

10 MAR 1960

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

R 6

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR JANUARY, 19 60

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1918).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st August 1957	21.2	21.2	0.00	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	17 December 1957	10.7	11.4	-0.05	121

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.
 TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.
 SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.		
			h.	m.	s.						
2	NE	e	05	55	-				Very small. 2½° N., 96° E. Near Sumatra. USCGS.		
		F	06	20	-						
2	NE	eL	07	40	-				Small. 56½° N., 163½° E. Near Kamchatka. USCGS.		
		F	08	00	-						
2	E	eSS	12	55	41				South Atlantic Ocean, west of Bouvet Island. USCGS.		
		eLQ	13	06	-						
		MQ	12	-	26					8½	
		M	17½	-	20					3	
		N	20½	-	20					5½	
		Z	20½	-	20					4	
3	ZV	iP	11	33	39	1.5	0.4		Mag. = 6½		
		e		34	43						
		eL		50	-	16	1½				
		M		55	-	15	4				
		F	12	15	-						
3	ZV	iP	20	23	10	1.8	0.8		Confused by strong microseisms. 39½° N., 15½° E. Tyrrhenian Sea. h about 250Km. USCGS. Mag. = 5.9		
		i		23	13						
		i		23	22						
		i		23	53						
		e(S)		26	07						
4	NE	eL	06	32	-				Confused by strong microseisms.		
		M		49½	-					20	5
		M		50	-					16	4½
		F	07	25	-						

M.O. 669

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JANUARY, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLI-TUDE	Δ	REMARKS
			h.	m.	s.				
17	N	eL	03	44	-				14½°S., 74½°W. Near coast of Peru. h about 150Km. Mag. = 6¼(Pas). USCGS.
	N	M		50	-	18	1½		
	E	M		51	-	18	2		
		F	04	05	-				
19	ZV,Z	iP	02	28	40				52°N., 158°E. Near Kamchatka. USCGS.
21	NE	e	11	55	-				
	N	M	12	03	-	18	1½		
		F		25	-				
23	ZV,Z	e(PP)	05	00	55				Confused by strong microseisms. 4°S., 127½°E. Ceram Island region. Mag. 6½(Pas). USCGS.
	N	ePFS		11	33				
	N	eSS		16	49				
	NE	eL		38	-				
	N	M		51	-	22	5		
	E	M		52	-	21	7½		
		F	06	30	-				
23	ZV,Z	iPKP	06	43	05				17°S., 177°W. Fiji Islands. USCGS.
23	ZV	iPP	07	50	09				Confused by strong microseisms. 4°S., 127½°E. Ceram Island region. USCGS. Mag. = 6½
	N	eL	08	30	-				
	N	M		41	-	23	5		
	E	M		42	-	21	7		
	F	10	05	-					
23	NE	eL	18	42	-				Confused by microseisms. 4°S., 127½°E. Ceram Island region. USCGS. Mag. = 6¼
	E	M	19	05	-	25	4½		
	N	M		06	-	26	4½		
		F	20	00	-				
24	E	eSS	05	03	31				Confused by microseisms. 15½°S., 179°W. Fiji Islands. Mag. 6¼-6½(Pas). USCGS. Mag. = 6½
	E	eSSS		08	47				
	E	eLQ		22	-				
	E	M		40	-	21	6		
	N	M		42½	-	20	6½		
	Z	M		42	-	20	6½		
		F	07	00	-				
25	E	eLQ	17	29	-				16°S., 179°W. Fiji Islands. Mag. 6¼(Pas). USCGS. Mag. = 6¼
	E	M		50	-	20	1½		
	N	M		50	-	20	3		
	F	18	45	-					
26	NE	e	03	50	-				Very small.
		F	04	05	-				
26	NE	eS	10	03.3	-				39½°N., 39½°E. Turkey. USCGS. Mag. = 5½
	N	eL		06	-				
	E	M		11	-	20	2		
	N	M		11	-	19	2½		
		F		25	-				
26	ZV,Z	eP	13	10	59				38°N., 29°E. Turkey. USCGS.
	N	M		20	-	16	1		
		F		30	-				

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			h.	m.	s.				
26	ZV	iP	20	31	12				Compression. 46° N., $26\frac{1}{2}^{\circ}$ E. Roumania. h = 150 Km. BCIS.
29	NE	eL	08	34	-				Confused by microseisms.
	E	M		43	-	22	$1\frac{1}{2}$		
	N	M		44	-	21	2		
		F	09	15	-				
31	N	e(S)	05	31	32				Confused by very strong microseisms. $33\frac{1}{2}^{\circ}$ N., $134\frac{1}{2}^{\circ}$ E. Near Shikoku, Japan. USCGS. Mag. = $6\frac{1}{4}$
	NE	eL		48	-				
	E	M	06	05	-	18	9		
	N	M		$05\frac{1}{2}$	-	16	13		
	Z	M		$05\frac{1}{2}$	-	14	7		
		F		55	-				

All the magnitudes are the "unified magnitudes" denoted by "m".



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N.	1st August 1957	21.2	21.2	0.00	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	17 December 1957	10.7	11.4	-0.05	121

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			h.	m.	s.						
1	ZV	iP	12	04	51	sec.	μ	km.	Dilatation. Confused by microseisms. 35°N., 23½°E. Near west coast of Crete. USCGS.		
	ZV	eFP		05	10						
	N	eS		09	12						
	N	eL		12½	-						
	N	M		15	-					18	7
	E	M		16	-					16	3
		F		30	-			Mag. = 5¼			
4	N	ePKS	04	09	03	sec.	μ	km.	Confused by strong microseisms. 4½°S., 153½°E. New Ireland region. USCGS.		
	N	ePS		17	18						
	N	ePPS		18	57						
	N	eSSS		28	56						
	NE	eL		47	-						
	N	M		52	-					32	18
	E	M		52	-					34	28
	E	M		05 13½	-					20	8
		F		15	-	20	5	Mag. = 6½			
4	NE	e	10	25	-	sec.	μ	km.	Small. 5°S., 154°E. New Ireland region. USCGS.		
		F	11	00	-						
4	NE	e	17	13	26	sec.	μ	km.	Confused by strong microseisms. 39°N., 143°E. Off east coast of Honshu, Japan. USCGS.		
		eL		30	-						
		M		41½	-					20	8½
		M		42½	-					21	6½
		M		44	-					21	4½
		F		18 30	-						

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
4	NE E N	eL	21	40	-				Confused by strong microseisms. 39 ¹⁰ N., 142 ¹⁰ E. Near Honshu, Japan. USCGS.
		M		49	-	20	2		
		M		50	-	20	1 ¹ / ₂		
		F	22	05	-				
5	NE	e	03	00	-			Very small. 37°S., 95 ¹⁰ W. South Pacific Ocean. USCGS.	
		F		15	-				
8	N NE NE NE E N Z	e(PKKP)	13	14	09				58°S., 67°W. Drake Passage. USCGS. Mag. = 6 ¹ / ₂
		ePS		15	59				
		eSS		22	43				
		eL		36	-				
		M		58 ¹ / ₂	-	20	10 ¹ / ₂		
		M		58 ¹ / ₂	-	20	8 ¹ / ₂		
		M	14	01	-	19	9		
		F	15	15	-				
10	ZV ZV,Z E E N N N E N E Z	ePKP	00	14	38			12700 Confused by microseisms. 4°S., 128°E. Ceram, Mag. 6 ¹ / ₂ -6 ³ / ₄ (Pas). USCGS. Mag. = 6 ³ / ₄	
		ePP		15	43				
		e(S)		22	49				
		ePS		25	15				
		eSS		31	51				
		eL		42 ¹ / ₂	-				
		M		58	-	30	29		
		M		58	-	30	21		
		M	01	10 ¹ / ₂	-	20	17		
		M		10 ¹ / ₂	-	20	12		
		M		12 ¹ / ₂	-	20	7		
		F	02	40	-				
11	N N E	eL	00	32	-			15 ¹⁰ S., 173°W. Samoa Islands region. USCGS.	
		M		42	-	20	2		
		M F		42 01	- 25	20	1 ¹ / ₂		
11	N	e	22	00	-			Small. 11 ¹⁰ S., 166 ¹⁰ E. Santa Cruz Islands. USCGS.	
		F		25	-				
14	NE	e	20	30	-			Small. Confused by microseisms. Indian Ocean. USCGS.	
		F	21	10	-				
16	NE E N	eL	13	34 ¹ / ₂	-			Confused by strong microseisms. 22°N., 45 ¹⁰ W. Atlantic Ocean. USCGS. Mag. = 5 ³ / ₄	
		M		37	-	20	2 ¹ / ₂		
		M F		37 45	- -	20	2		
17	NE	eL	13	35	-			Small. 30°S., 112 ¹⁰ W. Easter Islands region. Mag. 6 ¹ / ₂ (Pas). USCGS.	
		F	14	20	-				
19	ZV,Z ZV,Z ZV,Z ZV,Z NE NE E E N	iP	10	45	37	5	4.6	5770 Compression. Confused by strong microseisms. Depth = 220 Km. 36°N., 70 ¹⁰ E. Hindu Kush h about 200 Km. USCGS. Mag. = 6 ¹ / ₂	
		ipP		46	25				
		i		46	32				
		iPcP		46	48				
		iS		52	41	9	15.5 (H)		
		esS		54	01				
		eSS		56	32				
		e		57	28				
		e(PKKP)	11	07	31				
		F		45	-				

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			h.	m.	s.				
21	NE	e F	02	10	-				Very small. 42°S., 173°E. New Zealand. USCGS.
21	NE	e F	04	25	-				Very small.
21	ZV,Z ZV,Z	eP i	08	17	23	4	1.6	1900	Confused by microseisms. 36°N., 4½°E. Northern Algeria. 47 killed, 88 injured and many houses destroyed. USCGS. Mag. = 5.6
	N	eS		17	25				
	E	eL		20	30				
	N	M		21	-	19	11		
	Z	M		22	-	16	7½		
		F		23½	-	14	7½		
21	NE E N	eL M M F	09	33	-				Confused by microseisms. 38°N., 42°E. Turkey. USCGS. Mag. = 5½
				50	-	20	2		
				50	-	20	2		
				55	-				
22	N E N	eL M M F	21	15	-				Confused by strong microseisms. 39°N., 21°E. Greece. USCGS. Mag. = 5¼
				16	-	17	1		
				16	-	17	2½		
				23	-				
23	N E N	eL M M F	00	41	-				Confused by microseisms. 39°N., 20½°E. Greece. USCGS. Mag. = 5½
				42½	-	16	2		
				42½	-	16	4		
				53	-				
23	NE N E N Z	eS eL M M M F	07	42	40	7	4.6		Confused by strong microseisms. 39°N., 20°E. Greece. USCGS. Mag. = 5¾ overlapped by next shock.
				44½	-				
				46	-	18	5		
				46	-	18	13		
				47½	-	16	2½		
				-	-				
23	N E N	eL M M F	07	48	-				Confused by strong microseisms. 39°N., 20½°E. Greece. USCGS. Mag. = 5½
				49½	-	17	1½		
				49½	-	17	5		
			08	10	-				
23	N E N	eL M M F	08	51	-				Confused by strong microseisms. 23½°N., 121½°E. Formosa. USCGS.
			09	08	-	20	1		
				08	-	20	1½		
				20	-				
23	NE	e F	17	15	-				Very small. 6°S., 154½°E. Solomon Islands. USCGS.
				35	-				
24	ZV,Z ZV,Z N NE Z N E	iPKP iFP ePKS eL M M M F	21	56	20				7½°S., 156°E. Solomon Islands. Mag. 6½-6¾(Pas). USCGS.
				58	25				
				59	48				
			22	34	-				
				53	-	22	8		
				53	-	23	10		
				56	-	21	7		
			24	10	-				Mag. = 6½

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			h.	m.	s.				
26	N	e	01	50	-				Very small. 2 $\frac{1}{2}$ °S., 128°E. Ceram Sea, USCGS.
		F	02	15	-				
26	NE	e	03	10	-				Very small. 1°S., 138°E. New Guinea. USCGS.
		F		30	-				
26	ZV,Z	iP	23	41	23				Confused by strong microseisms. 51 $\frac{1}{2}$ °N., 178°W. Aleutian Islands. USCGS. Mag. = 6-6 $\frac{1}{4}$.
	E	eL	24	01	-				
	E	M		23 $\frac{1}{2}$	-	20	5		
	N	M		24	-	20	5		
27	NE	e	01	00	-				Very small. 51 $\frac{1}{2}$ °N., 178°W. Aleutian Islands. USCGS.
		F		20	-				
27	NE	eL	08	48	-				Confused by strong microseisms. 51 $\frac{1}{2}$ °N., 178°W. Aleutian Islands. Mag. = 6
	E	M		56	-	19	3		
	N	M		57	-	20	2		
		F	09	25	-				
29	ZV,Z	iP	23	45	14	5	3.6	2500	Compression. Confused by strong microseisms. 30.5°N., 9.7°W. B.C.I.S. Morocco. Over 12000 dead, 25000 wounded and major property damage at Agadir. Mag. : m = 6.1 ; M = 5.7
	ZV,Z	iPP		45	46	6	4.0		
	E	eS		49	18	14	12.3(H)		
	N	eL		50 $\frac{1}{2}$	-				
	E	M		54	-	20	30		
	N	M		54 $\frac{1}{2}$	-	20	25		
	Z	M		54 $\frac{1}{2}$	-	20	16		
	F	24	50	-					

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			h.	m.	s.				
2	ZV	eP	22	00	45	18	3	2180	Confused by microseisms. 52°N., 30°W. North Atlantic Ocean. USCGS. Mag. = 5½
	NE	eS		04	18				
	N	eL		04½	-				
	E	M		06	-				
	N	M		06	-				
		F		20	-	5½			
4	ZV	eP	02	28	01	6	2.1	2200	50½°N., 177°W. Andeanof Islands. USCGS.
	ZV	e		28	13				
4	ZV,Z	iP	04	05	40	20	2½	2200	Confused by microseisms. 31°N., 129°E. Near Kyushu, Japan. h about 100 Km. Mag. 6½(Pas). USCGS. Mag. = 6¼
	Z	eFP		09	07				
	E	eFS		17	03				
	N	eL		29	-				
	E	M		47	-				
	N	M		48	-				
		F	05	10	-	2½			
4	ZV,Z	eP	16	30	10	16	1½	2200	72°N., 1½°W. Jan Mayen Island region. USCGS.
	E	eS		33	46				
	E	M		36½	-				
	N	M		37	-				
		F		45	-	1½			
4	NE	eL	21	52	-	20	1½	2200	7½°N., 94°E. Nicobar Islands. USCGS.
	N	M	22	04	-				
		F		30	-				

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			h.	m.	s.				
5	ZV	iP	11	35	29				29°N., 81°E. Nepal. USCGS.
	N	M	12	05½	-	17	1½		
	E	M		06	-	18	1		
		F		10	-				
5	E	e(SKKS)	14	15	21				1°N., 129°E. Halmahera Island. USCGS. Mag. = 6¾
	N	eSS		24	12				
	NE	eL		35	-				
	N	M		42½	-	32	28		
	E	M		44	-	31	31		
	E	M		58	-	23	30		
	N	M	15	01	-	21	26		
	Z	M		01	-	20	7		
	F		16	25	-				
6	NE	eL	03	16	-				1°N., 129°E. Halmahera Island aftershock. USCGS.
	E	M		28½	-	20	2		
	N	M		34	-	20	1½		
	F		04	05	-				
6	NE	eL	04	46	-				24°N., 108°W. Gulf of California. Mag. 5-5¼ (Berk) USCGS.
	E	M		59½	-	20	4½		
	N	M		59½	-	20	3		
	Z	M		59½	-	20	4		
	F		05	20	-				
7	ZV	iP	06	23	08				52°N., 153°E. Near Kamchatka, USCGS
8	N	eL	13	12	-				Confused by microseisms. 65°S., 179½°E. Antarctic Ocean. USCGS.
	E	M		27	-	22	2		
	N	M		27	-	22	3		
	F			50	-				
8	ZV,Z	iPKP	16	52	47	6	32	15900	Dilatation. Confused by very strong microseisms. Depth = 250 Km. PPH 14 sec. 6 μ 16½°S., 168½°E. New Hebrides Islands. Mag. 7-7¼ (Pas). USCGS. Mag. = 7.0
	ZV,Z	ipPKP		53	51				
	Z	isPKP		54	14				
	ZV,Z	iPP		56	05	6	12.5		
	ZN	i		57	33				
	E	eSS	17	14	33				
	E	esSS		15	53				
	NE	eL		42	-				
	F		18	50	-				
10	ZV,Z	eP	00	07	21				Confused by strong microseisms. 16°S., 72°W. Southern Peru. 1 killed, several injured. h about 150 Km. USCGS.
	N	eL		30	-				
	E	M		44	-	22	3		
	N	M		44	-	22	2½		
	F		01	05	-				
10	N	e	01	49	-				Confused by strong microseisms.
	N	M	02	16	-	20	1½		
	N	M		16	-	20	3		
	F			30	-				

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

MARCH, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
10	N	e F	09 10	53 15	- -				Small. 10° S., 161° E. Solomon Islands. USCGS
10	ZV	iP	14	44	37				Dilatation. 47° N., 152° E. Kurile Islands. USCGS.
10	N N	eL M F	14 15	46 04 30	- - -	22	1½		15° S., 174° W. Samoa Islands region. USCGS.
12	ZV,Z ZV,Z E NE N E N Z	iP ePP iS eL M M M M F	11	58 58 01 02.8 04.0 05½ 05½ 05½ 40	08 35 27 - - - - -	6 9 15 9 9 8	2.2 5.8 25 34 21 29	2020	42° N., 21° E. Southern Yugoslavia. 1 killed, several injured at Tetovo. USCGS. Mag. = 5¾
12	ZV,Z ZV,Z NE NE N E	ePKP ePP ePKS eL M M F	20 21 22	49 51 53 34 46 48 50	52 48 15 - - - -	22 22	4½ 3½		6° S., 152° E. New Britain. Mag. 6½ (Pas) USCGS Mag. = 6¼
13	NE N	e M F	05	23½ 24½ 30	- - -	14	1		36° 56' N., 3° 11' E. Mediterranean, near Algiers. BCIS.
15	ZV	eP	09	33	00				51° N., 174½° W. Andreanof Islands. USCGS.
16	N	e F	01	25 35	- -				Very small. 59½° S., 26° W. Sandwich Islands. USCGS.
16	NE	eL F	18 19	48 50	- -				Small. 15½° S., 173½° W. Samoa Islands region. USCGS.
19	NE N E	eL M M F	20	10 28 29 45	- - - -	22 22	2 1½		3° S., 138° E. New Guinea. USCGS.
20	ZV E E N	i(P) eL M M F	13 14	49 16 25 29 55	20 - - - -	20 20	2 2		40° N., 143½° E. Off Honshu, Japan. h about 60 Km. USCGS.
20	ZV,Z ZV,Z NE NE E E E N	eP iPP iS iPS iSS eLQ M M	17	19 23 30 31 35 42 59 59	59 17 22 24 22 - - -	7 8 19 22 22	11.0 8.8 80(H)	9400	PH 16 sec. 12.4 μ EPH 16 sec. 17.8 μ 40° N., 143½° E. Off northeast coast of Honshu, Japan. h about 60 Km. Mag. 7 (Pas). USCGS.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

MARCH 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
contd. 20	Z	M F	18	00 $\frac{1}{2}$	-	21	370		
			21	50	-				Mag. = 7.3
20	NE	e F	23	48	-				Small. 17°N., 46 $\frac{1}{2}$ °W. North Atlantic Ocean. USCGS.
			24	00	-				
21	ZV, Z	iP	00	47	22	6	1.9	9400	Compression.
	NE	eS		57	44	16	2.7(H)		
	NE	eSS	01	03	12				39 $\frac{1}{2}$ °N., 143°E. Near Honshu, Japan. Mag. 6 $\frac{1}{2}$ (Pas). USCGS.
	E	eL		11	-				
	E	M		23 $\frac{1}{2}$	-	21	9		
	N	M		26	-	22	9		
	Z	M		26	-	21	3 $\frac{1}{2}$		
		F	02	15	-				Mag. = 6 $\frac{1}{4}$ -6 $\frac{1}{2}$
21	NE	e F	03	05	-				Small. 16°S., 173°W. Tonga Islands region. USCGS.
				25	-				
21	NE	eL	07	35	-				
	E	M		40 $\frac{1}{4}$	-	20	1 $\frac{1}{2}$		
	N	M		40 $\frac{1}{2}$	-	20	1 $\frac{1}{2}$		40°N., 143 $\frac{1}{2}$ °E. Near Honshu, Japan. USCGS.
		F	08	05	-				
21	ZV	iP	09	30	53			9400	
	NE	eS		41	16				40°N., 143°E. Near Honshu, Japan. USCGS.
	NE	eL		58	-				
	E	M	10	07 $\frac{1}{4}$	-	21	7		
	N	M		07 $\frac{1}{2}$	-	21	6		
	Z	M		10	-	20	3 $\frac{1}{2}$		
		F		45	-				Mag. = 6 $\frac{1}{4}$
21	NE	e F	20	35	-				Very small. 21°S., 70 $\frac{1}{2}$ °W. Off Chile. USCGS.
				50	-				
21	NE	e F	23	40	-				Very small. 39 $\frac{1}{2}$ °N., 143 $\frac{1}{2}$ °E. Near Honshu, Japan. USCGS.
			24	00	-				
22	NE	e F	00	05	-				Very small. 39 $\frac{1}{2}$ °N., 143°E. Near Honshu, Japan. USCGS.
				25	-				
22	NE	e F	02	35	-				Very small. 16°N., 97 $\frac{1}{2}$ °W. Off Oaxaca. USCGS.
				55	-				
22	NE	eSS	03	16.8	-				61 $\frac{1}{2}$ °S., 154°E. 400 miles northwest of Balleny Islands. USCGS.
	NE	eL		38	-				
	E	M	04	12	-	22	2		
	N	M		12	-	22	5 $\frac{1}{2}$		
	Z	M		12	-	21	2		
		F		40	-				Mag. = 6 $\frac{1}{4}$
22	N	eL	13	57	-				Jalisco, Mexico. Mag. 5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (Berk). USCGS.
	E	M	14	09 $\frac{1}{4}$	-	16	2		
	N	M		09 $\frac{1}{2}$	-	18	1		
		F		25	-				

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

MARCH, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS	
			h.	m.	s.					sec.
23	ZV,Z	eP	00	35	53	6	6.6	9400	Confused by microseisms. PH 14sec. 3.8 μ PPH 14sec 4.7 μ 39½°N., 143°E. Near east coast of Honshu, Japan. Mag. 6½-6¾(Pas)	
	ZV,Z	i		36	02					
	ZV,Z	ePP		39	14	9	3.2			
	NE	e(SKS)		46	22					
	NE	eS		46	33	15	24(H)			
	NE	e		46	51					
	NE	eSS		51	56					
	E	eLQ	01	00	-					
	E	M		12½	-	20	170			
	N	M		12½	-	20	120			
23	Z	M		15	-	20	30	Mag. = 7.0		
		F	03	30	-					
23	ZV	eP	01	19	48			39½°N., 143°E. Near Honshu, Japan. USCGS.		
23	NE	e	08	30	-			Small. 40°N., 142½°E. Near Honshu, Japan. USCGS.		
		F		50	-					
23	NE	eL	11	08	-			39½°N., 143°E. Near Honshu, Japan. h about 100 Km. USCGS.		
	E	M		18½	-	20	2½			
	N	M		18½	-	20	2			
23	NE	eL		30	-			39½°N., 143°E. Near Honshu, Japan. USCGS.		
			E	M		40	-		20	2
			N	M		40	-		20	1½
23	NE	e	16	35	-			Small. 39°N., 144°E. Near Honshu, Japan. USCGS.		
			F	17	00	-				
24	NE	e	22	20	-			Very small. 39½°N., 143½°E. Near Honshu, Japan. USCGS.		
		F		30	-					
23	ZV,Z	eP	22	35	10			9400	Confused by microseisms. 39½°N., 143°E. Near Honshu, Japan. Mag. 6(Pas). USCGS.	
	NE	eS		45	34	16	3.9(H)			
	NE	eSS		50.9	-					
	E	eL	23	02	-					
	E	M		12	-	20	10			
23	N	M		12	-	21	10	Mag. = 6¼		
		F	24	05	-					
23	ZV	eP	23	10	48			950	Superimposed on previous shock. 46½°N., 80E. Switzerland. Minor damage at Brigue and Sierre. USCGS.	
	ZV,Z	e(Pg)		11	24					
	ZV,E	eSn		12	24					
	NE	iSx		12	53					
	E	i(Lg)		13	12					
	NE	iSg		13	22					
24	ZV,Z	eP	06	06	35			47°N., 152½°E. Kurile Islands. USCGS		
24	NE	e	10	40	-			Small. 50½°N., 173°W. Andeanof Islands. USCGS.		
		F	11	05	-					

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

MARCH, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
26	NE	eL	04	53	-				Confused by microseisms. 13 ¹ / ₂ °S., 166°E. New Hebrides Islands. Mag. 6 ¹ / ₄ (Berk). USCGS.
	E	M	05	15	-	20	2		
	N	M		15	-	20	2		
		F	06	20	-				
26	NE	eL	09	56	-				13 ¹ / ₂ °S., 166 ¹ / ₂ °E. New Hebrides Islands. Mag. 6 ¹ / ₂ (Berk). USCGS.
	N	M	10	20	-	20	2 ¹ / ₂		
	E	M		21	-	20	2 ¹ / ₂		
		F	11	25	-				
27	ZV	eP	20	28	19				Confused by microseisms. 20°N., 104 ¹ / ₂ °W. Jalisco, Mexico. Mag. 6-6 ¹ / ₂ (Pas). USCGS. Mag. = 6
	NE	eL		50	-				
	E	M	21	05 ¹ / ₂	-	18	3 ¹ / ₂		
	N	M		05 ¹ / ₂	-	20	1 ¹ / ₂		
		F		25	-				
27	ZV	ePKP ₂	23	49	09				37 ¹ / ₂ °S., 177°E. Off New Zealand. USCGS.
	ZV	ePP		52	57				
28	ZV	iP	00	25	44			9000	Compression. Confused by microseisms. 7 ¹ / ₂ °N., 82°W. Off south coast of Panama. Mag. 6 ¹ / ₂ -6 ³ / ₄ (Pas). USCGS. Mag. = 6 ¹ / ₄
	NE	eS		35	49	19	4.6(H)		
	N	eLQ		47 ¹ / ₂	-				
	E	M		56	-	20	4 ¹ / ₂		
	N	M		56	-	20	3		
	Z	M		56	-	20	3		
		F	01	40	-				
28	ZV	e(P)	20	53	18				Confused by microseisms. 58°N., 32 ¹ / ₂ °W. North Atlantic Ocean. USCGS.
	E	M		59 ¹ / ₂	-	18	1 ¹ / ₂		
	N	M		59 ¹ / ₂	-	18	1 ¹ / ₂		
		F	21	10	-				
29	ZV,Z	ePKP	06	50	38			15700	17°S., 167°E. New Hebrides Islands. Mag. 6 ³ / ₄ (Pas). USCGS. Mag. = 6 ¹ / ₂
	ZV,Z	ePP		53	45				
	NE	eSS	07	12	41				
	E	eLQ		32	-				
	E	M		58 ¹ / ₂	-	20	5 ¹ / ₂		
	N	M		01	-	20	14		
		F	09	01	-	20	6 ¹ / ₂		
		F	09	20	-				
29	N	eL	23	12	-				6°S., 147°E. New Guinea. USCGS.
	E	M		20	-	26	2		
	N	M		24 ¹ / ₂	-	24	2 ¹ / ₂		
		F	24	15	-				
30	N	eL	11	53	-				13 ¹ / ₂ °S., 166°E. New Hebrides Islands. USCGS.
	E	M	12	19	-	20	1 ¹ / ₂		
	N	M		19	-	21	1		
		F		35	-				
30	NE	e	12	40	-				overlapped by next shock.
	E	M		55 ¹ / ₂	-	18	1 ¹ / ₂		
	N	M		55 ¹ / ₂	-	18	1		
		F	-	-	-				

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

MARCH, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
30	NE	e	13	07	-				
	E	M		09 $\frac{1}{2}$	-	18	1		
	N	M		10	-	20	1 $\frac{1}{2}$		
		F		25	-				
30	ZV,Z	ePKP	15	39	20				Small. 22 $\frac{1}{2}$ °S., 174°E. Loyalty Islands region. USCGS.
	N	eL	16	33	-				
		F	17	40	-				
31	N	eL	03	41	-				Small. 39 $\frac{1}{2}$ °N., 143°E. Off Honshu, Japan. USCGS.
		F	04	05	-				
31	NE	eL	12	15	-				49°N., 129 $\frac{1}{2}$ °W. Off coast of Vancouver Island. USCGS.
	E	M		20	-	20	1 $\frac{1}{2}$		
	N	M		20	-	20	1		
		F		35	-				
31	NE	e	16	35	-				Small. Pacific Ocean. USCGS.
		F	17	00	-				
31	ZV	eP	20	08	39				26°N., 110°W. Gulf of California. Mag. 5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (Berk). USCGS.
	N	eS		18	47				
	NE	eL		30	-	21	3		
	E	M		38 $\frac{1}{2}$	-	21	6		
	N	M		39	-	21	1 $\frac{1}{2}$		
	Z	M		40	-	19			
		F		21	30	-			

All the magnitudes are the "unified magnitudes" denoted by "m".



AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR APRIL, 19 60

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (i) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st August 1957	21.2	21.2	0.0	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	17 December 1957	10.7	11.4	-0.05	121

(ii) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
1	ZV	ePKP	03	13	52			22°S., 179½°W. Fiji Islands. USCGS.	
1	NE	eL	14	44	-			49°N., 129½°W. Off coast of Vancouver Island. USCGS.	
	E	M		50½	19	2½			
	N	M		51	19	2			
		F	15	15	-				
5	NE	eSS	07	53	-			61°S., 26°W. Sandwich Islands. USCGS.	
	E	eL	08	04	-				
	E	M		20½	18	1½			
	N	M		20½	20	3			
		F	09	10	-			Mag. = 6-6¼	
5	N	eL	17	31	-			65°N., 2°W. North Atlantic Ocean. USCGS.	
	E	M		33½	18	1			
	N	M		34	20	1			
		F		40	-				
6	N	e	14	07	-			Very small.	
		F		14	-				
7	ZV	ePKP	14	06	31			24°S., 179½°W. Fiji Islands. h about 500 Km. USCGS.	
	ZV	e		06	43				
8	ZV,Z	ePKP ₁	00	15	20			Depth = 220 Km.	
	ZV,Z	i		15	25			21°S., 177°W. Tonga Islands. Mag. 6 (Berk). USCGS.	
	ZV,Z	i		15	31				
	ZV,Z	epPKP		16	16				
	E	eSS		37	55				
	E	esSS		39	25				
		F	01	40	-				

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

APRIL, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLI- TUDE	Δ	REMARKS
			h.	m.	s.				
29	N	eL	21	43	-				Small. 0°., 121½°E. Celebes. USCGS.
		F	22	10	-				
									All the magnitudes are the "unified magnitudes" denoted by "m".

M.O. 669

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON. R.G.

KEY OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR MAY, 19 60

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (i) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1918).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st August 1957	21.2	21.2	0.00	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	17 December 1957	10.7	11.4	-0.05	121

(ii) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLITUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
2	NE	e F	01	28	-				44° N., 84½° E. Sinkiang Province, China. USCGS.
2	ZV	e (PKP)	12	28	46				0°, 121½° E. Celebes. USCGS.
	ZV	e		29	20				
	NE	eL		55	-				
	E	M	13	16	-	26	2		
	N	M		16	-	26	2		
		F		35	-				
2	E	e	18	47	14				
	N	M		51	-	16	1		
		F	19	00	-				
3	ZV	eP	07	07	31				29½° N., 55° E. Iran. USCGS.
3	ZV	eP F	08	06	44				29° N., 99½° E. China. USCGS.
				55	-				
3	ZV	eP	22	35	28				32° N., 140° E. Near Japan. USCGS.
4	NE	eL F	19	42	-				Very small. 20° S., 173° E. Loyalty Islands. USCGS.
			20	30	-				
5	ZV	eP F	11	37	44				Small. 52½° N., 158½° E. Near Kamchatka. USCGS.
			12	25	-				
6	ZV	eP	18	59	03				54° N., 161° E. Near Kamchatka. USCGS.
8	ZV	iP	14	41	26				45½° N., 151° E. Kurile Islands. USCGS.

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

MAY, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS			
			h.	m.	s.					sec.	μ	km.
9	NE	e F	02	00	-				Very small.			
9	ZV	e(P)	16	36	43				6 ¹ / ₂ °N., 33 ¹ / ₂ °W. Atlantic Ocean. USCGS.			
	NE	eL F	17	52	-							
10	NE	e F	21	00	-				Very small. Pacific Ocean. USCGS.			
11	N	eL	19	30	-				3°S., 131°E. Ceram Sea. Mag. 6 ¹ / ₂ (Pas). USCGS.			
	E	M		42	-	23	5 ¹ / ₂					
	N	M F		42	-	23	3					
12	ZV,Z	iP	22	44	35	5	1.2	8800	7 ¹ / ₂ °N., 81°W. Panama. USCGS.			
	NE	eS		54	30	10	3.5(H)					
	N	eL	23	05	-		3					
	E	M		15	-	22	3 ¹ / ₄					
	N	M		16	-	20	1 ¹ / ₂					
13	Z	M F		17	-	20	1 ¹ / ₂		Mag. m = 6.2, M = 5.9			
	NE	e F	10	40	-			Very small. 20°N., 109°W. Revilla Gigedo Islands. USCGS.				
			11	00	-							
	13	ZV,Z	iP	16	18	43	5			1.6	8100	55°N., 161 ¹ / ₂ °W. Alaska Peninsula. USCGS.
		ZV,Z	e		18	56						
13	NE	eS		28	08	8	1.6			Mag. m = 6 ¹ / ₄ , M = 6		
	ZNE	e		28	24							
	N	e		28	44							
	N	eSS		32.7	-							
	E	eL		38	-	24	3 ¹ / ₄					
13	E	M		49	-	24	4 ¹ / ₂		Very small. 32 ¹ / ₂ °S., 179°W. Kermadec Islands. USCGS.			
	N	M		49	-	24	1					
	Z	M F		51	-	20						
				17	40	-						
				18	37	-	20	1				
13	NE	e	22	00	-				Very small. 32 ¹ / ₂ °S., 179°W. Kermadec Islands. USCGS.			
		F		50	-							
14	ZV	iP	22	31	33				Compression. 53 ¹ / ₂ °N., 159 ¹ / ₂ °E. Kamchatka. USCGS.			
	N	M F	23	11	-	19	1/2					
15	NE	e F	00	05	-				Very small.			
				15	-							
15	NE	e F	06	55	-				Very small.			
			07	15	-							
15	NE	eL F	14	10	-				small. 24°N., 121 ¹ / ₂ °E. Near Formosa. USCGS.			
				35	-							

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

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MAY, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS	
			h.	m.	s.					sec.
18	ZV,Z	iP	06	47	55	5	2.5	9800	Compression. Depth = 60 Km. 29°N., 130°E. Ryukyu Islands. h about 100 Km. USCGS.	
	ZV,Z	epP		48	11					
	ZV,Z	eFP		51	25	5	1.4			
	Z	epFP		51	39					
	NE	eSKS		58	13					
	NE	eS		58	35	9	4.4(H)			
	NE	esPS	07	00	05					
	NE	esSS		04	49					
	E	eL		17	-					
	N	M		32	-	22	36			
	E	M		32 $\frac{1}{2}$	-	19	27			
	Z	M		32 $\frac{1}{2}$	-	19	18			
		F	08	50	-					Mag. m = 6.7, M = 6.7
18	NE	eS	08	56	19			27°N., 52 $\frac{1}{2}$ °E. Persian Gulf. USCGS.		
		F	09	45	-					
19	ZV,Z	iP	02	15	53	1.3	0.8(ZV)	5870	Depth = 160 Km. 36°N., 71°E. Hindu Kush. h about 200 Km. USCGS.	
	ZV	e		16	18					
	ZV,Z	epP		16	29					
	NE	eS		23	07					
	N	eSS		26.9	-					
		F		55	-					Mag. m = 6 $\frac{1}{4}$, M = 6
19	ZV,Z	eP	10	25	22	6	2.1	9650	17°S., 66°E. Mascarene Islands region. USCGS.	
	E	e(SKS)		35	31					
	N	eS		35	56	14	3.5(H)			
	NE	eSS		41.9	-					
	NE	eLQ		49.0	-					
	E	M	11	06	-	20	4			
	N	M		06 $\frac{1}{2}$	-	20	7			
	Z	M		06 $\frac{1}{2}$	-	20	1 $\frac{1}{2}$			
		F	12	35	-					Mag. m = 6.3, M = 6.1
										Persian Gulf. USCGS.
20	ZV,Z	ePKP ₁	11	32	27	8	2.1	17100	28°S., 167 $\frac{1}{2}$ °E. Norfolk Island. Mag. 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (Pas). USCGS.	
	ZV,Z	ePKP ₂		32	52					
	Z	ePP		36	28	8	2.3			
	Z	ePPP		39	44					
	NE	eL	12	24	-					
	E	M		36	-	20	9			
	N	M		36	-	20	6			
	Z	M		36	-	20	2			
		F	14	15	-					Mag. m = 6.5, M = 6.3
										Persian Gulf. USCGS.
21	ZV,Z	eP	06	45	49			2300	37 $\frac{1}{2}$ °N., 21°E. Near west coast of Greece. USCGS.	
	E	eS		49	32					
	E	M		53 $\frac{1}{2}$	-	16	$\frac{1}{2}$			
	N	M		53 $\frac{1}{2}$	-	16	1			
		F	07	10	-					
21	NE	e	09	10	-			Small. 15 $\frac{1}{2}$ °N., 121 $\frac{1}{2}$ °E. Philippine Islands. USCGS.		
		F		30	-					

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MAY, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
21	ZNE	eP	10	17	20	22	6	12200	Compression. PH 24 sec. 5.4 μ PFH 24 sec. 30 μ 37½°S., 73½°W. Near coast of Chile. Many casualties and extensive property damage at Concepcion and surrounding area. Mag. 7¼-7½(Berk). USCGS.
	ZV,Z	iPKP		21	18				
	ZV	iPP		21	48	22	22		
	NE	eSKS		27	54				
	NE	iS		29	27	26	52(H)		
	NE	iPS		31	24				
	NE	iSS		37	22				
	NE	eLQ		48½	-				
	E	M	11	05	-	20	860		
	N	M		05	-	20	600		
Z	M		05½	-	19	600			
	F	16	40	-			Mag. m = 7.6, M = 8.1		
21	NE	e	20	00	-			Small. Chile. USCGS.	
21	NE	e	23	00	-			Very small.	
		F		20	-				
22	NE	e	02	25	-			Very small.	
		F		03	00	-			
22	NE	e	04	40	-			Small. 37½°S., 73°W. Chile. USCGS.	
		F		05	25	-			
22	NE	eL	06	55	-			38°S., 73½°W. Chile. USCGS.	
	E	M	07	04	-	20	½		
	N	M		04	-	20	1	Mag. m = 5¾, M = 5¼	
22	NE	e	08	38	-			37½°S., 73°W. Chile. USCGS.	
	NE	eL	09	03	-				
	E	M		13	-	20	1		
	N	M		14	-	20	1		
	Z	M		14	-	20	½		Mag. m = 6, M = 5½.
22	Z	eP	10	45	09			38°S., 73½°W. Near coast of Chile. Mag. 6½(Pas). USCGS. PH 24 sec. 1.4 μ. Mag. m = M = 6½	
	ZV,Z	ePP		49	39	7	2.1		
22	Z	eP	10	47	13	20	2.6	12300	PH 24 sec. 2.0 μ PFH 24 sec. 10.4 μ 37½°S., 73°W. Near coast of Chile. Mag. 7¼-7½(Pas). USCGS.
	ZV,ZNE	ePP		51	42	12	5.7		
	NE	eSKS		57	50				
	NE	eS		59	24	24	13.6		
	NE	ePS	11	01	14				
	NE	eSS		07	14				
	NE	eLQ		18½	-				
	E	M		36	-	20	61		
	N	M		36	-	20	42		
	Z	M		36	-	19	32		
	F	15	20	-			Mag. m = 7.1, M = 7.3		
22	ZV,Z	iP	19	10	28	8	2.1	12300	Compression. PH 24 sec. 3.1 μ PFH 24 sec. 18.0 μ 38°S., 73½°W. Near coast of Chile. Mag. 7¼(Berk). USCGS.
	Z	ePKP		14	14				
	ZV,ZNE	iPP		15	01	8	8.5		
	NE	eSKS		21	04				
	NE	eS		22	44	25	23(H)		

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MAY, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS	
			h.	m.	s.					sec.
contd.										
22	NE	iPS F	19	24	31				Mag. m = 7.4, M = 7.8	
22	ZV,Z	eP	19	25	22	15	7.7		38°S., 73½°W. Near Chile.	
	ZV,Z	iPP		29	55	12	5.7		Mag. 7½-7¾ (Berk). USCGS. Mag. m = 7½, M = 7¾.	
22	ZV,ZNE	iP	19	25	42	16	21.5	12300	PH 24 sec. 33 μ	
	ZV,ZNE	iPP		30	15	12	41.5		Dilatation. PFH 25 sec. 60 μ	
	NE	iSKS		36	15				38°S., 73½°W. Near coast of Chile.	
	NE	iS		37	53	25	148 (H)		Mag. 8¼-8½ (Pas). 8½ (Berk). USCGS.	
			Surface waves, on Galitzin records, beyond range of registration.							
	ZV	M	20	20	-	20	1400		Mag. m = 8.1, M = 8.9	
		F	-	-	-				overlapped by next shock.	
23	Z	ePP	00	44	53				38½°S., 75°W. Near coast of Chile. USCGS.	
23	ZV,Z	ePP	01	10	27				Chile. USCGS.	
23	ZV,Z	ePP	03	05	52	6	1.1		41½°S., 73½°W. Southern Chile. USCGS.	
	Z	M		52½	-	19	6½			
	N	M		52½	-	19	8			
	E	M		53½	-	19	8			
		F	-	-	-				Mag. m = 6.6, M = 6.5.	
23	ZV,Z	ePP	03	15	53				43°S., 75½°W. Near coast of Chile. USCGS.	
		F	04	50	-					
23	ZV,Z	ePP	05	32	53				38°S., 73½°W. Chile. USCGS.	
	N	eLQ		58½	-					
	E	M	06	14	-	22	7½			
	N	M		14	-	22	8			
	Z	M		14	-	22	5			
		F	07	20	-				Mag. m = 6½, M = 6¼	
23	Z	e	07	29	-				48°S., 77°W. Off coast of Chile. USCGS.	
	E	M	08	16	-	20	5½			
	N	M		16	-	20	4			
	Z	M		16	-	20	3½			
		F	-	-	-				Mag. m = 6¼, M = 6.	
23	NE	e	09	00	-				Small. 40½°S., 75½°W. Near coast of Chile. USCGS.	
		F		55	-					
23	NE	e	10	25	-				37½°S., 73°W. Chile. USCGS.	
	E	M		54	-	20	2			
	N	M		54	-	20	2			
	Z	M		54	-	20	1½			
		F	11	30	-				Mag. m = 6, M = 5½	
23	ZV,Z	eP	10	57	41				43½°S., 73½°W. Chile. USCGS.	
	E	M	11	45	-	20	3½			
	N	M		45	-	20	4			
	Z	M		45	-	20	3			
		F	12	40	-				Mag. m = 6¼, M = 6.	

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MAY, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
23	NE	e F	14 15	37 45	- -				Small. Near coast of Chile. USCGS.
23	NE	e F	20 21	50 25	- -				Small.
24	NE	e F	04	10 55	- -				Small.
24	NE	e F	08 09	45 20	- -				Small.
24	ZV,Z	ePKP1	15	06	49			18700	
	Z	iPKP2		07	55				
	ZN	ePP		11	48	9	2.6		PPH 12 sec. 1.4 μ
	NE	e(SKKS)		18	39				
	NE	eLQ		57	-				44½°S., 167½°E. South Island, New Zealand.
	E	M	16	14	-	30	15		Mag. 6¾-7(Pas), 6¼-6½(Berk).USCGS.
	N	M		14	-	30	22		
	E	M		25	-	20	13		
	N	M		26	-	20	8		
	Z	M		26	-	20	4		
		F	17	55	-				Mag. m = 6.5, M = 6.3
24	NE	e	21	22	-				50½°S., 74°W. Southern Chile. USCGS.
	E	M		37	-	20	1½		
	N	M		37	-	20	1½		
		F	22	25	-				
24	NE	e F	23	40 55	- -				Very small.
25	NE	e F	01	15 40	- -				Very small.
25	NE	e F	04	05 35	- -				Very small. 44°S., 168°E. New Zealand. USCGS.
25	NE	e	05	35	-				Southern Chile. USCGS.
	E	M		49	-	20	3		
	N	M		49	-	20	2		
	Z	M		49	-	20	1½		
		F	06	20	-				
25	Z	eFP	08	54	24	6	3.7	12800	PPH 24 sec. 1.1 μ
	NE	eFS	09	04	11				45°S., 76°W. Off coast of Chile. Mag. 6¾(Pas). USCGS.
	NE	eLQ		24½	-				
	E	M		36½	-	22	41		
	N	M		36½	-	22	40		
	Z	M		36½	-	22	24		
		F	11	45	-				Mag. m = 6.9, M = 7.0
25	NE	e F	14 15	32 15	- -				Small. 1°N., 129½°E. Halmahera. USCGS.

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
26	ZNE N	e	00	58.0	-	16	1		
		M		58 $\frac{3}{4}$	-				
		F	01	07	-				
26	NE	e F	02	10 50	- -				Very small.
26	ZV,Z NE Z NE E N E N Z	iP	05	14	27	8	7.4	2010	Compression. NEe FH 12 sec. 7.0 μ 40.6°N., 20.6°E. Albania. 6 killed and serious property damage. BCIS
		eS		17	45	12	23(H)		
		i		17	58				
		eL		19	-				
		M		20 $\frac{1}{2}$	-	20	54		
		M		20 $\frac{1}{2}$	-	20	150		
		M		21	-	12	55		
		M		21	-	15	170		
		M		21	-	9	30		
		F	06	30	-				
26	NE	e F	12 13	50 15	- -				Very small.
26	NE	e F	16	05 25	- -				Very small.
26	ZV,Z ZV,Z	iP	20	16	30				Compression. 27°N., 93°E. Eastern India. USCGS.
		i(pP)		16	50				
26	NE N E	e	20	55	-	20	$\frac{1}{2}$ 1		
		M	21	04	-				
		M F		05 $\frac{1}{2}$ 30	- -				
27	NE	e F	01 02	55 15	- -				Very small.
		e F	04	07 35	- -				Very small. 41°S., 76°W. Chile. USCGS.
27	NE	e F	21 22	30 00	- -				Very small. Northern Chile - Bolivia border. USCGS.
27	NE N E N	e	23	34	-	23 23	3 2		45°S., 77°W. Off coast of Chile. USCGS.
		eL		53	-				
		M	00	09	-				
		M F		09 50	- -				
28	NE	e F	03 04	59 25	- -				Small. 39 $\frac{1}{2}$ °S., 74 $\frac{1}{2}$ °W. Chile. USCGS.
28	NE NE E N Z	e	11	34	-	20 20 20	3 $\frac{1}{2}$ 3 3		38°S., 73°W. Chile. USCGS.
		eL	11	52	-				
		M	12	08	-				
		M		08	-				
		M F		08 55	- -				
								Mag. m = 6 $\frac{1}{4}$, M = 6	

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
✓ 29	ZV,Z	ePP	07	58	28	6	1.1	12200	38°S., 72½°W. Chile. Mag. 6½(Pas). USCGS.
	Z	e		58	45				
	Z	ePPP	08	00	47				
	NE	ePS		07	51				
	NE	eL		24	-				
	E	M		41½	-	20			
	N	M		42	-	20			
	Z	M		42	-	20			
	F	-	-	-			Mag. m = 6.6, M = 6.5 overlapped by next shock.		
✓ 29	E	M	09	37	-	20	1½	37½°S., 73°W. Southern Chile. USCGS.	
	N	M		38	-	20	1½		
		F	10	25	-				
29	NE	e	15	00	-			Very small. 37½°N., 73°W. Chile. USCGS.	
	F		20	-					
✓ 29	NE	eL	22	10	-			Near coast of southern Chile. USCGS.	
	E	M		30	-	20	1		
	N	M		30	-	20	1		
		F	23	10	-				
✓ 31	NE	e	03	09	-			39½°S., 75°W. Chile. Mag. 6(Berk). USCGS.	
	NE	eL		25	-				
	E	M		40	-	22	2		
	N	M		41	-	22	2½		
		F	04	40	-				Mag. m = 6, M = 5¾.
✓ 31	ZV	iP	11	12	15	6	2.1	6550	Ze 18°N., 62°W. Leeward Islands. Mag. 5¾(Berk). USCGS.
	NE	eS		20	17	16	2.5(H)		
	ZE	ePS		20	42				
	NE	eL		29½	-				
	Z	M		33	-	20	5½		
	E	M		33	-	20	6½		
	N	M		33½	-	20	6½		
		F	12	35	-				

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON. 17 AUG 1960

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR JUNE, 1960.

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st August 1957	21.2	21.2	0.00	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	17 December 1957	10.7	11.4	-0.05	121

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.
 TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.
 SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLITUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
1	NE	e	05	28	-	20	2	38°S., 73°W. Chile. USCGS.	
	NE	eL		49	-				
	N	M	06	07	-				
	E	M		09	-				
1		F		45	-	20	1	42°S., 74°W. Near coast of Chile USCGS.	
	NE	eL	22	10	-				
	N	M		19	-				
		F		35	-				
2	Z	eFP	06	17	56	19	4 1/2	46 1/2°S., 74°W. Southern Chile. USCGS.	
	ZNE	ePS		27	30				
	NE	eL		48	-				
	E	M	07	06	-				
	N	M		06	-				
	Z	M		06	-				
2		F		45	-	17	1/2	Mag. m = 6.3, M = 6.1	
	NE	e	07	46	-				
	N	M		54 1/2	-				
2		F	08	05	-	22	7	33 1/2°N., 60°E. Iran. USCGS.	
	ZV, Z	ePKP	08	06	22				
	NE	ePKS		09	42				
	NE	e		26	16				
	NE	eL		40	-				
	Z	M	09	04 1/4	-				
	N	M		04 1/2	-				
	E	M		05 1/2	-				
	F	10	35	-	22	7	Mag. 5 1/2°S., 151 1/2°E. New Britain. Mag. 6 1/2 - 6 3/4 (Pas) USCGS.		
					22	7	Mag.: m = M = 6 1/2		

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
2	NE	e	13	05	-				Very small 33 ¹ / ₂ °N., 49°E. Iran. USCGS.
		F		15	-				
2	N	e	18	35	-				Very small 18 ¹ / ₂ °N., 61°W. Leeward Islands. USCGS.
		F		45	-				
2	ZV,Z	iPKP	19	17	56				20 ¹ / ₂ °S., 178 ¹ / ₂ °W. Fiji Islands. h about 550 Km. USCGS.
2	ZV,Z	e (PKP)	20	07	20				20 ¹ / ₂ °S., 178 ¹ / ₂ °W. Fiji Islands. h about 550 Km. USCGS.
2	NE	e	22	30	-				Very small. 38 ¹ / ₂ °S., 74°W. Chile. USCGS.
		F		45	-				
3	ZV,Z	iPKP	13	42	17	5	1.7		Compression 17 ¹ / ₂ °S., 179°W. Fiji. h = 600 Km. USCGS.
3	ZV,Z	eP	16	30	19	6	0.7		41 ¹ / ₂ °N., 141 ¹ / ₂ °E. Near south coast of Hokkaido. Japan.
	NE	eL		56	-				h = 100 Km. USCGS.
	E	M	17	10	-	20	1		
	N	M		10	-	20	1 ¹ / ₂		
	Z	M		10	-	20	1		
		F		30	-				
3	NE	e	19	15	-				Small. 42 ¹ / ₂ °S., 75°W. Chile. USCGS.
		F		35	-				
3	NE	e	22	50	-				Very small.
		F	23	05	-				
4	ZV,Z	iP	02	39	33	3	0.7		Compression
	NE	e		49	55				
	N	eL	03	01	-				20°N., 95 ¹ / ₂ °W. Near coast of Jalisco, Mexico. USCGS.
	N	M		09	-	28	1 ¹ / ₂		
	E	M		15	-	18	1		
	N	M		15	-	18	1		
	Z	M		15	-	18	1		
		F		35	-				Mag.: m = 6; M = 5 ³ / ₄
4	NE	eL	03	52	-				39°S., 73 ¹ / ₂ °W. Near coast of Chile. USCGS.
	N	M	04	07	-	20	1/2		
		F		30	-				
4	ZV,Z	iP	08	14	56				Compression
	N	e		19	03				
	E	eL		20 ¹ / ₂	-				Azores
	N	M		21 ¹ / ₂	-	14	1		
		F		35	-				
4	ZV,Z	eP	11	10	31				39 ¹ / ₂ °N., 30 ¹ / ₂ °W. Azores Islands region. USCGS.
	N	e		14	31				
	E	eL		16 ¹ / ₂	-				
	N	M		17	-	14	1		
		F		35	-				

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JUNE 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
5	NE	e F	06 07	45 25	-				Very small. 65°S., 178°E. Antarctic Ocean. USCGS.
5	NE	e	20 21	50 50	-				Small 31½°S., 177°W. Kermadec Islands. USCGS.
6	ZV,Z	iP	01	29	41	3	1.0	8580	41°N., 125°W. Off coast of Northern California Mag. 5½ - 5¾ (Berk) USCGS
	ZV,Z	i		29	49				
	NE	eS		39	27	12	1.6(H)		
	NE	eSS		44	12				
	N	eL		51	-				
	E	M		59	-	19	5		
	N	M		02	00½	19	5½		
	Z	M F			03½ 00	15	5		
6	Z	eP	06	10	44			13000	Mag. : = 6.2, M = 5.9
	ZV,Z	ePKP		14	34				
	ZV,Z	eFP		15	29	8	2.3		
	ZNE	e		16	34				
	NE	iPPS		26	21				
	NE	eSKKS		32.4	-				
	NE	e		37	30				
	NE	eL		44	-				
	E	M		07	01	20	160		
	N	M			03½	20	105		
Z	M F			05½ 45	18	120			
6	NE	e	18	03	-				Mag. : m = 7.0, M = 7.1
	E	M		21	-	20	1½		
	N	M		21	-	20	1½		
	Z	M F		21 40	-	20	1		
7	NE	e F	06	09 45	-				Small. 17°S., 98°E. Indian Ocean. USCGS.
	ZNE	e F	11	00 10	-				
7	ZV,Z	iP	13	08	54				Compression. 53°N., 158½°E. Near Kamchatka. USCGS
7	ZNE	e F	14	00 20	-				Small. Off coast of Southern Chile. USCGS
8	ZV,Z	iP	16	25	55	3	1	(3380)	35°N., 35°W. North Atlantic Ocean. USCGS.
	NE	e(S)		30	52				
	N	eL		32½	-				
	N	M		34	-	20	4½		
	E	M		35	-	16	3		
	ZE	eScS F		36 17	28 20				
8	NE	e F	22 23	39 05	-				Mag. : m = 5.9, M = 5.4
9	NE	e F	02 03	59 10	-				Small
									Very small. 39½°N., 39½°E. Turkey. USCGS

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

JUNE 19 60

SEISMOLOGICAL BULLETIN

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS	
			h.	m.	s.					sec.
9	N	eL	08	33 ¹ / ₂	-				Strait of Otranto. USCGS	
	E	M		35	-	20	2			
	N	M		35	-	20	3 ¹ / ₂			
9	ZV,Z	iPKP	11	43	37	8	3.2		18°S., 169°E. New Hebrides Islands. Mag. : m = 6 ¹ / ₄ , M = 6	
	N	eL	12	35	-		2			
	Z	M		49	-	21	4 ¹ / ₂			
	N	M		49	-	21	3			
	E	M		50	-	21				
		F		13	40	-				
9	ZV,Z	iP	17	52	45	5	2.2	2600	38°N., 26°W. Azores Islands. USCGS Mag. : m = 5.9, M = 5.4	
	ZV,Z	i		52	55					
	NE	e		56	16					
	E	iS		56	54	12	6.8(H)			
	NE	eL		58	-					
	E	M		59	-	16	7			
	N	M		59 ¹ / ₂	-	16	8 ¹ / ₂			
	Z	M		60	-	16	4 ¹ / ₂			
		F		18	55	-				
10	Z	ePKP	21	31	39				15 ¹ / ₂ °S., 174°W. Samoa Islands region. USCGS	
	N	eL	22	20	-		1			
	Z	M		33	-	20	3			
	N	M		33	-	20	1 ¹ / ₂			
	E	M		36	-	19				
11	NE	eSKS	00	57	35				21°S., 64 ¹ / ₂ °W. Southern Boliva, h about 300 Km. USCGS	
	E	M	01	14 ¹ / ₂	-	20	1			
	N	M		14 ¹ / ₂	-	20	1			
11	Z	iPKP	15	33	29				PPZ 7 sec. 2.1p 9°S., 152 ¹ / ₂ °E D'Entrecasteaux Islands USCGS Mag. ; m = 6.6, M = 6.5 overlapped by next shock.	
	ZNE	iPKS		36	57					
	Z	e		49	29					
	NE	eL	16	12	-					
	N	M		23	-	24	19			
	E	M		23 ¹ / ₂	-	24	24			
	N	M		36	-	20	10			
	E	M		36	-	20	10			
	Z	M		36	-	20	7			
		F		-	-	-				
11	Z	ePKP	16	56	58				9 ¹ / ₂ °S., 152 ¹ / ₂ °E. D'Entrecasteaux Islands. USCGS Mag. ; m = 6.6, M = 6.5	
	ZN	ePKS	17	00	27					
	NE	eL		35	-					
	N	M		46 ¹ / ₂	-	23	19			
	E	M		47	-	24	26			
	N	M		59	-	20	14			
	E	M		59	-	20	7			
	Z	M		59	-	20	7			
	F		19	40	-					
12	NE	e	00	50	-				Small. 37°S., 75°W. Off coast of Chile USCGS	
		F	01	30	-					

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

JUNE 19 60

SEISMOLOGICAL BULLETIN

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
12	NE	eL	08	10	-				36°S., 98°W. South Pacific Ocean. USCGS
	E	M		24	-	20	3½		
	N	M		24	-	20	3		
	Z	M		24	-	20	2		
		F	09	30	-				Mag. ; = 6½, M = 6
12	NE	e	23	20	-				Very small
		F		30	-				
13	NE	eL	06	34	-				44½°S., 76½°W. Off coast of Southern Chile. USCGS
	E	M		52	-	20	1½		
	N	M		53	-	20	1½		
		F	07	25	-				
14	NE	e	00	35	-				Very small
		F	04	00	-				
14	NE	e	03	50	-				Small. 43°S., 73°W. Chile. USCGS
		F	04	25	-				
15	NE	e	00	45	-				Small. 9°S., 152½°E. D'Entrecasteaux Islands. USCGS
		F	01	10	-				
15	NE	e	12	15	-				Small
		F		35	-				
15	ZV,Z	iP	15	49	16	6	0.8	9200	Compression
	ZV,Z	i		49	29				41°N., 142½°E. Near north coast of Honshu, Japan. USCGS
	Z	ePP		52	30				
	NE	eS		59	32				
	NE	eL	16	16	-				
	E	M		29	-	22	2		
	N	M		29	-	22	4½		
	Z	M		29	-	22	1½		
	F		17	00	-				Mag, : m = 6.1, M = 5.8
15	NE	e	23	50	-				32°S., 177½°W. Kermadec Islands. USCGS
	E	M	24	21	-	20	1		
	N	M		21	-	20	1½		
		F	-	-	-				Overlapped by next shock.
16	E	M	00	40	-	20	1		½°S., 133°E. New Guinea. USCGS
	N	M		40	-	20	1½		
16	E	M	01	03	-	19	2½		
	N	M		03	-	20	3		
	Z	M		03	-	20	2½		
		F	02	15	-				
17	ZV	iPKP	05	21	15				18°S., 178°W. Fiji Islands USCGS
17	ZV,Z	iP	16	47	28				52½°N., 173½°W. Andreanof Islands. USCGS
	E	eL	17	08	-				
	E	M		27½	-	20	1½		
	N	M		27½	-	20	1½		
	Z	M		27½	-	20	1		
	F		18	15	-				

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SEISMOLOGICAL BULLETIN

JUNE 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
18	NE	e F	02	15	-				Very small
18	NE	e F	03 04	55 40	-				Small. D'Entrecasteaux Islands USCGS
19	ZV,Z	iPKP	12	40	37				15°S., 178½°W. Fiji Islands USCGS
19	ZV	iP	12	46	52				44½°N., 149°E. Kurile Islands. USCGS
19	N E N	eL M M F	18	00	-				28°N., 142½°E. Bonin Islands USCGS
				13½	-	20	1½		
				13½	-	20	1½		
				40	-				
19	NE	e F	22 23	30 00	-				Very small
20	ZNE ZV,Z	eP iPP	02	15	39	16	1.9	12500	PH 22 sec 1.5u PPH 22 sec 6.6u
	NE	eSKS		20	14	16	8.6		
	NE	eS		26	21				
	NE	ePS		27	46	22	9.8(H)		38°S., 73½°W. Near coast of Chile Mag. 7 (Pas) 7½ (Berk) USCGS
	NE	eSS		29	41				
	NE	eSSS		35	50				
	NE	eL		39	46				
	NE	eL		48	-				
	Z	M	03	06	-	20	61		
	N	M		06	-	20	75		
	E	M		08	-	20	86		
		F	06	40	-				Mag. : m = 7.2, M = 7.5
20	Z	eP	13	14	15			12700	Compression
	Z	ePKP		18	08				
	ZV,Z	ePP		18	48	8	3.2		PPH 20 sec 2.8u
	Z	ePPP		20	54				
	NE	eSKS		24	51				39½°S., 73°W. Chile. Mag. 6½ (Pas), 7 (Berk) USCGS
	NE	e		25	06				
	NE	eS		26	24	22	4.2(H)		
	NE	iPS		28	22				
	N	eSS		34	28				
	NE	eL		45	-				
	E	M	14	00	-	22	43		
	N	M		01	-	22	58		
	Z	M		01	-	22	28		
		F	17	25	-				Mag. : m = 6.9, M = 7.0
20	NE	eL	17	52	-				38½°S., 74°W. Off coast of Chile USCGS
	E	M	18	05	-	20	1½		
	N	M		05	-	20	1½		
		F		30	-				
21	NE	e F	09	25	-				Very small. 4½°S., 105°W. Pacific Ocean., USCGS
				50	-				
21	NE	eL	22	21	-				61°S., 21°W. Sandwich Islands region. USCGS
	E	M		34½	-	20	1½		
	N	M		34½	-	20	1½		
		F	23	10	-				

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JUNE 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS	
			h.	m.	s.					sec.
22	NE	e F	04	25	-				very small. 62°S., 156½°E. Antarctic Ocean. USCGS	
22	NE	e F	07	35	-				very small. Near coast of Chile. USCGS	
22	ZV,Z N	iP eS F	16	22	18			6800	12°N., 57½°E. Arabian Sea. USCGS	
				30	34					
			17	05	-					
22	NE	e F	21	15	-				very small. 38½°S., 73½°W. Near coast of Chile. USCGS	
				35	-					
25	ZV,Z ZV,Z NE E N	ePKP ₁ ePKP ₂ eL M M F	02	22	35				30½°S., 177°W. Kermadec Islands USCGS	
			03	20	-					
				33	-	20		1½		
				34	-	20		1½		
			04	20	-					
25	ZV ZV,N	iPg eSg F	14	30	26			430	very small 51.5°N., 5.7°E. Holland - Belgium frontier BCIS ..	
				31	17					
				33	-					
25	Z ZV,Z ZV N Z N E	ePKP i e eL M M M F	15	01	45				30½°S., 177°W. Kermadec Islands. Mag. 6½-6¾ (Pas) 5¾ (Berk) USCGS	
				02	24					
				02	30					
				57	-			2½		
			16	13	-	20		4½		
				13	-	20		4½		
				14	-	20		3½		
			17	25	-				Mag. : m = 6½, M = 6¼	
27	NE	e F	17	15	-				very small	
				45	-					
27	NE E N	e M M F	18	10	-					
				24	-	20		1½		
				24	-	20		1½		
			19	20	-					
29	NE E N Z	eL M M M F	02	46	-				Southern Chile USCGS	
			03	01	-	20		3½		
				03	-	20		3		
				03	-	20		3		
				40	-				Mag. : m = 6¼, M = 6	
29	ZV,Z E N	ePKP ₂ M M F	04	49	47				30°S., 177½°W. Kermadec Islands USCGS	
			06	00	-	20		1½		
				00	-	20		3		
				40	-					
29	ZV,Z NE E N Z	iP e(S) eL M M M F	10	27	16	6		2.3	2040	Confused by microseisms
				30	37					
				30½	-				47½°N., 27°W. Atlantic Ocean USCGS	
				33	-	20		3		
				33	-	20		2		
				33	-	20		3		
			11	05	-				Mag. : m = 5.4, M = 4.6	

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JUNE 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
29	NE	e	17	40	-				Small. 53°N., 168½°W. Fox Islands USCGS
	F	F	18	20	-				
30	ZV,Z	iP	20	09	20				Dilatation. 60°N., 151°W. Kenai Peninsula, Alaska. USCGS

M.O. 669

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR JULY, 19 60

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS : (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS : FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1918).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st August 1957	21.2	21.2	0.00	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	17 December 1957	10.7	11.4	-0.05	124

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.	sec.	μ	km.	
1	E N	e(S) eL F	08	19	20				56°N., 165°E. Komandorskie Islands. USCGS.
			09	15	-				
2	NE E N	e M M F	09	53	-				
			10	04	-	20	$\frac{1}{2} \frac{1}{2}$		45½°S., 73½°W. Southern Chile. USCGS.
				04	-	20	$\frac{1}{2}$		
				20	-				
2	N E N	e M M F	12	20½	-				
				56	-	20	$\frac{1}{2}$		56°S., 27°W. Sandwich Islands. USCGS.
				57	-	20	1		
			13	30	-				
2	ZV	1P	12	55	31				41°N., 131½°E. Sea of Japan. USCGS.
3	NE	e F	04	00	-				Small. 52°N., 174°W. Andreanof Islands. USCGS.
				25	-				
3	NE	e F	07	55	-				Very small. 52°N., 173°W. Andreanof Islands. USCGS.
			08	10	-				
3	ZV,Z ZV,Z Z N N N N E N Z	1P i eFP iS eSS eSSS eL M M M F	20	32	50	7	11.4	8870	Dilatation. PH 8 sec. 4.2 μ
				32	55				
				35	48	7	2.0		
				42	49	10	8.3 (H)		50½°N., 177°W. Andreanof Islands, Aleutian Islands. Mag. 6½ (Berk).
				48	04				
				51	20				
				58	-				
			21	13	-	19	7½		
				14½	-	19	8		
				14½	-	18	2½		
			-	-	-				Mag.: m = 6.6, M = 6.5 overlapped by next shock.

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JULY, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
3	ZV,Z	eP F	23 24	04 15	29 -				Dilatation. 50 ¹ / ₂ °N., 177°W. Andreanof Islands. USCGS.
4	ZV,Z ZV,Z NE N N N E N N Z	eP e eS eSS e eL M M M M M F	04 04 04 04 05 05 05 05 05 05 05 07	39 39 48 53 56 01 05 ¹ / ₂ 06 10 ¹ / ₂ 11 11 50	43 55 46 18 26 - - - - - - -	7 16 24 24 17 16 16	2.6 6.7(H) 36 44 45 37 28	7700	52°N., 131 ¹ / ₂ °W. Queen Charlotte Islands. Mag. 6 ¹ / ₂ -6 ³ / ₄ (Pas). USCGS.
4	E NE N E Z	e(S) eL M M M F	13 13 13 13 14	30 44 52 52 ¹ / ₂ 52 ¹ / ₂ 35	20 - - - -	17 16 16	4 3 2 ¹ / ₂		52°N., 131°W. Queen Charlotte Islands. USCGS. Mag.: m = 6, M = 5 ³ / ₄
4	NE E N	eL M M F	22 22 22 23	31 35 35 05	- - - -	20 20	¹ / ₂ 1		43°S., 73°W. Southern Chile. USCGS.
5	NE NE E N	e(PS) eL M M F	06 06 06 06 07	14 31 47 47 30	08 - - - -	20 20	1 1		39°S., 73 ¹ / ₂ °W. Near coast of Chile. USCGS.
5	ZV,Z	iP	21	26	47				8°S., 71 ¹ / ₂ °W. Brazil. USCGS.
6	ZV N N	iP eS esS F	05 05 05 06	25 32 33 10	32 32 56 -			5700	Depth = 220 Km. 36 ¹ / ₂ °N., 70 ¹ / ₂ °E. Hindu Kush. region. USCGS.
8	NE N	eL M F	13 13 14	30 46 00	- - -	22	¹ / ₂		31°N., 130 ¹ / ₂ °E. Near Kyushu, Japan. USCGS.
8	NE	e F	19	10 25	- -				Very small.
8	NE	e F	21	10 35	- -				Very small.
9	NE	e F	01	10 25	- -				Very small. 50°N., 177 ¹ / ₂ °W. Andreanof Islands. USCGS.
9	NE E N	eL M M F	01 01 01 02	28 33 33 05	- - - -	20 20	1 ¹ / ₂ 2		25 ¹ / ₂ °N., 125 ¹ / ₂ °E. Ryukyu Islands. USCGS.

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JULY, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
9	NE	e F	18 19	44 00	- -				Small.
9	ZV NE N	e(P) eL M F	22 23	47 52½ 53 05	09 - - -	16	1		41°N., 21°E. Southern Yugoslavia. USCGS.
10	ZV,Z ZV,Z E EN N E N N E Z	eP ePP eSKS eSKKS eS eFS eL M M M F	00 00 00 00 01 01 01 01 01 01 03	18 22 29 29 29 31 48 04 08 08 10	45 38 19 33 53 19 - - - - -	6 6 20 20 20	1.3 1.1 6.0 9 7 3½	10500	0°, 98°E. Off west coast of Sumatra. USCGS. Mag.: m = 6.5, M = 6.3
11	ZV,Z	ePKP	12	14	45				16°S., 172°W. Tonga Islands. USCGS.
13	NE	e F	06 07	45 10	- -				Small.
13	Z N Z N E	e eL M M M F	08 08 08 08 09	14½ 46 53½ 53½ 54½ 40	- - - - -	22 22 20	4½ 9½ 5½		53½°S., 1½°E. Bouvet Islands region. USCGS. Mag.: m = 6½, M = 6¼
13	ZV,Z NE N	eP eS M F	10 10 10	25 28 32 40	05 45 - -	17	2		Greece. USCGS.
13	ZV,Z ZNE N N E Z	eP eS eL M M M F	13 13 13 13 13 13 13	05 09 10½ 12½ 13 13½ 40	37 13 - - - - -	6 10 17 16 8	1.9 3.2(H) 8 3 3½	2200	Dilatation. 41°N., 23½°E. Greece. Minor damage on Chalcidice Peninsula. USCGS. Mag: m = 5.5, M = 4.8
13	NE	e F	21	10 35	- -				Very small. 34°N., 139°E. Off Honshu, Japan. USCGS.
14	NE	eL F	02 03	55 15	- -				Small. 25°N., 124½°E. Ryukyu Islands. USCGS.
14	ZNE N E N	e eL M M F	10 11	55 16 29 31 45	- - - - -	22 22	2 2½		5°N., 127½°E. Molucca Passage. USCGS.

M.O. 669

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JULY, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
14	NE	eL F	19	03	-				Small. 7°N., 38½°E. Ethiopia. USCGS.
15	ZV,Z	iP	05	13	45				Very small. 12°S., 45½°E. Off Madagascar. USCGS.
	NE	eL F	06	44	-				
15	ZV,Z	eP	23	48	22				Small.
	NE	eL F	24	54	-				
17	NE	eL	05	37	-				36°N., 69°E. Hindu Kush. h about 200 Km. USCGS.
	E	M		48½	-	20	2½		
	N	M F	06	48½ 10	-	20	1½		
17	NE	e F	20	10	-				Small. 10°S., 13°W. Ascension Island region. USCGS.
18	NE	eL	02	37	-				4½°S., 151°E. New Britain region. h about 200 Km. USCGS.
	E	M		52½	-	26	4		
	N	M F	03	54 30	-	26	5		
18	ZV	iP	19	02	09				7°S., 51½°E. Amirante Islands. USCGS.
	ZV	e		02	18				
19	ZV	eP	04	32	11				7°S., 80°W. Near coast of Peru. USCGS.
		F	05	25	-				
19	ZV,Z	epP	16	15	53				16½°N., 92½°W. Mexico. h about 200 Km. USCGS.
20	ZV,Z	e(P)	09	42	34				49°N., 157½°E. Kurile Islands region. USCGS.
	N	e(S)		52	33				
	N	M	10	19	-	20	1½		
	E	M F		20 35	-	20	1½		
20	ZV,Z	ePKP	21	18	51				20½°S., 169°E. New Hebrides Islands USCGS.
	ZV,Z	i		18	53				
	NE	eL	22	00	-				
	E	M		25	-	22	1½		
	N	M		26	-	22	2		
	Z	M F		26 23	-	22	2		
22	NE	eL	06	45½	-				
	N	M		47	-	18	1½		
	E	M		48	-	16	2½		
	Z	M F		48 55	-	16	2		
24	ZV	e(P)	10	00	22				56°N., 164°E. Near coast of Kamchatka. USCGS.
	E	M		33	-	20	2½		
	N	M		34	-	19	2½		
	Z	M F		34 11	-	19	1		

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JULY, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS			
			h.	m.	s.					sec.	μ	km.
25	ZV,ZN	eP	03	52	34	8	1.2	8120	PH 16 sec. 1.3 μ 55°N., 163°E. Near coast of Kamchatka. Mag. 6½ (Pas). USCGS.			
	Z	ePP		55	25							
	NE	eS	04	01	58	14	3.2(H)					
	N	ePPS		02	42							
	N	eSS		07	06							
	E	eL		13½	-							
	E	M		26	-	20	6					
	N	M		26	-	20	13					
Z	M		26	-	20	3						
		F	06	55	-			Mag.: m = 6.2, M = 5.9				
25	ZV,Z	iP	11	23	29	7	13.6	8150	Dilatation. PH 14 sec. 8.5 μ FPH 14 sec. 5.1 μ 54°N., 159°E. Kamchatka. h about 100 Km. Mag. 6¾ (Berk), 7 (Pas). USCGS.			
	Z	ipP		24	06							
	ZV,ZN	isP		24	20							
	ZN	iPP		26	16	8	4.8					
	NE	iS		32	49	16	28(H)					
	N	esS		33	20							
	ZNE	ePS		33	46							
	N	ePPS		34	18							
	E	eSS		37	32							
	N	eL		48	-							
		F	14	30	-			Mag.: m = M = 6.8				
25	NE	e	21	39	-				Small. 32°N., 56½°E. Iran. USCGS.			
		F		55	-							
25	NE	e	22	40	-				Small. 3°S., 148°E. Bismarck Sea. USCGS.			
		F	23	05	-							
26	NE	e	04	40	-				Very small. 40½°N., 144½°E. Off Hokkaido, Japan. USCGS.			
		F	05	00	-							
26	ZV,Z	eP	12	42	10	18	1		40½°N., 37°E. Turkey. USCGS.			
		N	M		54					-		
			F	13	05					-		
27	NE	e	04	15	-				Very small. 59.4°S., 25.1°E. Sandwich Islands. USCGS.			
		F	05	00	-							
27	ZV,Z	ePP	10	24	40			13000	44.7°S., 75.1°W. h about 25 Km. Near coast of southern Chile. USCGS.			
		E	eSKS		30					30		
		E	eSKKS		31					36		
		NE	ePS		34					21		
		E	eL		54					-		
		E	M	11	10½					-	20	3
		N	M		12½					-	20	4
		Z	M		12½					-	19	3
		F	12	40	-			Mag.: m = 6¼, M = 6				
28	ZV,Z	iPKP	00	43	55	6	4.7		19½°S., 170½°E. Loyalty Islands. USCGS.			
		ZV,Z	e		44	11						
		NE	eL	01	26	-						
		E	M		51	-	20			2½		
		N	M		51	-	20			4		
		Z	M		51	-	20			1½		
		F	02	50	-			Mag.: m = 6¼, M = 6				
29	ZV,Z	e(P)	10	54	23				26.9°N., 90.3°E. India. USCGS.			
		N	eL	11	14					-		
		E	M		23					-	24	1
		N	M		23					-	24	3½
			F		35					-		

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

JULY, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
29	N	eSS	14	54.3	-				31.7°N., 67.0°E. Eastern Afganistan. h about 64 Km. USCGS.
	E	M	15	06	-	20	2		
	N	M		06½	-	20	4		
		F		35	-				
29	ZV,Z	iP	17	44	02	8	6.4	9200	PH 16 sec. 3.5 μ PFH 18 sec. 9.0 μ
	ZV,Z	iPP		47	16	8	4.3		
	N	iS		54	17	18	9.0(H)		
	E	iPS		54	43				40.1°N., 142.3°E. Honshu, Japan. h about 50 Km. Mag. 6¼(Pas).USCGS.
	N	ePPS		55	27				
	E	eSS		59	51				
	NE	eL	18	09	-				
	E	M		17½	-	28	95		
	N	M		18	-	27	70		
	E	M		23	-	20	40		
	N	M		24½	-	20	56		
	Z	M		24½	-	20	36		
	F	20	40	-			Mag.: m = M = 6.7		
30	NE	e	14	45	-			Small. 56.3°N., 163.9°E. Near Kamchatka. USCGS.	
		F	15	10	-				
30	ZV,Z	e(PKP)	03	14	48			PFH 16 sec. 2.2 u 5.6°S., 150.0°E. New Britain. Mag. 6¼(Pas). USCGS.	
	NE	ePKS		18	19				
	NE	e		34	37				
	NE	eL		55	-				
	E	M	04	13	-	21	35		
	N	M		14	-	20	47		
	Z	M		14	-	20	24		
	F	06	00	-			Mag.: m = M = 6¾		
30	NE	eL	08	03	-			6.0°S., 150.0°E. New Britain. USCGS.	
	E	M		22	-	22	3½		
	N	M		22	-	22	4½		
	Z	M		22	-	22	3		
		F		50	-				Mag.: m = 6¼, M = 6
31	N	eSS	15	35	13			43.6°S., 74.3°W. Near coast of Central Chile. USCGS.	
	NE	eL		43	-				
	E	M	16	00	-	20	2		
	N	M		00	-	20	1½		
	Z	M		00	-	20	1		
	F		30	-					
31	NE	e	19	50	-			Small. 2.8°S., 148.2°E. Bismarck Sea. USCGS.	
		F	20	10	-				
31	ZV	iP	22	35	28			5300 27.9°N., 54.6°E. Southern Iran. h about 127 Km. USCGS.	
	ZV	i		34	46				
	N	eS		42	15				
	N	eL		49	-				
	N	M		54	-	24	1½		
	E	M		56	-	20			
		F	23	15	-				

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AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR AUGUST, 19 60

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st August 1957	21.2	21.2	0.00	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	17 December, 1957	10.7	11.4	-0.05	121

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK. TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY. SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLITUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
✓ 1	ZV,Z	iP	02	29	15	4	1.3	5290	27.9°N., 54.2°E. h about 110 Km. Southern Iran. USCGS.
	N	eS		36	02				
	N	eSS		39	31				
	N	eL		43	-				
	N	M		48	-	24	3½		
	E	M		50	-	20	2		
	Z	M		51	-	16	½		
✓ 2	ZV,Z	iPKP	05	26	58			3660	22.2°S., 171.5°E. h about 108 Km. Loyalty Islands. USCGS.
	Z	ePP		30	36				
	N	ePSKS		40	55				
	Z	eSP		41	11				
	E	eL	06	11	-		½		
	E	M		32	-	22	1		
	N	M		32	-	21			
2	ZV,Z	ePKP2	07	30	-			3660	28.2°S., 176.6°W. h about 61 Km. Kermadec Islands. USCGS.
	E	M	09	50	49	20	½		
	N	M	11	00	-	20	1		
2	ZV	eP	20	57	44			3660	84.2°N., 2.3°E. h about 40 Km. North Polar region. USCGS.
	N	eS	21	02	59				
	E	eL		05½	-				
		F		20	-				

REPORT OF THE OBSERVATORY, BISHOPSCOTE, NORTH YORKSHIRE

1911

Time	Direction	Intensity	Duration	Remarks
11.15	W	3	10	Light tremor
11.30	W	2	5	Light tremor
11.45	W	2	5	Light tremor
12.00	W	2	5	Light tremor
12.15	W	2	5	Light tremor
12.30	W	2	5	Light tremor
12.45	W	2	5	Light tremor
13.00	W	2	5	Light tremor
13.15	W	2	5	Light tremor
13.30	W	2	5	Light tremor
13.45	W	2	5	Light tremor
14.00	W	2	5	Light tremor
14.15	W	2	5	Light tremor
14.30	W	2	5	Light tremor
14.45	W	2	5	Light tremor
15.00	W	2	5	Light tremor
15.15	W	2	5	Light tremor
15.30	W	2	5	Light tremor
15.45	W	2	5	Light tremor
16.00	W	2	5	Light tremor
16.15	W	2	5	Light tremor
16.30	W	2	5	Light tremor
16.45	W	2	5	Light tremor
17.00	W	2	5	Light tremor
17.15	W	2	5	Light tremor
17.30	W	2	5	Light tremor
17.45	W	2	5	Light tremor
18.00	W	2	5	Light tremor
18.15	W	2	5	Light tremor
18.30	W	2	5	Light tremor
18.45	W	2	5	Light tremor
19.00	W	2	5	Light tremor
19.15	W	2	5	Light tremor
19.30	W	2	5	Light tremor
19.45	W	2	5	Light tremor
20.00	W	2	5	Light tremor
20.15	W	2	5	Light tremor
20.30	W	2	5	Light tremor
20.45	W	2	5	Light tremor
21.00	W	2	5	Light tremor
21.15	W	2	5	Light tremor
21.30	W	2	5	Light tremor
21.45	W	2	5	Light tremor
22.00	W	2	5	Light tremor
22.15	W	2	5	Light tremor
22.30	W	2	5	Light tremor
22.45	W	2	5	Light tremor
23.00	W	2	5	Light tremor
23.15	W	2	5	Light tremor
23.30	W	2	5	Light tremor
23.45	W	2	5	Light tremor
24.00	W	2	5	Light tremor

M.O. 669

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND. 46

SEISMOLOGICAL BULLETIN FOR SEPTEMBER, 1960

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T. sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ^2 .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st August 1957	21.2	21.2	0.00	62.5
E.	1st August 1957	21.1	21.1	0.00	52.0
Z.	1st September 1960	11.1	9.1	+0.01	156.0

(H) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.
			h.	m.	s.				
1	NE	e	08	55	-	sec.	μ	km.	Small. 27.6°S., 176.9°W. Tonga Islands region. USCGS.
		F	09	40	-				
1	ZV,Z	e(PKP)	09	47	47	20	$1\frac{1}{2}$	7950	16.8°S., 167.6°E. h about 63 Km. New Hebrides Islands. USCGS.
	NE	eL	10	35	-				
	E	M	55	$\frac{1}{2}$	-				
	N	M	55	$\frac{1}{2}$	-				
		F	-	-	-			overlapped by next shock.	
1	Z	e(PKP)	10	54	36	20	$1\frac{1}{2}$	7950	16.5°S., 167.6°E. New Hebrides Islands. USCGS.
	N	M	12	03	-				
		F	-	-	-				
1	N	M	12	42	-	20	$1\frac{1}{2}$	7950	16.6°S., 167.4°E. New Hebrides Islands. USCGS.
		F	13	10	-				
1	ZV,Z	eP	15	48	30	6	1.3	7950	56.1°N., 153.7°W. h about 24 Km. Kodiak Island, Alaska. Mag. 6-6 $\frac{1}{4}$ (Pas). USCGS.
	NE	eS	57	45	14	1.5(H)			
	NE	ePS	58	04	-				
	N	eSS	16	02	06				
	E	eL	07	-	-				
	Z	M	20	-	20	$2\frac{1}{2}$			
	N	M	20	-	20	$5\frac{1}{2}$			
	E	M	20	$\frac{1}{2}$	-	18	7		
	F	17	40	-			Mag.: m = 6.2; M = 5.9		

M.O. 669

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

SEPTEMBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
1	ZV,Z N	ePKP M F	20 21 22	21 28 20	34 - -	20	1/2		16.1°S., 179.6°W. h about 183 Km. Fiji Islands. USCGS.
2	N N E N	eS eSS M M F	14 11 31 1/2 32	07 11 - -	06 58 - -	12 20 20	1.1 3 4		28.7°N., 98.3°E. h about 48 Km. Tibet. USCGS. Mag.: m = 5.9; M = 5.5
2	ZV,Z E E N Z	eP eS M M M	22 24 54 54 1/2 54 1/2 24	14 24 54 - - 45	37 12 - - -	6 19 19 19	0.7 5 5 1/2 2 1/2	8360	52.0°N., 171.4°W. h about 49 Km. Fox Islands, Aleutian Islands. Mag. 5 3/4-6 (Pas). USCGS. Mag.: m = 6.0; M = 5.6
3	NE	e F	00 01	55 30	- -				Very small. 43.2°N., 144.4°E. Near Hokkaido, Japan. USCGS.
3	NE	e F	07	00 35	- -				Small. 20.9°S., 174.4°W. Tonga Islands. USCGS.
3	ZV,Z NE	iPP ePKS F	13 03 14	02 03 15	42 26 -	8	1.8		Confused by microseisms. 6.1°S., 154.5°E. h about 457 Km. Solomon Islands. USCGS.
3	ZV,Z N E N NE E N Z	iP eS e eSS eL M M M F	23 24 08 14 22 35 36 1/2 40 25	58 08 08 14 - - - - 45	38 41 59 07 - - - -	6 20 20 18	2.6 4 1/2 5 1/2 2	8960	Compression. 44.6°N., 149.1°E. h about 27 Km. Kurile Islands. Mag. 6 1/4 (Pas). USCGS. Mag.: m = 6 1/4; M = 6
4	NE	e F	05 06	55 15	- -				Very small. 56.3°N., 153.1°W. Kodiak Island. USCGS.
6	ZV,Z	iPKP	14	22	42				Compression. 20.4°S., 169.4°E. USCGS. Loyalty Islands.
6	ZV	e(P)	15	36	51				41.9°N., 142.5°E. Near Hokkaido, Japan. USCGS.
6	NE E	e M F	17 18	48 51 15	- - -	18	1 1/2		
7	ZV,Z E E N	iP eS M M F	01 02	30 05	36 30 - - 45	4 24 24	1.1 1/2 1 1/2	10150	Compression. 37.2°S., 16.1°W. h about 25 Km. Tristan da Cunha region. USCGS.
8	NE	e F	11 12	50 25	- -				Small. 6.2°N., 126.2°E. Near Mindanao. P.I. USCGS.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

SEPTEMBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD sec.	AMPLI- TUDE μ	Δ km.	REMARKS	
			h.	m.	s.					
8	ZV	eP	14	43	41				52.5°N., 158.8°E. Kamchatka. USCGS	
9	ZV	iP	10	14	11				36.4°N., 71.6°E. Hindu Kush. USCGS	
9	ZV,Z	iP	16	24	04	13	1.3	2220	71.5°N., 2.4°W. h about 23 Km. Jan Mayen Island region. USCGS.	
	E	eS		27	42					
	N	e		27	56					
	E	eL		29	-					
	E	M		30 ¹ / ₂	-					
9	ZV,Z	iP	20	09	16	13	1.5	2300	71.7°N., 1.3°W. h about 23 Km. Jan Mayen Island region. USCGS.	
				09	28					
				13	00					
10	ZV,Z	eP	00	24	52	16	3.9	2870	34.4°N., 26.4°E. h about 10 Km. Crete. USCGS.	
				29	16					
				34 ¹ / ₂	-					
				45	-					
10	ZV,Z	e(P)	10	01	45	18	1/2			
				09	-					
				09	-					
10	NE	e(SKS)	11	07	48	16	1		Small. 4.0°N., 122.6°E. Celebes Sea. USCGS.	
				12	10					
10	NE	e	14	55	-				Very small. 11.2°S., 163.1°E. Solomon Islands. USCGS.	
				15	30					
12	ZV,Z	iP	12	30	04	4	0.9		27.3°N., 128.4°E. h about 48 Km. Ryukyu Islands. USCGS.	
				13	00					
				13	-					
				13	-					
13	NE	e	01	40	-				Very small.	
				02	00					
15	NE	e	00	30	-				Very small. 20.9°S., 174.1°W. Tonga Islands. USCGS.	
				01	10					
16	NE	e	02	03	-				Very small. 38.5°N., 68.7°E. Tadzhik SSR. USCGS.	
				20	-					
17	ZV,Z	iP	08	04	45			8560	Compression. 49.3°N., 155.4°E. Kurile Islands. USCGS. overlapped by next shock.	
					14					30

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

..... SEPTEMBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS	
			h.	m.	s.					sec.
✓ 17	ZV,Z	iP	08	17	25	6	1.1	8580	Compression. 49.4°N., 155.2°E. h about 28 Km. Kurile Islands. USCGS.	
	ZV,Z	e		17	50					
	Z	ePP		20	19					
	N	eS		27	11					
	E	e		27	30					
	E	eL		37	-					
	E	M		56	1/2	19	5			
	N	M		57	1/2	19	6 1/2			
Z	M		57	1/2	19	3				
		F	09	45	-			Mag.: m = 6.2; M = 5.9		
✓ 17	ZV,Z	ePKP	20	16	01				20.9°S., 174.5°W. h about 28 Km. Tonga Islands. USCGS.	
	NE	eL		58	-					
	E	M	21	21	-	20	1 1/4			
	N	M	21	21	-	20	1 1/2			
		F	22	25	-					
✓ 19	ZV,Z	ePP	03	56	50				15.6°N., 120.0°E. Luzon Island. P.I. USCGS.	
	NE	eSKS	04	03	34					
	NE	ePPS		05	53					
	E	eSS		10	38					
	E	M		32	1/2	20	3 1/2			
	N	M		32	1/2	19	4			
		F	05	30	-			Mag. m = 6 1/4; M = 6		
✓ 19	ZV,Z	eP	19	13	14	5	0.9	8640	6.9°N., 77.5°W. h about 66 Km. Colombia-Panama border. Mag. 6-6 1/4 (Pas). USCGS.	
	ZV,Z	ePP		16	07					
	N	eS		23	00	14	1.9			
	E	e		23	14					
	N	eL _Q		33	1/2					
	E	M		40	-	26	14			
	N	M		40	-	24	7			
	Z	M		40	-	26	9			
	N	M		43	1/2	20	5			
	E	M		44	-	20	9			
			F	20	50	-				
20	ZNE	e	04	35	-			Small. 49.9°N., 88.4°E. USSR. USCGS.		
		F		50	-					
✓ 22	ZV,Z	eP	05	48	22	4	1.0	6800	Dilatation. 3.4°S., 29.1°E. h about 29 Km. Belgian Congo. USCGS.	
	N	eS		56	38	9	1.4			
	E	e		56	50					
	E	eL	06	03	-					
	Z	M		13	-	19	2 1/2			
	N	M		13	-	19	6 1/2			
	E	M		14	-	19	6			
			F	07	20	-				
✓ 22	E	eL	09	30	1/2	-			P and S lost during changing of charts. 3.3°S., 29.3°E. h about 28 Km. Belgian Congo. USCGS.	
	Z	M		40	1/2	-	19			10
	N	M		40	1/2	-	19			33
	E	M		41	1/2	-	19			24
			F	-	-	-				



KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

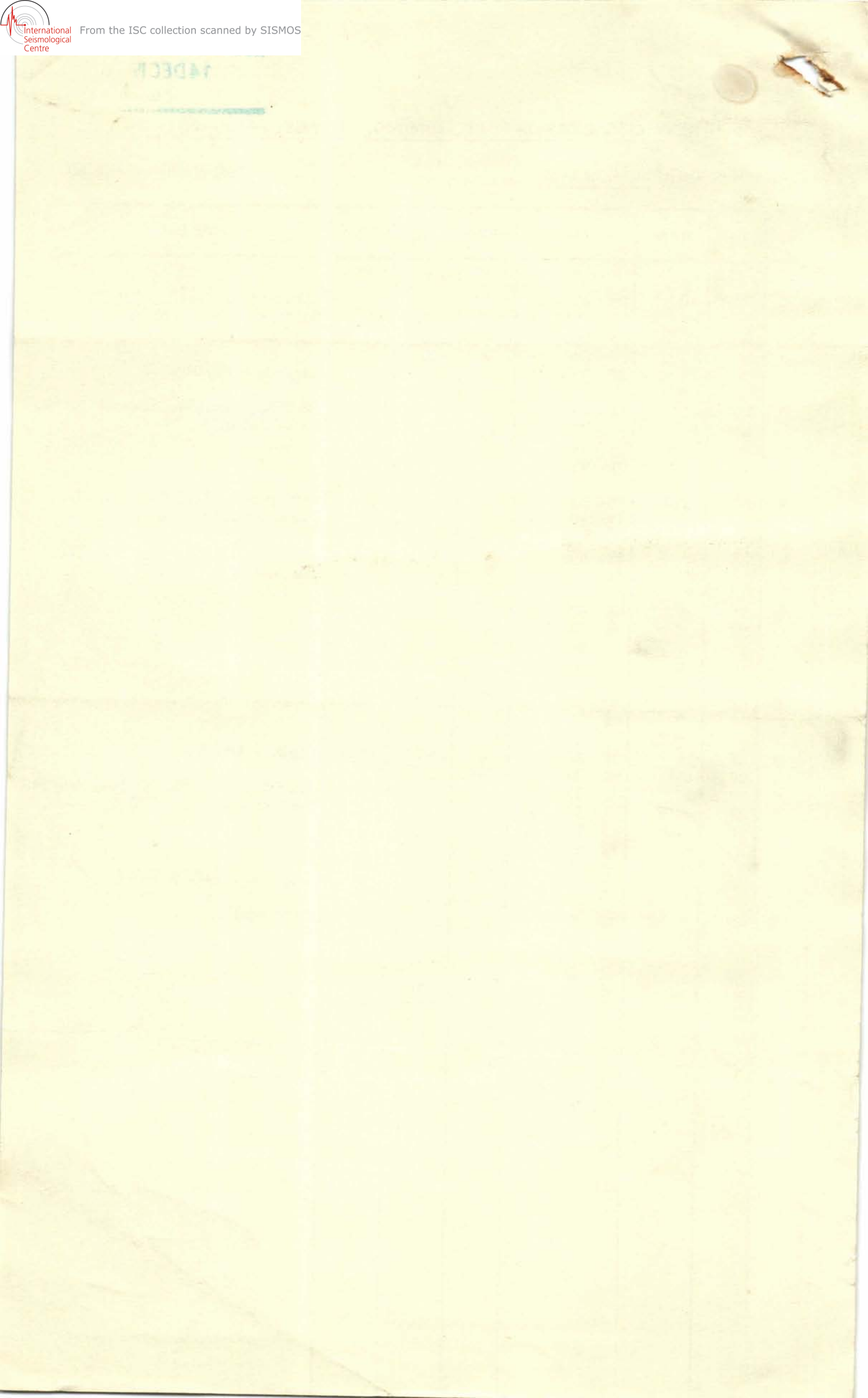
SEISMOLOGICAL BULLETIN

SEPTEMBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
22	ZV,Z	iP	09	25	05	8	3.3		Dilatation. 2.8°S., 29.8°E. Belgian Congo. USCGS.
	Z	M		49 $\frac{1}{2}$	-	20	22		
	N	M		49 $\frac{1}{2}$	-	20	35		
	E	M		51	-	20	30		
		F	12	30	-			Mag.: m = 6 $\frac{1}{2}$; M = 6 $\frac{1}{4}$	
23	NE	eL	24	20	-				22.2°S., 174.8°W. h about 39 Km. Tonga Islands USCGS.
	E	M		33	-	20	1		
	N	M		33	-	20	$\frac{1}{2}$		
		F	25	15	-				
25	ZV	iPKP	15	58	56				Very small. 17.3°S., 173.4°W. Tonga Islands. USCGS.
	N	F	17	40	-				
26	NE	e	15	55	-				Very small. 51.6°N., 172.2°W. Fox Islands. USCGS.
		F	16	15	-				
28	E	eL	05	59	-				
	E	M	06	08 $\frac{1}{2}$	-	20	1		
	N	M		08 $\frac{1}{2}$	-	20	$1\frac{1}{2}$		
		F		20	-				
28	NE	eL	20	52 $\frac{1}{2}$	-				Small.
		F	21	00	-				
29	ZV,Z	eP	11	32	09	6	0.7	11200	Depth = 460 Km. 18.9°N., 144.7°E. h about 469 Km. Mariana Islands. USCGS.
	ZV,Z	eFP		36	27	10	2.0		
	ZV,Z	i		36	32				
	ZV	epFP		37	57				
	NE	eSS		50	27				
	E	M	12	15 $\frac{1}{2}$	-	21	3 $\frac{1}{2}$		
	N	M		15 $\frac{1}{2}$	-	21	3 $\frac{1}{2}$		
		F	13	15	-				
							Mag.: m = 6.2; M = 5.9		
29	NE	e	19	30	-				Very small.
		F		55	-				
30	NE	e	06	45	-				
	E	M	07	15	-	19	3		
	N	M		15	-	20	$1\frac{1}{2}$		
	Z	M		15	-	19	$\frac{1}{2}$		
		F		55	-				
30	NE	e	08	25	-				Very small.
		F		55	-				



1950



AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR OCTOBER, 1960

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1 October 1960	21.3	21.4	+0.01	64.0
E.	1 August 1957	21.1	21.1	0.00	52.0
Z.	1 Sept. 1960	11.1	9.1	+0.01	156.0

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLITUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
1	ZV N	iP F	05	35	59				Compression. 35.4°N., 26.2°E. Near Crete. USCGS.
✓ 1	ZV,Z ZV N NE N N Z N E	iP e eS ePS eSS eL M M M F	16	22	48			8500	52.2°N., 172.6°W. h about 41 Km. Fox Islands. Aleutian Islands. USCGS.
						20	2		
						20	2½		
			17	00	-	20	2½		
			18	10	-				Mag.: m = 6; M = 5½-5¾
2	NE	e F	05	35	-				Small. 61.0°S., 23.3°W. Sandwich Islands. USCGS.
			06	10	-				
3	NE	e F	20	45	-				Small. 5.7°S., 103.0°E. Off coast of Sumatra. USCGS.
			21	15	-				
4	NE	e F	10	50	-				Very small. 7.5°S., 155.3°E. Solomon Islands. USCGS.
			11	30	-				
✓ 6	ZV NE E N Z	e(P) eL M M M F	16	29	24				52.2°N., 107.2°E. h about 46 Km. Lake Baikal region. USCGS.
				50	-	16	11½		
				58	-	16	2		
				58	-	16	1		
			17	10	-				Mag.: m = 5¾; M = 5-5¼

NO. 669
14 DEC 1960

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS			
			h.	m.	s.							
✓ 6	ZV,Z	iP	20	00	05	8	4.8	2260	Compression. PH 14sec. 8 μ 58.2°N., 31.6°W. h about 63 Km. North Atlantic Ocean. USCGS.			
	ZV	ePP		00	33							
	N	eS		03	45							
	E	e		03	51							
	NE	eL		04 ¹ / ₂	-							
	E	M		06	-					20	18	
	N	M		06	-					20	15	
Z	M		06	-	20	11						
	F		21	10	-			Mag.: m = 5.9; M = 5.4.				
7	ZV,ZNE	eP	03	19	57	8	1.9	2300	Compression. PH 14sec. 1.8 μ 58.1°N., 31.9°W. h about 71 Km. North Atlantic Ocean. USCGS.			
	N	eS		23	39							
	N	eL		24 ¹ / ₂	-							
	E	M		26	-					20	5	
	N	M		26	-					20	3 ¹ / ₂	
	Z	M		26	-					20	2 ¹ / ₂	
	F	F		55	-							Mag.: m = 5.4; M = 4.6
✓ 7	ZV,Z	iPKP	15	37	23	8	2.9	13100	7.4°S., 130.7°E. h about 45 Km. Banda Sea. USCGS.			
	ZV,Z	e		37	40							
	ZV,Z	ePP		38	41							
	NE	eSKS		44	17							
	NE	eSKKS		45	45							
	NE	ePS		48	35							
	NE	eSKKS		55	11							
	N	eLq	16	08	-							
	N	M		26	-					23	45	
	E	M		35	-					24	14	
	N	M		35	-					24	16	
	Z	M		35	-					24	9	
	F	F		18	20					-		Mag.: m = 6.8; M = 6.8
7	NE	e	20	50	-			Small. 20.4°S., 113.7°W. Easter Island region. USCGS.				
	F	F	22	25	-							
8	ZV,Z	e(P)	02	04	04	20	1	(9500)	16.7°N., 97.9°W. h about 74 Km, Oaxaca, Mexico. USCGS.			
	ZV,Z	i		04	15							
	NE	eS		14	29							
	E	M		40	-							
	N	M		40	-							
	F	F	03	10	-					20	1/2	
✓ 8	ZV,Z	iP	06	04	07	8	2.9	8720	Dilatation. Depth = 600 Km. PH 14 sec. 2.0 μ pPH 14 sec. 4.6 μ PPH 14 sec. 3.3 μ 40.0°N., 129.7°E. h about 608 Km. Sea of Japan. USCGS.			
	ZV,ZNE	epP		06	13					10	4.9	
	ZV,Z	iPP		07	15					10	3.4	
	ZV,Z	epPP		08	55							
	NE	iS		13	15					14	32(H)	
	E	iPS		13	55							
	E	esS		16	32							
	N	esPS		17	29							
	N	eSSS		22	09							
	F	F	08	30	-							Mag.: m = 6.3; M = 6.1

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OCTOBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
8	ZV,Z	eP	20	52	42			9600	7.9°N., 92.9°E. h about 84 Km. Nicobar Islands. USCGS.
	NE	eS	21	03	11				
	N	eL		15	-				
	N	M		32 $\frac{1}{2}$	-	21	4 $\frac{1}{2}$		
	E	M		36	-	20	3 $\frac{1}{2}$		
	Z	M		36	-	20	1		
		F	22	40	-				
9	ZV,Z	iP	09	12	51	5	1.8	9100	Dilatation. 40.8°N., 141.2°E. h about 155 Km. Near coast of Honshu, Japan. USCGS.
	ZV,Z	e(pP)		13	25				
	ZV,Z	eFP		16	17				
	N	iS		22	57				
	NE	e(SKS)		23	07				
	N	e		23	31				
	N	e(PFS)		24	45				
	NE	eSS		28	17				
	NE	eL		37	-				
	N	M		45	-	26	15		
	E	M		46	-	25	20		
	Z	M		50	-	16	2		
		F	10	35	-				
13	ZV,Z	eP	02	25	34				Very small. 45.2°N., 25.8°E. Romania. USCGS.
		F		40	-				
13	ZV,Z	iP	15	04	06	7	2.0	8100	Compression. PH 16 sec. 2.8 μ 54.8°N., 161.2°E. h about 35 Km. Kamchatka. USCGS.
	NE	eS		13	28	12	2.3(H)		
	N	ePPS		14	12				
	N	eSS		18	28				
	NE	eL		23	-				
	E	M		36	-	21	7 $\frac{1}{2}$		
	N	M		36	-	20	9 $\frac{1}{2}$		
	Z	M		36	-	20	3 $\frac{1}{2}$		
		F	17	45	-				
14	ZV,Z	eP	13	22	38				59.8°N., 136.4°W. Alaska. USCGS.
14	NE	eL	18	35	-				37.9°S., 74.7°W. h about 25 Km. Off coast of Chile. USCGS.
	N	M		53	-	20	1 $\frac{1}{2}$		
	E	M		54	-	20	1 $\frac{1}{2}$		
	F	19	30	-					
14	ZV,Z	iP	21	31	04	5	1	8400	Compression. Confused by microseisms. 51.7°N., 172.1°W. h about 50 Km. Fox Islands, Aleutian Islands. USCGS.
	Z	e		31	19				
	N	eS		40	41				
	E	ePPS		41	03				
	N	e		46	15				
	N	eL		56	-				
	Z	M	22	06 $\frac{1}{2}$	-	20	5		
	N	M		06 $\frac{1}{2}$	-	20	13		
	E	M		08 $\frac{1}{2}$	-	20	11		
		F	24	30	-				
14	ZV,Z	iP	23	00	24	6	3.4	2200	Confused by microseisms. 55.5°N., 35.2°W. h about 40 Km. North Atlantic Ocean. USCGS.
	E	eS		04	01				
	NE	e		04	21				
	E	eL		05 $\frac{1}{2}$	-				
	N	M		06 $\frac{1}{2}$	-	20	10		
	E	M		07 $\frac{1}{2}$	-	19	12		

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SEISMOLOGICAL BULLETIN

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
contd.						sec.	μ	km.	
14	Z	M F	23	07 $\frac{1}{2}$	-	16	7		Mag.: m = 5 $\frac{3}{4}$; M = 5-5 $\frac{1}{4}$
15	ZV,Z	e(P)	01	58	51			2200	Confused by microseisms.
	N	e(S)	02	02	29				55.6°N., 35.6°W. h about 37 Km.
	E	eL		04	-	20	3 $\frac{1}{2}$		North Atlantic Ocean. USCGS.
	N	M		05	-	18	4 $\frac{1}{2}$		
	E	M		06	-	16	3		Mag.: m = 5 $\frac{1}{2}$; M = 4 $\frac{3}{4}$
	Z	M F		06 $\frac{1}{2}$	-				Small.
				25	-				
15	NE	e F	06	45	-				
				55	-				
16	NE	e F	10	15	-				Very small. 9.4°N., 90.6°W.
				35	-				Off coast of Nicaragua. USCGS.
17	ZV,Z	iP	15	57	34			8900	4.8°N., 78.4°W. h about 83 Km.
	NE	eS	16	07	29				Off coast of Colombia. USCGS.
		F		45	-				
17	ZV,Z	e(P)	16	08	12				Near coast of Colombia. USCGS.
17	ZV	iP	19	09	17				Very small. 31.7°, 40.7°W.
	NE	M		21	-				Atlantic Ocean. USCGS.
		F		30	-				
17	NE	eL	22	47	-		1 $\frac{1}{2}$		14.6°N., 92.8°W. h about 128 Km.
	E	M	23	01	-	20	1		Mexico-Guatemala border. USCGS.
	N	M		01	-	18	1		
	Z	M		01	-	20	1		
		F		30	-				
18	NE	e F	01	05	-				Very small. 52.5°N., 170.2°W.
				20	-				USCGS. Fox Islands.
20	ZV,Z	e(PKP)	11	25	17		0.7		11.0°S., 164.9°E. h about 40 Km.
	Z	eFP		28	07	8	1 $\frac{1}{2}$		Santa Cruz Islands region. USCGS.
	E	M	12	31	-	20	1 $\frac{1}{2}$		
	N	M		31	-	20			Mag.: m = 6; M = 5 $\frac{1}{2}$
		F	13	30	-				
22	Z	e(FP)	08	44	10				10.3°S., 161.2°E. h about 93 Km.
	Z	e(pFP)		44	42				Solomon Islands region. USCGS.
	NE	e(SP)		54	26				
	NE	eL	09	18	-				
	E	M		40	-	24	3 $\frac{1}{2}$		
	N	M		40	-	24	7		
	Z	M		40	-	24	4		
		F	10	35	-				Mag.: m = 6 $\frac{1}{2}$; M = 6 $\frac{1}{4}$
22	NE	e	19	24	-				46.1°N., 21.0°E.
	N	M		26 $\frac{1}{2}$	-	18	1 $\frac{1}{2}$		Romania-Hungary border. BCIS
		F		33	-				

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SEISMOLOGICAL BULLETIN

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
23	N	eS	06	44	56			31.2°N., 40.7°W. h about 61 Km. Atlantic Ocean. USCGS.	
	NE	eL		48	-				
	E	M		51	-	18	1		
	N	M		51	-	18	1½		
		F	07	15	-				
24	NE	e	04	25	-				
	N	M		37	-	18	1		
		F		50	-				
24	N	e	18	10	-			6.0°S., 150.0°E. h about 122 Km. New Britain region. USCGS.	
	N	M		27	-	20	1		
		F		40	-				
26	N	e	23	05	-			Very small.	
		F		12	-				
27	ZV,Z	iP	15	43	57			2370 71.3°N., 8.6°W. h about 43 Km. Jan Mayen Island region. USCGS. Mag.: m = 5.3; M = 4.5	
	NE	eS		47	47	10	2.2(H)		
	NE	eL		48 ^{1/2}	-				
	E	M		50 ^{1/2}	-	16	1½		
	N	M		50 ^{1/2}	-	18	1½		
		F		16	15	-			
28	ZV,ZN	iP	04	23	18	9	5.0	2350 71.3°N., 8.6°W. h about 48 Km. Jan Mayen Island. USCGS. Mag.: m = 6.0; M = 5.6	
	ZNE	iS		27	06	10	21(H)		
	NE	eL		28 ^{1/2}	-				
	E	M		30	-	16	19		
	N	M		30	-	18	15		
	Z	M		30	-	16	9		
		F		05	50	-			
28	ZV,Z	iP	07	51	14			2350 71.3°N., 8.4°W. h about 61 Km. Jan Mayen Island. USCGS. Mag.: m = 5.2; M = 4.3	
	NE	eS		55	02	10	2.0(H)		
	E	M		58	-	16	1½		
	N	M		58	-	18	1½		
		F		08	35	-			
28	ZV,ZN	iP	13	29	50	5	5.4	8300 52.0°N., 157.4°E. h about 96 Km. Kamchatka. USCGS. Mag.: m = 6.6 ; M = 6.5	
	Z	i		30	26				
	ZV,Z	iPP		32	39	5	2.2		
	NE	eS		39	18	12	5.6(H)		
	NE	esS		39	50				
	NE	ePS		40	06				
	NE	eSPP		40	38				
	NE	eSS		44	00				
	E	esSS		44	58				
	E	eL		53	-				
		F		15	15	-			
	28	ZV,Z	e(P)	22	42	13			
N		eSKS		52	36				
NE		eS		52	52	9	3.1(H)		
E		eL	23	06	-				
E		M		23	-	20	8		
N		M		23½	-	22	9½		
Z		M		24	-	22	3		
		F		24	15	-			

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

OCTOBER, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD sec.	AMPLI- TUDE μ	Δ km.	REMARKS
			h.	m.	s.				
29	NE	eL F	00	14 $\frac{1}{2}$	-				Small. 44.0°N., 11.3°E. Italy. USCGS.
29	NE E N	eL M M F	01 02	56 03 $\frac{1}{2}$	-	18	1 $\frac{1}{2}$ 3 $\frac{1}{2}$		25.5°N., 67.6°E. h about 23 Km. West Pakistan. USCGS.
29	ZV NE NE E N Z	e(P) eS eL M M M F	04	26	04			(5900)	15.4°N., 46.4°W. h about 38 Km. North Atlantic Ocean. USCGS.
				33	30				
				39	-	18	1 $\frac{1}{2}$		
				44	-	18	1 $\frac{1}{2}$		
				44	-	18	1 $\frac{1}{2}$		
			05	05	-				Mag.: m = 5 $\frac{1}{2}$ -5 $\frac{3}{4}$; M = 5
29	NE N	e M F	10	45	-	22	1		15.8°S., 172.9°W. h about 99 Km. Samoa Islands region. USCGS.
			11	35	-				
29	ZV,Z EN E N Z	iP eL M M M F	13	30	25				Dilatation.
				34 $\frac{1}{2}$	-	20	2		
				36	-	18	2		
				36	-	18	2 $\frac{1}{2}$		
				55	-				
30	ZV,Z NE E N Z	eP eL M M M F	08	36	49				
				40 $\frac{1}{2}$	-	19	2		
				42 $\frac{1}{2}$	-	18	1 $\frac{1}{2}$		
				42 $\frac{1}{2}$	-	18	1 $\frac{1}{2}$		
			09	05	-				
30	Z Z E NE E Z E N	eP ePP eSKS eS eL M M M F	12	28	06	8	0.7	10600	Confused by microseisms.
				31	50				
				38	37				
				39	20	20	2.3(H)		
				55	-				
			13	08 $\frac{1}{2}$	-	20	3		
				08 $\frac{1}{2}$	-	20	6		
				09	-	20	5 $\frac{1}{2}$		
			14	50	-				Mag.: m = 6.2; M = 5.9
30	NE	e F	16	46	-				Very small. 1.0°S., 127.0°E. Spice Islands. USCGS.
			17	25	-				
30	NE NE	eSKS ePPS F	21	56	34				22.8°S., 68.0°W. h about 60 Km. Chile-Bolivia border. USCGS.
				59	06				
			22	45	-				

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

R.6.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

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SEISMOLOGICAL BULLETIN FOR NOVEMBER, 19 60

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (i) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1st October 1960	21.3	21.4	+0.01	64.0
E.	1st November 1960	20.7	20.7	-0.01	59.3
Z.	1st September 1960	11.1	9.1	+0.01	156.0

(ii) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD.	AMPLITUDE.	Δ	REMARKS.	
			h.	m.	s.					
1	NE Z N E	eL	06	44	-	18	2	km.	11.1°S., 12.7°W. h about 35 Km. Ascension Island region. USCGS.	
		M	53 $\frac{1}{2}$	-						
		M	53 $\frac{1}{2}$	-						
		M	54	-						
		F	07	35	-					
1	ZV,Z ZV,Z NE NE ZNE NE NE E N Z	ePP	09	04	58	8	1.6	12450	Confused by microseisms.	
		e(pPP)	05	29	-	18	3.8(H)		38.4°S., 74.4°W. h about 97 Km. Near coast of Chile. USCGS.	
		eSKS	11	10	-					
		eS	12	50	-					
		eSP	14	37	-					
		eLQ	31 $\frac{1}{2}$	-	-					
		eLR	36 $\frac{1}{2}$	-	-					
		M	49	-	21					36
		M	49	-	21					46
		M	49	-	21					41
F	11	55	-		Mag.: m = M = 6.7					
1	NE E N	e	13	25	-	21	2 $\frac{1}{2}$		Confused by strong microseisms. 38.5°S., 75.0°W. h about 64 Km. Near coast of Chile. USCGS.	
		M	32	-						
		M	32 $\frac{1}{2}$	-						
1	E N	M	14	15	-	16	2		Confused by strong microseisms. 40.9°N., 21.0°E. h about 33 Km. Greece-Yugoslavia border. USCGS.	
		M	24 $\frac{1}{2}$	-						
		F	30	-						
2	ZV,Z NE E N Z	i(PKP)	17	34	13	20	8		Confused by very strong microseisms. 10.9°S., 164.9°E. h about 25 Km. Santa Cruz Islands. USCGS.	
		eL	18	11	-					
		M	39 $\frac{1}{2}$	-						
		M	40	-						
		M	40	-						
Form 3717.	F	F	19	55	-	20	7		Mag.: m = 6 $\frac{1}{2}$; M = 6.	

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

NOVEMBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
✓ 5	ZV,Z	iP	20	25	16	6	6.9	2200	Compression. PH 6 sec. 6.8 μ 39.2°N., 20.5°E. h about 49 Km. Near coast of Greece. USCGS.
	NE	eS		28	51				
	NE	eL		31 ^{1/2}	-				
	E	M		32 ^{1/2}	-	16	16		
	N	M		32 ^{1/2}	-	16	46		
	Z	M		32 ^{1/2}	-	8	9		
		F	21	15	-				
✓ 6	ZV,Z	iP	04	49	56	6	2.0	8200	Compression. 53.0°N., 159.8°E. h about 32 Km. Near coast of Kamchatka. USCGS.
	N	e(S)		59	25				
	NE	eL	05	10	-				
	E	M		26 ^{1/2}	-	20	4 ^{1/2}		
	N	M		29 ^{1/2}	-	20	7		
	Z	M		29 ^{1/2}	-	18	3 ^{1/2}		
		F	06	20	-				
✓ 6	ZV	e(PKP ₂)	06	35	25			8500	31.0°S., 177.7°W. h about 184 Km. Kermadec Islands region. USCGS.
	NE	eL		23	-				
	E	M	07	45	-	20	2		
	N	M		46	-	20	4		
	Z	M		46	-	20	3		
	F	08	45	-					
✓ 6	ZV,Z	iP	22	21	51			8500	Compression. 52.7°N., 168.0°W. h about 42 Km. Fox Islands, Aleutian Islands. USCGS.
	NE	eS		31	31				
	NE	eL		43	-				
	E	M		57	-	20	2		
	N	M		57 ^{1/2}	-	20	3		
	Z	M		57 ^{1/2}	-	20	3		
		F	23	55	-				
7	NE	e	13	55	-				Very small. 32.2°N., 131.5°E. Kyushu, Japan. USCGS.
		F	14	50	-				
8	NE	e	00	55	-				Very small. 41.1°N., 105.5°E. China-Mongolia border. USCGS.
		F	01	05	-				
8	NE	e	04	45	-				Very small. 27.8°N., 44.3°W. North Atlantic Ocean. USCGS.
		F	05	05	-				
8	ZV	iP	05	34	23				Compression. 45.2°N., 149.8°E. Kurile Islands. USCGS.
8	ZV	iP	05	39	36				Compression. 45.2°N., 149.8°E. Kurile Islands. USCGS.
8	E	e	05	47	-			16	1/2
	E	M		48 ^{1/2}	-				
		F		55	-				
8	NE	eL	12	11	-				Small. 44.9°N., 125.2°W. Near coast of Oregon. USCGS.
		F		35	-				
✓ 9	Z	e(PP)	03	37	35			12800	60.7°S., 24.8°W. h about 37 Km. Sandwich Islands. USCGS.
	E	eS		45	24				
	NE	ePS		47	12				
	N	ePFS		48	18				
	NE	eSS		53	24				
	E	eSSS		57	22				

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

NOVEMBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
contd.						sec.	μ	km.	
✓ 9	NE	eLQ	04	06	-				
	E	M		19½	-	18	6½		
	N	M		22	-	18	7½		
	Z	M		22	-	18	6		
		F	05	50	-				Mag.: m = 6½; M = 6½
✓ 9	ZV	eP	10	55	15			8150	Confused by microseisms.
	N	eS	11	04	40				
	N	eSSS		13	06				32.7°N., 103.4°E. h about 47 Km.
	NE	eL		17½	-				Szechwan Province, China.
	E	M		24½	-	20	20		
	N	M		24½	-	20	32		
	Z	M		24½	-	20	8		
		F	12	30	-				Mag.: M = 6½
✓ 9	N	e	20	30	-				Confused by strong microseisms.
	N	eL		48	-				
	E	M	21	00½	-	20	2		23.2°S., 70.6°W. h about 52 Km.
	N	M		00½	-	20	6		Near coast of Chile. USCGS.
	Z	M		00½	-	20	6		
		F		50	-				Mag.: m = 6¼; M = 6
✓ 10	N	eL	15	35	-				Confused by very strong
	N	M		59	-	20	5½		microseisms. 2.6°S., 139.4°E.
		F	16	45	-				Near New Guinea. USCGS.
✓ 11	N	eL	05	41½	-				Confused by very strong
	N	M		43	-	18	11		microseisms. 39.5°N., 21.1°E.
		F		55	-				Greece-Albania region. USCGS.
13	N	e(SS)	07	11	37				Confused by strong microseisms.
	N	eL		22	-				
	N	M		41	-	21	4½		1.4°N., 127.2°E. h about 59 Km.
		F	08	25	-				Molucca Passage. USCGS.
✓ 13	ZV,ZN	iP	09	32	28	8	18.5	8600	Dilatation. PH 12 sec. 11.0 μ
	ZV,Z	i(PF)		32	46				
	Z	iFP		35	18	8	5.3		
	NE	iS		42	10	17	21(H)		51.1°N., 168.8°W. h about 65 Km.
	NE	iFS		42	52				Fox Islands, Aleutian Islands.
	N	eSS		47	04				Mag. 7(Pas). USCGS.
	NE	eL		53	-				
	Z	M	10	05½	-	24	26		
	N	M		05½	-	24	40		
	E	M		07½	-	24	30		
		F	12	40	-				Mag.: m = 7.0; M = 7.1
14	NE	eL	20	35	-				Confused by strong microseisms.
	E	M		48	-	20	3		14.5°N., 92.8°W. h about 100 Km.
	N	M		48	-	20	3		Near Chiapas, Mexico. USCGS.
		F	21	10	-				
✓ 15	NE	e	07	40	-				Confused by strong microseisms.
	E	M	08	02	-	20	1½		62.5°S., 161.7°W.
	N	M		02	-	20	3		Antarctic Ocean. USCGS.
		F		35	-				
17	ZV	iP	23	10	05				Small. Confused by microseisms.
	ZV	i		10	11				38.0°N., 89.5°E. h about 24 Km.
	N	eL		26	-				Sinkiang Province, China. USCGS.
	N	M		35	-				
	N	F		50	-				

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

NOVEMBER, 19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
18	N	e F	06	13 25	-				Very small. 35.0°N., 28.6°E. Near Crete. USCGS.
19	N E N	eL M M F	13	01 25 25 50	- - - -		1 1½		8.6°N., 137.6°E. Caroline Islands region. USCGS.
✓ 20	ZV,ZE NE N ZE NE N N E E N Z	iP e(SKS) iS eSP eSS eLQ M M M M M F	22	14 25 25 26 31 40½ 45 49 52 52 52	54 09 42 49 25 -	6 20 20 -	2.0 19(H) 45 50 36 22 28	10100	Confused by microseisms. 6.8°S., 80.7°W. h about 93 Km. Near coast of Peru. 2 killed and extensive property damage from seismic sea wave. Mag. 6¾(Pas). USCGS. Mag.: m = M = 6.7
22	N E N	eL M M F	03	15 30 30 40	- - - -		1 1½		7.0°S., 80.8°W. Near coast of Peru. USCGS.
22	E NE E N	eSS eL M M F	04	14.1 47 56½ 56½	- - - -		1½ 3		19.2°S., 173.1°W. h about 25 Km. Tonga Islands region. USCGS.
✓ 22	N NE N E N	ePS eSS eL M M F	06 07	48 53 04 18 19 45	19 49 -		2 3		35.9°S., 52.3°E. h about 21 km. Indian Ocean. USCGS. Mag.: m = 6; M = 5¾
✓ 22	Z NE N E N Z	e(P) e eL M M M F	12 13	48 07 12 31 31 31	27 49 -		5 5 5		Confused by microseisms.
✓ 23	ZV,Z ZV,Z ZV,Z NE N E Z	ePKP e ePP eSS M M M F	14	32 32 36 55 37 40 40 00	18 51 08 29 -	8 20 20 20	3.4 27 35 25	16800	Confused by microseisms. 24.2°S., 176.1°W. h about 28 Km. South of Tonga Islands region. USCGS. Mag.: m = M = 6¾
✓ 23	ZV,Z N	e(P) eL	18 19	16 07	32 -				

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

.....NOVEMBER,.....19 60

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
contd.									
✓ 23	E	M	19	24	-	20	2		
	N	M		24	-	20	1½		
		F	20	05	-				
✓ 24	NE	eL	05	45	-				Confused by strong microseisms.
	N	M	06	00	-	28	10		
	E	M		08	-	20	3		4.6°S., 153.0°E. New Britain region. USCGS.
	N	M		08	-	20	4		Mag.: m = 6¼; M = 6
		F		30	-				
✓ 24	ZV,Z	iPKP	07	12	34			16800	Confused by strong microseisms.
	ZV,Z	ePP		16	21				
	N	eSS		35	19				24.2°S., 176.1°W. h about 23 Km. South of Tonga Islands. region. USCGS.
	E	e		35	58				
	N	eL		54	-				
	E	M	08	21	-	20	75		
	N	M		21	-	20	66		
	Z	M		21	-	20	58		
		F	10	00	-				Mag.: m = 7; M = 7¼
27	NE	e	22	20	-				Very small.
		F		55	-				
28	E	eL	19	56.0	-				
	N	M		57	-	16	1½		
	E	M		57½	-	20	3		
		F	20	15	-				
✓ 29	NE	e	10	30	-				Confused by strong microseisms.
	N	M		43	-	20	2		
		F	11	00	-				

12 FEB 1961



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AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR DECEMBER, 1960

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: (I) GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE"

(LEIPZIG, 1914) OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

COMPONENT.	DATE FROM WHICH CONSTANTS APPLY.	GALVANOMETER FREE PERIOD T ₁ sec.	PENDULUM FREE PERIOD T. sec.	DAMPING CONSTANT μ ² .	$\frac{Ak}{\pi l}$ sec. ⁻¹
N.	1 October 1960	21.3	21.4	+0.01	64.0
E.	1 November 1960	20.7	20.7	-0.01	59.3
Z.	1 Sept. 1960	11.1	9.1	+0.01	156.0

(II) VERTICAL SEISMOGRAPH, PERIOD 1.5 SECS., DIRECT OPTICAL REGISTRATION (ZV.).

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

DATE.	COMPT.	PHASE.	G.M.T.			PERIOD. sec.	AMPLITUDE. μ	Δ km.	REMARKS.
			h.	m.	s.				
1	NE	e F	04	15	-				Confused by strong microseisms. 38.1°N., 30.6°E. Turkey. USCGS.
✓ 1	NE E N Z	eL M M M F	21	18	-	20	12 11 9		Confused by strong microseisms. 48.8°N., 129.3°W. h about 15 Km. Off coast of Vancouver Island. USCGS. Mag.: M = 6
1	NE E N Z	eL M M M F	22	17½	-	20	3½ 3 3		Confused by strong microseisms. 49.0°N., 129.3°W. h about 60 Km. Near Vancouver Island. USCGS. Mag.: M = 5½
✓ 2	ZV ZV,E NE NE ZNE NE NE E N Z	iP ePP e(SKKS) eS ePPS eSSS eL M M M F	09	24	13	26	26(H)	10800	Confused by microseisms. PH 24 sec. 4.3 μ FPH 28 sec. 8.8 μ 24.5°S., 69.9°W. h about 37 Km. Near coast of Chile. Mag. 7-7¼ (Berk). USCGS.
✓ 2	E N Z	M M M F	10	31½	-	20	30 28 15		Superimposed on previous shock. 24.3°S., 69.8°W. Near coast of Chile. USCGS. Mag.: M = 6¾

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

DECEMBER, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
3	ZV,Z	iP	04	35	00	8	7.4	7480	Compression. Confused by strong microseisms. PH 14 sec. 4.2 μ 42.8°N., 104.5°E. h about 45 Km. Outer Mongolia. USCGS.
	ZV,Z	iPPP		39	09				
	NE	eS		43	49	14	7.2(H)		
	NE	eSSS		51	01				
	NE	eL		55	-				
	E	M	05	06	-	17	93		
	N	M		06	-	16	115		
	Z	M		06½	-	14	68		
	F	06	35	-			Mag.: M = 6.7		
5	ZV	iP	18	01	13			54.8°N., 161.2°E. Near Kamchatka. USCGS.	
5	ZV	iP	18	18	59			54.3°N., 161.2°E. Near Kamchatka. USCGS.	
5	ZV,Z	iP	21	25	37			(1700)	Dilatation. 35.7°N., 65°W. h about 66 Km. Straits of Gibraltar. USCGS.
	ZV,Z	i		25	45				
	ZV,E	e(S)		28	29				
	NE	eL		29	-				
	E	M		32½	-	20	3		
	N	M		32½	-	20	3		
	F		47	-					
6	NE	e	04	04	-			Confused by microseisms. 42.9°N., 104.5°E. h about 55 Km. Outer Mongolia. USCGS.	
	E	M		17	-	16	1½		
	N	M		17	-	16	1½		
		F		35	-				
6	ZV,Z	iP	09	09	29			Compression. 21.4°S., 69.0°W. Chile. USCGS.	
6	NE	eL	09	30	-			8.5°N., 82.7°W. h about 116 Km. Near coast of Panama. USCGS.	
	E	M		48	-	20	9		
	N	M		48	-	20	8		
	Z	M		48	-	20	8		
	F	10	30	-			Mag.: M = 6		
8	ZV	iPKP	01	43	00			21.8°S., 179.4°W. Fiji Islands. USCGS.	
9	ZV	iP	21	29	38			72.0°N., 1.6°W. Jan Mayen region. USCGS.	
11	NE	eL	01	36	-			Confused by microseisms. 36.8°N., 84.5°E. h about 77 Km. Sinkiang Province, China. USCGS.	
	N	M		44	-	16	2½		
	E	M		45	-	16	1½		
		F	02	00	-				
11	NE	eL	19	52	-			Confused by microseisms. 15.7°S., 166.9°E. h about 133 Km. New Hebrides Islands region. USCGS.	
	E	M	20	16	-	20	1½		
	N	M		16	-	20	3		
	Z	M		16	-	20	3		
	F	21	20	-					

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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

DECEMBER, 1960

DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
✓ 13	ZV	ePKP	07	56	42			18900	Confused by strong microseisms. 52.1°S., 160.9°E. h about 29 Km. Macquarie Islands. Mag. 7¼ (Paw), 7 (Pal.) USCGS.
	ZV	iPKP ₂		58	04				
	ZV	eFP	08	01	52				
	N	eSS		22	40				
	E	e		27	50				
	E	e		38	58				
	N	eL _Q		46.1	-				
	E	M	09	21½	-	20	21		
	N	M		21½	-	20	29		
Z	M		21½	-	20	23	Mag: M = 7 overlapped by next shock.		
	F	-	-	-					
13	E	M	11	01½	-	19	3	27.7°N., 142.4°E. h about 133 Km. Bonin Islands region. USCGS.	
	N	M		01½	-	19	4½		
		F	11	40	-				
14	NE	e	02	05	-			Small. Confused by strong microseisms. Santa Cruz Islands, USCGS	
		F		45	-				
15	NE	e	00	17	50			Confused by strong microseisms. 2.9°N., 126.5°E. h about 77 Km. Molucca Passage. USCGS.	
	NE	eL		42½	-				
	E	M		54½	-	19	11		
	N	M		57½	-	20	9		
	Z	M		58	-	20	8		
		F	01	35	-			Mag.: M = 6½	
16	ZV,Z	eP	18	26	14			(2400)	Confused by microseisms. 43.8°N., 28.9°W. h about 21 Km. North Atlantic Ocean. USCGS.
	N	e(S)		30	07	16	5.4(H)		
	N	M		31½	-	14	3		
	E	M		32	-	14	2		
		F	18	55	-				
17	ZV	e(P)	13	19	01			North Atlantic Ocean.	
	N	e(S)		22	54				
	N	M		24½	-	16	2		
	E	M		25	-	14	1½		
		F		35	-				
17	ZV	iP	16	56	55			47.3°N., 153.6°E. Kurile Islands. USCGS.	
18	NE	e	02	04	-			Very small. 45.0°N., 15.0°E. Yugoslavia. BCIS.	
		F		08	-				
18	N	eL	19	03	-			8.5°N., 125.9°E. h about 36 Km. Mindanao, Philippine Islands. USCGS.	
	E	M		28	-	20	3		
	N	M		28½	-	19	1½		
	E	M		28½	-	19	1½		
		F		45	-				
21	ZV,Z	iP	14	50	28			61.6°N., 152.3°W. Alaska. USCGS.	
21	N	eL	23	44	-			62.5°S., 167.1°E. h about 29 Km. North of Balleny Islands. USCGS.	
	N	M	24	11	-	20	1½		
	N	M		11	-	20	1		
		F		35	-				

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

SEISMOLOGICAL BULLETIN

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DATE	COMPT.	PHASE	G.M.T.			PERIOD	AMPLITUDE	Δ	REMARKS
			h.	m.	s.				
22	ZV	eP	03	15	02				9.8°N., 94.2°E. h about 60 Km. Nicobar Islands. USCGS.
	N	eL		42	-				
	N	M		55	-	20	1		
	E	M		56	-	20	1/2		
		F	04	25	-				
22	NE	e	07	50	-				Small. 30.8°S., 177.1°W. Kermadec Islands. USCGS.
		F	08	35	-				
22	NE	eL	15	35	-				27.8°S., 176.1°W. Kermadec Islands region. USCGS.
		E		43	-	20	1 1/2		
		N		43	-	20	1 1/2		
			F	16	25	-			
22	ZV,Z NE	i (PP)	21	23	51				Compression. 6.8°S., 155.3°E. h about 469 Km. Solomon Islands. USCGS.
		e		40	31				
		F	22	35	-				
23	NE	e	11	40	-				Small. Confused by microseisms. Philippine Islands. USCGS.
		F	12	10	-				
27	NE	eL	11	07	-				Confused by very strong microseisms. 41.3°N., 124.9°W. Off coast of California. USCGS. Mag.: 5 3/4-6.
		E		16	-	20	4 1/2		
		N		17	-	20	5 1/2		
			F		35	-			
28	N	e	05	50	-				Small. Confused by very strong microseisms. Greece. USCGS.
		F	06	00	-				
21	NE	e	11	10	-				Confused by strong microseisms. 44.8°S., 75.6°W. h about 30 Km. Near coast of Chile. USCGS. Mag.: M = 6 1/4
		E		42	-	20	6 1/2		
		N		44	-	20	8		
		Z	M		44	-	20	7 1/2	
		F	12	35	-				
29	NE	e	18	28	-				Confused by strong microseisms.
		E		33 1/2	-	20	2		
		N		33 1/2	-	20	4		
			F		45	-			