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SEISMIC RECORDS
AT DE BILT

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K O N I N K L I J K N E D E R L A N D S
M E T E O R O L O G I S C H I N S T I T U U T

Seismic Records
at De Bilt

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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 officer, and Mr. G. Houtgast, Scientific assistant.

The Director in Chief of
the Royal Netherlands Meteorological Institute,

Dr. M.W.F. Schregardus.

De Bilt, april 1971

I N T R O D U C T I O N

SEISMOLOGICAL STATION DE BILT

The geographic coordinates of the seismological station are $52^{\circ}06'06.0''N$ and $5^{\circ}10'36.0''E$. The instruments are placed at a height of 3 m above mean sealevel on a subsoil consisting of sand (pleistocene).

The instruments are: two sets of seismographs (two horizontal and one vertical) with galvanometric recording according to GALITZIN and PRESS-EWING.

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 recording paper, and the rough values for the natural period of the undamped pendulum T , of the damping constant and of the multiplying factor k for the year 1966.

GALITZIN seismographs	NS comp.	EW comp.	Z comp.
Period of galvanometer T_g	24.43 sec	24.96 sec	12.0 sec
Reduced length of pendulum l	123 mm	123 mm	406 mm
Distance A	1380 mm	1380 mm	1380 mm
Period of pendulum T_s	25 sec	25 sec	12 sec
Damping constant	0.0	0.0	0.0
Multiplying factor k	11.0	11.0	175.

PRESS-EWING seismographs NS, EW, Z comp.

Period of galvanometer T_g	90 sec
Reduced length of pendulum l	360 mm
Distance A	1000 mm
Period of pendulum T_s	30 sec
Damping constant galvanometer	0.025
Damping constant pendulum	0.470
Multiplying factor k	147

SEISMOLOGICAL STATION HEERLEN (HEE)

The geographic coordinates of the seismological station are: $50^{\circ}53'09.7''N$ and $5^{\circ}58'57.4''E$.

The instrument, a horizontal seismograph, EW-component, $M = 450$ 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 1966 are:

T	E	V	V max.	T max.
2	3	400	600	2

SEISMOLOGICAL STATION WITTEVEEN (WIT)

The geographic coordinates of the seismological station are: $52^{\circ}48'48.0''N$ and $6^{\circ}40'06.0''E$.

The instruments, a GRENET vertical seismograph with galvanometric record, and one vertical and one horizontal WILLMORE seismograph, are placed at a height of 17 m above mean sea-level on a subsoil consisting of pleistocene sand.

The period of the GRENET 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.

The constants for the WILLMORE seismographs are:
T seismograph 2 sec, T galvanometer 0,25 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.

The data from the seismographs at Heerlen and Witteveen are also mentioned. The time is Greenwich mean time.

In the column "first motion" + means an upward movement of the soil (compression), - means a downward movement (dilatation). Uncertain data have been given in parentheses. 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.
- 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.
- 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 wave 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 the discernable movement.
- H = time of the shock at point of origin.
- h = depth of the origin.

The indices H, N, E and Z refer to 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 maximum amplitudes measured from the medium line (Galitzin records). The amplitudes have been calculated by means of the formula:

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

In this formula A 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 magnitudes have been calculated by means of the formula:

$$M = \log \left(\frac{A}{T} \right) + 1.66 \log \Delta + 3.3$$

- A = maximum amplitude of the L-wave in microns (measured from the medium line)
- T = the period of the concerning L-wave in seconds
- Δ = distance in degrees.

THE MICROSEISMIC ACTIVITY

The table on page 1 shows the character of the microseismic activity (see also 1915 page 101 and 1916 page 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 horizontal 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	$0 + \frac{1}{2}$ mm	0 - $1\frac{1}{2}$ μ
1	$\frac{1}{2}$ - 2 mm	$1\frac{1}{2}$ - 5 μ
2	2 - 4 mm	5 - 10 μ
3	> 4 mm	> 10 μ

Seismic Records at De Bilt

Character of the microseismic movement

Date 1966	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3	3	2	1	1	0	0	1 2 1	1	0 1	1 2 1	3
2	3	3	2	1	1	0	0	1	1 2 1	1 2	1	3
3	3 2 1	3	2 3	1 2	1	0	0	1	1	2 3 2	1	3 2
4	1 2	3	3 2	2	1	0 1	0	1	1 2 1	2	1 2	2 1
5	2 3	3	2 1	2 1	1 2	1	0	1	1 3	2 1	2 3	1 2
6	3	3	1	1	2	1	0	1	3	1 2 3	2	2 3
7	3	3	1	1	2	1	0 1	1	3 2	2 1	2 1	3
8	3 2	3	1	1 2	2	1	1 0	1 0	2 1	1	1	3
9	2 3	3 2	1	2 3	2 3 2	1	0 1	0 1	1	1	1	3
10	3	2 1	1 3	3	2	1	1	1	1	1 0	1	3 2
11	3 2	1	3	3 2	2 3	1	1	1	1	0	1	2
12	2 3	1 2	3 2	2 1	3 1	1	1	1	1 2 1	0 1	1 2	2
13	3	2	2 1	1 3	1	1	1	1 2	1 2 1	1	2 3	3 1
14	3 2	2 3	1	3	1 3	1 0	1	2 3 1	1 3	1	3	1
15	2 1	3	1	3	3 2	0 1	1	1	3 2	1	3	1 2
16	1	3	1	3 1	2 1	1	1	1 0	2 1	1	3	2 3
17	1 2	3	1 3	1	1 2	1	1	0	1 0	1	3 2	3
18	2 3	3 2	3 2	1 2	2 1	1	1	0	0	1 2	2	3
19	3	2 3	2	2 1	1	1	1	0	0 1	2 1	2 1	3 2
20	3	3	2 1	1	1 0	1	1	0	1	1	1	2
21	3 2	3	1	1	0	1 0	1	0	1	1	1	2
22	2 1	3	1 2	1	0 2	0	1	0 1	1 0	1	1 2 1	2
23	1	3	2 3	1 2	2	0 1	1	1	0	1 2	1	2 3
24	1	3	3	2 1	2 1	1	1	1	0	2	1	3 2
25	1 3	3	3 2	1	1 2	1	1	1	0	2	1	2 3
26	3 2	3	2 3	1 2	2 1	1	1 2	1	0	2 1	1 2	3
27	2	3	3	2	1	1 2	2 1	1	0 1	1	2 3	3 2
28	2 3	3 2	3 2	2 1	1 0	2	1	1 0	1 0 1	1	3	2
29	3		2 1	1 2 1	0 1	2 1	1	0 1	1 0 1	1 0	3	2
30	3		1	1	1 0	1	1	1 2 1	1 0	0 1	3	2
31	3		1		0		1	1		1		2

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Jan. 5	eL F WIT eP	18 18 17	10 30 33								d.b.m. 13.2N 95.5E, H: 17 21 28.4, h 37 km, M 5.3. Andaman Islands region.
Jan. 11	eL F	15 15	00 35		14		11		6.2		d.b.m. 33.7N 137.2E, H: 14 16 32.3, h 33 km, M 5.3. South of Honshu, Japan.
Jan. 16	e F	01 02	30 05								d.b.m.
Jan. 16	HEE e	06	52	14							
Jan. 16	WIT eP	09	23	25							52.9N 171.9E, H: 09 11 50.0, h 25 km, M 5.7. Near Islands Aleutian Islands.
Jan. 16	eL F WIT i HEE i i	12 12 12 12 12	33.7 35 33 33 33								d.b.m. BCIS: 50°27'N 4°15'E, H: 12 32 51. Belgium.
Jan. 17	WIT iPKP	18	08	44.0							20.8S 178.5W, H: 17 49 59.3, h 543 km, M 5.7. Fiji Islands region.
Jan. 22	e F	00 00	34 43								d.b.m. 37.7N 30.0E, H: 00 23 42.7, h 23 km, M 5.0. Anatolia, Turkey.
Jan. 22	eP eS eH eL F WIT iP	14 14 14 15 16 14	38 47 56.3 01 15 38	22 44	18		22		6.5		d.b.m. 56.0N 153.7W, H: 14 27 07.9, h 33 km, M 5.8. South of Alaska.
Jan. 23	e F	01 01	44 55								d.b.m. 45.9N 12.2E, H: 01 31 28.9, h 33 km, M 3.8. Venice, Italy.
Jan. 24	e F WIT iP	07 08 07	45 20 32	09							d.b.m. 29.9N 69.7E, H: 07 23 07.6, h 12 km, M 5.8. Western Turkistan.
Jan. 28	WIT ePKP	04	55	20							17.5S 176.9E, H: 04 36 46.1, h 558 km, M 5.6. Fiji Islands
Jan. 28	ePKP eSS eL F	06 06 06 08	01.7 23.9 57 15		22		13		6.5		d.b.m. 17.1S 168.4E, H: 05 42 16.4, h 24 km, M 5.7. New Hebrides Islands.
Jan. 28	WIT iP	22	49	33	+						51.6N 157.0E, H: 22 38 12.2, h 107 km, M 5.6. Near east coast of Kamchatka.
Feb. 2	WIT iPKP	05	53	42.5							17.8S 173.2W, H: 05 34 01.8, h 33 km, M 5.2. Tonga Islands
Feb. 4	WIT ipPKP	10	59	33.5	+						15.9S 167.9E, H: 10 39 12.2, h 190 km, M 6.0. New Hebrides Islands.
Feb. 5	eP eS eL F WIT iP HEE iP	02 02 02 02 02 02	06.0 09 11 40 05 05	18	18		132		6.5		d.b.m. 39.2N 22.0E, H: 02 01 48.3, h 38 km, M 5.8. Greece.

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Feb. 5	eL F WIT iP	15 16.5 15	50 24			16		36	6.6		d.b.m. 26.1N 103.1E, H: 15 12 29.1 h 15 km, M 6.1. Yunnan Province, China.
Feb. 5	WIT iP	16	27	13.5							50.2N 155.1E, H: 16 16 00.8, h 98 km, M 5.8. Kurile Islands.
Feb. 7	eS eL F WIT eP	04 04 05.5 04	42 55	47		16		65	6.7		d.b.m. 29.8N 69.7E, H: 04 26 13.9, h 33 km, M 6.0. Western Pakistan.
Feb. 7	eH eL F WIT eP	23 23 24.3 23	28.5 33			15		39	6.5		d.b.m. 30.2N 69.8E, H: 23 06 34.5, h 10 km, M 5.8. Western Pakistan.
Feb. 9	eL F	05 06	38 15			20		12	6.5		d.b.m. 56.7S 25.7W, H: 04 40 28.4, h 27 km, M 5.9. South Sandwich Islands region.
Feb. 10	eL F	06 06	16 50								31.1N 141.6E, H: 05 29 13.3, h 33 km, M 5.3. South of Honshu, Japan.
Feb. 10	eP ePP ePS eL F WIT ePP	14 14 14 15 16.0 14	35 39.2 48.0 08	00		24		25	6.2		d.b.m. 20.8N 146.3E, H: 14 21 10.9, h 43 km, M 6.2. Mariana Islands.
Feb. 12	WIT iPKP	11	58	44.5							18.3S 174.8W, H: 11 39 25.5, h 190 km, M 5.6. Fiji Islands region.
Feb. 12	e F	13 13	47 52								d.b.m. 38.9N 21.4E, H: 13 36 20.2, h 33 km, M 4.5. Greece.
Feb. 13	e F WIT iP i	05 05 05 05	24 29								49.8N 78.1E, H: 04 57 57.7, h 0 km, M 6.3. Semipalatinsk region.
Feb. 13	eL F WIT eP	11 12.2 10	19								d.b.m. 26.1N 103.2E, H: 10 44 41.0, h 33 km, M 5.7. Yunnan Province, China.
Feb. 15	WIT iPKP	10	16	27.5	+						22.7S 176.2W, H: 09 56 29.8, h 33 km, M 5.0. Fiji Islands region.
Feb. 16	ePKP ePP eSS eL F WIT ePKP	03 03 04 04 06.0 03	38 41 00.0 30	00 24		24		21	6.5		d.b.m. 17.7S 167.9E, H: 03 18 27.2, h 31 km, M 6.5. New Hebrides Islands.
Feb. 17	eL F	12 13.5	15								d.b.m. 32.2S 78.9E, H: 11 48 00.8, h 33 km, M 6.4. Mid Indian Rise.
Feb. 18	WIT iP	19	14	18							44.3N 143.1E, H: 19 02 51.5, h 225 km, M 5.2. Hokkaido, Japan.

Seismic Records at De Bilt

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Feb. 21	WIT iP	13	31	15.0	+						26.3N 125.7E, H: 13 18 47.0, h 103 km, M 5.6. Ryukyu Islands.
Feb. 22	ePS eSS eSSS eL F WIT iPKP	05 05 05 06 07.5 05	33.6 41.0 45.0 00 07.5 21			20		32	6.5		d.b.m. 5.4S 151.5E, H: 05 02 37.2, h 28 km, M 6.2. New Britain region.
Feb. 26	WIT iP	00	45	25.8	-						52.4N 173.6E, H: 00 33 50.1, h 51 km, M 5.3. Near Islands, Aleutian Islands.
Feb. 28	WIT iP	02	13	36.3	-						43.7N 139.6E, H: 02 02 13.6, h 225 km, M 5.5. Eastern Sea of Japan.
Feb. 28	eL F WIT iP	14 14 13	22 42 48	11.5	-						29.2N 130.1E, H: 13 35 39.0, h 33 km, M 5.5. Ryukyu Islands.
Mar. 2	e F WIT eP	02 03 02	53 05 42	51							d.b.m. 43.0N 45.8E, H: 02 37 02.3, h 24 km, M 5.3. Eastern Caucasus.
Mar. 3	eL F WIT iP	04 04 03	00 35 37	10.1	-						48.3N 154.3E, H: 03 25 28.0, h 45 km, M 5.9. Kurile Islands.
Mar. 4	WIT iPKP	02	00	25.0	(+)						17.9S 178.2W, H: 01 41 46.1, h 532 km, M 3.7. Fiji Islands region.
Mar. 5	eL F	01 02	35 00								38.8S 177.9E, H: 23 58 55.9, h 27 km, M 6.1. New Zealand.
Mar. 5	eL F WIT eP	21 21 21	22 40 04	30							0.0 18.0W, H: 20 54 45.7, h 33 km, M 5.2. North of Ascension Island.
Mar. 6	e F WIT iPKP	00 01 23	51 05 09	22.0	(-)						21.5S 175.3W, H: 22 49 34.9, h 40 km, M 5.1. Tonga Islands.
Mar. 6	eP eS ePS eSS eL F WIT eP	02 02 02 02 02 04.5 02	25 33 34 37.5 43 04.5 25	41 43 07 43 42	-	5	4				31.6N 80.5E, H: 02 15 56.7, h 44 km, M 6.1. Tibet.
Mar. 6	WIT ePKP	18	21	42.0		20	242		7.2		24.1S 176.9W, H: 18 01 50.0, h 33 km, M 5.4. South Fiji Islands.
Mar. 7	eP eS eL F WIT eP	01 01 01 02.0 01	22.0 27.0 30 02.0 21	56		20	20		5.7		39.1N 41.7E, H: 01 16 05.8, h 13 km, M 5.5. Eastern Turkey.
Mar. 7	WIT iPKP	02	54	06.5	+						20.5S 178.4W, H: 02 35 27.6, h 601 km, M 4.9. Fiji Islands region.

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Mar. 7	eP eS eSS eL F WIT eP HEE eL	21 21 21 22 24.0 21 22	40.9 50.1 55.0 01 01 40 08	34		14		386	7.7		d.b.m. 37.2N 114.8E, H: 21 29 17.0, h 33 km, M 5.8. Hopeh Province, China.
Mar. 7	WIT eP	22	47	07							29.2N 98.6E, H: 22 36 03.2, h 17 km, M 5.2. Southern China.
Mar. 8	e(PKP) WIT iPKP	00 00	38.0 37	49.8	(+)						18.9S 173.3W, H: 00 18 09.8, h 33 km, M 5.3. Tonga Islands.
Mar. 8	e eL F WIT ePP	01 02 03 01	36.2 22 40 36	43							13.9S 166.6E, H: 01 13 42.3, h 37 km, M 5.8. New Hebrides Islands.
Mar. 8	eL F	04 04	26 37								37.6N 114.9E, H: 03 46 37.6, h 33 km, M 5.0. Northeastern China.
Mar. 8	e eL F WIT eP	06 06 07 05	06 33 30 55	13		20		11	6.4		1.9N 126.4E, H: 05 41 04.5, h 33 km, M 5.9. Molucca Passage
Mar. 8	e F	11 11	15 30								54.2N 35.2W, H: 11 02 27.2, h 33 km, M 4.2. North Atlantic Ocean.
Mar. 8	e F	19 19	01 06								38.9N 21.3E, H: 18 51 47.2, h 48 km, M 5.1. Greece.
Mar. 12	iP iS iSS M F WIT iP HEE iP	16 16 17 17.3 21.0 16 16	44 54 00 00 00 43 44	00.0 31 30	+	4	5			8	24.1N 122.6E, H: 16 31 21.8, h 63 km, M 6.7. Taiwan region.
Mar. 13	WIT iPKP	19	00	21.4	+						20.9S 175.4W, H: 18 40 40.7, h 65 km, M 5.2. Tonga Islands.
Mar. 16	eL F	00 00	21 40								24.4N 122.7E, H: 23 31 46.1, h 22 km, M 5.6. Taiwan region.
Mar. 16	WIT iPKP	12	32	47.3	-						21.2S 174.3W, H: 12 13 02.4, h 66 km, M 5.4. Tonga Islands.
Mar. 16	eL F	21 21.9	35 35								9.5N 121.9E, H: 20 38 23.5, h 24 km, M 5.4. Philippine Islands region.
Mar. 17	iPKP ipPKP ePP F WIT iPKP HEE iPKP	16 16 16 17.5 16 16	09 11 12 09 09 09	06.4 38 44	-						21.1S 179.2W, H: 15 50 32.2, h 626 km, M 6.2. Fiji Islands region.
Mar. 19	eL F	17 17	38 56								37.4N 114.8E, H: 16 59 41.7, h 33 km, M 4.9. Northeastern China.

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Apr. 11	eL F	18	04								18.4N 102.3W, H: 17 17 33.8, h 72 km, M 5.7. Mexico.
Apr. 11	eP ePPP eS eSSS eL F WIT eP	23	11	40							56.6N 152.0W, H: 23 00 24.0, h 33 km, M 5.4. Kodiak Island region.
Apr. 12	ePP ePS eL F	23	57.1			22		49	7.1		38.1S 73.0W, H: 23 37 42.1, h 44 km, M 5.7. Central Chile.
Apr. 13	eL F	04	35		22			9	6.4		38.2S 73.2W, H: 03 35 16.3, h 40 km, M 5.8. Near coast of Central Chile.
Apr. 13	WIT iPKP	04	46	46							23.6S 179.9W, H: 04 27 54.8, h 550 km, M 5.2. Fiji Islands region.
Apr. 14	WIT eP	18	56	38							34.5N 24.0E, H: 18 51 45.8, h 33 km, M 5.0. Crete.
Apr. 14	WIT eP	21	14	33							38.9N 70.6E, H: 21 06 17.4, h 33 km, M 5.2. Afghanistan-USSR border region.
Apr. 16	eP eS eSS eL F WIT iP	01	38	30		18		17	6.3		d.b.m. 57.0N 153.6W, H: 01 27 15.3, h 33 km, M 5.7. Kodiak Island region.
Apr. 20	e F	15	10								37.1N 114.8E, H: 14 31 25.6, h 33 km, M 4.9. China.
Apr. 20	eP ePP eS eSS eL F WIT eP	16	48.0			14		9.7	5.5		d.b.m. 41.7N 48.2E, H: 16 42 03.7, h 19 km, M 5.5. Eastern Caucasus.
Apr. 21	eS eL F	16	08	23		14		13	6.3		36.1N 141.8E, H: 15 45 25.4, h 30 km, M 5.5. Near east coast of Honshu, Japan.
Apr. 21	WIT iPKP	16	31	31.7	+						20.4S 178.0W, H: 16 12 45.1, h 511 km, M 4.5. Fiji Islands.
Apr. 21	eL F	18	20			14		6	6.0		35.5N 142.0E, H: 17 36 50.0, h 46 km, M 5.1. Near east coast of Honshu, Japan.
Apr. 22	eL F	04	05			18		6	6.2		37.8S 73.4W, H: 03 06 32.3, h 18 km, M 5.7. Near coast of Central Chile.
Apr. 22	eP eS eL F WIT eP	23	38	28							57.5N 152.1W, H: 23 27 20.5, h 22 km, M 5.9. Kodiak Islands region.

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Apr. 23	iPP ePS eSS eL F WIT ePP	00	28	19.0							0.9S 122.4E, H: 00 09 34.4, h 45 km, M 6.0. Northern Celebes.
Apr. 23	ePP eS eSS eL F	09	15	30		26		36	6.7		0.5S 122.2E, H: 08 56 45.8, h 79 km, M 5.8. Northern Celebes.
Apr. 25	WIT iPKP	11	00	41.8							21.0S 178.7W, H: 10 41 58.2, h 561 km, M 5.3. Fiji Islands region.
Apr. 25	e F	23	48								41.2N 69.3E, H: 23 22 52.6, h 33 km, M 5.0. Kirgiz SSR.
Apr. 27	eL F WIT eP	20	00		20			6.7	5.3		38.2N 42.7E, H: 19 48 49.8, h 25 km, M 4.9. Turkey.
Apr. 28	ePKP F WIT ePKP	17	16	03							d.b.m. 19.1S 173.6W, H: 16 56 20.0, h 27 km, M 5.2. Fiji Islands region.
Apr. 28	e e F WIT ePKP	17	32.8								19.3S 173.5W, H: 17 13 31.6, h 33 km, M 5.2. Tonga Islands.
Apr. 29	WIT eP	01	58	11							53.8N 157.8W, H: 01 46 42.6, h 33 km, M 5.2. South of Alaska.
Apr. 30	eL F	14	10								41.0N 72.1E, H: 13 41 09.1, h 19 km, M 5.1. Kirgiz SSR.
May 1	eP epP eS eSS F WIT iP epP	16	35	41							8.5S 74.3W, H: 16 22 56.3, h 165 km, M 5.7. Peru-Brazil border.
May 2	WIT iPKP	11	12	06.7	-						18.0S 178.3W, H: 10 53 28.4, h 537 km, M 4.9. Fiji Islands.
May 2	eL F	23	25								38.0N 42.6E, H: 23 12 22.9, h 41 km, M 4.8. Turkey.
May 4	eP iS eL F WIT eP	06	41	00		16		7.2	5.0		39.1N 21.8E, H: 06 36 59.8, h 41 km, M 5.0. Greece.
May 4	e eL F WIT eP	21	58.0			14		11	5.3		37.7N 27.9E, H: 21 48 58.2, h 14 km, M 4.7. Turkey.
May 5	eP ePP eS eL F WIT eP	14	34	02	(+)	18		40	6.7		24.4N 122.6E, H: 14 21 22.7, h 60 km, M 5.7. Taiwan region.

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
May 7	eP eS eL F WIT eP	13	13	10		14		21	5.5		37.8N 27.9E, H: 13 08 16.0, h 12 km, M 5.2. Turkey.
May 9	iP iS eL F WIT iP	00	48	02.0	+	4	3				34.5N 26.5E, H: 00 42 55.6, h 33 km, M 5.5. Crete.
May 9	WIT iP	03	56	06							37.2N 31.2E, H: 03 51 09.4, h 125 km, M 5.1. Turkey.
May 10	e eL F	21	29			13		5.5	5.6		51.8N 99.0E, H: 21 04 04.0, h 2 km, M 4.9. USSR-Mongolia border region.
May 11	eP eS ePS eL F WIT iP	14	29	26		20			12	6.2	48.9N 156.2E, H: 14 17 34.1, h 13 km, M 5.8. Kurile Islands region.
May 11	WIT iP	14	38	25.0	+						49.0N 156.2E, H: 14 26 41.6, h 33 km, M 5.5. Kurile Islands region.
May 11	eS eL F WIT iP	22	01.3			20		6.7	6.0		48.8N 156.3E, H: 21 39 35.3, h 28 km, M 5.7. Kurile Islands region.
May 13	WIT eP	13	16	58							34.8N 27.0E, H: 13 11 51.1, h 31 km, M 4.8. Crete.
May 14	e F	17	45								34.2N 138.9E, H: 17 03 56.5, h 33 km, M 4.9. Off east coast of Honshu, Japan.
May 14	WIT eP	20	38	38							10.5N 63.0W, H: 20 27 27.4, h 16 km, M 5.5. Off coast of Venezuela.
May 15	eP eS eL F WIT iP	14	57	58							d.b.m. 51.5N 178.4W, H: 14 46 06.5, h 31 km, M 5.8. Andreanof Islands, Aleutian Islands.
May 17	WIT iP ipP	01	11	28.0	-						35.8N 140.5E, H: 00 59 06.3, h 68 km, M 5.3. Near east coast of Honshu, Japan.
May 18	HEE i	01	20	59							25.0N 109.0W, H: 07 32 07.3, h 33 km, M 5.3. Gulf of California.
May 18	eL F	08	10	09.0							
May 19	eP eS eSS eL F WIT iP	07	18	00		18		6.8	5.9		d.b.m. 54.1N 164.1W, H: 07 06 26.8, h 28 km, M 5.8. Unimak Island region.
May 19	WIT i	14	08	27.5	-						

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
May 20	WIT e HEE e	00	59								43.0N 0.3W, H: 00 53 00.0, h 33 km, M 4.2. Pyrenees, France.
May 20	ePP ePS eL F	09	33.4			19			7	6.2	d.b.m. 13.9N 146.1E, H: 09 14 49.2, h 66 km, M 6.0. South of Mariana Islands.
May 20	eL F	18	51								d.b.m. 19.6N 122.0E, H: 18 02 41.4, h 96 km, M 5.6. Philippine Islands region.
May 21	WIT iPKP	08	27	26.0	-						24.3S 179.8E, H: 08 08 30.6, h 518 km, M 5.1. South of Fiji Islands.
May 22	eL F	07	49								38.7N 28.1E, H: 07 37 29.2, h 40 km, M 4.6. Western Turkey.
May 22	e F	15	30								d.b.m. 20.7N 108.5W, H: 14 50 47.3, h 33 km, M 4.2. Off west coast of Mexico.
May 23	e F	01	39								d.b.m. 52.6N 33.9W, H: 01 28 53.2, h 33 km, M 4.6. North Atlantic Ocean.
May 24	e(S) eL F	09	47.7								d.b.m. 37.4N 22.1E, H: 09 39 26.0, h 34 km, M 4.9. Southern Greece.
May 25	WIT iPKP	12	26	43.0	+						21.6S 119.9E, H: 12 07 04.8, h 35 km, M 5.5. Loyalty Islands.
May 25	ePKP1 ePKP2 ePP eL F WIT ePKP2 ePP	13	40	56		18			6.8	6.5	52.9S 160.0E, H: 13 20 56.2, h 33 km, M 6.6. Macquarie Islands region.
May 29	WIT iPKP iPP	14	03	22.5							21.6S 178.7W, H: 13 44 32.9, h 516 km, M 5.2. Fiji Islands.
May 30	WIT eP	03	21	45							7.6N 77.0W, H: 03 09 34.4, h 32 km, M 5.3. Northern Colombia.
June 2	eP eS eL F WIT iP	03	39	44							51.1N 176.0E, H: 03 27 53.3, h 41 km, M 6.0. Rat Islands, Aleutian Islands.
June 2	eL F	23	00								38.5N 27.4E, H: 22 51 27.2, h 33 km, M 4.5. Western Anatolia.
June 3	WIT ePP	14	11	59.5							17.9S 178.8W, H: 13 49 13.8, h 643 km, M 5.3. Fiji Islands.
June 5	eP eS eL F WIT iP	00	00	23		18			8.1	6.0	46.5N 152.5E, H: 23 48 17.8, h 27 km, M 5.9. Kurile Islands.

Date 1966	Phase	G.M. Time			First Motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
June 5	eL F	05	35								24.7N 122.3E, H: 04 49 53.2, h 33 km, M 4.7. Taiwan region.
June 6	iP ipP isP iPP isPP iH isS iSS F WIT iP HEE iP	07	54	35.5	+	6	20				36.3N 71.2E, H: 07 46 16.2, h 225 km, M 6.3. Hindu Kush.
June 6	eP ePP eSKS eL F WIT eP	21	00	57		18		6	6.1		9.6N 126.4E, H: 20 47 11.5, h 45 km, M 5.7. Mindanao, Philippine Islands.
June 7	eP ePP eSKS eS eL F WIT eP	01	13	08		24		15.6	6.5		15.0S 75.8W, H: 00 59 46.6, h 48 km, M 5.5. Near coast of Peru.
June 7	eP ePP ePPP eSKS iSP eSS eL F WIT iP	14	13	43		20		96	7.3		11.3N 139.6E, H: 13 59 36.0, h 50 km, M 6.5. Caroline Islands.
June 8	WIT iP	20	07	27.0	+						53.1N 171.1E, H: 19 56 21.3, h 20 km, M 5.4. Aleutian Islands.
June 9	WIT eP	15	51	15							44.3N 147.6E, H: 15 39 27.8, h 110 km, M 5.5. Kurile Islands.
June 9	eL F	23	00								27.6N 52.5E, H: 22 24 39.0, h 8 km, M 4.9. Iran.
June 10	eL F	22	30								32.9N 39.8W, H: 22 14 37.3, h 8 km, M 5.2. North Atlantic Ocean.
June 10	eL F	23	14								45.1N 99.7E, H: 22 41 48.5, h 33 km, M 5.1. Mongolia.
June 11	eL F WIT e(P)	03	45		20		8.2		6.1		23.6N 119.9E, H: 03 01 08.7, h 33 km, M 5.2. Taiwan region.
June 11	eS eL F WIT eP	10	29	24							38.9N 21.4E, H: 10 21 55.9, h 43 km, M 4.7. Greece.
June 11	e F	12	15								37.5N 21.2E, H: 12 05 03.2, h 51 km, M 4.8. Greece.

Date 1966	Phase	G.M. Time			First Motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
June 13	ePKP eL F WIT ePKP	07	53	00							21.2S 174.1E, H: 07 33 13.4, h 49 km, M 5.9. New Hebrides Islands.
June 13	iPKP epPKP ePP epPP eSS F WIT iPKP	18	27	33.0	+						12.2S 167.1E, H: 18 08 38.4, h 259 km, M 6.2. Santa Cruz Islands.
June 14	WIT iPKP	02	57	22.3	+						20.8S 178.6W, H: 02 38 37.2, h 545 km, M 4.6. Fiji Islands.
June 15	iPKP eZ iPP eSKP eSS eL F WIT ePKP HEE eL	01	19	15.0	+	24		246	7.7		10.4S 160.8E, H: 00 59 45.8, h 31 km, M 6.1. Solomon Islands.
June 15	WIT ePKP	01	52	10							10.2S 161.1E, H: 01 32 55.5, h 33 km, M 6.2. Solomon Islands.
June 15	HEE i	17	24	28							
June 16	HEE i	21	11	48							
June 19	eL F WIT eP	18	06			14		4.8	4.8		38.6N 27.4E, H: 17 55 32.3, h 31 km, M 4.6. Western Anatolia.
June 21	ePP eL F	01	05	20							10.9S 165.3E, H: 00 43 13.5, h 25 km, M 5.3. Santa Cruz Islands.
June 21	eL F WIT iP	23	50								50.1N 157.8E, H: 23 06 25.9, h 14 km, M 5.8. Kurile Islands.
June 22	eP epP ePKP ePP epPP ePPP (epPPP) (eSP) SPP F WIT epP ePKP	20	43	00							7.2S 124.6E, H: 20 29 03.6, h 507 km, M 6.1. Banda Sea.
June 25	e F	02	25								29.6N 142.1E, H: 01 46 10.4, h 49 km, M 5.5. South of Honshu, Japan.
June 27	eP eS M F WIT iP	10	51	04		4	3				29.7N 80.9E, H: 10 41 08.6, h 37 km, M 6.1. Nepal border region.
		10	59	14		14		58	6.6		
		11	19								
		in next shock									
		10	50	58.0	+						

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
June 27	eP ePP M F WIT iP	11	09	17	+	15	126	7.0		29.7N 81.0E, H: 10 59 18.1, h 40 km, M 6.0. Nepal border region. Disturbed by preceding shock.	
		11	11	30							
		11	37								
		12.5									
		11	09	06.4							
June 28	eL F	05	00		20	14		6.3		d.b.m. 35.9N 120.5 W, H: 04 26 12.4, h 4 km, M 5.3. Central California.	
		06	00								
June 29	eL F	23	00							d.b.m. 13.8S 166.7E, H: 21 46 54.5, h 35 km, M 6.2. New Hebrides Islands.	
		23	50								
June 30	eL F	13	23							d.b.m. 9.6N 126.7E, H: 12 27 41.9, h 44 km, M 5.4. Mindanao, Philippine Islands.	
		14.0									
June 30	eL F WIT iP	22	57		+					d.b.m. 37.3N 116.3W, H: 22 15 00.0. Nevada.	
		23	30								
		22	26	58.5							
July 1	iP epP ePP eS eL F WIT iP epP ePP	06	03	08.7	+	5	5		6	52.3N 174.2E, H: 19 05 26.5, h 56 km, M 5.0. Aleutian Islands.	
		06	03	30							
		06	06	31							
		06	13	25							
		06	30								
		07	20								
		06	03	02.7							
		06	03	30							
		06	06	20							
July 3	ePKP eL F WIT ePKP	04	29.5							21.1S 174.2W, H: 04 09 30.0, h 33 km, M 5.0. Tonga Islands.	
		05	34								
		06.0									
		04	29	17							
July 4	eP eS eL F WIT iP	12	21	00	9		18	5.6		37.5N 24.8W, H: 12 15 28.1, h 33 km, M 5.5. Azores Islands region.	
		12	25	38							
		12	27.5								
		13.5									
		12	21	06.5							
July 4	eP eS eSS eH eL F WIT eP i	18	45	30	-	20	107	7.1		51.7N 179.9E, H: 18 33 35.7, h 13 km, M 6.2. Rat Islands, Aleutian Islands.	
		18	55	16							
		19	00.1								
		19	06.0								
		19.2									
		23.0									
		18	45	29							
		18	45	30.0 (-)							
July 5	eL F	00	20							39.0N 23.9W, H: 23 49 52.7, h 33 km, M 4.4. Azores Islands region.	
		00	10								
July 5	eP eL F WIT eP	02	33	45						52.2N 178.4W, H: 02 21 43.8, h 66 km, M 4.9. Andreanof Islands, Aleutian Islands.	
		03.1									
		03.8									
		02	33	35							
July 5	eP eS eL F	05	14	36	+					37.6N 24.6W, H: 05 09 03.6, h 12 km, M 5.1. Azores Islands region.	
		05	19	34							
		05	22								
		06.1									
July 6	eL F	00	55							15.3S 75.5W, H: 00 05 51.0, h 7 km, M 5.1. Near coast of Peru.	
		01	10								

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
July 6	e F	04	32							40.9N 15.7E, H: 04 24 40.5, h 25 km, M 4.3. Southern Italy.	
		04	38								
July 6	eL F	14	25		14		6.4	5.6		43.9N 83.2E, H: 13 59 14.8, h 33 km, M 4.8. Sinkiang Province, China.	
		14	40								
July 6	eL F	21	08							25.8N 128.0E, H: 20 21 43.5, h 23 km, M 5.3. Ryukyu Islands.	
		21	30								
July 9	WIT iPKP	14	33	22.5	+					20.1S 178.4W, H: 14 14 41.6, h 559 km, M 5.1. Fiji Islands	
July 10	iP ePP eS eSSS eL F WIT iP	16	25	28.5							
		16	28	55	+	4	3			24.2N 125.2E, H: 16 12 41.5, h 28 km, M 5.9. Southwest of Ryukyu Islands.	
		16	36	00							
		16	46.5								
		16	56								
		18.0									
		16	25	22.5 (-)							
		16	25	22.5							
July 10	WIT iP	22	17	02.5						24.8N 125.3E, H: 22 04 24.4, h 58 km, M 5.4. Ryukyu Islands.	
July 11	ePKP eL F WIT ePKP	23	05	41							
		00.1								19.2S 173.6W, H: 22 46 05.7, h 120 km, M 5.6. Tonga Islands.	
		01.1									
		23	05	40							
July 12	eL F WIT e	03	07							35.5N 22.4E, H: 02 56 23.5, h 15 km, M 4.9. North of Crete.	
		03	20								
		03	01.1								
July 12	iP eS eL F WIT iP	18	58	13.4	-	2	10			44.6N 37.4E, H: 18 53 08.5, h 26 km, M 5.9. Northwest of Caucasus Mountains.	
		19	02	16							
		19	03.8								
		19	30								
		18	58	04.4							
July 16	eL F	20	08							40.7N 74.2E, H: 19 43 27.4, h 33 km, M 4.8. Kirgiz-Sinkiang border region.	
		20	15								
July 17	WIT iPKP	02	43	42.3						21.6S 169.9E, H: 02 24 06.9, h 63 km, M 5.2. Loyalty Islands.	
July 19	eL F	00	30								
		00	40							55.5N 35.4W, H: 00 20 11.0, h 33 km, M 4.6. North Atlantic Ocean.	
July 19	eP eS eL F WIT eP	01	52	10							
		02	01	30	14		16	6.3		56.2N 164.9E, H: 01 40 53.9, h 18 km, M 5.4. Komandorsky Islands.	
		02	45								
		04.0									
		01	52	09							
July 19	eL F	20	08							51.7N 173.3W, H: 19 20 33.4, h 47 km, M 5.5. Andreanof Islands, Aleutian Islands.	
		20.6									
July 20	e F	10	26							38.9N 21.0E, H: 10 16 07.4, h 46 km, M 5.1. Greece.	
		10	30								
July 21	WIT iPKP	18	48	47.3	+					17.8S 178.6W, H: 18 30 14.9, h 591 km, M 5.6. Fiji Islands	

Date 1966	Phase	G.M Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
July 22	eL F	04	07								42.8N 84.5E, H: 03 39 59.7, h 33 km, M 5.2. Sinkiang Province, China.
July 23	eP eL F WIT eP	14	43	36							51.7N 173.5W, H: 14 31 51.2, h 55 km, M 5.3. Andreanof Islands, Aleutian Islands.
July 24	WIT iPKP	17	37	50.3	-						20.4S 175.8W, H: 17 18 17.6, h 112 km, M 5.2. Tonga Islands.
July 27	eL F	05	35								24.2S 70.3W, H: 04 48 59.4, h 35 km, M 6.0. Near coast of Northern Chile.
Aug. 1	eH eL F	19	26		20	28			6.3		d.b.m. 29.9N 68.8E, H: 19 09 55.1, h 33 km, M 5.8. West Pakistan.
Aug. 1	eS eL F	20	52.5								d.b.m. 29.9N 68.6E, H: 20 30 57.0, h 33 km, M 5.7. West Pakistan.
Aug. 1	WIT e	20	44.0								44.6N 150.4E, H: 20 32 11.3, h 24 km, M 5.2. Kuril Islands region.
Aug. 1	eS eSS eL F WIT eP	21	19	20	17	156			7.1		d.b.m. 30.0N 68.7E, H: 21 02 59.6, h 33 km, M 6.2. West Pakistan.
Aug. 2	eL F	19	33								36.5N 138.1E, H: 18 48 33.8, h 2 km, M 4.9. Honshu, Japan.
Aug. 5	e F	01	33								32.6N 79.6E, H: 01 03 04.4, h 55 km, M 5.3. Kashmir-Tibet border region.
Aug. 5	e F WIT e	04	26.0								49.9N 78.0E, H: 03 57 58.1, h 0 km, M 5.7. Kazakstan.
Aug. 6	e(S) F	02	38.5								42.2N 18.8E, H: 02 31 07.8, h 33 km, M 5.3. Off coast of Yugoslavia.
Aug. 6	e F	05	59.5								42.2N 18.8E, H: 05 51 56.7, h 11 km, M 5.4. Off coast of Yugoslavia.
Aug. 7	iP ePP eS ePS eL F WIT iP	02	25	00.5	-	5	12				50.6N 171.3W, H: 02 13 05.1, h 39 km, M 6.5. Aleutian Islands.
Aug. 7	eP eS eL F	17	48	40							31.8N 114.5W, H: 17 36 26.7, h 33 km, M 6.3. Gulf of California.
Aug. 8	eL F	08	45		16	6.5			6.0		19.3N 108.1W, H: 08 02 45.8, h 33 km, M 5.4. Revilla Gigedo Islands region.

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		h	m	s			Z	NS	EW		
Aug. 9	eL F	03	43								40.3N 19.0E, H: 03 34 14.3, h 33 km, M 5.0. Albania.
Aug. 10	ePKP F WIT iPKP	05	20.8								20.1S 175.3W, H: 05 01 09.4, h 96 km, M 5.8. Tonga Islands
Aug. 10	e F	22	30								38.4N 69.6E, H: 22 05 35.0, h 4 km, M 5.5. Tadzhik SSR.
Aug. 11	e eL F	04	41.9								38.9N 21.8E, H: 04 34 17.2, h 33 km, M 4.5. Greece.
Aug. 11	ePKP eL F WIT iPKP	05	32	26.0	(+)	5	5				19.3S 173.9W, H: 05 12 42.2, h 33 km, M 5.5. Tonga Islands.
Aug. 11	ePKP eL F WIT iPKP	23	45	28							23.4S 175.9W, H: 23 25 37.9, h 37 km, M 5.3. Tonga Islands.
Aug. 12	WIT iPKP	04	19	25.4							22.4S 176.2W, H: 03 59 50.1, h 128 km, M 5.4. South of Fiji Islands.
Aug. 12	eP eS eL F	16	11	42							53.6N 35.4W, H: 16 06 27, h 33 km, M 4.6. North Atlantic Ocean.
Aug. 12	WIT eP	19	34	18							34.0N 137.2E, H: 19 22 24.2, h 324 km, M 4.9. Near south coast of Honshu, Japan.
Aug. 12	WIT iP i	20	28	38.5	(-)						52.9N 161.6W, H: 20 16 59.8, h 31 km, M 5.6. South of Alaska.
Aug. 13	eL F	18	06								
Aug. 15	eL F	03	30		20	64			7.1		13.3N 121.3E, H: 02 45 32.3, h 14 km, M 5.7. Philippine Islands. No vertical record.
Aug. 16	iP e eSS eSS F WIT iP	02	24	40							36.4N 70.8E, H: 02 16 19.7, h 199 km, M 5.7. Hindu Kush region.
Aug. 16	e F	04	02								40.3N 19.9E, H: 03 53 42.9, h 33 km, M 4.9. Albania.
Aug. 16	eL F WIT e	18	39								37.4N 114.2W, H: 18 02 36.1, h 33 km, M 6.1. Southern Nevada.
Aug. 16	ePKP ePP eSS eL F WIT e	20	05	23							21.4S 171.3E, H: 19 45 38.7, h 36 km, M 5.3. Loyalty Islands region.

Seismic records at De Bilt

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Aug. 17	WIT e	23	19	8							37.3N 114.1W, H: 23 07 58.9, h 33 km, M 5.2. Southern Nevada.
Aug. 18	eP eS ePS eL F WIT iP	10 10 10 11 12.0 10	45 55 56 07 07	33 45 20 07 38.0	+	6 26	2	15.6	6.2		14.6N 91.7W, H: 10 33 16.5, h 76 km, M 5.9. Guatemala.
Aug. 18	eP ePP eS F WIT eP	14 14 14 in next shock 14	48 52 59.9 48	18 50 14							0.2S 125.1E, H: 14 33 59.8, h 56 km, M 6.3. Molucca Sea.
Aug. 18	eP ePP eS eSS eL F WIT eP	14 14 15 15 15 16 14	52 56 03 12 25 30 52	08 42 42 00 00 08							0.1S 125.1E, H: 14 37 52.6, h 33 km, M 6.3. Molucca Sea.
Aug. 19	iP i eS eL F WIT iP HEE iP	12 12 12 12 16.5 12 12	28 28 32 35 27 28	08.3 09.2 50 50 57.0 00	+	20		231	7.0		39.2N 41.7E, H: 12 22 09.6, h 26 km, M 6.1. Turkey
Aug. 19	WIT eP	14	00	13							38.9N 41.7E, H: 13 54 24.9, h 33 km, M 5.3. Turkey.
Aug. 20	eP ePP eS eL F WIT iP	09 09 09 10 10 09	44 44 53 10 40 44	13 50 51 10 40 06.9		19		80	7.0		43.1N 140.6E, H: 09 32 31.7, h 161 km, M 5.8. Hokkaido, Japan
Aug. 20	eP eS eL F WIT iP	12 12 13 14.0 12	05 09 11 04	00 52 40 54.0	+	20		82	6.3		39.3N 40.9E, H: 11 59 12.1, h 37 km, M 5.4. Turkey.
Aug. 20	e F WIT e	19 19 19	16 20 16								42.3N 18.9E, H: 19 08 21.4, h 20 km, M 4.9. Yugoslavia.
Aug. 20	ePKP e eSKP eSS eL F WIT iPKP	23 23 23 23 00 01 23	14 15 18 38.0 18 30 14	45 12 26 07 30 51.5	+	18		5.1	6.3		23.4S 176.0W, H: 22 55 03.0, h 57 km, M 5.6. South of Fiji Islands.
Aug. 21	iP iS eL F WIT e	01 01 01 02 01	35 38 40.6 05 35.1	05.4 54	(-)	12		14.8	5.3		40.3N 17.4E, H: 01 30 45.2, h 33 km, M 4.9. Turkey.

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Aug. 21	eP ePP eSKS eS eL F WIT eP	05 05 05 05 06 05	14 18 24 25 47 45 14	13 27 50 50 10		21			11	6.3	8.5N 126.7E, H: 05 00 26.8, h 67 km, M 6.0. Mindanao, Philippine Islands.
Aug. 22	ePKP eL F WIT ePKP	18 18 20.5 18	01 43 01	57 43 51.5	(-)						22.4S 170.6E, H: 17 42 10.6, h 39 km, M 5.5. Loyalty Islands region.
Aug. 22	e F	22 22	00 15								71.9N 11.4W, H: 21 49 17.4, h 33 km, M 4.3. NW of Jan Mayen Island.
Aug. 23	eL F WIT ip	19 19 18	06 30 34		+						23.8N 123.2E, H: 18 22 16.7, h 37 km, M 5.6. Ryukyu Islands region.
Aug. 26	eL F	06 06	05 16								38.1N 8.4W, H: 05 56 24.3, h 33 km, M 4.7. Portugal.
Aug. 26	ePKP eL F WIT ePKP e	09 10 11.5 09 09	26.6 22 26 26								22.1S 170.0E, H: 09 06 50.4, h 33 km, M 5.6. Loyalty Islands region.
Aug. 28	e F	04 04	25 40								42.2N 18.7E, H: 04 18 13.3, h 39 km, M 4.6. Yugoslavia.
Aug. 28	eL F	04 05	54 20								36.6N 138.1E, H: 04 09 24.3, h 24 km, M 4.5. Honshu, Japan
Aug. 28	WIT ePKP2	07	50	10							35.8S 178.5E, H: 07 29 34.7, h 94 km, M 5.8. Off east coast of North Island; New Zealand.
Aug. 28	WIT iPKP	10	21	08.0	+						4.6S 155.2E, H: 10 03 03.0, h 509 km, M 5.6. Solomon Islands.
Aug. 28	eL F	16 16	25 35								36.6N 138.2E, H: 15 36 18.5, h 17 km, M 5.0. Honshu, Japan.
Aug. 29	eL F	14 15	35 05								65.2S 176.9E, H: 13 10 27.0, h 33 km, M 5.5. Balleny Island region.
Aug. 30	eL F	06 07	42 00		14			3.5		5.5	51.7N 104.4E, H: 06 10 33.4, h 33 km, M 5.0. Lake Baikal region.
Aug. 31	eP eS eL F	18 18 18 19.0	20 23 26	12 50		14			3.5	4.7	71.6N 2.7W, H: 18 15 39.5, h 33 km, M 5.1. Jan Mayen Island region.
Sep. 1	eL F	01 02.1	50								71.8N 2.8W, H: 01 38 29.9, h 17 km, M 4.9. Jan Mayen Island region.
Sep. 1	iP eS eL F WIT eP	14 14 14 15 14	27 30 32 00 27	22.8 58	+	18			29	5.7	37.5N 22.1E, H: 14 22 57.0, h 17 km, M 5.3. Southern Greece.

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Sep. 1	eP eS F WIT eP	19	22.5								71.6N 2.9W, H: 19 18 00.6, h 33 km, M 5.2. Jan Mayen Island region.
Sep. 1	eL F	21	38								58.3N 32.6W, H: 21 27 38.6, h 33 km, M 4.7. North Atlantic Ocean.
Sep. 8	iP iPP iPPP ePS eL F WIT eP	21	30	03.5	+	6	2				2.4N 128.4E, H: 21 15 52.8, h 96 km, M 6.9. Halmahera.
Sep. 8	WIT ePKP	21	37	00				43	7.0		21.7S 176.3W, H: 21 17 21.4, h 80 km, M 5.7. Fiji Islands region.
Sep. 8	WIT eP	22	07	33							45.4N 150.5E, H: 21 55 40.1, h 32 km, M 5.6. Kurile Is- lands.
Sep. 10	WIT iPKP	17	50	53.5							23.3S 179.8E, H: 17 32 03.0, h 550 km, M 5.0. South of Fiji Islands.
Sep. 11	WIT iP	17	49	48.2	-						6.8N 72.9W, H: 17 38 04.2, h 167 km, M 5.9. Northern Colombia.
Sep. 12	iPKP ipPKP eSS eSSS eL F WIT iPKP	11	49	19.3	-	5	3				23.1S 170.6E, H: 11 29 40.3, h 49 km, M 6.1. Loyalty Islands region.
Sep. 12	eP eS eL F WIT eP	16	53.0			18		11.4	6.5		39.4N 120.1W, H: 16 41 01.7, h 8 km, M 5.4. Northern California.
Sep. 14	ePP ePS eSS eSSS eL F	23	38.4			18		57	7.2		d.b.m. 60.1S 27.0W, H: 23 18 41.6, h 33 km, M 6.2. South Sandwich Islands region.
Sep. 15	ePS eL F	12	21	20		20		9.2	6.3		60.3S 26.7W, H: 11 51 55.7, h 33 km, M 5.7. South Sand- wich Islands.
Sep. 15	eL F WIT eP	17	57			20		12.5	6.3		22.8N 121.4E, H: 17 10 46.8, h 47 km, M 5.5. Taiwan.
Sep. 17	e F	21	50								20.7S 176.3W, H: 21 05 26.8, h 220 km, M 4.6. Fiji Is- lands.
Sep. 18	e F	14	55								22.6N 102.1E, H: 14 15 57.2, h 33 km, M 5.4. Yunnan, China.

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Sep. 18	e F	16	10								60.4S 27.0W, H: 15 14 24.9, h 33 km, M 5.4. South Sand- wich Islands.
Sep. 18	eP ePP eS eL F WIT iP	20	52	00							27.8N 54.3E, H: 20 43 53.3, h 16 km, M 6.2. Southern Iran.
Sep. 19	e F	05	42								30.2N 138.4E, H: 04 53 10.5, h 450 km, M 4.7. South of Honshu, Japan.
Sep. 22	WIT iP	00	15	51.8							52.6N 159.5E, H: 00 04 28.0, h 61 km, M 5.2. Off east coast of Kamchatka.
Sep. 22	e F	19	35								37.4N 114.2W, H: 18 57 36.5, h 33 km, M 5.3. Southern Nevada.
Sep. 23	eP eS eL F WIT iP	01	41	50							44.7N 150.3E, H: 01 29 47.2, h 34 km, M 5.2. Kurile Is- lands region.
Sep. 24	eL F	10	25								27.4N 54.5E, H: 10 00 46.4, h 33 km, M 5.4. Southern Iran.
Sep. 25	eP eS eL F WIT iP	06	14	59.5							18.3N 100.8W, H: 06 02 26.4, h 60 km, M 6.1. Guerrero, Mexico.
Sep. 25	WIT iP	20	31	05.7	(+)						53.0N 159.7E, H: 20 19 42.5, h 48 km, M 5.3. Off east coast of Kamchatka.
Sep. 26	eL F	05	07								22.3N 117.9E, H: 04 22 51.2, h 19 km, M 5.5. Taiwan region.
Sep. 26	eP eS eL F WIT iP	05	22.0			14		6.1	5.8		27.5N 92.6E, H: 05 10 58.1, h 33 km, M 5.6. India-China border region.
Sep. 28	eP eS eSS eSSS eL F WIT iP	14	11	42							27.4N 100.1E, H: 14 00 22.9, h 33 km, M 6.2. Yunnan Pro- vince, China.
Oct. 2	eL F	03	03								43.7N 125.2E, H: 02 24 57.1, h 33 km, M 4.5. Northeastern China.
Oct. 2	eP eL F	07	35.4								51.6N 174.5W, H: 07 23 35.3, h 34 km, M 5.1. Andreanof Islands, Aleutian Islands.

Seismic records at De Bilt

Seismic Records at De Bilt

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Oct. 2	iP eS F WIT iP	11	25	15.5	-						45.7N 26.5E, H: 11 21 44.9, h 140 km, M 5.3. Rumania.
Oct. 7	iPKP iPP iSKKS eSKSP eSS F WIT ePKP ePP	16	14	36.0	+	5	10				21.6S 170.5E, H: 15 55 10.8, h 161 km, M 6.4. Loyalty Islands region.
Oct. 8	ePP eL F WIT ePKP	00	35.1								16.4S 177.6W, H: 00 12 18.1, h 33 km, M 5.7. Fiji Islands
Oct. 8	WIT iPKP	02	41	12.5	-						19.4S 175.4W, H: 02 21 56.4, h 241 km, M 5.0. Tonga Islands.
Oct. 8	eL F	03	42								57.7N 151.6W, H: 03 06 46.4, h 32 km, M 5.0. Kodiak Island.
Oct. 8	WIT iP	19	50	39.5	-						10.8N 62.6W, H: 19 39 40.5, h 90 km, M 4.8. Near coast of Venezuela.
Oct. 9	WIT iPKP i	02	25	04.0	+						17.8S 178.2W, H: 02 06 35.3, h 639 km, M 4.8. Fiji Islands region.
Oct. 9	eS eSS eL F	07	03.5			18		10	5.7		d.b.m. 12.6N 30.8E, H: 06 48 40.3, h 11 km, M 5.1. Sudan.
Oct. 11	eSS eL F	06	55.5								d.b.m. 60.3S 26.0W, H: 06 25 55.1, h 37 km, M 5.9. South Sandwich Islands region.
Oct. 12	e eL F	00	26								d.b.m. 11.9S 121.8E, H: 00 06 37.8, h 33 km, M 5.7. South of Timor.
Oct. 13	eH eL F	19	06.5								d.b.m.
Oct. 14	e eL F	01	27.0			16		13	6.0		d.b.m. 36.4N 87.5E, H: 01 04 43.3, h 24 km, M 5.2. Sinkiang, China.
Oct. 16	eL F	09	57								29.6N 142.4E, H: 09 13 31.0, h 56 km, M 5.5. South of Honshu, Japan.
Oct. 17	e eL F	10	37	52							
Oct. 17	iP e iSKS M F WIT iP HEE eSKS	21	55	15.6	+	12	10				10.7S 78.7W, H: 21 41 56.3, h 38 km, M 6.2. Near coast of Peru.

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Oct. 19	iP eS ePS eL F WIT eP	08	11	16.2	+	4	8				1.6S 15.5W, H: 08 01 33.8, h 33 km, M 6.2. North of Ascension Island.
Oct. 20	e F	01	23								33.6N 78.5E, H: 00 53 38.7, h 27 km, M 5.0. Kashmir-Tibet border.
Oct. 23	eL F	07	54								51.0N 159.2E, H: 07 09 20.9, h 38 km, M 5.2. Kamchatka.
Oct. 25	e F	18	50								36.8N 138.2E, H: 18 04 11.8, h 28 km, M 5.2. Honshu, Japan.
Oct. 27	iP eL F WIT iP	06	04	08.0	+	2	4	10	5.5		73.4N 54.8E, H: 05 57 58.0, h 0 km, M 6.3. Novaya Zemlya.
Oct. 27	eP ePS eL F WIT eP	14	34	42							22.2N 145.9E, H: 14 21 04.8, h 29 km, M 6.0. North Pacific Ocean.
Oct. 29	iP eS eL F WIT iP	02	43	34.0	-	10		52	5.7		39.2N 21.2E, H: 02 39 29.4, h 20 km, M 5.7. Greece.
Nov. 3	iP eS ePS eL F WIT iP	16	35	05.0	-	5	3				19.2N 67.9W, H: 16 24 31.0, h 22 km, M 5.6. Mona Passage.
Nov. 5	e F	14.0	15.0								d.b.m. 15.3S 175.2W, H: 12 45 13.9, h 38 km, M 5.3. Tonga Islands.
Nov. 6	e F WIT eP	08	40								d.b.m. 59.8N 30.0W, H: 08 29 14.3, h 33 km, M 4.8. North Atlantic Ocean.
Nov. 9	e F WIT eP	12	13								26.9N 125.5E, H: 11 26 24.7, h 39 km, M 5.4. Ryukyu Islands.
Nov. 9	e F	15	21								39.2N 20.6E, H: 15 12 27.0, h 30 km, M 5.2. Ionean Sea.
Nov. 11	e F WIT iP	16	18								52.3N 169.1W, H: 15 31 04.2, h 38 km, M 5.4. Fox Islands, Aleutian Islands.
Nov. 12	e F	12	45								23.8S 67.6W, H: 11 50 31.6, h 126 km, M 5.6. Chile.
Nov. 12	eL F WIT iP	13	30			30		16	6.5		d.b.m. 41.8N 144.1E, H: 12 49 43.6, h 33 km, M 5.8. Hokkaido, Japan.

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Nov. 12	e eL F WIT ePKP e ePP	19	21.3			24	16		6.7	d.b.m. 15.6S 167.3E, H: 18 45 01.0, h 40 km, M 5.2. New Hebrides Islands.	
Nov. 18	e F	10	15							d.b.m. 36.3S 100.7W, H: 09 12 09.9, h 33 km, M 5.1. Easter Island region.	
Nov. 18	e F	19	00							d.b.m. 73.4N 6.8E, H: 18 48 43.9, h 33 km, M 4.9. Greenland Sea.	
Nov. 18	e F	20	05							d.b.m. 24.0N 46.3W, H: 19 43 35.2, h 33 km, M 4.7. Mid Atlantic Ocean.	
Nov. 19	eL F WIT iP	07	24.0		15		14		5.4	d.b.m. 35.0N 23.5E, H: 07 12 39.7, h 33 km, M 5.3. Crete.	
Nov. 19	eL F	19	12							d.b.m. 37.0N 71.4E, H: 19 05 38.1, h 130 km, M 4.9. Hindu Kush region.	
Nov. 20	eL F	18	00							d.b.m. 55.1S 129.4W, H: 16 47 33.0, h 33 km, M 4.9. Southern Pacific.	
Nov. 21	WIT eP	12	31	17.0	+					46.7N 152.5E, H: 12 19 27.3, h 40 km, M 5.6. Kurile Islands.	
Nov. 22	WIT iP	06	40	42.5	+					48.2N 146.7E, H: 06 29 53.5, h 453 km, M 5.6. Sea of Okhotsk.	
Nov. 23	eL F WIT ePKP	03	33							d.b.m. 14.9S 166.9E, H: 02 19 13.8, h 48 km, M 5.6. New Hebrides Islands.	
Nov. 26	e F	03	40							d.b.m. 78.4N 5.2E, H: 03 23 44.3, h 33 km, M 4.7. Greenland Sea.	
Nov. 27	eL F WIT eP	20	24							78.5N 6.4E, H: 20 13 01.5, h 33 km, M 5.6. Greenland Sea.	
Dec. 7	WIT iP	17	29	43.0	-					44.3N 151.7E, H: 17 17 42.0, h 26 km, M 5.8. Kurile Islands region.	
Dec. 10	eP eS eSS eL F WIT iP	13	18	55		20		39	6.7	d.b.m. 14.3N 92.0W, H: 13 06 32.6, h 70 km, M 5.6. Guatemala.	
Dec. 10	eS eL F WIT eP	17	17.7							d.b.m. 41.0N 33.5E, H: 17 08 32.2, h 13 km, M 4.9. Turkey.	
Dec. 10	eL F	19	09							d.b.m. 3.6S 145.4E, H: 18 08 14.4, h 33 km, M 5.7. Near north coast of New Guinea.	

Date 1966	Phase	G.M. Time			First motion	Period s	Amplitude μ			Magnitude De Bilt	Remarks Data without indication are from USCGS; d.b.m. means disturbed by microseisms
		h	m	s			Z	NS	EW		
Dec. 14	ePP ePPP ePS eSS eL F WIT ePKP	21	28	20							d.b.m. 4.8S 143.9E, H: 21 07 52.1, h 74 km, M 6.0. New Guinea.
Dec. 16	eL F WIT eP	21	24		14			29	6.4	d.b.m. 29.6N 81.0E, H: 20 52 13.5, h 9 km, M 5.9. Nepal.	
Dec. 17	WIT iP	05	05	59.8	+					49.9N 77.7E, H: 04 57 57.8, h 0 km, M 5.9. Semipalatinsk.	
Dec. 20	e F WIT iP	16	16							d.b.m. 37.3N 116.4W, H: 15 30 00.1. Nevada.	
Dec. 20	eL F	19	25		28		12		6.3	14.3N 122.1E, H: 18 39 40.3, h 37 km, M 5.4. Luzon, Philippine Islands.	
Dec. 21	iPKP WIT iPKP	09	11	12.0	-	4	10			20.0S 169.7E, H: 08 52 00.2, h 245 km, M 5.6. New Hebrides Islands.	
Dec. 23	ePP ePS ePPS eSS eL F WIT iPKP	16	11	21						d.b.m. 7.1S 148.3E, H: 15 50 20.4, h 43 km, M 6.4. East of New Guinea region.	
Dec. 27	WIT iPKP	12	10	02.2	-					24.3S 179.8E, H: 11 51 07.7, h 520 km, M 4.7. South of Fiji Islands.	
Dec. 28	iP ePP eS F WIT iP ePP HEE eL	08	31	57.0	+	8	7			25.5S 70.7W, H: 08 18 07.4, h 47 km, M 6.9. Near coast of Northern Chile.	
Dec. 30	WIT iPKP	01	18	51.3	(+)					17.8S 178.9E, H: 01 00 25.4, h 658 km, M 5.0. Fiji Islands	
Dec. 31	ePKP ePP eSS M F WIT e HEE eL	18	42	20						d.b.m. 11.8S 166.5E, H: 18 23 03.9, h 33 km, M 7.7. Santa Cruz Islands.	
Dec. 31	ePKP ePP eS eSS M F WIT ePKP	22	34	41						d.b.m. 11.3S 164.8E, H: 22 15 14.0, h 33 km, M 7.3. Santa Cruz Islands region.	