ez eS eL F	4 4 4 6	19 24 33 00	10 05				(112) Disturbed by microseisms. BCIS and USCGS: 30° N 70° E, H. 4h 07m 34s. Northeastern Baluchistan.
May 14 (113)	e F	13 14	52 07					(113) Disturbed by microseisms. BCIS and USCGS: 9° N 86° W, H. 13h 02m. 40s, h = about 100 km. Off coast of Costa Rica.
May 15 (114)	1P 1pP 1PP 1pPP eSKS eSKKS eSS eL F	5 5 5 5 5 5 5 6 6	32 32 36 36 42 43 50 01 30	11 30 07 26 47 12 15				(114) BCIS and USCGS: 21° S 69½° W, H. 5h 18m 46s, h = about 100 km. Northern Chile.
May 15 (115)	eP* ez eSn eS* 1Sg F	22 22 22 22 22 23	56 57 57 58 58 15	40 08 46 06 26				(115) W1: ePn 22h 56m 23s; eP* 22h 56m 41s; 1Pg 22h 56m 56s; eS* 22h 58m 05s; eSg 22h 58m 36s. BCIS: 45.5° N 9.6° E, H. 22h 54m 31s. USCGS: 45° N 9° E, H. 22h 54m 23s. Roma: 45.3° N 9.5° E, H. 22h 54.6m. Northern Italia.

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Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
May 16 (116)	eSn eS* P	2	30	27 44 38				(116) W1: ePn 2h 28m 58s; ePg 2h 29m 34s; e 2h 29m 44s. Aftershock of (115). BCIS: H. 2h 27m 03s. USCGS: H. 2h 26m 55s. Roma: H. 2h 27m 02s.
May 16 (117)	eL P	15	03	15 25				(117) BCIS: 2° N 126° E, H. 14h 06.2m. Molucca Islands.
May 19 (118)	eP eS eSSS eL P	15	58	08 17 00 30 30				(118) W1: 1P 15h 58m 22s; e 15h 58m 28s; e 15h 58m 53s; eSS 16h 02m 07s e 16h 02m 40s. BCIS: 32.2° N 4.3° W, H. 15h 54m 24s. USCGS: 38° N 4° W, H. 15h 54m 25s. Cartuja: 38.3° N 4.2° W. South central Spain.
May 21 (119)	ePKP epPKP 1PP 1pPP ePKS ePS eSS eL P	8	46	09 55 15 51 37 19 05.7 25 30				(119) W1: 1PKP 8h 46m 12s. BCIS and USCGS: 6° S 154.2° E, H. 8h 27m 21s, h = about 150 km. Solomon Islands.
May 22 (120)	ez eL P	17	54.2	18 33 18 40				(120) W1: 17h 54m 08s. BCIS: Probably south of Japan.
May 24 (121)								(121) W1: 8h 34m 04s. BCIS: Probably Pacific Ocean.
May 25 (122)	eL P	20	48	25 54				(122) Disturbed by microseisms. W1: eP 20h 45m 30s. BCIS: 42.8° N 14° E, H. 20h 42m 29s. USCGS: 43° N 15° E, H. 20h 42m 25s. Roma: 42.8° N 14.2° E, H. 20h 42m 27s. Adriatic Sea.
May 25 (123)	1PKP	22	06	09				(123) Disturbed by microseisms. W1: 22h 06m 08s, dilatation. BCIS and USCGS: 17° S 179° W, H. 21h 47m 31s h = about 600 km. Fiji Islands.
May 27 (124)	eP eS eL P	4	39.5	4 46.5 4 53 5 05				(124) Disturbed by microseisms. BCIS and USCGS: 23.1° N 45° W, H. 4h 30m 55s. North Atlantic Ocean.
May 28 (125)	1P eS eL P	16	09	48 20 30 00				(125) BCIS and USCGS: 29° N 86.1° E, H. 15h 59m 20s. Poona: 27.5° N 85° E, H. 15h 59m 30s. Southern Tibet.
May 29 (126)	e(P.P) ez ePS eSS eL P	6	23	09 20 05 40.0 58 45				(126) USCGS: 3° S 138.1° E, H. 6h 03m 06s. Northern New Guinea.
May 30 (127)	eL P	13	55	14 05				(127) BCIS: 35.1° N 22 3/4° E, H. 13h 43m 51s. USCGS: H. 13h 43m 53s. West of Crete.
May 30 (128)	ePKP 1PP ePS eSS eL P	20	15	28 22 40 32 55 40				(128) BCIS and USCGS: 3° S 126.1° E, H. 19h 57m 01s. Molucca Islands.

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		h	m	s				
May 31 (129)	eP epP iPP ePPP iSKS iPS eSS eL F	21 21 21 21 21 21 21 21 22	08 09 12 14.7 19 20 25.7 40 40	51 16 32 22 44 			μ	(129) W1: 1P 21h 08m 51s -; 1 21h 08m 55s. BCIS and USCGS: 19° N 121° E. H. 20h 56m 00s, h = about 100 km. Off north coast of Luzon.
June 1 (130)	eP ePS eL F	16 16 17 17	42 51 18 46	14 36 				(130) BCIS and USCGS: $14\frac{1}{2}^{\circ}$ N 145° E, H. 13h 23m 35s. Mariana Islands.
June 1 (131)	eP eS ePS F	20 20 20 20	13.5 23.4 24.2 40					(131) USCGS: $52\frac{1}{2}^{\circ}$ N 172° W, H. 20h 02m 14s, h = about 100 km. Aleutian Islands.
June 2 (132)	eP ePP eSKS eS eSS eL F	7 7 7 7 7 7 8	01 05 12 12 19 38 30	25 30 05 55 45 				(132) W1: 1P 7h 01m 25s. BCIS: $6\frac{3}{4}^{\circ}$ N $116\frac{1}{2}^{\circ}$ E, H. 6h 47m 53s. USCGS: 7° N 117° E, H. 6h 47m 52s. Near north coast of Borneo.
June 3 (133)	eP eL F	18 19 19	43.0 15 45					(133) W1: eP 18h 43m 03s. BCIS and USCGS: $24\frac{1}{2}^{\circ}$ N 122° E, H. 18h 30m 23s. Off northeast coast of Formosa.
June 5 (134)								(134) W1: 1P 3h 41m 35s. BCIS: $36\frac{1}{2}^{\circ}$ N $48\frac{1}{2}^{\circ}$ W, H. 3h 34m 50s. USCGS: H. 3h 34m 55s. Northwestern Iran.
June 5 (135)	e F	8 8	20 30					(135) BCIS: $23\frac{1}{2}^{\circ}$ N 122° E, H. 7h 32.4 m. Off north coast of Formosa.
June 5 (136)	eL F	3 4	50 10					(136) W1: eP 3h 41m 35s. BCIS: $36\frac{1}{2}^{\circ}$ N $48\frac{1}{2}^{\circ}$ W, H. 3h 34m 50s. USCGS: H. 3h 34m 55s. Northwestern Iran.
June 5 (137)	1P 1PcP 1pP 1PP eS eSS eL F	17 17 17 17 17 17 17 20	10 10 11 13 20 27 38 00	23 30 07 54 43 				(137) W1: 1P 17h 10m 16s; 1PcP 17h 10m 27s; ePP 17h 13m 49s. BCIS: $29\frac{1}{2}^{\circ}$ N 131° E, H. 16h 57m 47s, h = about 100 km. USCGS: 30° N 132° E, H. 16h 57m 47s, h = about 100 km. South of Kyushu, Japan.
June 6 (138)	1P eS eSS eL F	16 16 16 16 20	15 19 19 21 00	28 14 51 20 	+	4	3	(138) W1: 1P 16h 15m 24s +. BCIS: $72\frac{1}{2}^{\circ}$ N $8\frac{1}{2}^{\circ}$ W, H. 16h 10m 49s, h = about 60 km. USCGS: $71\frac{1}{2}^{\circ}$ N 8° W, H. 16h 10m 52s, h = about 60 km. Jan Mayen Island.
June 7 (139)	ez eL F	12 12 13	02.3 30 00					
June 7 (140)	ePKP1 ePKP2 ez ePP eSS eL F	23 23 23 23 23 0 1	19.0 19 19 23 43 22 30	26 50 00 00 				(140) BCIS: $26\frac{1}{2}^{\circ}$ S $176\frac{1}{2}^{\circ}$ W, H. 22h 59.0m. USCGS: $27\frac{1}{2}^{\circ}$ S 176° W, H. 22h 59m 00s. Kermadec Islands region.

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		h m s		s	μ	
June 9 (141)						(141) W1: 1PKP 4h 10m 43s; 1pPKP 4h 13m 02s. BCIS and USCGS: 20° S 179½° W, H. 3h 52m 02s, h = about 600 km. Fiji Islands.
June 9 (142)	eP ePP eS eSS eL F	11 29 20 11 30 42 11 35 12 11 38.0 11 40 12 25				(142) W1: 1P 11h 29m 15s; 1 11h 29m 32s. BCIS: 32° N 50° E, H. 11h 22m 00s. USCGS: H. 11h 22m 05s. Western Iran.
June 10 (143)	eL F	0 54 1 20				(143) BCIS: 30½° N 130° E, H. 0h 08m 00s. USCGS: 31½° N 131° E, H. 0h 08m 07s. Southern Kyushu, Japan.
June 10 (144)	eL F	9 25 9 45				(144) BCIS: South Atlantic Ocean.
June 12 (145)	eP	22 48 43				(145) Disturbed by microseisms. W1: 1P 22h 48m 51s; 1PP 22h 50m 50s. BCIS: 36½° N 71 1/4° E, H. 22h 40m 36s, h = about 220 km. USCGS: H. 22h 40m 40s, h = about 200 km. Hindu Kush.
June 14 (146)	eL F	12 05 12 10				(146) Disturbed by microseisms.
June 15 (147)						(147) W1: 21h 02m 01s.
June 17 (148)	eL F	0 24 0 38				(148) W1: eP 23h 58m 57s. USCGS: Foreshock of (149), H. 23h 46m 58s.
June 17 (149)	e(S) eL F	10 02.0 10 12 10 37				(149) W1: eP 9h 52m 08s. BCIS: 44°6' N 129°8' W, H. 9h 40m 19s. USCGS: 44½° N 130° W, H. 9h 40m 15s. About 300 miles off the coast of Oregon.
June 18 (150)	eP ePP eS eL F	17 56 30 18 00.0 18 06 40 18 27 18 45				(150) W1: 1P 17h 56m 43s; 1PcP 17h 56m 45.5s; 1pP 17h 57m 03s; 1pPcP 17h 57m 05.5s BCIS: 10°2' N 84°8' W, H. 17h 44m 25s, h = about 100 km. USCGS: 11° N 85° W, H. 17h 44m 27s, h = about 100 km. Tacubaya: H. 11h 44m 29s. Costa Rica Nicaragua border.
June 19 (151)						(151) W1: 1PKP1 17h 06m 20s; 1PKP2 17h 06m 25s. BCIS: 20° S 180°, H. 16h 47m 40s, h = 600 km. Fiji Islands region.
June 20 (152)	eP ePP eS ePS eL	22 03 00 22 06 20 22 13.5 22 14 32 22 37				(152) W1: 1P 22h 02m 58s; 1 22h 03m 05s. F in next shock BCIS: 24°6' N 121°7' E, H 21h 50m 20s. USCGS: 25° N 121° E, H 21h 50m 20s. Northern Formosa.
June 21 (153)	e(PP) e(PS) eL F	0 03.0 0 12.5 0 35 1 15				(153) BCIS: H. 23h 43.0m. New Guinea region.
June 24 (154)	ePP eL F	11 14.1 11 40 12 25				(154) Disturbed by microseisms. USCGS: 19° N 146½° E, H. 10h 55m 40s Mariana Islands region.
June 25 (155)	e F	4 23 4 45				(155) Disturbed by microseisms.

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Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
June 25 (156)	e(SS) eL F	5 56.2 6 14 6 50				(156) Disturbed by microseisms. BCIS: 35° S 52° E, H. 5h 25m 30s. Indian Ocean southeast of Madagascar.
June 25 (157)	e F	16 47 17 50				(157) W1: 1P 16h 23m 05s. Disturbed by microseisms. USCGS: 61° N 150° W, H. 16h 12m 32s, h = about 100 km. Southern Alaska.
June 26 (158)	ePP ePS eL F	4 00 4 09.5 4 37 5 00				(158) BCIS: H. 3h 39.9m. Northern New Guinea.
June 29 (159)	eL F	22 50 23 10				
July 1 (160)	1PKP .	18 12 31				(160) W1: 1PKP 18h 12m 27s -. BCIS: 18 S 179 W, H. 17h 53m 57s. USCGS: H. 17h 54m 00s, h = about 600 km. Fiji Islands.
July 2 (161)	eL F	1 21 1 25				(161) BCIS: South America?
July 2 (162)	ePP ePS ePPS eL F	5 24 45 5 34.0 5 34 50 5 58 6 35				(162) W1: 5h 24m 38s. USCGS: 6° N $124\frac{1}{2}^{\circ}$ E, H. 5h 06m 23s, h = about 100 km. Near south coast of Mindanao.
July 2 (163)	ePKP1 ePP eSKSP eSS eL F	22 06 15 22 09.9 22 20 10 22 29.0 23 05 0 30				(163) W1: 1PKP1 22h 06m 17s; 1PKP2 22h 06m 21s. USCGS: 21° S 176° W, H. 21h 46m 30s. Tonga Islands region.
July 3 (164)	eP eS eSS eL F	5 32 56 5 40 20 5 44 06 5 50 6 40				(164) W1: 1P 5h 32m 52s. BCIS: 11.8 N 45.0 E, H. 5h 23m 47s. Gulf of Aden.
July 3 (165)	eP eS eL F	18 25 10 18 32 42 18 42 19 25				(165) W1: 1P 18h 25m 08s. BCIS: Aftershock of (164), H. 18h 16m 04s.
July 4 (166)	1PKP F	7 26 10 7 27				(166) W1: 1PKP 7h 25m 58s+. BCIS and USCGS: 19° S $174\frac{1}{2}^{\circ}$ W, H. 7h 06m 41s, h = about 150 km. Tonga Islands.
July 5 (167)	eP eS eL F	9 13.6 9 21.5 9 30 9 50				(167) BCIS: 35° N 84° E, H. 9h 03m 48s. Eastern Turkestan.
July 8 (168)	eP ePP eSKS eS eSS eSSS eL F	5 58 00 6 02 11 6 08 34 6 09 28 6 16 30 6 20 6 29 8 30				(168) W1: 1P 5h 57m 53s. BCIS: $9^{\circ}9$ N $122^{\circ}2$ E, H. 5h 44m 20s. USCGS: 11° N 122° E, H. 5h 44m 20s. Panay Island, Philippines.

Seismic Records at De Bilt



Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
July 9 (169)	(eZ eP ePP eS eSS eL F	0 16 25 0 16 32 0 19 39 0 26 46 0 32.2 0 45 1 35				(169) BCIS: 16°0 N 96°4 W, H. 0h 03m 53s, h = about 60 km. USCGS: 16° N 96° W, H. 0h 03m 54s, h = about 60 km. Tacubaya: 16°08' N 96°48' W, H. 0h 03m 53s, h = 50 km. Near coast of Oaxaca, Mexico.
July 10 (170)	eL F	23 49 0 20				(170) BCIS: South Pacific.
July 11 (171)	eP ePP e(PP) ePPP eS isS eH eSS eSSS F	18 34 05 18 35 52 18 40 03 18 41 32 18 44 13 18 47 30 18 48 31 18 50 33 18 53 22 21 15				(171) BCIS: 29°0 N 139°3 E, H. 18h 21m 56s. USCGS: 28½° N 139½° E, H. 18h 22m 00s, h = 550 km. Bonin Islands region.
July 13 (172)	ePP ePS ePPS eSS eL F	20 14.5 20 24 41 20 26 19 20 31.5 20 43 22 15				(172) USCGS: 7° S 156° E, H. 19h 54m 00s, h = about 100 km. Solomon Islands.
July 14 (173)	ePKP ez eSKKS	6 41 12 6 41 39 6 51 24				(173) F in next shock. BCIS: 52° S 128° W, H. 6h 21m 14s. South Pacific.
July 14 (174)	iP eS F	7 30 11 7 40 09 9 00				(174) eL during change of papers USCGS: 47° N 154½° E, H. 7h 18m 12s. Kurile Islands.
July 14 (175)	eP eL F	10 05.0 10 35 11 00				(175) BCIS: Aftershock of (174), H. 9h 53.1m.
July 14 (176)	e F	18 01 18 05				(176) BCIS: Atlantic Ocean?
July 15 (177)	e F	18 45 18 52				(177) Beograd: 43°22' N 19°21' E, H. 18h 38m. Yugoslavia.
July 16 (178)	ePP ePPP ePPPP ePS eSS eL F	11 00 55 11 01 29 11 04 07 11 11.0 11 17 43 11 40 13 00				(178) BCIS: 6°0 S 146°2 E, H. 10h 40m 24s, h = about 150 km. USCGS: 6° S 146° E, H. 10h 40m 23s, h = about 200 km. Eastern New Guinea.
July 18 (179)	iP iPP iPPP iS eSSS eL F	9 16 10 9 18 23 9 19 45 9 24 15 9 31 9 35 14 30	+			(179) BCIS: 0°8 N 27°0 W, H. 9h 06m 17s USCGS: 1° N 27° W, H. 9h 06m 16s. Mid Atlantic Ocean.
July 19 (180)	eP ePPP eS ePS eSS eL F	20 53 14 20 58 00 21 03 05 21 03.7 21 08 20 21 18 23 00				(180) BCIS: 52°2 N 177.4 W, H. 20h 41m 27s, h = about 60 km. USCGS: 51½° N 177½° W, H. 20h 41m 25s, h = about 60 km. Near Adak, Aleutian Islands.

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
July 21 (181)	eP eS eScS eL F	1	43	31 34 35 05 00				(181) W1: 1P 1h 43m 26s -; 1(PcP) 1h 43m 40s. Aftershock of August 15, 1950, Northern Assam. BCIS: H. 1h 32m 23s. USCGS: H. 1h 32m 31s.
July 21 (182)	eP F	3	32	40 30				(182) BCIS: 14° 0' N 55° 0' E, H. 3h 23m 06s. Arabian Sea.
July 21 (183)	e F	20	58	21 15				
July 24 (184)	eL F	9	31	20 34				(184) BCIS: 46° 23' N 7° 33' E, H. 9h 28.0m. Valais, Switzerland.
July 25 (185)	eS eL F	10	56	34 59 15				(185) W1: 1P 10h 52m 36s. BCIS: 47° 0' N 27° 0' W, H. 10h 47m 31s. USCGS: 47° N 27° W, H. 10h 47m 30s. North Atlantic Ocean.
July 25 (186)	eL F	17	57	18 15				(186) USCGS: 43½° N 144° E, H. 17h 13m 30s, h = about 200 km. Hokkaido, Japan.
July 25 (187)	e F	18	44	18 55				
July 25 (188)	eL F	21	25	21 35				(188) USCGS: 30° N 131½° E, H. 20h 33m 57s. South of Kyushu, Japan.
July 26 (189)	1P epP 1PP eS esS eL F	10	12	06 21 11 11 30 39 30	+			(189) W1: 1P 10h 12m 02s; 1pP 10h 12m 15s. USCGS: 41 N 143 E, H. 10h 00m 00s, h = about 100 km. South of Hokkaido, Japan.
July 27 (190)	eL F	1	49	2 15				(190) W1: eP 1h 12m 13s; e 1h 12m 35s. BCIS: 32° N 143° E, H. 0h 59m 26s. USCGS: H. 0h 59m 23s. Tokyo: 33° N 143° E. About 250 miles off southeast coast of Honshu, Japan.
July 27 (191)	eL F	16	45	17 06				(191) USCGS: 33° N 142½° E, H. 15h 53m 55s. Off southeast coast of Honshu, Japan.
July 28 (192)	e L	20	06	20 25				(192) W1: 1P 19h 28m 14s. BCIS: Aftershock of (190), H. 19h 15.3m. USCGS: H. 19h 15m 10s.
July 28 (193)	eS eL F	21	21	40 45 15				(193) W1: 1P 21h 10m 49s. USCGS: 35° N 147° E, H. 20h 58m 20s, h = about 200 km. East of Honshu, Japan.
July 28 (194)	1P epP eS esS eL F	23	17	05 13 25 30 45 00				(194) W1: 1P 23h 17m 00s +; 1pP 23h 17m 11s. USCGS: 37° N 143° E, H. 23h 04m 33s. Off east coast of Honshu, Japan.
July 28 (195)								(195) W1: eP 23h 26m 52s. BCIS: Aftershock of (194), H. 23h 10.5m.
July 29 (196)	ePP ez ePS eH eL F	23	52	24 50 55 02.4 30 05				(196) W1: 1PP 23h 52m 10s. BCIS: 5° S 129.5 E, H. 23h 32m 45s. Banda Sea.

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
July 31 (197)	eL F	23	15					(197) BCIS: Probably northern Indian Ocean.
Aug. 1 (198)		23	30					(198) W1: 1P 1h 05m 57s. BCIS: 5°0 N 59°8 W, H. 0h 55m 24s. Indian Ocean.
Aug. 1 (199)								(199) W1: 1P 3h 35m 27s; 1 3h 35m 33s. USCGS: 3° N 84° W, H. 3h 22m 46s, h = about 100 km. Off coast of Columbia.
Aug. 1 (200)	e F	14	13					(200) W1: eP 13h 48m 41s. BCIS: 31° N 97° E, H. 13h 37m 14s. Tibet.
Aug. 2 (201)	1(pPKP) 1PS eSS F	4	01	10				(201) W1: 1(PKP) 3h 58m 38s. USCGS: 4° S 154½° E, H. 3h 40m 27s, h = about 500 km. New Britain Island region.
		4	09	44				
		4	17					
		5	15					
Aug. 2 (202)	ePKP ePP eSS eL F	10	35.5					(202) W1: ePKP 10h 35m 33s. BCIS: 50° S 117° W, H. 10h 15m 55s. USCGS: H. 10h 16m 03s. 1700 miles south of Easter Island.
		10	38.8					
		10	57.5					
		11	17					
		13	00					
Aug. 2 (203)	eL F	21	01					(203) W1: eP 20h 42m 38s. USCGS: Foreshock of (204), H. 20h 30m 17s, h = about 100 km.
		21	50					
Aug. 3 (204)	eS eSS eL F	0	46	20				(204) W1: eP 0h 36m 15s; epP 0h 36m 25s. BCIS: 13°7 N 87°3 W, H. 0h 23m 57s, h = 100 km. USCGS: 13° N 87½° W H. 0h 23m 58s, h = about 100 km. Near south coast of Nicaragua.
		0	51					
		0	59					
		2	00					
Aug. 4 (205)	e F	0	01					(205) USCGS: H. 23 32.0. Asia.
		0	10					
Aug. 4 (206)	e F	0	41					(206) BCIS: Probably aftershock of (205), H. 0h 12.6m.
		0	50					
Aug. 4 (207)	e F	12	10					(207) BCIS: H. 11h 20.6m. Southeast of Formosa.
		12	25					
Aug. 5 (208)	eL F	16	54					(208) USCGS: 13½° S 176° W, H. 15h 32m 56s, h = about 300 km. Samoa Islands region.
		17	00					
Aug. 6 (209)	eL F	8	44					(209) BCIS: Aftershock of (204), H. 8h 08m 53s. USCGS: H. 8h 08m 56s.
		9	20					
Aug. 6 (210)	1PKP 1PP ePS eL F	15	29	52				(210) W1: ePKP 15h 29m 47s; ePP 15h 31m 39s. BCIS: 6°0 S 153°0 E, H. 15h 10m 42s. USCGS: 6° S 152° E, H. 15h 10m 42s. New Britain Island.
		15	31	50				
		15	41.7					
		16	10					
		17	00					
Aug. 8 (211)	ez eL F	21	01.3					(211) W1: eP 20h 59m 34s; e 21h 01m 57s; eL 21h 02.5m. BCIS: 42°5 N 13°4 E, H. 20h 56m 30s. Roma: 42°6 N 13°5 E, H. 20h 56m 28.5s. North of Gran Sasso, Italy.
		21	02.5					
		21	30					
Aug. 10 (212)	eP eS eL F	5	42.3					(212) Disturbed by microseisms. BCIS: 8°2 N 39°9 W, H. 5h 32m 33s. USCGS: 8½° N 40° W, H. 5h 32m 33s. Atlantic Ocean.
		5	50	14				
		5	58					
		6	30					
Aug. 12 (213)	eL F	22	06					(213) Disturbed by microseisms. USCGS: 3½° S 141° E, H. 21h 10m 00s. Near north coast of New Guinea.
		22	30					

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Aug. 13 (214)	iP eS eL F	18 18 18 23	38 42 44 30	23 24 26	-	8	12	(214) W1: iP 18h 38m 21s. He: iP 18h 38m 19s. BCIS: 40° 9' N 33° 2' E, H. 18h 33m 26s. USCGS: 43° N 32½° E H. 18h 33m 40s. Black Sea, off north coast of Turkey.
Aug. 14 (215)	ez eS eL F	18 18 18 19	51 55.0 59 20					(215) BCIS: Aftershock of (214), H. 18h 45m 59s. USCGS: H. 18h 46m 00s.
Aug. 17 (216)	eP ePP eS eSS eL F	0 0 0 0 0 1	00 02 07 10 13 00	39 21 11 21				(216) W1: iP 0h 00m 25s; ePP 0h 02m 14s. BCIS: 28° 0' N 56° 0' E, H. 23h 51m 59s. USCGS: H. 23h 52m 10s. Southern Iran.
Aug. 18 (217)	ePP eSKS eL F	3 4 4 5	57.0 03 34 10	13				(217) BCIS: 1° N 127° 5' E, H. 3h 38m 33s, h = about 200 km. USCGS: H. 3h 39m, 19s. Gilolo Island region.
Aug. 20 (218)	eL F	6 7	31 00					(218) USCGS: 23½° N 108° W, H. 5h 59m 14s. Gulf of California.
Aug. 20 (219)	eL F	13 13	00 15					(219) W1: iP 12h 35m 39s. BCIS: 11° S 34½° E, H. 12h 24m 34s. Lake Nyassa.
Aug. 20 (220)	iP eS eL e(PcS) F	22 23 23 23 23	56 00 03 04 15	41 49 05				(220) W1: iP 22h 56m 39s. BCIS: 34° 6' N 26° 2' E, H. 22h 51m 25s. Mediterranean Sea, south of Crete.
Aug. 21 (221)	ePKP iPP ePPP eSKS 1(S) iPS ePPS eSS eSSS eL F	11 11 11 11 11 11 11 11 11 11 14	15 15 17.8 22 23 25 26 30.5 34.6 47 00	20 43 03 18 07 11	+			(221) USCGS: 19 3/4° N 156° W, H. 10h 56m 57.5s. Near west coast of Hawaii.
Aug. 21 (222)	eH eH eL F	19 19 19 19	15 19 22 40	29 39				(222) BCIS: Probably aftershock of (221).
Aug. 22 (223)	eL F	6 6	22 45					(223) USCGS: 10° N 83° W, H. 5h 41m 31s. Costa Rica.
Aug. 24 (224)	eP e(pP) eS eL F	10 10 10 10 10	31 31 35 38 55	42 53 30				(224) W1: iP 10h 31m 50s. BCIS: 37° 0' N 20° 9' E, H. 10h 27m 29s, h = about 100 km. USCGS: 37° N 32° E, H. 10h 27m 24s, h = about 100 km. Off east coast of Greece.
Aug. 25 (225)	1Z 1pP ePP epPP eZ eS eL F	14 14 14 14 14 14 14 15	33 33 36 36 39 42 58 30	20 52 03 46 07 44				(225) W1: eP 14h 33m 05s. e 14h 33m 16s. e or iP under paperclip. BCIS: 46° 8' N 151° 2' E, H. 14h 21m 30s, h = about 150 km. USCGS: 47° N 151° E, H. 14h 21m 15s. Kurile Islands.

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Aug. 27 (226)								(226) W1: 1 17h 09m 36s; F 17h 13m
Aug. 28 (227)	ePKP epPKP eSS F	16 16 17 17	50.2 52 16 30	 24				(227) W1: 1PKP 16h 50m 09s; 1pPKP 16h 52m 56s. USCGS: 27° S 178° E, H. 16h 31m 11s, h = about 600 km. Kermadec Islands region.
Aug. 31 (228)	ePKP epPKP ePP	10 10 10	27 30 31.2	58 16				(228) W1: 1PKP 10h 27m 56s -. USCGS: 19° S 179° W, H. 10h 09m 18s, h = about 600 km. Fiji Islands region.
Aug. 31 (229)	eP eS 1z eL F	12 12 12 12 13	34 38 38 40 10	16 06 13				W1: 1P 12h 34m 19s -. BCIS: 35° 7' N 22° 4' E, H. 12h 29m 35s. USCGS: 36½° N 23° E, H. 12h 29m 42s. Near south coast of Greece.
Aug. 31 (230)	1P eS eL F	20 20 20 20	23 27 29 50	18 09 30				(230) W1: 1P 20h 23m 17s. BCIS: 36° 1' N 22° 9' E, H. 20h 18m 35s. USCGS: H. 20h 18m 40s. Near south coast of Greece.
Sept. 1 (231)	eL F	5 6	44 20					(231) USCGS: Foreshock of (233), H. 4h 40m 40s.
Sept. 1 (232)	eP eS eL F	6 7 7 7	58 00 01 30	46 54 30				(232) W1: e 7h 02.5m BCIS: 43° 0' N 13° 2' E, H. 6h 56m 04s. Roma: 43° 15' 5' N 13° 35' E, H. 6h 56m 01.7s. Central Italy
Sept. 1 (233)	ePKP ePP e(PKS) ePS eSS eL F	9 9 9 9 9 9 11	08 10 11 21.0 28 55 40	39 48 57				(233) USCGS: 33° S 110° W, H. 8h 49m 18s. Easter Island region.
Sept. 2 (234)	e(ScP) F	0 1	05 00	10				(234) BCIS: 35° N 23° E, H. 23h 52m 48s. Mediterranean Sea, near Crete.
Sept. 5 (235)	eL F	8 9	43 30					(235) BCIS: 18° N 145½° E, H. 7h 52m 13s. USCGS: H. 7h 52m 15s. Mariana Islands region.
Sept. 7 (236)	ePn eSn F	23 23 23	07 07 12	22 44				(236) W1: 1P 23h 07m 32s; 1 23h 08m 03s. He: 1P 23h 06m 55s; 1S 23h 06m 59s. BCIS: 50° 25' N 6° 05' E, H. 23h 06m 52s. Near Malmedy, Belgium.
Sept. 8 (237)	eL F	7 8	10 00					(237) BCIS: Foreshock of (238), H. 6h 40m 25s. USCGS: H. 6h 40m 23s.
Sept. 8 (238)	eL F	12 12	07 40					(238) BCIS: 28° 9' N 43° 7' W, H. 11h 47m 25s. USCGS: 28½° N 43° W, H. 11h 47m 23s. North Atlantic Ocean.
Sept. 9 (239)	ePKP 1z ePP ePS ez eSS eL F	5 5 5 5 5 5 5 7	03.7 04 06 17 19 25 56 30	40 48 05 50 48	+			(239) W1: ePKP 5h 03m 44s. USCGS: 16° S 173° W, H. 4h 44m 00s. Samoa Islands region.

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Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Sept. 9 (240)								(240) W1: 1 22h 08m 19s. BCIS: Probably aftershock of (236).
Sept. 12 (241)	eL F	15	47					(241) Disturbed by microseisms. W1: 1P 15h 22m 16s. BCIS: 46.2° N 150.1° E, H. 15h 10m 20s. USCGS: 45.1° N 151° E, H. 15h 10m 18s. Kurile Islands region.
Sept. 15 (242)	eL F	23	02					(242) Disturbed by microseisms. BCIS: 40.3° N 28.1° E, H. 22h 52m 07s. Turkey.
Sept. 16 (243)								(243) W1: 1 16h 57m 33s. USCGS: 22° S 177° W, H. 16h 38m 03s, h = about 200 km. Tonga Islands.
Sept. 17 (244)	1PKP ePP eL F	12	17	28				(244) W1: 1PKP 12h 17m 25s. USCGS: 18° S 173° W, H. 11h 57m 39s. Tonga Islands.
Sept. 17 (245)	eSKS eS ePS eL F	21	12	05				(245) BCIS: 1.8° S 102.3° E, H. 20h 48m 06s. Sumatra.
Sept. 20 (246)	eL F	2	40					(246) BCIS: 30° S 180°, H. 1h 11.1m h = about 100 km. USCGS: H. 1h 11m 00s. Kermadec Islands region.
Sept. 20 (247)	eL F	6	31					(247) BCIS: 5 1/4° S 80 3/4° W, H. 5h 48m 08s. USCGS: 5.1° S 81° W, H. 5h 48m 03s. Near coast of Peru.
Sept. 21 (248)								(248) W1: 1PKP 3h 40m 19s; 1 3h 40m 26s. USCGS: 24° S 179.1° E, H. 3h 20m 15s. Kermadec Islands region.
Sept. 21 (249)	ePP eSKS ePS eSS eL F	9	29	12				(249) BCIS: 0.0° 124.5° E, H. 9h 10m 17s. USCGS: H. 9h 10m 16s. Molucca Passage.
Sept. 21 (250)	ePKP1 ePKP2 ePP eL F	19	04	51				(250) W1: ePKP1 19h 05m 18s. USCGS: 28.1° S 178° W, H. 18h 44m 57s. Kermadec Islands.
Sept. 22 (251)	eP e(PPP) eS eSSS eL F	23	50	05				(251) W1: eP 23h 50m 12s. BICS and USCGS: 16.5° N 47.0° W, H. 23h 40m 37s. North Atlantic Ocean.
Sept. 24 (252)	eP eS e(PS) eL F	13	22.8					(252) Disturbed by microseisms. USCGS: 49.1° N 156° E, H. 13h 10m 41s, h = about 100 km. Kurile Islands.
Sept. 27 (253)	eS eSS eL F	19	45	07				(253) BCIS: 49.5° N 128.5° W, H. 19h 24m 12s. USCGS: 49° N 129° W, H. 19h 24m 12s. Off coast of Vancouver Island, British Columbia.

Seismic Records at De Bilt



Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
Sept. 28 (254)	eL F	2 54 3 20				(254) Disturbed by microseisms. USCGS: H. 1h 25m 22s. About 300 miles south of Fiji Islands.
Sept. 28 (255)	eL F	4 35 5 30				(255) Disturbed by microseisms. BCIS: 8° S 130° E, H. 3h 31.1m Banda Sea.
Sept. 28 (256)	eL F	12 44 13 40				(256) USCGS: 11½° N 86° W, H. 12h 07m 24s. Near coast of Guatemala.
Sept. 28 (257)	ePKP eL F	14 57 15 31 17 00		30		(257) BCIS: 29° S 177° W, H. 14h 37m 23s. USCGS: H. 14h 37m 30s. Kermadec Islands region.
Sept. 28 (258)	ePKP1 ePP ePPP eSS eL F	23 48 23 52 23 56 0 12 0 45 3 00		35 45 28 40		(258) W1: ePKP 23h 48m 55s -; 1 23h 49m 06s -; 1 23h 49m 15s -. USCGS: 30° S 178° W, H. 23h 28m 37s. Kermadec Islands region.
Sept. 30 (259)	eL F	5 50 6 30				(259) USCGS: H. 4h 21m 28s. Kermadec Islands region.
Oct. 1 (260)	e(S) eL F	1 36 1 39 1 55				(260) W1: eP 1h 31m 40s. BCIS: 34°6 N 26°7 E, H. 1h 26m 33s. USCGS: H. 1h 26m 36s. Mediterranean Sea, near Crete.
Oct. 1 (261)	eL F	10 52 11 45				(261) Disturbed by microseisms. USCGS: 55° N 166° W, H. 10h 11m 40s. Fox Islands, Aleutian Islands.
Oct. 2 (262)	eL F	0 37 0 50				(262) W1: 1P 0h 10m 05s. BCIS: 22 3/4° N 94½° E, H. 23h 59m 37s. Birma.
Oct. 3 (263)	e F	23 37 24 00				(263) BCIS: 2° N 96° W, H. 22h 53 4m. Galapagos Islands.
Oct. 5 (264)						(264) W1: ePKP 6h 51m 22s. BCIS: 31°5 S 178°5 W, H. 6h 30m 49s. USCGS: H. 6h 30m 48s. Kermadec Islands region.
Oct. 5 (265)	ePKP1 ePKP2 ePP eSS eL F	11 57 11 58 12 02.0 12 21.6 13 08 14 00		32 10		(265) BCIS: 29°6 S 176°5 W, H. 11h 37m 27s. USCGS: 28½° S 177° W, H. 11h 37m 30s. Kermadec Islands region.
Oct. 6 (266)	ePKP1 ePKP2 ePP ePPS eL F	3 48 3 49 3 53.0 4 06.5 4 55 6 00		43 20		(266) BCIS: 30° S 178° W, H. 3h 28m 40s. USCGS: H. 3h 28m 45s. Kermadec Islands region.
Oct. 6 (267)	e F	6 11 6 20				(267) W1: e 6h 06m 06s. BCIS: Mediterranean Sea, Near Crete.
Oct. 8 (268)	eS eH eL F	4 33 4 37.8 4 44 5 30				(268) Disturbed by microseisms. BCIS: 40°0 N 124°5 W, H. 4h 10m 34s. USCGS: 40° N 125° W, H. 4h 10m 35s. Off cape Mendocino, California.
Oct. 11 (269)	ePKP ePPP ePS eL F	1 56 2 01.6 2 08.8 2 34 3 55		40		(269) Disturbed by microseisms. W1: 1PKP 1h 56m 36s; 1 1h 57m 14s. BCIS: 5°0 S 151°8 E, H. 1h 37m 32s. New Britain Island.

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Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
Oct. 11 (270)	eL F	5 35 5 45				(270) Disturbed by microseisms. BCIS: 43° N 143° E, H. 4h 53m 00s. USCGS: H 4h 53m 00s. Hokkaido, Japan.
Oct. 11 (271)	e F	11 15 11 20				Oct. 12. No records from 7h 55m till 15h 30m.
Oct. 13 (272)	ePPP eSS eL F	22 50.3 23 03.5 23 28 0 50				(272) BCIS: 61° S 21° W, H. 22h 28m 11s. USCGS: 60° S 19° W, H. 22h 28m 06s. Sandwich Islands region.
Oct. 14 (273)	eL F	10 28 10 55				(273) BCIS: 8° S 107° E, H. 9h 29m 37s. USCGS: H. 9h 29m 39s. Java Sea.
Oct. 15 (274)	eL F	21 44 22 30				(274) Disturbed by microseisms. W1: eP 21h 14m 23s. BCIS: 33° N 133° E, H. 21h 01m 57s. USCGS: 33° N 134° E, H. 21h 01m 57s. Off south coast of Shikoku, Japan.
Oct. 16 (275)	eP iz eS eL F	6 59 54 7 00 07 7 04 26 7 06 7 22				(275) W1: eP 6h 59m 44s; e 6h 59m 50s. BCIS: 77° N 6° E, H. 6h 54m 30s. USCGS: 76° N 5° E, H. 6h 54m 33s. Arctic Ocean.
Oct. 16 (276)	eL F	19 45 19 53				(276) Disturbed by microseisms. USCGS: H. 18h 52m 40s. About 150 miles east of Honshu, Japan.
Oct. 18 (277)	e F	5 45 5 50				(277) Disturbed by microseisms. BCIS: 29° N 94° E, H. 5h 02m 37s. Assam.
Oct. 19 (278)	iP ez eS ePS eSS eL F	8 38 26 8 44 43 8 48 (20) 8 49.1 8 53.7 9 03 10 00	(+)			(278) Disturbed by microseisms. W1: iP 8h 38m 21s; iPP 8h 41m 23s BCIS: 41° N 142° E, H. 8h 26m 24s, h = about 60 km. USCGS: 42° N 142° E, H. 8h 26m 25s, h = about 100 km. Near south coast of Hokkaido, Japan.
Oct. 19 (279)	eL F	15 30 16 00				(279) Disturbed by microseisms. W1: iP 15h 03m 28s; iPP 15h 03m 45s. USCGS: aftershock of (278), H. 14h 51m 14s.
Oct. 21 (280)	iP iPP eS iSS eL F	21 47 00 21 50 32 21 57 30 22 03 53 22 13 24 10	+			(280) Disturbed by microseisms. W1: iP 21h 46m 55s. BCIS: 23° N 121° E, H. 21h 34m 13s. USCGS: 24° N 122° E, H. 21h 34m 13s. Off east coast of Formosa.
Oct. 21 (281)						(281) W1: iP 23h 08m 05s. USCGS: aftershock of (280). H. 22h 55m 54s.
Oct. 22 (282)	iP eS eL	3 42 28 3 52 56 4 10				(282) Disturbed by microseisms. W1: iP 3h 42m 07s. F in next shock. BCIS: aftershock of (280), H. 3h 29m 26s. USCGS: H. 3h 29m 26s.
Oct. 22 (283)						(283) W1: iP 4h 40m 57s. USCGS: aftershock of (280), H. 4h 28m 05s.
Oct. 22 (284)						(284) W1: iP 5h 55m 41s. USCGS: aftershock of (280), H. 5h 43m 01s.

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Oct. 22 (285)	eL F	10	00					(285) Disturbed by microseisms.
Oct. 22 (286)	eL F	11	11					(286) Disturbed by microseisms.
Oct. 22 (287)	eL F	11	54					(287) Disturbed by microseisms.
Oct. 22 (288)	eL F	13	32					(288) Disturbed by microseisms. USCGS: aftershock of (280), H. 12h 48m 38s.
Oct. 22 (289)	eL	15	30					(289) Disturbed by microseisms. F in next shock. BCIS: aftershock of (280), H. 14h 46m 42s.
Oct. 22 (290)	eL F	16	10					(290) Disturbed by microseisms. Wi: eP 15h 42.5m. USCGS: after- shock of (280), H. 15h 29m 47s.
Oct. 22 (291)	eL F	19	25					(291) Disturbed by microseisms. Wi: eP 18h 55.3m. BCIS: aftershock of (280), H. 18h 42m 33s.
Oct. 22 (292)	eL F	21	35					(292) Disturbed by microseisms. BCIS: aftershock of (280), H. 20h 51m 38s.
Oct. 23 (293)	eL F	0	23					(293) Disturbed by microseisms.
Oct. 23 (294)	eP eS eL F	1	32	23				(294) Disturbed by microseisms. Wi: 1P 1h 32m 16s. USCGS: after- shock of (280), H. 1h 19m 35s.
Oct. 23 (295)	eP eS 1ScS eL F	9	08.0	26				(295) Disturbed by microseisms. USCGS: aftershock of (280), H. 8h 55m 13s.
Oct. 23 (296)	e F	14	10					(296) BCIS: aftershock of (280), H. 13h 27m 16s.
Oct. 23 (297)	e F	19	03					(297) BCIS: aftershock of (280), H. 18h 18m 48s.
Oct. 23 (298)	e F	23	19					
Oct. 24 (299)	eP eS eH eL F	3	51.9	05				(299) BCIS: aftershock of (280), H. 3h 38m 57s.
Oct. 24 (300)	eL F	8	21					
Oct. 24 (301)	eL F	14	36					(301) BCIS: aftershock of (280), H. 13h 42m 12s.
Oct. 24 (302)								(302) Wi: 1P 19h 35m 16s + ; F 19h 36.5m. BCIS: 43 $\frac{1}{2}$ $^{\circ}$ N 142 $^{\circ}$ E, H. 19h 23m 17s. Hokkaido, Japan.
Oct. 25 (303)	eP eS eL F	12	32.3					(303) Disturbed by microseisms. Wi: 1P 12h 32m 11s. USCGS: aftershock of (280), H. 12h 19m 38s.

Seismic Records at De Bilt

Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
Oct. 28 (304)	eS eL F	2 19.0 2 44 3 10				(304) Disturbed by microseisms. BCIS: aftershock of (280), H. 1h 55.6m.
Oct. 28 (305)	ePKP ePP eSS eL F	7 07.5 7 12.4 7 32.8 8 15 9 20				(305) BCIS: 58° S 158° E, H. 6h 47m 45s. South of Maquarie Islands.
Oct. 30 (306)	eL F	16 12 16 20				(306) BCIS: foreshock of (307), H. 15h 45.0m.
Oct. 30 (307)	eL F	16 41 16 50				(307) BCIS: $44\frac{1}{2}^{\circ}$ N 78° E, H. 16h 14.9m. Alu-Tau.
Oct. 31 (308)	1P eSKS 1S ePS eL F	7 09 32 7 20 06 7 20 32 7 21.9 7 40 9 35				(308) W1: 1P 7h 09m 30s. Change of papers from 7h 25 till 7h 31. BCIS: 1° N $98\frac{1}{4}^{\circ}$ E, H. 6h 56m 24s. USCGS: 3° N 101° E, H. 6h 56m 21s. Near west coast of Sumatra.
Oct. 31 (309)	eS eL	10 46 28 11 10				(309) F in next shock. BCIS: after- shock of (308), H. 10h 22m 19s.
Oct. 31 (310)	ePP eSS eL F	12 03 15 12 18.5 12 29 14 15				(310) BCIS: 56° S 6° W, H. 11h 43m 38s. West of Bouvet Islands.
Oct. 31 (311)	eL F	19 41 19 50				(311) Uppsala: aftershock of (306).
Nov. 1 (312)	eS eL F	11 29.3 11 41 12 15				(312) W1: 1P 11h 20m 55s + ; 1 11h 21m 03s. BCIS: 4° S 35° E, H. 11h 10m 36s. Central Africa.
Nov. 2 (313)	eL F	22 06.7 22 35				(313) Disturbed by microseisms. W1: eP 22h 01m 38s. BCIS: 41° N 47° E H. 21h 55m 31s. USCGS: 44° N 45° E, H. 21h 55m 52s. Northern Caucasia.
Nov. 3 (314)	eL F	14 18 14 35				(314) Disturbed by microseisms. BCIS: H. 13h 45.5m. Kamchatka region.
Nov. 4 (315)	ePS eL F	11 36.5 11 58 12 30				(315) Disturbed by microseisms. W1: 1P 11h 23m 18s -. BCIS: 11° N 125° E, H. 11h 09m 42s. USCGS: $11\frac{1}{2}^{\circ}$ N 125° E, H. 11h 09m 41s. Samar Island, Philippine Islands.
Nov. 6 (316)	eL F	1 28 1 40				(316) Disturbed by microseisms. BCIS: 29° N 96° E, H. 0h 50m 41s. USCGS: H. 0h 50m 40s. Assam.
Nov. 6 (317)	eL F	5 24 5 45				(317) Disturbed by microseisms.
Nov. 6 (318)	eL F	15 34 16 15				(318) Disturbed by microseisms. USCGS: foreshock of (319), H. 14h 57m 15s.
Nov. 6 (319)	1P eS 1PS eSS eL	16 52 04 17 01 58 17 02 18 17 07 32 17 15				(319) Disturbed by microseisms. F in next shock. W1: eP 16h 52m 00s. BCIS: 47° N 153° E, H. 16h 40m 07s. USCGS: 47° N 154° E, H. 16h 40m 06s. Kurile Islands.
Nov. 6 (320)	1P F	19 02 26 20 30				(320) Disturbed by microseisms. W1: eP 19h 02m 21s. USCGS: aftershock of (319), H. 18h 50m 27s.

Seismic Records at De Bilt



Date 1951	Phase	Time	Direction	Period	Amplitude	Remarks
		h m s		s	μ	
Nov. 7 (321)	e F	18 25 18 27				(321) BCIS: Probably Southern Norway.
Nov. 8 (322)	eP eS ePS eSSS eL F	13 56 40 14 06 15 14 07.0 14 14.3 14 22 16 45				(322) USCGS: $54\frac{1}{2}^{\circ}$ N 160° W, H. 13h 45m 09s. Off south coast of Alaska Peninsula.
Nov. 9 (323)	eL F	6 38 7 05				(323) Disturbed by microseisms. BCIS: $26\frac{3}{4}^{\circ}$ N 122° E, H. 5h 52m 54s. USCGS: H. 5h 52m 47s. Near northern coast of Formosa.
Nov. 9 (324)	eP eL F	8 09.3 8 38 9 30				(324) Disturbed by microseisms. USCGS: aftershock of (319), H. 7h 57m 28s.
Nov. 9 (325)	eS eL F	22 32.0 22 50 23 35				(325) Disturbed by microseisms. BCIS: $20^{\circ}8$ S $68^{\circ}0$ W, H. 22h 07m 54s, h = about 100 km. USCGS: 22° S 68° W, H. 22h 07m 53s, h = about 100 km. Chile-Bolivia border.
Nov. 10 (326)	eL F	6 40 7 15				(326) BCIS: $16\frac{1}{4}^{\circ}$ S $177\frac{1}{4}^{\circ}$ W, H. 5h 32m 09s. USCGS: H. 5h 31m 54s. Fiji Islands region.
Nov. 11 (327)	1P eS eL F	12 27 28 12 37.5 12 50 13 30				(327) Disturbed by microseisms. W1: 1P 12h 27m 22s. USCGS: 47° N 152° E, H. 12h 15m 28s. Kurile Islands.
Nov. 12 (328)	1P 1S eSS eL F	8 21 31 8 31 24 8 37.0 8 44 11 20	-			(328) W1: eP 8h 21m 20s. BCIS: $47^{\circ}7$ N $154^{\circ}0$ E, H. 8h 09m 28s. USCGS: 47° N 154° E, H. 8h 09m 26s. Kurile Islands.
Nov. 12 (329)						(329) W1: 1P 9h 33m 01s -; 1pP 9h 34m 32s. USCGS: $23\frac{1}{2}^{\circ}$ S 179° W, H. 9h 13m 50s, h = about 400 km. South of Fiji Islands.
Nov. 12 (330)	eL F	20 02 20 30				(330) USCGS: $47\frac{1}{2}^{\circ}$ N 155° E, H. 19h 21m 30s. Kurile Islands.
Nov. 13 (331)	eL F	8 52 9 20				(331) BCIS: 15° N 146° E, H. 7h 57m 41s. USCGS: H. 7h 57m 40s. Mariana Islands.
Nov. 15 (332)	eL F	7 08 7 20				(332) Disturbed by microseisms.
Nov. 15 (333)	eL F	9 00 10 00				(333) Disturbed by microseisms. W1: eP 8h 37m 19s. USCGS: foreshock of (340), H. 8h 25m 53s.
Nov. 15 (334)						(334) W1: eP 8h 50m 38s. USCGS: foreshock of (340), H. 8h 39m 15s.
Nov. 15 (335)	eL F	10 43 12 10				(335) Disturbed by microseisms. W1: eP 10h 14m 09s. USCGS: foreshock of (340), H. 10h 02m 42s.
Nov. 15 (336)						(336) W1: eP 10h 42m 52s. USCGS: foreshock of (340), H. 10h 31m 33s.
Nov. 15 (337)						(337) W1: eP 15h 14m 23s. BCIS: foreshock of (340), H. 15h 03m 01s.

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Nov. 15 (338)								(338) W1: eP 16h 23m 36s. BCIS: foreshock of (340), H. 16h 12m 12s.
Nov. 15 (339)								(339) W1: 1P 17h 56m 46s. USCGS: foreshock of (340), H. 17h 45m 23s.
Nov. 15 (340)	eL F	20	20					(340) Disturbed by microseisms. W1: 1P 19h 53m 41s. BCIS: $52^{\circ}4' N$ $160^{\circ}9' E$, H. 19h 42m 10s, h = about 60 km. USCGS: $52^{\circ}1' N$ $160^{\circ}1' E$, H. 19h 42m 12s, h = about 60 km. Near east coast of Kamchatka.
Nov. 15 (341)	eL F	22	40					(341) Disturbed by microseisms. W1: eP 22h 10m 45s. USCGS: aftershock of (340), H. 21h 59m 18s.
Nov. 16 (342)								(342) W1: 1P 1h 31m 07s. USCGS: $46^{\circ}1' N$ $159^{\circ} E$, H. 1h 39m 07s. Kurile Islands.
Nov. 16 (343)	eL F	15	40					(343) Disturbed by microseisms. W1: 1P 15h 14m 52s + . USCGS: aftershock of (340), H. 15h 03m 26s.
Nov. 16 (344)								(344) W1: eP 15h 32m 08s. USCGS: aftershock of (340), H. 15h 20m 44s.
Nov. 16 (345)								(345) W1: eP 15h 40m 30s. USCGS: aftershock of (340), H. 15h 29m 05s.
Nov. 16 (346)								(346) W1: PKP 17h 53m 43s + . BCIS: $29^{\circ}5' S$ $179^{\circ}5' W$, H. 17h 33m 20s, h = about 60 km. USCGS: $29^{\circ}1' S$ $178^{\circ} W$, H. 17h 33m 22s, h = about 60 km. Kermadec Islands.
Nov. 16 (347)								(347) W1: 1P 19h 18m 17s. BCIS: aftershock of (340), H. 19h 06m 49s.
Nov. 17 (348)	e F	5	12					(348) Disturbed by microseisms. W1: eP 4h 56m 30s. USCGS: foreshock of (353), H. 4h 46m 00s.
Nov. 17 (349)								(349) W1: eP 13h 29m 22s. BCIS: aftershock of (340), H. 13h 17m 58s.
Nov. 17 (350)								(350) W1: eP 20h 36m 16s. USCGS: aftershock of (340), H. 20h 24m 50s.
Nov. 18 (351)	eL F	5	15					(351) Disturbed by microseisms. W1: 1P 4h 49m 58s. 1 4h 50m 13s. USCGS: aftershock of (340), H. 4h 38m 35s.
Nov. 18 (352)	1P 1S eL	9	37	13				(352) F in next shock. W1: 1P 9h 37m 15s + . He: eP 9h 37m (20)s. USCGS: foreshock of (353), H. 9h 26m 33s.
Nov. 18 (353)	1P 1PP ePPP 1S 1H eL F	9	46	25				(353) W1: 1P 9h 46m 17s; eL 10h 06m (40)s. He: 1P 9h 46m 29s; eL 10h 07m. BCIS: $30^{\circ}3' N$ $91^{\circ}7' E$, H. 9h 35m 44s. USCGS: $31^{\circ} N$ $90^{\circ}1' E$, H. 9h 35m 43s. Eastern Tibet, felt: north of Lhasa.
Nov. 18 (354)	eL F	19	15					(354) BCIS: aftershock of (353), H. 18h 41m 29s.

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Nov. 19 (355)	e F	22	30					(355) USCGS: $16\frac{1}{2}^{\circ}$ S 172° W, H. 21h 03m 35s. Tonga Islands.
Nov. 22 (356)	eL F	3	05					(356) Disturbed by microseisms. USCGS: 5° S $151\frac{1}{2}^{\circ}$ E, H. 2h 04m 49s New Britain.
Nov. 22 (357)	e F	10	30					(357) BCIS: 6° S 108° W, H. 9h 34m 28s. USCGS: H. 9h 34m 20s. About 1400 miles south of Easter Island.
Nov. 23 (358)	e F	4	47					(358) BCIS: aftershock of (353), H. 4h 11m 50s.
Nov. 24 (359)	e F	2	30					(359) Disturbed by microseisms. BCIS: H. 5h 42m 08s. Southwestern coast of Peru.
Nov. 24 (360)	1P 1SKS 1S eL	19	00	02				(360) Disturbed by microseisms. F in next shock. W1: 1P 18h 59m 55s. USCGS: foreshock of (361) H. 18h 47m 13s.
Nov. 24 (361)	1P eH 1S eSS eL F	19	03	03				(361) Disturbed by microseisms. W1: 1P 19h 03m 00s. USCGS: 23° N $121\frac{1}{2}^{\circ}$ E, H. 18h 50m 19s. Near east coast of Formosa.
Nov. 25 (362)	eL F	14	35					(362) Disturbed by microseisms. BCIS: aftershock of (353), H. 14h 02.6m.
Nov. 26 (363)	1P 1PP eS eSS eL F	6	51	18				(363) Disturbed by microseisms. W1: 1P 6h 51m 10s; 1 6h 52m 05s BCIS: aftershock of (361), H. 3h 38m 34s. USCGS: H. 3h 38m 29s.
Nov. 29 (364)	eL F	05	36					(364) Disturbed by microseisms. USCGS: 1° N 121° E, H. 4h 45m 44s. Northern Celebes.
Nov. 29 (365)	eL F	15	13					(365) Disturbed by microseisms. BCIS: Probably North Atlantic Ocean.
Nov. 30 (366)	eL F	8	10					(366) Disturbed by microseisms. BCIS: $31^{\circ}7'$ N $40^{\circ}3'$ W, H. 7h 51m 12s USCGS: 32° N 41° W, H. 7h 51m 17s. North Atlantic Ocean.
Dec. 4 (367)	eL F	9	03					(367) Disturbed by microseisms. BCIS: $54^{\circ}5'$ N $36^{\circ}0'$ W, H. 8h 50m 50s: North Atlantic Ocean.
Dec. 5 (368)	eL F	7	40					(368) Disturbed by microseisms. USCGS: 23° N $122\frac{1}{2}^{\circ}$ E, H. 6h 58m 35s. Formosa.
Dec. 8 (369)	eP ePP eH eSKS ePS eSS eSSS eL F	4	27	54				(369) Disturbed by microseisms. W1: 1P 4h 27m 47s; 1PP 4h 31m 52s. BCIS: $33^{\circ}6'$ S $56^{\circ}7'$ E, H. 4h 14m 30s, h = about 200 km. USCGS: 34° S $56\frac{1}{2}^{\circ}$ E, H. 4h 14m 20s, h = about 100 km. Indian Ocean, about 900 miles south-east of Madagascar.

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s		s	μ	
Dec. 11 (370)	eL F	21	57					
		22	10					
Dec. 12 (371)	iP ipP iS isS eSS eL F	1	49	54	(+)			(371) W1: iP 1h 49m 58s; i 1h 50m 02s epP 1h 50m 20s; eS 2h 00m 15s. BCIS: 16°7' N 94°6' W, H. 1h 37m 35s, h = 100 km. USCGS: 17° N 94½° W, H. 1h 37m 34s, h = about 100 km. Oaxaca, Mexico.
		1	50	16	-			
		2	00	08				
		2	00	42				
		2	05.4					
		2	12					
		3	30					
Dec. 13 (372)	eL F	20	55					(372) W1: eP 20h 50m 15s. BCIS: 40 1/4° N 25° E, H. 20h 46m 05s. Aegean Sea.
		21	10					
Dec. 17 (373)								(373) W1: iPKP 12h 49m 51s. USCGS: 18° S 173° W, H. 12h 30m 08s. Tonga Islands.
Dec. 18 (374)								(374) W1: iPKP 14h 28m 43s; epPKP 14h 29m 01s. BCIS: 18°9' S 174°8' W, H. 14h 09m 06s, h = 60 km. USCGS: 19° S 174½° E, H. 14h 09m 03s, h = about 60 km. Tonga Islands.
Dec. 21 (375)	eL F	9	10					(375) Disturbed by microseisms. W1: iP 8h 48m 50s. BCIS: 27°0' N 99°7' E, H. 8h 37m 27s. USCGS: 26½° N 100° E, H. 8h 37m 28s. Yunnan Province, China.
		10	10					
Dec. 21 (376)								(376) W1: iP 18h 18m 52s. USCGS: 49° N 156° E, H. 18h 07m 06s. Kurile Islands.
Dec. 25 (377)	eL F	16	43					(377) Disturbed by microseisms. W1: iP 16h 09m 12s. BCIS: 49°5' N 155°0' E, H. 15h 58m 28s, h = about 60 km. Kurile Islands.
		17	00					
Dec. 26 (378)	eL F	1	32					(378) Disturbed by microseisms. W1: iP 0h 59m 19s. USCGS: 32°6' N 118°7' W, H. 0h 46m 49s. Pacific Ocean, off coast of southern California.
		1	43					
Dec. 26 (379)	eL F	10	38					(379) Disturbed by microseisms. W1: iP 10h 17m 21s. USCGS: 32° N 91° E, H. 10h 06m 57s. Eastern Tibet.
		11	15					
Dec. 26 (380)	eL F	16	59					(380) Disturbed by microseisms. W1: iP 16h 40m 55s. BCIS: 41½° N 95½° E, H. 16h 30m 55s. USCGS: H. 16h 30m 51s. Northern Kansu Province, China.
		17	30					
Dec. 26 (381)								(381) W1: iP 17h 05m 06s. USCGS: 49½° N 156° E, H. 16h 53m 23s. Northern Kurile Islands.
Dec. 28 (382)	eP eS eL F	9	33	02				(382) Disturbed by microseisms. BCIS. 17°4' N 98°4' W, H. 9h 20m 27s. USCGS: 17° N 98½° W, H. 9h 20m 25s. Guerrero, Mexico.
		9	43	47				
		10	00					
		11	00					
Dec. 29 (383)	eL F	22	50					(383) Disturbed by microseisms. W1: iP 22h 16m 55s. BCIS: 21 3/4° N 121° E, H. 22h 04m 08s. USCGS: H. 22h 04m 05s. About 100 miles south of Formosa.
		23	10					
Dec. 30 (384)	eL F	18	45					(384) Disturbed by microseisms. W1: eP 18h 29m 20s. BCIS: 28½° N 58 1/4° E, H. 18h 21m 05s. Kirman, Persia.
		19	00					

Seismic Records at De Bilt



Date 1951	Phase	Time			Direction	Period	Amplitude	Remarks
		h	m	s				
Dec. 30 (385)	eL F	23	23			s	μ	(385) Disturbed by microseisms. BCIS: $26\frac{1}{2}^{\circ}$ S 114° W, H. 22h 23m 09s. USCGS: 28° S $114\frac{1}{2}^{\circ}$ W, H. 22h 23m 05s. Pacific Ocean, west of Easter Island.