Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR JANUARY 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		30.0	100		750 at 30 sec.
	E		30.0	100		
	Z		30.0	100		
BENIOFF WWSS	N'		1.0	0.75		12500 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1	Z'	eP	21	43	07.1	1.8			0.47	Δ = 20.7° = 2300 km.
	Z'	e		43	14.0					PZ 8 sec. 4.3 μ
	ZEN	eS		46	52	18	2.2	1.7		
	ZN	eLQ		48	-					21 38 29.2; 35.7°N., 4·4°E.
ESK	E	M		49½	-	22		5		h = 10km. Algeria.
	N	M		49½	-	22	7½			4 killed, 40 injured and
	Z	M		51½	-	12			13	major property damage.
	E	M		51½	-	11		11		USCGS.
	N	M		51½	-	13	14			
		F	22	45						Mag.: M = 4.8(ESK)
	ZV,Z	iP	21	42	19	4			2.0	C. Δ = 16.9° = 1880 km.
	EN	eS		45	26	8	4.1	2.5		
	EN	eLQ		46½	-					
KEW	Z	eLR		48	-					
	E	M		48½	-	11		19		
	N	M		49½	-	12	16			
	Z	M		49½	-	10			5	
		F	22	30	-					Mag.: M = 5 (KEW)

Met. O. 765

SEISMOLOGICAL BULLETIN

JANUARY 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
2	Z'	eP	13	57	56					Δ = 100° = 11100 km.
	Z'	ePP	14	02	05					
	ZEN	ePPS		11	46					
	EN	eSS		16	32					13 44 18.9; 19.1°N.,
ESK	E	eLQ		26	-					145.4°E. h = 142 km.
	ZEN	eLR		32	-					Mariana Islands. USCGS.
	Z	M		34	-	44			4	
	E	M		34	-	40		4		
	N	M		34½	-	40	4½			
	ZN	M		40	-	28	2		2½	
		F	15	05	-					
	EN	eL	14	32	-					
KEW	E	M		44½	-	20		2		
	N	M		45	-	20	2½			
		F	15	10	-					
3	Z'	iP	23	24	02.7	0.8			0.03	23 13 50.4; 60.2°N.,
ESK										151.2°W. h = 93 km.
										Alaska. USCGS.
4	Z'	iPKP	07	26	00.2	0.9			0.04	07 07 31.1; 19.1°S.,
ESK										177.5°W. h = 570 km.
										Fiji Islands. USCGS.
4	Z'	iP	20	58	11.4					20 48 54.9; 67.4°N.,
ESK										136.2°W. h = 33 km.
										Yukon, Canada. USCGS.
5	Z'	ePKP	18	25	31.0					Confused by very strong
	Z'	e		25	36.4					microseisms.
ESK	E	eSS		47	42					18 05 58.6; 20.3°S.,
	ZE	M	19	35½	-	18		3½	7	174.1°W. h = 33 km. Tonga
		F	20	00	-					Islands. USCGS.
KEW	ZV	ePKP	18	25	42					- " -
7	ZV	iP	10	27	33					10 22 17.5; 36.5°N.,
KEW										26.9°E. h = 45 km.
										Dodecanese Islands.USCGS.
10	Z'	eP	02	57	01.3					02 52 23.9; 45.8°N.,
ESK										26.6°E. h = 128 km.
										Rumania. USCGS.
KEW	ZV,Z	iP	02	56	37					D.
10	Z	ePKP	13	55	45					
	ZN	ePP		58	25	19	4.8		8.6	
	NE	ePKS		59	24					
	ZN	ePPS	14	10	40					
ESK	EN	eSS		17	14					13 36 30.7; 13.5°S.,
	ZEN	eSSS		22	05					166.6°E. h = 32 km.
	EN	eLQ		34	-					New Hebrides Islands.
	ZN	eLR		41½	-					USCGS.
	N	M		54½	-	23	20			
	E	M		55½	-	23		12		
	Z	M		56	-	22			24	
		F	16	20	-					Mag.: M = 6.7(ESK)
	N	ePKS	13	59	31					
KEW	EN	eSS		17	26					
	EN	eLR		44½	-					
	N	M		57	-	20	17			
	E	M		58	-	20		19		
		F	16	10	-					Mag.: M = 6¾(KEW)

Met. O. 765

SEISMOLOGICAL BULLETIN

JANUARY 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
11 ESK	Z'	eP	17	07	37.7					16 57 27.0; 61.1°N., 151.0°W. h = 59 km. Southern Alaska. USCGS.
11 ESK	Z'	iP	22	58	35.4	0.6			0.04	22 47 06.3; 48.8°N., 153.5°E. h = 102 km. Kurile Islands. USCGS.
KEW	ZV	iP	22	58	54					
12	Z;Z	iP	13	43	26.2	1.1			0.23	C. 13 32 24.0; 27.6°N., 88.0°E. h = 23 km.
	N	eLQ	14	01	-					
ESK	ZE	M		16½	-	18		3	5½	Nepal. USCGS.
	N	M		17½	-	16	5			
		F		30	-					Mag.: M = 5.9(ESK)
	ZV,Z	iP	13	43	22					C.
KEW	EN	M	14	15½	-	22	4½	6		
		F		25	-					Mag.: M = 5¾-6(KEW)
14 ESK	Z'	eP	01	22	19.3					01 10 42; 48.6°N., 154.3°E. h = 33 km. Kurile Islands. USCGS.
14	Z'	eP	08	38	05.6	1.3			0.13	08 25 17.5; 5.5°S.,81.3°W.
ESK	Z'	e		38	15.8					h = 32 km. Near coast of
	N	eS		48	48	16	5.0			Peru. USCGS.
										Mag.: M = 5¾-6(ESK)
KEW	ZV	eP	08	38	10					
	ZV	e		38	21					
15 ESK	N'E'	eP	06	08	35.8					05 59 58.5; 49.9°N.,79.0°E h = 0 km. Eastern Kasakh SSR. USCGS.
KEW	ZV	iP	06	08	41					
15	Z'	eP	23	52	04.0					23 47 27.8°; 35.7°N.,
ESK	ZEN	eL		57	-					4.3°E. h = 31 km.
	E	M		59½	-	16		3		Algeria. USCGS.
	NZ	M		59½	-	20	3½		5	
		F	24	10	-					Mag.: M = 4¾(ESK).
	ZV	eP	23	51	16					
KEW	EN	eL		55	-					
	E	M		56½	-	19		7		
	N	M		57	-	18	4½			
		F	24	05	-					Mag.: M = 4¾(KEW)
21	NE	eL	13	58	-					13 31 29.4; 34.6°N.,
ESK	NE	M	14	06	-	22	2	3½		86.9°E. h = 33 km. Tibet.
		F		20	-					USCGS. Mag.: M = 5½(ESK).
24	Z	eP	00	26	11	14	3.2	6.6	5.8	SH 18 sec. 40 u
KEW	ZV	ePKP		29	43					Δ = 114° = 12700 km.
	ZV,Z	ePP		30	47	13	31	70	42	
	Z	ePPP		33	28					00 11 12.1; 2.4°S.,
	E	eSKS		36	36					126.0°E. h = 6 km. Ceram
	EN	ePPS		41	41					Sea. USCGS .
	EN	eSS		46	47					
	N	eLQ		58½	-					
	E	eLR	01	04½	-					
	ZEN	M		18	-	22	165	305	40	
		F	04	40	-					Mag.: M = 7¾-8(KEW)
28 ESK	Z'	eP	23	15	28.9					23 10 44.2; 42.7°N., 23.2°E. h = 33km. Bulgaria. USCGS.
29 ESK	Z'	iPKP	03	46	56.2					03 28 18.0; 21.2°S., 178.9°W. h = 550 km. Fiji Islands. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

JANUARY 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
29 ESK	Z'	iP	09	46	32.9	1.0		0.09		C.09 35 25.7; 54.8°N., 161.7°E. h = 33km. Near Kamchatka. USCGS.
29 ESK	Z'	eP	20	15	27.2					20 06 02.4; 35.6°N., 73.6°E. h = 33km. Kashmir. USCGS.
KEW	ZV	eP	20	15	21					- " -
30 ESK	Z'	eP	04	48	45.2					04 37 15.1; 51.6°N., 179.8°W. h = 33 km. Andreanof Islands. USCGS.

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR FEBRUARY, 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(II) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		30.0	100		750 at 30 sec.
	E		30.0	100		
	Z		30.0	100		
BENIOFF WWSS	N'		1.0	0.75		12500 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1 ESK	Z*	iPKP	05	45	41.9	1.4			0.16	C. 05 27 04.5; 18.6°S., 178.1°W. h = 472 km. Fiji Islands. USCGS.
	Z'	i		45	43.9					
KEW	ZV	iPKP	05	45	54					C. - " -
	ZV	i		45	57					
2 ESK	Z'	eP	04	42	11.6					04 30 33.1; 17.2°N., 94.5°W. h = 140 km. Chiapas, Mexico. USCGS.
KEW	ZV	eP	04	42	27					- " -
2 ESK	Z'	ePKP	10	17	36.1					09 58 17.7; 21.4°S., 176.2°W. h = 171 km. Fiji Islands. USCGS.
2 ESK	Z'	eP	16	06	05.9					Δ = 53.0° = 5900 km.
	N	eS		13	32					
	EN	eSS		17	08					
	N	eLQ		19½	-					15 56 51.0; 37.5°N., 73.4°E. h = 33 km. Tadzhik SSR. USCGS.
	N	M		26½	-	22	28			
	E	M		27	-	20		7		
	Z	M		27½	-	16			9	
		F	17	15	-					Mag.: M = 6¼ (ESK).

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h. m. s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
4. ESK	Z'	iP	09 17 59.1					09 06 27; 51.2°N.177.4°E. h = 40km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	10 03 33.9					09 52 02.9; 51.5°N.175.9°E h = 30km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	11 30 14.7					11 18 42.9; 51.6°N.175.0°E h = 25km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	11 34 40.5					11 23 10.7; 52.1°N.172.9°E h = 15km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	11 59 55.7					11 48 23.9; 51.2°N.177.2°E h = 40km. Rat Islands aftershock. USCGS.
4. ESK	Z',Z	eP	12 17 28.4	10			8.6	Δ = 73.0° = 8100km.
	EN	iS	26 52	18	2.9	7.5		
	Z	M	44 -	24			23	12 06 04.3; 52.6°N.172.1°E h = 25km. Rat Islands aftershock. USCGS. Mag.: M = 6.5(ESK)
	N	M	45 -	23	16			
	E	M	46 -	21		10		
KEW	ZV	eP	12 17 50					- " -
4. ESK	Z'	eP	13 02 28.7					12 50 57.5; 51.6°N.174.8°E h = 25km. Rat Islands aftershock. USCGS.
KEW	ZV	eP	13 02 51					- " -
4. ESK	Z'	eP	13 04 36.2					12 53 07.7; 52.1°N.174.2°E h = 25km. Rat Islands aftershock. USCGS.
4. ESK	Z'	iP	13 24 14.8					13 12 39.2; 51.0°N.175.5°E h = 25km. Rat Islands aftershock. USCGS.
4. ESK	Z'	iP	13 41 25.4					13 29 54.6; 51.6°N.174.7°E h = 30km. Rat Islands aftershock. USCGS.
4. ESK	Z',Z	iP	14 29 50.1	11			5.5	Δ = 72.7° = 8080km.
	EN	iS	39 12	17	3.5	5.8		
	N	eSS	44 07					14 18 27.9; 53.0°N.171.0°E h = 30km. Rat Islands aftershock. USCGS.
	ZN	eLR	52½ -					
	Z	M	56½ -	24			16	
	N	M	57½ -	22	10			
	E	M	58½ -	22		5		Mag.: M = 6.3(ESK)
KEW	ZV	eP	14 30 12					- " -
4. ESK	Z'	eP	15 15 06.1					15 03 33.8; 51.4°N.175.7°E h = 30km. Rat Islands aftershock. USCGS.
4. ESK	Z',Z	eP	16 02 46.0	1.1			0.14	Δ = 72.4° = 8050 km.
	EN	eS	12 06	16	1.4	2.0		15 51 25.5; 53.1°N., 170.8°E. h = 40km. Rat Islands aftershock.USCGS. Mag.: M = 6(ESK)
	N	eSS	17 00					
	ZN	eL	25½ -					
KEW	ZV	eP	16 03 07					- " -
4. ESK	Z'	eP	16 44 05.0					16 32 36.0; 52.0°N.173.1°E h = 30km. Rat Islands aftershock. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
4.ESK	Z'	eP	06	53	25.0					Rat Islands aftershock.
4 ESK	Z'	iP	07	04	19.2					06 52 51.7; 52.2°N., 173.1°E. h = 33 km. Rat Islands aftershock. USCGS.
4.ESK	Z'	eP	07	22	56.2					07 11 22.7; 51.1°N., 177.7°E. h = 35 km. Rat Islands aftershock. USCGS.
4.ESK	Z'	iP	07	26	28.7	1			0.12	07 14 58.7; 52.0°N., 173.9°E. h = 25 km. Rat Islands aftershock. USCGS.
KEW	ZV	iP	07	26	50					- " -
4.ESK	Z'	eP	07	27	35.0					Rat Islands aftershock.
4.ESK	Z'	eP	07	34	43.0					07 23 12.3; 51.9°N., 173.2°E. h = 25 km. Rat Islands aftershock. USCGS.
	Z'	i		34	49.1					
KEW	ZV	iP	07	35	10					- " -
4.ESK	Z'	eP	07	55	07.0					07 43 43.2; 52.7°N., 172.9°E. h = 33 km. Rat Islands aftershock. USCGS.
4.ESK	Z'	eP	08	15	37.2					08 04 09.4; 52.1°N., 172.8°E. h = 30km. Rat Islands aftershock. USCGS.
4.ESK	Z'	iP	08	17	44.7					08 06 16.6; 51.9°N. 174.3°E h = 40km. Rat Islands aftershock. USCGS.
4.ESK	Z'	eP	08	22	44.2					Rat Islands aftershock.
4.ESK	Z'	eP	08	45	09.5					08 33 40.9; 51.9°N. 174.0°E h = 30 km. Rat Islands aftershock. USCGS.
KEW	ZV	eP	08	45	31					- " -
4.ESK	Z'	eP	08	48	43.8					08 37 14.5; 51.7°N. 174.6°E h = 35 km. Rat Islands aftershock. USCGS.
4.ESK	Z'	eP	08	50	56.0					08 39 22.6; 51.2°N. 179.3°E h = 25km. Rat Islands aftershock. USCGS.
4.ESK	Z'	eP	08	52	12.5					Δ = 74.7 = 8300km.
	Z'	i		52	13.5					08 40 40.9; 51.3°N. 179.5°E
	Z'N'	i		52	17.2	1			0.8	h = 40km. Rat Islands aftershock. USCGS.
	EN	eS	09	01	45					
KEW	ZV	eP	08	52	35					- " -
	ZV	i		52	39					
4.ESK	Z'	eP	09	10	44.6					08 59 17.9; 52.4°N. 173.7°E h = 25km. Rat Islands aftershock. USCGS.
4.ESK	Z'	iP	09	12	00					09 00 31.5; 51.9°N. 174.3°E h = 35 km. Rat Islands aftershock. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
2. KEW	ZV	eP	16	06	02					
4. ESK	N	eSS	04	09	10					03 25 00.8; 51.8°S.139.7°E.
	N	eLQ		32	-	20				h = 33km. South of
	E	M		59	-	20		2		Australia. USCGS.
	Z	M	05	00½	-	20			4½	
	N	M		01	-	20	3½			Mag.: M = 6 (ESK)
4. ESK	Z'	eP	05	05	30					04 53 57.7; 51.1°N.,
										178.4°E. h = 40 km.
										Rat Islands foreshock.
										USCGS.
4. ESK	Z,Z'	eP	05	12	52.0					C. △ = 73½° = 8150 km.
	Z'	e		12	56.3					Multiple shock.
	Z,Z',	i		13	00.3					05 01 21.8; 51.3°N.,
	Z'	e		13	04.1					178.6°E. h = 40 km.
	Z',N'	i		13	20.1					Rat Islands. USCGS.
	Z'	i		13	31.0	10			106	
	E	iS		22	36					Mag.: M = 8¼(ESK).
	Trace very confused!									
4. KEW	ZV	eP	05	13	18					
	ZV	i		13	26					— " —
	ZV	i		13	36					
	ZV	i		13	49					
4. ESK	Z'	eP	05	36	25.5					Rat Islands aftershock.
4. ESK	Z'	eP	05	38	07.0					- " -
KEW	ZV	iP	05	38	29					- " -
4. ESK	Z'	eP	05	47	09.9					- " -
4. ESK	Z'	eP	05	48	40.1					- " -
4. ESK	Z'	eP	06	00	21.8					- " -
KEW	ZV	eP	06	00	45					- " -
4. ESK	Z'	eP	06	02	29.9					- " -
4. ESK	Z'	iP	06	07	17.0					- " -
4. ESK	Z'	iP	06	08	32.4					- " -
4. ESK	Z'	eP	06	16	26.5					06 04 58; 51.7°N.,
										174.9°E. h = 35 km.
										Rat Islands aftershock.
										USCGS.
KEW	ZV	eP	06	16	49					- " -
4. ESK	Z'	eP	06	18	36.2					Rat Islands aftershock.
4. ESK	Z'	eP	06	21	45.0					- " -
4. ESK	Z'	eP	06	33	29.3					- " -
4. ESK	Z'	eP	06	36	45.0					- " -
4. ESK	Z'	eP	06	48	29.3					06 37 05.4; 52.6°N.,
										172.0°E. h = 35 km.
										Rat Islands aftershock.
										USCGS.
4. ESK	Z'	iP	06	51	01.0					06 39 30.1; 51.7°N.,
										175.8°E. h = 30 km.
										Rat Islands aftershock.
KEW	ZV	eP	06	51	24					USCGS.
										- " -

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
4. ESK	Z'	eP	17	15	07.0					17 03 43.8; 52.8°N.171.8°E h = 30km. Rat Islands aftershock. USCGS.
4. ESK	Z'	iP	17	16	10.0					17 04 35.4; 51.3°N.176.9°E h = 20km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	18	45	41.2					18 34 07.3; 51.2°N.176.7°E h = 35km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	18	51	19.0					18 39 47.2; 51.5°N.174.8°E h = 33km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	18	59	38.7					18 48 11.0; 52.0°N.174.9°E h = 40km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	19	09	39.0					18 58 12.6; 52.1°N.173.0°E h = 42km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	19	12	59.6					19 01 36.2; 52.7°N.170.8°E h = 35km. Rat Islands aftershock. USCGS.
4. ESK	Z	eP	19	53	21					Δ = 53.8° = 6000 km.
	EN	eS	20	00	52	22	4.5	2.7		
	EN	eLQ		06	-					19 44 05.6; 13.3°N., 44.8°W. h = 33km. North Atlantic Ridge. USCGS.
	Z	eLR		07	-					
	EN	M		07	-	28	6	4		
	Z	M		08	-	28			9	
		F	21	10	-					Mag.: M = 5.6
	KEW	ZV	eP	19	53	15				- " -
4. ESK	Z'	eP	20	06	09.3					19 54 37.1; 51.6°N.175.3°E h = 25km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	20	09	21.0					19 57 49.1; 51.6°N.174.7°E h = 25km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	20	43	55.0					20 32 25.1; 51.6°N.176.6°E h = 40km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	20	58	53.0					20 47 12.1; 51.5°N.175.4°E h = 30km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	21	41	09.0					21 29 38.9; 52.4°N.174.7°E h = 15km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	22	25	33.0					22 14 04.0; 51.8°N.173.9°E h = 33km. Rat Islands aftershock. USCGS.
4. ESK	Z'	iP	22	41	35.1					22 30 05.1; 51.8°N.174.2°E h = 31km. Rat Islands aftershock. USCGS.
4. ESK	Z'	eP	23	37	55.5					23 26 22.5; 51.3°N.177.5°E h = 30km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	00	43	02.7					00 31 35.5; 52.0°N.176.6°E h = 40km. Rat Islands aftershock. USCGS.
	Z'	e		43	25.7					
	Z'	e		43	36.5					

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
5. ESK	Z'	eP	00	53	48.6					00 42 22.2; 52.2°N.172.4°E h = 35km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	02	18	06.0					02 06 33.3; 51.8°N.173.8°E h = 15km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	02	45	08.7					02 33 39.5; 52.0°N.173.1°E h = 30km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	03	10	00.0					02 58 28.5; 51.5°N.174.9°E h = 36km. Rat Islands aftershock. USCGS.
	Z'	i		10	10.4					
5. ESK	Z'	eP	05	16	43.0					05 05 17.1; 52.2°N.173.1°E h = 40km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	06	51	19.7	1.1			0.14	06 39 49.6; 51.8°N.175.1°E h = 25km. Rat Islands aftershock. USCGS.
	Z'	e		51	29.6					
KEW	ZV	eP	06	51	42					- " -
	ZV	e		51	52					
5. ESK	Z'	eP	07	19	29.5					07 07 59.7; 51.6°N.175.9°E h = 40km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	07	30	43.8					07 19 15.0; 51.7°N.174.7°E h = 40km. Rat Islands aftershock. USCGS.
5. ESK	Z'	iP	09	02	49.9					08 51 23.0; 52.2°N.175.1°E h = 35km. Rat Islands aftershock. USCGS.
5. ESK	Z',Z	iP	09	43	34.2	1			0.26	C. Δ = 72.7° = 8080km. PZ 12 sec. 2.9 μ
	E	eS		52	56					09 32 09.3; 52.3°N.174.3°E h = 41km. Rat Islands aftershock. USCGS. Mag.: M = 6.0(ESK).
	N	ePPS		53	49					
	ZN	eSS		57	36					
	ZEN	M		18½	-	18	6	3	8	
		F	11	30	-					
KEW	ZV	iP	09	43	56					C. - " -
5. ESK	Z'	eP	11	01	52.3					10 50 27.2; 52.3°N.172.4°E h = 40km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	13	50	14.9					13 38 46.7; 52.0°N.174.0°E h = 35km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	14	03	15.9					13 51 48.6; 52.1°N.173.3°E h = 35km. Rat Islands aftershock. USCGS.
5. ESK	Z'	iP	14	19	53.0					14 08 22.7; 51.6°N.174.4°E h = 35km. Rat Islands aftershock. USCGS.
5. ESK	Z'	eP	18	35	34.8					18 24 02.8; 51.6°N.174.0°E h = 34km. Rat Islands aftershock. USCGS.

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
5. ESK	Z',Z	eP	20	58	41.8					Δ = 73.9° = 8200km.
	EN	eS	21	08	10					
	N	ePPS		08	53					20 47 13.3; 51.9°N.174.6°E
	N	eSS		13	13					h = 35km. Rat Islands
	E	eLQ		18	-					aftershock. USCGS.
	EN	eLR		22	-					
	Z	M		27	-	22			2	
	N	M		27	-	20	2			
	E	M		28	-	20		1½		
		F	23	20	-					Mag.: M = 5¼(ESK).
5. ESK	Z'	eP	21	55	33.1					21 43 59.7; 51.3°N.176.7°E
										h = 25km. Rat Islands
										aftershock. USCGS.
5. ESK	Z'	eP	22	00	00.4					21 48 25.8; 51.1°N.178.3°E
										h = 25km. Rat Islands
										aftershock. USCGS.
5. ESK	Z'	eP	22	27	32.1					22 15 59.5; 51.5°N.176.7°E
										h = 25km. Rat Islands
										aftershock. USCGS.
6. ESK	Z,'Z	iP	01	51	46.2	10			18	D. Δ = 71.5° = 7950km.
	EN	iS	02	01	01	15	13.7	7.2		PH 10 sec. 6.8 μ
	N	eScS		01	46					
	E	eLQ		10	-					01 40 33.2; 53.2°N.161.9°W
	ZE	eLR		13½	-					h = 33km. South of
	ZEN	M		19	-	24	14	7	17	Alaska. USCGS.
	Z'	eP'P'		19	37					Mag.: M = 6¾-7(ESK).
	KEW	ZV	01	52	11					- " -
6. ESK	Z'	eP	03	53	53.4					03 47 54.1; 35.1°N.26.9°E.
										h = 50km. Crete. USCGS.
	KEW	ZV	eP	03	53	24				- " -
6. ESK	Z,'Z	iP	04	14	20.2	16			3.8	C. Δ = 71.3° = 7920km.
	EN	eS		23	34	18	1.7	2.7		
	N	eScS		24	36					04 02 53; 52.1°N.175.7°E.
	EN	eSS		28	46					h = 35km. Rat Islands
	ZN	M		43	-	21	4½		5	aftershock. USCGS.
	E	M		43	-	22		3½		
		F	06	00	-					Mag.: M = 5.9(ESK).
	KEW	ZV	iP	04	14	41				- " -
6. ESK	Z'	eP	05	02	25.1					04 50 51.8; 51.1°N.177.4°E
										h = 35km. Rat Islands
										aftershock. USCGS.
6. ESK	Z'	eP	06	35	07.1					06 23 39.0; 52.0°N.173.2°E
	Z'	e		35	18.1					h = 30km. Rat Islands
										aftershock. USCGS.
6. ESK	Z'	eP	07	26	12.9					07 14 45.1; 52.1°N.173.0°E
	Z'	e		26	20.4					h = 35km. Rat Islands
										aftershock. USCGS.
6. ESK	Z'	eP	08	58	20.4					08 46 51.2; 51.9°N.174.0°E
										h = 30km. Rat Islands
										aftershock. USCGS.
6. ESK	Z'	eP	09	06	07.2					08 54 38.9; 52.1°N.175.4°E
										h = 30km. Rat Islands
										aftershock. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
6. ESK	Z'	iP	12	33	55.6					12 22 26.2; 51.8°N.175.3°E. h = 35km. Rat Islands aftershock. USCGS.
6. ESK	Z,'Z	eP	17	01	40.1	10			9.6	D. Δ = 70.9° = 7880km.
	Z'	i		01	42.6					PH 10sec. 3.6 μ
	Z'	i		01	55.1					
	EN	eS		10	52	18	14	6		16 50 29; 53.3°N.161.8°W.
	N	eScS		11	40					h = 33km. South of Alaska.
	E	eLQ		20	-					USCGS.
	ZN	eLR		24	-					
	Z'	eP'P'		29	35					
	E	M		31	-	24		5		
	NZ	M		32½	-	20	11		21	
		F	20	25	-					Mag.: M = 6¾(ESK).
KEW	ZV	eP	17	02	06					D. - " -
6. ESK	Z'	eP	18	54	03.3					18 42 29.2; 51.3°N.176.2°E h = 25km. Rat Islands aftershock. USCGS.
6. ESK	Z'	eP	19	59	45.3					19 48 12; 51.4°N.177.0°E. h = 20km. Rat Islands aftershock. USCGS.
6. ESK	Z'	iP	21	14	24.9					21 02 59.6; 52.8°N.172.0°E h = 20km. Rat Islands aftershock. USCGS.
6. ESK	Z'	eP	23	35	12.1					23 23 40.4; 51.5°N.176.5°E h = 33km. Rat Islands aftershock. USCGS.
7. ESK	Z	eP	01	11	39.3					01 00 12.5; 52.2°N.172.1°E h = 30km. Rat Islands aftershock. USCGS.
7. ESK	Z',Z	eP	02	28	39	9			2.4	D. Δ = 74.8° = 8300km.
	EN	eS		38	12					
	EN	eSS		43	09					02 17 09.2; 51.4°N.173.4°E
	E	eLQ		48	-					h = 40km. Rat Islands
	ZN	eLR		52	-					aftershock. USCGS.
	ZN	M		56½	-	23	2		2½	
	E	M		57½	-	23		1		
		F	04	00	-					Mag.: M = 5½-5¾(ESK).
KEW	ZV	eP	02	29	01					- " -
7. ESK	Z	iP	04	22	49					Δ = 73.7° = 8200km.
	EN	eS		32	16					04 11 19.3; 51.9°N., 175.3°E.h = 25km. Rat Islands aftershock.USCGS.
KEW	ZV	iP	04	23	11					- " -
7. ESK	Z	eP	09	37	22	16			1.1	Δ = 74.0° = 8220km.
	E	eS		46	51	20		1.4		
	EN	eSS		51	50					09 25 51.1; 51.4°N.179.1°E
	E	eLQ		57	-					h = 30km. Rat Islands
	ZN	M	10	09	-	20	2½		3½	aftershock. USCGS.
	E	M		09	-	21		1½		
		F	11	15	-					Mag.: M = 5.1(ESK).
KEW	ZV	eP	09	37	45					- " -

Met. O. _____

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
7. ESK	Z'	eP	11	34	40.9					11 23 14.8; 52.2°N.172.4°E h = 35km. Rat Islands aftershock. USCGS.
7. ESK	Z'	eP	11	41	56.6					11 30 40.8; 53.3°N.161.9°W h = 10km. South of Alaska. USCGS.
7. ESK	Z'	eP	11	57	26.0					11 45 52.8; 51.2°N.177.3°E h = 33km. Rat Islands aftershock. USCGS.
7. ESK	Z'	iP	12	32	44.1					12 21 21.1; 53.0°N.171.7°E h = 25km. Rat Islands aftershock. USCGS.
7. ESK	Z'	eP	13	32	20.3					13 20 46.3; 51.1°N.175.8°E h = 40km. Rat Islands aftershock. USCGS.
7. ESK	Z'	eP	14	58	42.0					14 47 11.6; 51.7°N.174.6°E h = 33km. Near Islands, Aleutian. USCGS.
7. ESK	Z'	iP	16	15	23.4					16 03 52.3; 51.3°N.179.0°E h = 40km. Rat Islands aftershock. USCGS.
7. ESK	Z'	eP	17	24	35.4					17 13 08.2; 52.2°N.173.1°E h = 35km. Rat Islands aftershock. USCGS.
7. ESK	Z'	eP	19	40	33.6					19 29 23.9; 55.2°N.165.2°E h = 20km. Komandorsky Islands. USCGS.
8. ESK	Z'	eP	07	34	38.7					07 23 08.8; 51.8°N.174.6°E h = 33km. Rat Islands aftershock. USCGS.
8. ESK	Z'	eP	15	52	46.4					15 41 19.7; 52.5°N.172.0°E h = 25km. Rat Islands aftershock. USCGS.
8. ESK	Z'	eP	15	57	55.9	8			2.5	Δ = 70.0° = 7780km.
	Z'	ipP		58	07.5					
	N	eS	16	07	03	10	2.7	0.9		15 46 49.9; 55.1°N.165.7°E h = 40km. Komandorsky Islands. USCGS.
	E	eLQ		15	-					
	ZN	eLR		22	-					
	EN	M		37	-	17	3	1½		
	Z	M		38	-	17			3½	
		F	17	20	-					Mag.: M = 6.0(ESK).
KEW	ZV	eP	15	58	18					- " -
	ZV	epP		58	28					
8. ESK	Z'	iP	17	48	32.4					17 37 24.6; 55.2°N.165.3°E h = 30km. Komandorsky Islands. USCGS.
	Z'	e		49	11.6					
9. ESK	Z'	iPKP	17	13	08.0					16 53 28.8; 22.2°S.170.6°E Loyalty Islands. USCGS. h = 29km.
9. ESK	Z'	iP	17	48	38.4	0.9			0.13	17 37 15.9; 52.8°N.171.9°E h = 41km. Rat Islands aftershock. USCGS.
KEW	ZV	eP	17	48	59					- " -
9. ESK	Z'	eP	18	29	53.9					18 18 21.2; 51.8°N.173.9°E h = 10km. Rat Islands aftershock. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
9. ESK	Z'	eP	20	43	53.2					20 38 45.3; 37.7°N.20.3°E.
	EN	M		52½	-	22	2	1½		h = 51km. Ionian Sea.
		F	21	05	-					USCGS.Mag.-4½-4¾(ESK).
9. ESK	Z'	eP	23	22	53.8					23 11 26.7;52.2°N.173.3°E. h = 33km. Rat Islands aftershock. USCGS.
9. ESK	Z'	eP	23	38	05.6					23 32 58.9; 38.0°N.20.3°E. h = 44km. Ionian Sea.USCGS.
10. ESK	Z'	eP	00	49	32.4					00 38 06.1;52.4°N.173.5°E. h = 35km. Rat Islands aftershock. USCGS.
10. ESK	Z'	eP	00	51	50.0					00 40 20.0;51.9°N.172.8°E. h = 25km. Rat Islands aftershock. USCGS.
10. ESK	Z'	eP	02	20	00.1					02 08 32.9;52.2°N.172.9°E. h = 33km. Rat Islands aftershock. USCGS.
10.ESK	Z'	eP	08	23	30.8					08 12 00.1; 51.4°N.175.2°E h = 35km. Rat Islands aftershock. USCGS.
10. ESK	Z'	eP	16	17	07.0					16 09 54.1; 37.6°N.47.1°E.
	Z'			17	09.1					h = 52km. Iran. USCGS.
11. ESK	Z'	ePKP	02	52	49.1					02 33 29.3; 21.8°S.176.4°W h = 174km. Fiji Islands. USCGS.
KEW	ZV	ePKP	02	52	55					- " -
11. ESK	Z'	eP	04	51	48.1					Δ = 57.3° = 6370km.
	N	eS		59	40					04 42 00.7; 1.3°S. 14.4°W. h = 33km. Ascension Island. USCGS.
11. ESK	Z'	iP	06	57	47.3					06 46 23.3; 52.9°N.171.6°E h = 25km. Rat Islands aftershock. USCGS.
11. ESK	Z'	eP	13	16	28.8					13 04 54.8; 51.0°N.175.9°E h = 35km. Rat Islands aftershock. USCGS.
11. ESK	Z'	iP	16	22	33.4					16 10 30.4; 1.4°S. 77.8°W. h = 190km. Ecuador.USCGS.
12. ESK	Z'	eP	00	54	48.1					Δ = 74.6° = 8290km.
	EN	eS	01	04	20					00 43 17.1;51.5°N.175.8°E. h = 33km. Rat Islands aftershock. USCGS.
KEW	ZV	eP	00	55	05					- " -
12. ESK	Z,'Z	eP	01	06	34.6	14			2.3	Δ = 74.5° = 8280km.
	Z'	i		06	40.1					
	EN	eS		16	06	21	2.4	1.6		00 55 06.2;52.2°N.172.8°E.
	N	eScS		16	45					h = 25km. Rat Islands
	ZN	eSS		20	56					aftershock. USCGS.
	E	eLQ		26½	-					
	E	M		36	-	20		2		
	Z	M		37	-	19			3½	
	N	M		38	-	18	3			
		F	03	05	-					Mag.: M = 5.7(ESK).
KEW	ZV	eP	01	06	56					- " -

Met. 9. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
12. ESK	Z'	iP	01	14	50.6					01 03 18.0; 51.3°N.176.2°E h = 35km. Rat Islands aftershock. USCGS.
12. ESK	Z'	eP	01	47	22.1					01 35 53.6; 52.1°N.172.8°E h = 33km. Rat Islands aftershock. USCGS.
14. ESK	Z'	eP	17	59	55.5					17 55 42.4; 72.8°N. 5.4°E. h = 19km. Norwegian Sea. USCGS.
14. ESK	Z'	eP	19	41	28.8					19 37 17.8; 73.0°N. 6.5°E. h = 33km. Greenland Sea. USCGS.
14. ESK	Z'	eP	21	28	59.1					21 17 34.4; 52.4°N.173.9°E h = 39km. Rat Islands aftershock. USCGS.
15. ESK	Z'	eP	01	36	40.1					△ = 76.5° = 8500km.
	Z'	e		36	49.7					01 25 08.8; 51.4°N.
	N	eS		46	22					179.4°E. h = 42km. Rat
	N	eSS		51	19					Islands aftershock. USCGS.
	EN	M	02	14	-	20	2	2		
		F		50	-					Mag.: M = 5¼-5½(ESK).
15. ESK	Z'	eP	05	12	54.4					05 01 27.2; 52.2°N.172.7°E h = 33km. Rat Islands aftershock. USCGS.
15. ESK	Z'	eP	06	16	25.3					06 04 57.5; 52.3°N.172.6°E h = 26km. Rat Islands aftershock. USCGS.
15. ESK	Z'	eP	06	53	43.6					06 42 11.2; 51.4°N. 179.5°E. h = 28km. Rat Islands.aftershock.USCGS.
15. ESK	ZEN	eS	10	00	02	34	8.2	1.5		09 42 22; 0.4°N. 19.2°W.
	ZEN	M		14	-	20	2½	2	3	h = 33km. Mid-Atlantic
		F		40	-					Ridge. USCGS.
										Mag.: M = 5.4(ESK).
15. ESK	EN	eL	11	30	-					10 43 19.8; 3.0°N. 125.9°E
	ZE	M		49	-	26		2	5½	h = 33km. Taland Islands.
	N	M		49	-	28	3			USCGS.
		F	12	10	-					Mag.: M = 5¾-6(ESK).
15. ESK	Z'	eP	12	43	21.8					12 34 54.8; 53.6°N.81.3°E. h = 11km. Central Russia. USCGS.
16. ESK	Z'	eP	12	36	21.9					12 24 08.8; 39.5°N.
	EN	eL		58	-					141.8°E. h = 33km. Honshu,
	ZE	M	13	08½	-	28		1½	1½	Japan. USCGS.
	N	M		08½	-	26	1			
		F		25	-					Mag.: M = 5¼(ESK).
16. ESK	Z'	eP	21	21	15.4					21 09 47.2; 52.0°N.175.8°E h = 40km. Rat Islands aftershock. USCGS.
17. ESK	Z'	eP	10	24	42.5					10 13 03.2; 50.3°N. 173.1°E. h = 23km. Rat Islands aftershock.USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
17. ESK	Z'	eP	10	30	21.3					10 18 51.3; 51.8°N.176.6°E h = 44km. Rat Islands aftershock. USCGS.
KEW	ZV	eP	10	30	41					- " -
18. ESK	Z'	eP	04	38	07.0					04 26 33.5; 25.0°N.94.3°E. h = 36km. Burma-India border. USCGS.
	Z'	e		38	22.4					
	Z'	e		38	33.3					
18. ESK	Z'	eP	07	38	26.8					07 26 57.8; 51.9°N.174.1°E h = 36km. Rat Islands aftershock. USCGS.
18. ESK	Z'	eP	08	45	37.6					08 34 05.4; 51.8°N.176.4°E h = 15km. Rat Islands aftershock. USCGS.
18. ESK	Z'	eP	09	46	25.5					09 34 52.4; 51.6°N.174.9°E h = 20km. Rat Islands aftershock. USCGS.
18. ESK	Z'	eP	19	40	40.6					19 30 19.9; 59.2°N.147.5°W h = 30km. Gulf of Alaska. USCGS.
18. ESK	Z'	eP	22	43	57.7					22 32 19.6; 9.9°S.71.2°W. h = 594km. Peru-Brazil border. USCGS.
18. ESK	Z'	iP	23	25	08.6	1			0.11	C. Δ = 73.3°3 = 8140km.
	E	eS		34	33	24		1.6		
	EN	eSS		39	21					23 13 36.3; 51.4°N.179.1°E h = 28km. Rat Islands aftershock. USCGS.
	EN	eLQ		45	-					
	Z	eLR		49	-					
	Z	M		57	-	20			2½	
	EN	M		57	-	24	1½	1½		
		F	24	55	-					Mag.: M = 5¼(ESK).
KEW	ZV	eP	23	25	30					- " -
19. ESK	Z'	eP	03	36	15.7					03 24 43.1; 51.6°N.175.0°E h = 23km. Rat Islands aftershock. USCGS.
19. ESK	Z'	eP	19	04	14.2					18 52 42.1; 51.1°N.178.4°E h = 35km. Rat Islands aftershock. USCGS.
20. ESK	Z'	eP	22	18	15.8					22 06 38.8; 50.4°N.178.2°E h = 32km. Rat Islands aftershock. USCGS.
20. ESK	Z'	eP	22	52	23.3					22 47 09.2; 38.4°N.21.9°E. h = 10km. Greece. USCGS.
21. ESK	Z'	eP	04	50	36.5					04 38 46.3; 44.7°N.148.1°E h = 61km. Kurile Islands. USCGS.
21. ESK	E	eL	12	13	-					11 14 15.1; 15.1°S.173.2°W h = 33km. Tonga Islands. USCGS.
	ZEN	M		31	-	20	2	2	3½	
		F	13	30	-					
22. ESK	Z'	eP	09	26	20.3					09 14 51.3; 51.9°N.173.4°E h = 35km. Rat Islands aftershock. USCGS.
23. ESK	Z'	eP	07	18	36.4					07 07 13; 52.6°N.173.0°E. h = 40km. Rat Islands USCGS.

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
23. ESK	Z',Z	eP	22	25	23	14			3.2	Δ = 101° = 11200km.
	Z'	ePP		29	23					
	EN	eSKS		35	52					
	EN	iS		36	49	38	28	16		22 11 50.2; 25.7°S.70.5°W.
	ZNE	iSP		38	23					h = 80km. Near coast of
	EN	iSS		43	45					Northern Chile. One killed
	N	eSSS		47	19					5 injured and heavy
	EN	eLQ		53	-					damage. USCGS.
	E	M		57	-	40		43		
	N	M		57	-	38	66			
	ZN	M	23	03	-	30	32		56	
	E	M		03	-	28		35		
	ZE	M		11	-	21		13	22	
	N	M		11	-	22	22			Mag.: M = 7.0(ESK).
		F	26	20	-					
KEW	ZV	eP	22	25	20					- " -
	ZV	e		25	40					
24. ESK	Z¦Z	eP	08	21	10.1					Δ = 78.7° = 8750km.
	E	eS		31	03					08 09 17.2; 14.0°N.92.2°W.
	ZE	eLR		46	-					h = 56km. Near coast of
	NE	M		54	-	22	1½	2		Mexico. USCGS.
	Z	M		55	-	20			4	
		F	09	30	-					Mag.: M = 5½
24. ESK	Z'	eP	09	49	11.3					09 37 17.6; 14.2°N.92.1°W.
										h = 33km. Near coast of
										Mexico. USCGS.
24. ESK	Z'	eP	21	05	18.9					20 53 52.4; 52.2°N.174.4°E
										h = 34km. Rat Islands
										aftershock. USCGS.
25. ESK	Z'	ePKP	05	10	28.7					Δ = 126.5° = 14500km.
	ZN	ePP		12	28	18			3.0	
	EN	ePKS		13	49					04 51 27.8; 5.5°S.152.0°E.
	ZEN	ePS		22	28					h = 35km. New Britain
	ZN	eSPP		23	51					region. USCGS.
	ZNE	e		24	56					
	ZNE	eSS		29	59					
	N	eL		44	-					
	ZNE	M	06	08	-	20	10	6	15	Mag.: M = 6.3(ESK).
		F	-	-	-					overlapped by next shock.
KEW	ZV	ePKP	05	10	31					- " -
25. ESK	Z¦Z	eP	05	33	41.0	18			3.7	Δ = 73.9° = 8200km.
	EN	eS		43	09	19	5.1	3.6		05 22 14.5; 52.1°N.173.2°E
										h = 35km. Rat Islands
										aftershock. USCGS.
										Mag.: M = 6.1(ESK).
KEW	ZV	eP	05	34	03					- " -
25. ESK	Z'	eP	06	32	26.5					06 20 57.5; 51.9°N.173.4°E
										h = 30km. Rat Islands
										aftershock. USCGS.
25. ESK	Z'	eP	10	45	40.5					10 34 06.1; 23.8°N.94.8°E
										h = 87km. Burma-India
										border. USCGS.
26. ESK	Z'	eP	01	45	23.7					01 37 05.6; 35.1°N.57.6°E.
										h = 33km. Iran. USCGS.
KEW	ZV	eP	01	45	12					- " -

Met. O. 765

SEISMOLOGICAL BULLETIN

FEBRUARY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
26. ESK	N	eL	09	46	-					08 55 42.2; 6.7°S.102.7°E.
	ZE	M	10	00½	-	20		2	2½	h = 33km. South west of
	N	M		01	-	20	3½			Sumatra. USCGS.
		F		45	-					Mag.: M = 6(ESK).
26 ESK	Z'	eP	23	47	26.4					Δ = 71.1° = 7800km.
	N	eS		56	39					23 36 12.2; 6.9°N.73.0°W.
										h = 146km. Northern
										Colombia. USCGS.
27. ESK	NE	eS	08	08	05	20	1.7	0.7		07 46 29.1; 28.5°N.112.1°W
	N	eSS		13	09					h = 33km. Gulf of
	NE	eLQ		18½	-					California. USCGS.
	N	M		30	-	17	11			
	E	M		30½	-	17				
	Z	M		30½	-	18		8	14	
		F	09	35	-					Mag.: M = 5¾(ESK)
27. ESK	Z'	iP	11	36	26.4	0.9			0.14	C. 11 29 59.0; 24.2°N.,
										5.1°E. h = 0 km. Southern
										Algeria. USCGS.
KEW	ZV	eP	11	35	48					C. - " -

Note.

It is regretted that the issue of November and December 1964 Bulletins are still delayed. The next bulletin will be for November and this will be followed by December 1964.

D 44575/1/R.72 140 9/65 PD

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR MARCH 19 65

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		30.0	100		750 at 30 sec.
	E		30.0	100		
	Z		30.0	100		
BENIOFF WWSS	N'		1.0	0.75		12500 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	NE	eL	08	22	-					07 20 55.3; 5.5°S, 152.1°E
	ZNE	M		37½	-	20	1½	1	2	h = 35 km. New Britain.
		F		-	-					USCGS. Mag. M = 5½(ESK).
1. ESK	ZE	M	08	43½	-	20		1	1½	07 28 08; 5.1°S., 151.7°E.
	N	M		43½	-	18	1			h = 63 km. New Britain.
		F	-	-	-					USCGS.
1. ESK	NE	eL	09	02	-					08 18 56.4; 21.1°N.,
	ZEN	M		16½	-	20	3	2½	5½	121.2°E. h = 42km.
		F		35	-					Formosa. USCGS.
										Mag.: M = 5¾(ESK).
1. ESK	N	eS	13	44	47					13 20 56.7; 21.2°N.,
	N	eL	14	02	-					121.2°E. h = 42km.
	ZNE	M		18½	-	20	2	1½	3½	Formosa. USCGS.
		F		30	-					Mag.: M = 5½(ESK)
1. ESK	Z'	eP	19	33	30.3					19 22 01.6; 52.2°N.,
										173.9°E. h = 30 km.
										Rat Islands. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

MARCH 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z,Z'	eP	21	43	55.0					Δ = 76.9° = 8500 km.
	Z,Z'	ipP		44	22.3	16			2.8	Depth = 106 km.
	Z'	i		44	36.7					21 32 11.8; 15.4°N.92.5°W.
	E	eS		53	34					h = 92 km. Mexico-Guatemala
	N	eLQ	22	04½	-					border. USCGS.
	EZ	eLR		08½	-					
	ZEN	M		14	-	24	3	5	9	
		F	23	10	-					Mag.: M = 5.6 (ESK)
KEW	ZV	eP	21	44	10					Depth = 107 km.
	ZV	epP		44	38					
	ZV	e		44	51					
1. ESK	Z'	ePKP1	22	10	49.1					21 52 04.4; 23.5°S.179.0°E
	Z'	e		10	54.7					h = 541 km. Fiji Islands.
										USCGS.
2. ESK	Z	eP	22	05	43					Δ = 27.9° = 3100 km.
	EN	eS		10	22	18	2.7	3.1		22 00 07.8; 38.6°N.28.3°E.
	EN	eLQ		12	-					h = 45 km. Turkey USCGS.
	EN	M		15½	-	19	9½	6		
	Z	M		18½	-	14			6	
		F		55	-					Mag.: M = 5.4 (ESK)
KEW	ZV	eP	22	05	16					
3. ESK	Z'	ePKP	03	36	54					03 17 04.1; 27.2°S.177.6°W
	E	eL	04	21	-					h = 33 km. Kermadec
	ZEN	M		43½	-	20	1½	1	4	Islands. USCGS.
		F	05	35	-					Mag.: M = 5¾(ESK)
3. ESK	Z'	iP	06	23	31.1	0.9			0.05	06 14 57.0; 49.8°N.78.1°E
										h = 0 km. E. Kasakh USSR
KEW	ZV	iP	06	23	35					Mag.: M = 5 (ESK) USCGS
3. ESK	Z'	ePKP	14	58	54.5					14 39 05.0; 27.0°S.177.8°W
										h = 43 km. Kermadec
										Islands. USCGS.
3. ESK	Z'	ePKP	15	33	09.2					Δ = 126.7° = 14,100 km.
	ZEN	iPP		35	10	20	3.9	1.8	7.6	15 14 09.7; 5.5°S.151.9°E.
	EN	ePKS		36	24					h = 44 km. New Britain
	ZEN	iPS		45	13					Reg. USCGS.
	ZEN	ePPS		46	39					
	ZEN	e		47	41					
	EN	eSS		52	48					
	ZN	eSSS		57	14					Mag.: M = 6.7(ESK)
	ZE	eL	16	08	-					
	ZEN	M		30	-	22	23	12	42	
		F	18	20	-					
KEW	ZV	ePKP	15	33	14					
3. ESK	Z'	iP	16	58	49.2	1			0.24	16 47 25.7; 53.1°N.171.2°E
										h = 23km. Rat Islands.
KEW	ZV	iP	16	59	10					USCGS.
3. ESK	Z'	eP	19	41	07.7					19 29 16.1; 45.7°N.,
										150.9°E. h = 33 km.
										Kurile Islands. USCGS.
4. ESK	Z'	ePn	00	49	06.7					Δ = 7.2° = 800 km.
	Z'	ePg		49	59					00 47 11; 47.6°N.,0.6°W.
	Z'	eSn		50	27.9					France. BCIS.
		F		53	-					

Met. O. 765

SEISMOLOGICAL BULLETIN

MARCH 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	Ṫ s.	AMPLITUDE (μ) N	E	Z	REMARKS
KEW	ZV	ePg	00	48	33					Δ= 3.6° ; 400 km.
	ZV	eSn		49	01					
	ZV	eSg		49	20					
		F		53	-					
4. ESK	Z'	eP	02	13	00.2					02 01 27.1; 51.5°N.176.3°E h = 25km. Rat Is. USCGS.
4. ESK	Z'	iP	06	41	44.2					06 30 16.2; 52.0°N.175.0°E h = 40km. Rat Is. USCGS.
5. ESK	Z'	eP	06	26	36.1					06 15 01.1; 51.2°N.179.3°E h = 25km. Rat Is. USCGS.
5. ESK	Z'	eP	06	37	39.9					06 25 56; 49.9°N.177.4°E. h = 15km. Rat Is. USCGS.
5. ESK	Z'	iP	13	54	11.3	0.9			0.14	C. 13 42 44.1; 52.3°N., 174.9°E. h = 35km. Rat Is. USCGS.
5. ESK	Z'	eP	14	44	48.4	0.9			0.04	D. 14 32 19.2; 27.0°S., 63.3°W. h = 573 km. Santiago Del Estero Prov. Argentina. USCGS.
KEW	ZV	iP	14	44	43					
5. ESK	Z'	eP	18	10	40.2	1.2			0.08	17 59 13.5; 52.3°N.174.3°E h = 35km. Rat Is. USCGS.
5. ESK	Z'	eP	23	40	44.5	1.3			0.09	23 29 23.2; 53.0°N.171.1°E h = 45 km. Rat Is. USCGS.
5. ESK	Z'	eP	06	04	24.1					05 52 58.9; 52.3°N.172.4°E h = 44km.Near Is.Aleutian Is. USCGS.
6. ESK	Z'	eP	08	30	58.0	0.9			0.04	C. 08 19 30.5;52.4°N., 174.2°E. h = 25km. Rat Is. USCGS.
6. ESK	Z'	eP	13	52	44.3					13 41 17.0; 52.1°N.175.4°E h = 35km. Rat Is. USCGS.
6. ESK	Z'	eP	14	47	21.2					14 35 42.3; 50.4°N.177.8°E h = 33km. Rat Is. USCGS.
6. ESK	Z	eP	20	36	57					
	EN	eSKS		47	26					Δ= 92° = 10,200 km.
	EN	eSS		54	00					20 23 49.5; 20.1°N.121.3°E
	N	eL	21	01	-					h = 8km. Philippine Is.
	E	M		17	-	22		2		USCGS.
	N	M		19	-	21	2½			
	Z	M		22½	-	18			6	Mag.: M = 5½-5¾(ESK)
		F	22	05	-					
7. ESK	Z'	eP	01	48	54.2					01 37 55.6; 46.1°N.137.1°E h = 328km. Near E. coast of Eastern Russia. USCGS.
7. ESK	Z	ePKP1	02	02	56					Δ = 154° = 17,100km.
	Z',Z	ePKP2		03	20					01 43 11.4; 30.3°S.177.9°W
	Z	ePP		06	50	16			1.1	h = 60km. Kermadec Is.
	N	eSS		26	25					USCGS.
	NE	eL		46	-					
	ZEN	M	03	05½	-	24	1	1½	2½	Mag.: M = 5.4(ESK)
KEW	ZV	ePKP1	02	03	04					
7. ESK	Z'	eP	07	52	23.7					07 42 31.2; 12.1°N.46.3°E. h = 33km. W.Gulf of Aden. USCGS.
KEW	ZV	eP	07	51	56					

Met. O. 765

SEISMOLOGICAL BULLETIN

MARCH 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
7. ESK	NE	eL	07	52	-					
	N	M		53	-	20	2			
	E	M		53	-	22		1		
		F	08	02	-					
7. ESK	Z'	eP	11	16	08.4					11 04 39.3; 51.8°N.176.4°E h = 35km. Rat Is. USCGS.
8. ESK	Z'	ePKP	19	42	12.7					19 22 45.6; 22.3°S.171.4°E h = 125km. Loyalty Is. USCGS.
8. ESK	Z'	eP	23	08	05.3					23 02 56.0; 38.0°N.21.2°E. h = 55km. Greece. USCGS.
9. ESK	Z,'Z	iP	18	03	10.2	5			9	C.Δ= 23.6° = 2,600km.
	EN	eS		07	19	15	31	28		17 57 53.7; 39.4°N.24.0°E.
	EN	eLQ		08	-					h = 18km. Aegean Sea.
	ZEN	M		13	-	17	112	68	83	USCGS.
		F	19	30	-					Mag.: M = 6.4(ESK)
KEW	ZV	iP	18	02	36					
9. ESK	Z'	iP	18	04	49.1	1			0.37	Aegean Sea.
KEW	ZV	iP	18	04	17					
9. ESK	Z'	eP	18	43	09.1					18 37 54.4; 39.3°N.24.0°E. h = 33km. Aegean Sea.USCGS
KEW	ZV	eP	18	42	35					
9. ESK	Z'	eP	19	52	14.9					19 46 58.2; 39.3°N.23.9°E. h = 19km. Aegean Sea.USCGS
KEW	ZV	eP	19	51	42					
9. ESK	Z'	eP	21	25	23.4					21 20 04.9; 39.2°N.23.8°E.
	EN	M		34	-	17	3	2		h = 13km. Aegean Sea.USCGS
	Z	M		35	-	17			4	
		F		45	-					Mag.: M = 4¾(ESK)
KEW	ZV	eP	21	24	52					
9. ESK	Z'	eP	22	24	23.2					22 19 05; 39.2°N.24.0°E. h = 5km. Aegean Sea.USCGS.
KEW	ZV	eP	22	23	52					
9. ESK	Z'	eP	22	40	31.8					22 35 16; 39.2°N.23.7°E. h = 31km. Aegean Sea.USCGS
10. ESK	Z'	eP	01	41	22.1					01 36 07; 39.2°N.23.9°E.
	Z'	i		41	26.2	1.2			0.22	h = 33km. Aegean Sea.USCGS
KEW	ZV	eP	01	40	51					
	ZV	i		40	55					
10. ESK	Z'	eP	05	52	42.4					05 44 47.8; 32.8°N.49.2°E
	ZEN	M	06	14	-	19	2	1	3	h = 33km. Western Iran.
		F		25	-					USCGS.
										Mag.: M = 5(ESK).
KEW	ZV	eP	05	52	24					
10. ESK	Z'	iPKP	16	12	16.4					15 53 37.8; 21.9°S.179.6°E
	Z'	i		12	19.5					h = 547km. S. of Fiji Is. USCGS.
10. ESK	Z'	eP	21	55	33.1					21 50 17; 39.3°N.23.9°E.
										h = 16km. Aegean Sea. USCGS.
11. ESK	ZN	ePS	17	35	28					
	ZN	eSS		41	40					

contd.

SEISMOLOGICAL BULLETIN

MARCH 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
contd.										
11. ESK	E	eLQ	17	52	-					17 07 06; 54.7°S. 0.7°E.
	ZN	eLR		58½	-					h = 33km. Bouvet Islands.
		F	18	40	-					USCGS.
11. ESK	Z'	eP	21	31	20.2					21 19 56.1; 52.6°N.173.0°E.
										h = 35km. Near Is.Aleutian Is. USCGS.
13. ESK	Z'	eP	04	13	58.3					04 08 40.5; 39.1°N.23.9°E.
										h = 12km. Aegean Sea.USCGS
KEW	ZV	eP	04	13	28					
13. ESK	Z'	eP	04	14	52.8	1			0.20	Δ = 24.4 = 2,700km.
	Z',Z	e		14	54.2					04 09 38.5; 39.0°N.23.4°E.
	EN	eS		19	08	16	1.5	2.0		h = 33km. Aegean Sea.USCGS
	EN	eLQ		20	-					
	EN	M		24½	-	17	5½	4		
	Z	M		25	-	20			6	
		F		50	-					Mag.: M = 4.8(ESK)
KEW	ZV	eP	04	14	20					
13. ESK	Z'	eP	07	44	36.6					Depth = 37km.
	Z'	epP		44	47.7					07 33 23.0; 53.1°N.162.2°W
										h = 37km. S.of Alaska. USCGS.
13. ESK	Z'	ePKP	14	13	15.7					13 54 33.0; 20.4°S.177.6°W
										h = 470km. Fiji Is.USCGS.
13. ESK	Z'	eP	15	47	32.2					15 42 16.8; 39.1°N.24.1°E.
										h = 34km. Aegean Is.USCGS.
14. ESK	Z;Z	iP	16	01	57.3	20	23	72	152	Δ = 52.3° = 5800km.
	Z'	ipP		02	47.2					Depth = 226km.
	Z;Z	ePP		03	56	16	21	49	76	N'S 5sec. 30 μ
	NE,N'E'	iS		09	03.7	30	250	149		E'S 5sec. 13 μ
	N'E'	eScS		11	25.0					15 53 06'6; 36.3°N, 70.7°E.
	E	M		22	-	26		136		h = 219km. Hindu Kush.
	N	M		22	-	22	206			USCGS.
	Z	M		23	-	24			236	
		F	22	30	-					Mag.: M = 7.6(ESK)
KEW	ZV	iP	16	01	50					C. Depth = 230 km.
	ZV	ipP		02	41					
15. ESK	NE	eS	02	25	50					02 02 08.9; 22.4°N.121.4°E
	NE	eL		44	-					h = 33km. Taiwan Reg.
	E	M		58½	-	20		1½		USCGS.
	NZ	M		59½	-	16	3		5	Mag.: M = 5¾(ESK)
		F	03	20	-					
16. ESK	Z'	eP	02	23	19.8					02 11 18.9; 23.1°S.13.5°W.
										h = 32km. S.Atlantic Ridge USCGS.
16. ESK	Z,'Z	eP	16	58	22.9	20	2.2		4.2	
	Z,'Z	ePP	17	01	25.2					Δ = 79.7° = 8,800 km.
	EN	eS		08	22	26	2.2	10		16 46 15.5; 40.8°N.142.9°E
	EN	eSS		13	24					h =34km. Near Honshu,
	EN	eLQ		20	-					Japan. USCGS.
	ZE	eLR		23½	-					
	N	M		32½	-	22	24			
	E	M		33	-	21		21		
	Z	M		34½	-	22			25	Mag.: M = 5.9 Body waves
		F	18	40	-					M = 6.5 Surface waves.
KEW	ZV	eP	16	58	38					

Met. O. 765

SEISMOLOGICAL BULLETIN

MARCH 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
16. ESK	Z'	eP	18	35	41.5					18 24 15.2; 52.1°N,175.0°E h = 36km. Rat Is. USCGS.
17. ESK	Z'	eP	14	38	37.1	0.8			0.11	14 27 12.4; 52.8°N.171.9°E h = 23km. Near Is.Aleutian Islands. USCGS.
18. ESK	Z'	ePKP	06	41	18.7					06 22 02.9; 19.9°S.176.1°W h = 151 km. Fiji Is.USCGS.
19. ESK	Z'	eP	07	46	50.4					07 35 21.7; 52.0°N.174.9°E h = 35km. Near Is.Aleutian Is. USCGS.
19. ESK	NE	eLQ	17	10	-					16 20 51.4; 2.0°S.119.8°E. h = 46km. Celebes. USCGS. Mag.: M = 6¼(ESK)
	ZEN	M		23	-	28	8	4½	3½	
		F	18	00	-					
21. ESK	Z	ePP	11	27	40	14			5.1	11 08 16.2; 1.5°S.126.5°E. h = 33km. Molucca Sea. USCGS.
	ZE	ePS		37	17					
	N	eSS		43	34					
	EN	eLQ		57	-					
	Z	eLR	12	03½	-					
	EN	M		20½	-	22	10	8		
	Z	M		21	-	21			13	Mag.: M = 6.7(ESK)
		F	13	50	-					
21. ESK	Z'	eP	12	53	42.5					12 41 47.5; 36.2°N.136.6°E h = 270km. Near Honshu, Japan. USCGS.
22. ESK	Z	ePP	03	07	04					02 44 47.5; 15.3°S.173.4°W h = 51km. Tonga Is. USCGS.
	ZN	ePKS		07	48					
	N	eSS		26	00					
	EN	eLQ		41½	-					
	Z	eLR		49½	-					Mag.: M = 6½(ESK)
	ZEN	M	04	00½	-	20	13	11	23	
		F	05	20	-					
22. ESK	Z'	eP	03	27	42.0					03 22 25.9; 39.1°N.24.2°E h = 33km. Aegean Sea. USCGS.
22. ESK	Z'	eP	22	13	52.4					22 02 24; 51.9°N.174.9°E. h = 33km. Near Is. Aleutian Is. USCGS.
22. ESK	EN	eLQ	23	41	-					22 56 26.5; 31.9°S.71.5°W h = 46km. Near.C.Chile USCGS. Mag.M = 6(ESK)
	ZEN	M		54	-	22	4	3½	7	
		F	24	30	-					
23. ESK	Z'	eP	12	56	30.3					12 44 59.6; 51.2°N.177.8°E h = 45km. Rat Is. USCGS.
23. ESK	Z'E'	iPg	14	38	57.6	0.3		0.10	0.06	C. Δ = 0.2° = 20km. Azimuth = 280° Local
	Z'	iPn		38	59.7					
	Z'N'E'	iSg		39	01.1	0.5	0.41	0.47	0.52	
		F		39	45					
23. ESK	Z	eL	19	21	-					18 16 08.4; 15.2°S.173.5°W h = 75km. Tonga Is.USCGS.
	ZEN	M		33	-	20	1½	1	3	
		F		50	-					

Met. O. 765

SEISMOLOGICAL BULLETIN

MARCH 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
23. ESK	Z	eSKP	24	17	06					
	NE	eLQ		52	-					23 54 14.7; 15.2°S.173.5°W
	Z	eLR		59	-					Tonga Is. USCGS. h = 130km
	Z	M	25	10½	-	20			14	
	NE	M		11½	-	20	8	8		
		F	26	20	-					
24. ESK	Z'	eP	08	18	49.1					Δ = 67.2° = 7,470 km.
	E	eS		22	40					08 08 05.2; 56.6°N.152.4°W
	E	eL		35	-					h = 30km. Kodiak Is.
	E	M		49½	-	20		2½		USCGS.
	N	M		50	-	20	5			
	Z	M		50½	-	18			4½	Mag.: M = 5¾(ESK)
		F	09	15	-					
24. ESK	Z'	eP	13	40	38.3					13 30 04.5; 57.8°N.148.6°W
										h = 13km. Gulf of Alaska.
										USCGS.
25. ESK	Z'	eP	09	04	40.8					08 53 13.6; 52.3°N.172.6°E
										h = 31km. Near Is.Aleutian
										Is. USCGS.
26. ESK	Z'	ePKP	00	39	27.6					00 20 56.3; 20.0°S.178.1°W
										h = 567km. Fiji Is.USCGS.
26. ESK	Z'	eP	20	34	19.7					20 29 22.0; 36.8°N.30.9°E.
										h = 110km. Turkey. USCGS.
28. ESK	Z'	iP	13	34	02.7	1.1			0.11	C. Δ = 69.8 = 7,760 km.
	N	eS		43	9					13 22 57.6; 55.1°N.162.1°E
	E	eLQ		51½	-					h = 33km. Nr. coast of
	ZN	eLR		56	-					Kamchatka. USCGS.
	ZEN	M	14	13	-	18	1½	1	2	
		F		50	-					Mag.: M = 5½(ESK)
KEW	ZV	iP	13	34	24					
28. ESK	ZE	eP	16	47	14	22	2.2	2.2	10	Δ = 106° = 11,800km.
	ZNE	ePP		51	34	26	10	9	26	
	EN	eSKS		57	50	30	43	42		16 33 14.6; 32.4°S.71.2°W
	EN	eS		59	03	30	35	15		h = 61km. Nr.coast of Chile
	ZNE	iSP	17	00	38					USCGS.
	EN	eSS		06	12					
	EN	eLQ		17	-					
	EN	eLR		23	-					
	ZE	M		29½	-	27		97	184	
	N	M		29½	-	26	60			
	E	M		38	-	20		50		
	N	M		39½	-	20	57			
		F	23	00	-					Mag.: M = 7.6(ESK)
KEW	ZV	eP	16	47	13					
	ZV	ePP		51	26					
29. ESK	Z¦Z	eP	10	59	45.2	14			5.9	C. Δ = 80° = 8,900km.
	Z¦Z	ePP	11	02	47.1	20	2.0		3.1	PN 18sec. 2.3 μ
	EN	eS		09	45	22	1.9	7.1		PZ' 2sec. 0.66μ
	EN	eSS		14	56					PPZ' 2sec. 0.57μ
	E	eLQ		22	-					
	N	M		34	-	22	21			10 47 37.6; 40.8°N.142.8°E
	E	M		34	-	21		15		h = 33km. Near coast of
		F	13	30	-					Honshu, Japan. USCGS.
										Mag: M=5.9 Body waves.
										M=6.4 Surface waves.
KEW	ZV	iP	10	59	59					
	ZV	ePP		03	09					

Met. O. 765

SEISMOLOGICAL BULLETIN

MARCH 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
29. ESK	Z'	eP	14	44	09					14 32 41.2; 52.2°N. 175.4°E. h = 34km. Rat Islands. USCGS.
30. ESK	Z'	ePKP	00	40	31.4					00 21 00.2; 20.0°S. 173.9°W. h = 33km. Tonga Is. USCGS. Mag. M = 5¾ (ESK)
	E	eSS	01	02	36					
	E	eLQ		22	-					
	NEZ	M		43	-	20	1½	1	2½	
		F	-	-	-					
KEW	ZV	ePKP	00	40	41					
30. ESK	Z;Z	eP	02	38	43.0	14	71		144	D. Δ = 76.6° = 8,500km. PE 10 sec. 4.9 μ.
	Z;Z	i		38	45.0					
	Z',	i		39	15.9					
	EN	iS		48	24	27	133	99		02 27 07.2; 50.6°N. 177.9°E h = 51km. Rat Is. USCGS.
	EN	eSS		52	34					
	E	eLQ		58	-					
	Z	eLR	03	02½	-					Mag.: M = 8.0 (ESK)
	E	M		14	-	23		96		
	N	M		15	-	20	106			
		F	08	00	-					
KEW	ZV	eP	02	39	03					
	ZV	i		39	05					
30. ESK	Z'	eP	16	11	41.2					15 59 34.1; 41.0°N. 142.7°E. h = 33km. Near coast of Honshu. USCGS. Mag.: M = 5-5¼ (ESK).
	ZEN	M		45½	-	22	1	½	1	
		F	17	20	-					
30. ESK	Z'	eP	16	20	15.2					16 09 02.4; 53.7°N. 165.6°W. h = 30km. Fox Is. USCGS.
30. ESK	Z'	eP	16	21	51.2					16 10 26.3; 51.6°N. 170.3°W h = 48km. Fox Is. USCGS.
30. ESK	Z'	eP	19	13	01.2					19 01 27.6; 50.2°N. 159.4°E h = 33km. Kurile Is. USCGS.
31. ESK	Z;Z	iP	09	52	38.5	14	18	25	54	C. Δ = 24.3° = 2,700km. PZ' 2 sec. 17 μ ES 20sec. 150 μ
	EN	iS		56	50	20	220			
	EN	eL		58	-					
	ZEN	M	10	03½	-	22	150	133	258	
		F	13	45	-					
KEW	ZV	iP	09	52	04					09 47 30.7; 38.6°N. 22.4°E. h = 78km. Greece. USCGS. Mag.: M = 7.1 (ESK)
31. ESK	Z'	eP	10	57	48.2					10 46 08.6; 50.3°N. 178.2°E h = 30km. Rat Is. USCGS.
31. ESK	Z'	eP	12	06	18.1					12 01 10.3; 38.3°N. 22.0°E. h = 74km. Greece. USCGS.
31. ESK	Z'	eP	20	13	39.0					20 08 26 39.4°N. 24.1°E. h = 33km. Aegean Sea. USCGS

D 60003/1/B-72 140 12/65 H.

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR APRIL 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		30.0	100		750 at 30 sec.
	E		30.0	100		
	Z		30.0	100		
BENIOFF WWSS	N'		1.0	0.75		12500 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z	ePPS	21	55	16					21 20 43.8; 50.0°S., 114.1°W. h = 33km. Eastern Island Cordillera. USCGS.
	NE	eSS	22	01	26					
	NE	eL		20	-					
	E	M		36	-	21		1½		
	N	M		36	-	22	1			
	Z	M		36½	-	22			2½	
		F	23	40	-					Mag.: M = 5½-5¾(ESK)
2. ESK	N	eL	13	45	-					13 04 01.8; 12.5°N. 123.5°E h = 33km. Philippine Islands. Mag.: M-5½(ESK) USCGS.
	NE	M		58½	-	24	1½	1½		
		F	14	25	-					
2. ESK	Z'	ePKP	16	03	10.0					15 44 01.0; 27.1°S., 179.2°W. h = 382km. Kermadec Islands. USCGS.
2. ESK	E'	e	15	57	06.0					15 52 48; 65.7°N., 0.2°E. h = 33km. Norwegian Sea. USCGS.
	Z'N'E'	e		57	32.5					

SEISMOLOGICAL BULLETIN

APRIL 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
2. ESK	Z'	eP	22	35	36.4					
	N	eL		48	-					22 26 47.3; 36.8°N.,66.6°E.
	N	M		56	-	24	1½			h = 38km. Hindu Kush.USCGS.
		F	23	10	-					
3. ESK	Z'	eP	02	49	26.5					02 37 56.1; 51.6°N.,175.8°E
										h = 38km. Rat Islands.USCGS
3. ESK	Z,Z'	eP	11	32	53.3	11			2.0	Δ = 81° = 9000 km.
	Z,Z'	ePP		35	53	11			2.0	
	NE	eS		42	58	12	1.3	1.2		11 20 43.5; 16.0°N.97.8°W
	ZE	eLR		57½	-					h = 16km. Near coast of
	Z	M	12	03½	-	26			3½	Oaxaca, Mexico. USCGS.
	E	M		03½	-	24		2		
	N	M		04	-	24	2			
		F	-	-	-					Mag.: M = 5.6(ESK)
3. ESK	Z,Z'	eP	11	41	15					
	ZE	eLR	12	06½	-					11 29 13.0; 16.1°N.,97.8°W.
	E	M		11½	-	24		2½		h = 45km. Oaxaca, Mexico.
	Z	M		12	-	26			5	
	N	M		12½	-	24	3			
		F	12	55	-					Mag.:M = 5¾(ESK)
3. ESK	Z'	eP	14	35	55.3					14 30 47.7; 38.3°N.,20.4°E
										h = 22km. Greece. USCGS.
4. ESK	Z'	eP	13	42	06.4					13 30 37.8; 51.9°N.175.2°E.
	Z'	ipP		42	15.9					h = 40km. Rat Islands.
										USCGS.
KEW	ZV	eP	13	42	28					- " -
	ZV	epP		42	38					
4. ESK	Z'	ePKP	15	56	02					15 36 11.9; 26.9°S.176.1°W.
										h = 33km. South of Fiji.
										USCGS.
4. ESK	Z'	ePKP	16	12	37.4					15 52 47.7; 26.9°S.176.1°W.
										h = 29km. South of Fiji.
										USCGS.
4. ESK	Z'	ePKP	16	29	59.8					16 10 08.3; 27.1°S.176.0°W.
										h = 28km. Kermadec Islands.
										USCGS.
4. ESK	Z'	ePKP	16	52	36.9					16 32 41.9; 26.9°S.176.0°W.
										h = 12km. South of Tonga
										Islands. USCGS.
4. ESK	Z'	eP	20	22	10.1					20 09 41.1; 8.8°S.,74.5°W.
										h = 143 km. Peru-Brazil
										border. USCGS.
KEW	ZV	eP	20	22	12					- " -
5. ESK	Z'	eP	03	18	11.1	0.7			0.30	Δ = 25.3° = 2800km.
	Z'	i		18	20.6					03 12 54.2; 37.7°N.21.8°E.
	NE	eS		22	32	18	11.6	13.8		h = 34km. Southern Greece.
	ZNE	eL		24	-					20 dead, 200 injured and
	EN	M		27	-	22	74	51		2000 houses destroyed.
	Z	M		29	-	20			33	USCGS.
		F	04	25	-					Mag.: M = 6.0(ESK)
KEW	ZV	eP	03	17	36					- " "
5. ESK	NE	eL	07	20	-					06 21 34.2; 3.2°S.148.4°E.
	E	M		27½	-	26		1½		h = 10km. Bismarck Sea.
	N	M		28	-	26	2½			USCGS.
	Z	M		29	-	26			2½	
		F		55	-					Mag.: M = 5¾-6(ESK)

SEISMOLOGICAL BULLETIN

APRIL 1965

	DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
5.	ESK	Z'	eP	14	04	04.9	0.9			0.11	Δ = 79.2° = 8800 km.
		Z'	ipP		04	24.8					Depth = 76 km.
		N	eS		13	58					13 52 13.4; 44.6°N., 151.1°E.
		E	eL		27	-					h = 81km. Kurile Islands.
		EN	M		28½	-	22	1½	1½		USCGS.
			F	15	15	-					Mag.: M = 5½(ESK)
	KEW	ZV	eP	14	04	22					Depth = 76 km.
		ZV	ipP		04	42					
5.	ESK	Z'	eP	17	07	14					16 55 51.3; 52.8°N.172.4°E.
											h = 42km. Near Islands.
											USCGS.
6.	ESK	Z'	eP	03	30	29.7					03 19 01.7; 52.2°N.173.3°E.
											h = 30km. Near Islands.
											USCGS.
6..	ESK	Z'	iP	05	44	21.8					C.
											05 31 59.7; 36.1°N.139.6°E.
											h = 69km. Honshu, Japan.
											USCGS.
	KEW	ZV	iP	05	44	34					C.- " -
6.	ESK	Z	ePP	10	01	22	12			1.2	
		E	eSKS		07	30					09 42 28.2; 0.5°S.119.9°E.
		E	eS		08	50					h = 33km. Northern Celebes.
		EN	M		42	-	28	6½	4½		USCGS.
		ENZ	M		51½	-	20	6	2½	5½	
			F	12	15	-					Mag.: M = 6.1(ESK)
6.	ESK	Z'	eP	13	30	33.1					13 19 02.2; 51.3°N.179.8°W
											h = 46km. Andreanof
											Islands. USCGS.
6.	ESK	Z'	eP	13	42	23.3					13 30 45.1; 50.2°N.178.3°E.
											h = 40km. Rat Is. USCGS.
6.	ESK	Z'	eP	17	05	52.4					16 53 57.8; 14.2°N.92.6°W.
											h = 57km. Near coast of
											Mexico. USCGS.
6.	ESK	Z'	eP	19	34	12.6					19 21 49.7; 3.1°S., 78.2°W.
											h = 97km. Peru-Ecuador
											border. USCGS.
6.	ESK	Z'	eP	22	02	16.0					21 50 21.9; 45.4°N.149.9°E.
											h = 16km. Kurile Is. USCGS.
7.	ESK	Z'	eP	04	22	00.6					04 16 47; 37.7°N.22.5°E.
											h = 70km. Southern Greece.
											USCGS.
7.	ESK	Z'	iP	18	07	34.3	0.9			0.06	17 48 59.7; 21.0°S.178.8°W.
											h = 568km. Fiji Is. USCGS.
8.	ESK	Z,Z'	eP	13	55	18.3	16			2.0	Δ = 73.7° = 8200km.
		Z'	e		55	22.5					
		NE	eS	14	04	46	20	2.6	2.8		13 43 52.8; 52.2°N.173.5°E.
		N	eScS		05	32					h = 46km. Near Islands,
		ZN	eLR		18½	-					Aleutian. USCGS.
		ENZ	M		26½	-	20	4½	3	4½	
			F	15	25	-					Mag.: M = 5.7(ESK)
	KEW	ZV	eP	13	55	40					- " -
8.	ESK	Z'	eP	14	42	38.6					14 31 10.9; 52.0°N.173.4°E
											h = 34km. Near Is. USCGS.
9.	ESK	ENZ	M	12	16	-	19	2½	2½	4½	10 45 29.4; 32.6°S.178.3°W
			F	13	15	-					h = 52km. South of
											Kermadec Is. Mag.: M=6(ESK)
											USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

APRIL 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
9. ESK	NE	eL	23	43	-					
	NE	M		54	-	26	3½	4½		22 52 24.3; 4.2°S.134.1°E.
	N	M	24	04½	-	20	4½			h = 33km. New Guinea region
	Z	M		04½	-	22			6	USCGS.
		F	-	-	-					Mag.: M = 6.1(ESK)
10. ESK	Z,Z'	iP	00	02	48.6	14			6.7	C. Δ = 27.7° = 3080 km.
	Z,Z'	ipP		03	04.0					Depth = 67km.
	NE	eS		07	25	18	13	13		23 57 03.2;35.1°N.24.3°E.
	Z	i		08	04					h = 51km. Crete. USCGS.
	NE	eL		09	-					
	EN	M		13½	-	20	50	33		
	Z	M		16	-	20			22	
		F	01	20	-					Mag.: M = 5.9(ESK)
	KEW	ZV	iP	00	02	16				C.
10. ESK	Z'	ePKP	15	06	23.3					14 46 50.7; 20.2°S.173.7°W.
										h = 33km. Tonga Is.USCGS.
10. ESK	Z'	iP	17	06	20.9	1.0			0.12	C.
										16 54 55.8; 53.1°N.170.9°E.
	KEW	ZV	eP	17	06	42				h = 8km. Near Is. USCGS.
10. ESK	Z'	iPKP	22	51	18.2	1.0			0.05	22 32 46.6; 17.8°S.178.8°W.
	KEW	ZV	ePKP	22	51	26				h = 543km. Fiji Is. USCGS.
11. ESK	Z'	iPKP	19	10	25.7	1.0			0.08	18 51 38.1; 26.2°S.178.5°E.
										h = 581km. South of Fiji Islands. USCGS.
11. ESK	Z'	eP	22	44	21.3					22 33 05.9; 26.7°N.92.3°E.
										h = 70km. Eastern India. USCGS.
12. ESK	ENZ	M	21	56½	-	19	1½	1½	2½	20 26 15.3; 32.3°S.178.5°W.
		F	22	30	-					h = 167km. South of Kermadec Islands. USCGS.
12. ESK	ENZ	M	22	58½	-	19	1	2	1	21 27 59; 32.6°S.178.0°W.
		F	23	30	-					h = 33km. South of Kermadec Islands. USCGS.
13. ESK	Z'	eP	15	34	36.6					15 23 06.0; 51.5°N.172.1°E.
										h = 35km. Rat Is. USCGS.
13. ESK	Z'	eP	17	56	53					17 45 27.2; 51.6°N.159.4°E
										h = 33km. Near Kamchatka. USCGS.
13. ESK	Z'	eP	23	34	04.5					23 22 57.2; 54.2°N.163.4°W
										h = 36km. Unimak Is.USCGS.
14. ESK	Z'	eP	07	46	26.0					07 35 39.4; 56.3°N.153.5°W
										h = 27km.Kodiak Is. USCGS.
14. ESK	Z'N'	eP*	21	15	19.1					Δ = 70 km.
	E'N'	eSg		15	27.5					
	Z'N'E'	M		15	34	1.1	0.12	0.10	0.16	Local shock.
		F		16	00					
15. ESK	Z'	eP	05	22	18.7					05 09 51.1; 24.9°N.122.6°E
										h = 190km. Taiwan region. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

APRIL 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
15. ESK	N	eLQ	22	10	-					22 09 52.1; 50.2°S.113.4°E.
	ZE	eLR		18	-					h = 33km. Indian Rise.
	ENZ	M		38	-	20	1	1	1½	USCGS.
		F	24	20	-					Mag.: M = 5½(ESK)
16. ESK	Z'	ePKP	00	35	19.5					00 15 52.3; 22.3°S.175.5°W. h = 120km. Tonga Is.USCGS.
16. ESK	Z'	iP	23	32	21.0	12			2.7	C. Δ = 60.1° = 6680 km.
	Z'	i		32	21.9					PZ' 1.1 sec. 0.28 μ
	NE	eS		40	30	27	5.8	2.9		
	E	eLQ		47	-					23 22 18.6; 64.7°N.160.1°W.
	NZ	eLR		50	-					h = 5km. Central Alaska.
	N	M		57½	-	18	6½			USCGS.
	EZ	M		57½	-	20		3½	5½	
		F	25	10	-					Mag.: M = 5.8(ESK)
	KEW	ZV	iP	23	32	48.5				
17. ESK	Z'	iP	00	11	53.6	0.9			0.06	D.
										00 00 29.7; 52.6°N.173.1°E.
										h = 43km. Near Islands.
										USCGS.
18. ESK	E	e(PS)	06	54	52					06 33 58.8; 41.5°N.127.1°W.
	NE	eL	07	05	-					h = 20km. Off coast of
	ENZ	M		16	-	20	1½	2	3½	California. USCGS.
		F		40	-					Mag.: M = 5¼(ESK)
18. ESK	N	ePS	10	09	00					
	N	eSS		15	14					09 39 18.7; 59.8°S.26.8°W.
	E	eLQ		28	-					h = 29km. Sandwich Islands
	ZN	M		40½	-	22	7		8	region. USCGS.
	ZNE	M		44	-	20	5	3½	4	
		F	11	30	-					Mag.: M = 6.1(ESK)
18. ESK	N	ePS	13	11	39					
	E	eL		30	-					12 41 54.9; 59.7°S.26.4°W.
	N	M		43	-	22	5½			h = 25km. Sandwich Islands
	E	M		44	-	21		2½		region. USCGS.
	Z	M		44½	-	20			6	
		F	14	20	-					Mag.: M = 6.1(ESK)
18. ESK	Z'	ePKP	14	27	52					14 08 01.4; 26.9°S.176.1°W
										h = 33km. Fiji Is.USCGS.
19. ESK	Z'	eP	23	54	28					Δ = 84.3° = 8370 km.
	NE	eS	24	04	50					23 41 58.8; 34.9°N.138.0°E
	ZE	eL		21½	-					h = 36km. Near Honshu,
	ZN	M		35½	-	18	6½		8	Japan. USCGS.
	E	M		37½	-	18		4½		
		F	25	05	-					Mag.: M = 6.0(ESK)
KEW	ZV	eP	23	54	39					Depth = 45 km.
	ZV	epP		54	52					
20. ESK	Z'	iP	06	54	34.6	0.9			0.08	Depth = 38km.
	Z'	epP		54	45.7					06 43 08.8;52.4°N.172.0°E
										h = 35km. Near Is.USCGS.
20. ESK	Z'	eP	07	01	25.9	0.8			0.05	06 50 17.6;54.6°N.161.4°E
										h = 33km. Near Kamchatka.
										USCGS.
22. ESK	Z'	eP	18	47	30.5					18 36 01.2; 51.8°N.176.1°E
										h = 37km. Rat Is. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

APRIL 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
23. ESK	Z'N'E'	iPx	15	31	59.3					Δ = 63 km.
	Z'	ePg		32	00.5					
	N'E'	iSg		32	06.4					Local.
	ENZ	M		32	12	0.9	0.14	0.17	0.14	
		F		33	00					
24. ESK	N	eSS	22	29	10					21 55 26.5; 11.4°N. 140.1°E.
	ENZ	M	23	02½	-	20	2½	2	4	h = 59km. West Caroline
		F		25	-					Islands. USCGS.
										Mag.: M = 5¾ (ESK)
25. ESK	Z'	eP	01	13	36.8					Δ = 95.1° = 10570km.
	Z'	ePP		17	36.5					
	N E	eS		24	46	20	1.5	1.8		01 00 11.6; 24.5°N. 142.7°E.
	E	eSS		31	16					h = 15km. Volcano Islands.
	E	eL		42	-					USCGS.
	E	M	02	00½	-	20		2½		
	NZ	M		01½	-	20	4½		4	
		F		35	-					Mag.: M = 5.8(ESK)
25. ESK	Z'	eP	01	54	55.0					01 43 28; 51.5°N. 178.8°E.
										h = 49km. Rat Is. USCGS.
25. ESK	Z'	eP	08	50	58.7					08 39 31.6; 52.0°N. 175.9°E.
										h = 45km. Rat Is. USCGS.
26. ESK	Z'	eP	02	07	31.0					01 57 14.4; 58.9°N. 142.7°W.
	ZNE	eL		26	-					h = 33km. Gulf of Alaska.
	ENZ	M		34	-	20	1½	2	2	USCGS.
		F	03	00	-					Mag.: M = 5¼ (ESK)
26. ESK	Z'	eP	20	40	11.8	1			0.16	20 29 07.4; 54.5°N. 162.6°W.
	Z'	i		40	12.3					h = 53km. Alaska Peninsula.
	E	M	21	11	-	22		1½		USCGS.
	NZ	M		12	-	20	4		4	
		F		25	-					Mag.: M = 5.8(ESK)
26. ESK	Z'	eP	22	28	41.5					Δ = 90.8° = 10100 km.
	NE	eS		39	33	22	4.6	3.4		
	N	eSS		45	50					22 15 42.5; 21.1°N. 120.7°E.
	NE	eL		54½	-					h = 33km. Taiwan region.
	EN	M	23	08	-	20	17	21		USCGS.
	ENZ	M		15	-	19	19	18	31	
		F	24	10	-					Mag.: M = 6.3(ESK)
27. ESK	Z'	iP	14	14	44.1	1			0.23	Δ = 27° = 3000 km.
	Z'	i		14	46.6					
	NE	eS		19	17					14 09 07.1; 35.7°N. 23.5°E.
	N	eL		21	-					h = 50km. Crete. USCGS.
	EN	M		26½	-	20	8	5½		
	Z	M		28	-	20			3½	
		F	15	00	-					Mag.: M = 5.3(ESK)
KEW	ZV	eP	14	14	11					
27. ESK	Z'	iP	15	01	44.7					14 50 55; 48.3°N. 146.4°E.
										h = 428km. Sea of Okhotsk.
										USCGS.
27. ESK	Z'	eP	20	21	47.3					Δ = 84.1° = 9350 km.
	NE	eS		32	08					20 09 18; 1.5°N., 85.2°W.
	ZE	eLR		48½	-					h = 33km. Off coast of
		F	21	15	-					Ecuador. USCGS.
29. ESK	Z'	eP	06	20	04.0					06 09 31; 52.1°N. 152.2°E.
										h = 451km. N. of Kurile
										Islands. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

APRIL, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
29. ESK	Z'	ePKP	10	03	13.5					09 44 34.2; 22.1°S.179.8°E. h = 540km. South of Fiji Is. USCGS.
29. ESK	Z,Z'	iP	15	39	23.1	18	2.9	2.7	11.0	
	Z	ipP		39	39					C. Δ = 65.7°=7300km.
	NE	iS		48	02	15	9	40		Depth = 60km.
	N	eScS		49	04					PZ' 1 sec. 0.67 μ
	N	eSS		52	12					PE' 1 " 0.18 μ
	NE	eL		56	-					PN' 1 " 0.18 μ
	N	M	16	05½	-	24	43			15 28 43.3; 47.4°N.122.4°W.
	EZ	M		06	-	24		34	73	h = 57km. Washington.
		F	19	30	-					Two killed, some injured, moderate property damage. USCGS.
										Mag.: M = 6.6 (ESK)
KEW	ZV	iP	15	39	50					C.
	ZV	eP'P'	16	07	54					
30. ESK	Z'	eP	11	55	53.1					11 45 27.1; 10.9°N.62.4°W. h = 86km. Near coast of Venezuela. USCGS.
30. ESK	Z'	eP	16	12	28.8					16 00 57.5; 51.6°N.175.0°E. h = 33km. Rat Is. USCGS.

D 62578/1/R.72 140 2/66 PD

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR MAY, 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		30.0	100		750 at 30sec. *
	E		30.0 *	100		
	Z		30.0	100		
BENIOFF WWSS	N'		1.0	0.75		12500 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

* 15 sec. from 13th May.

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	ZNE	eS	02	10	28					01 59 47; 37.1°N.27.0°E.
	N	eL		14	-					h = 33km. Turkey.
		F		25	-					USCGS.
1. ESK	Z'	eP	21	38	06.2					
	N	eS		46	25					Δ = 61.8° = 6870km.
	E	eLQ		55½	-					21 27 54.4; 60.4°N.146.0°W
	E	M	22	03	-	20		1		h = 33km. Southern
	N	M		03½	-	20	½			Alaska. USCGS.
	Z	M		03½	-	20			1	
		F		25	-					Mag.: M = 5(ESK)
2. ESK	NE	eL	07	52	-					07 13 42; 28.9°N.128.9°E.
	Z	M	08	05½	-	20			3	h = 30km. Ryukyu Islands.
	E	M		06	-	18		1½		US
	N	M		07	-	18	5			
		F		45	-					Mag.: M =
2. ESK	Z'	ePKP	11	10	45.4					10 52 13.
										h = 581 k
										USCGS.

SEISMOLOGICAL BULLETIN

MAY, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
2. ESK	Z'	eP	22	39	04.8					22 33 23.5; 35.7°N.,23.8°E. h = 36km. Crete. USCGS.
3. ESK	Z'	eP	10	13	29.4					Δ = 75.5° = 8390km.
	NE	eS		23	06					10 01 35.2; 13.5°N.89.3°W.
	ZE	M		49	-	18		3½	6½	h = 23km. El Salvador.
	N	M		49½	-	18	3			125 killed; 400 injured
		F	12	30	-					and major property damage. USCGS.
KEW	ZV	eP	10	13	43					Mag.: M = 5¾(ESK).
3. ESK	Z'	eP	17	52	26.4					17 40 58.4; 52.0°N.175.8°E. h = 42km. Rat Islands. USCGS.
4. ESK	Z'	eP	08	44	00.8					Δ = 53.0° = 5900km.
	Z'	i		44	06.2					08 34 39.8; 41.7°N.79.4°E.
	E	eS		51	26					h = 6km. Kirgiz-Sinkiang
	EN	eSS		55	44					border region. USCGS.
	N	eLQ		57½	-					
	EN	M	09	03½	-	24	7	5		
	Z	M		08	-	16			12	Mag.: M = 5.6(ESK)
		F		35	-					
5. ESK	Z'	eP	23	13	26.7					23 02 01.7; 52.6°N.173.5°E. h = 32km. Near Islands. USCGS.
7. ESK	Z'	eP	14	47	57.4					14 42 21.8; 36.7°N.26.9°E. h = 162km. Dodecanese Is. USCGS.
9. ESK	Z'E'N'	iPg	13	38	06.6					Δ = 45km.
	Z'N'	iSg		38	11.9					
	Z'E'N'	eSx		38	13.1					Local.
	Z'E'N'	e		38	15.2					
	Z'E'N'	M		38	17	0.7	0.11	0.12	0.16	
		F		39	00					
11. ESK	Z'	eP	06	48	32.7					06 39 57.8; 49.8°N.77.9°E. h = 0km. Kazakh S.S.R. USCGS.
11. ESK	Z'	eP	17	47	45.3					17 37 38.3; 61.4°N.149.6°E.
	Z'	epP		48	00.5					h = 58km. Alaska. USCGS.
13. ESK	Z'	eP	02	35	22.0					02 23 23; 19.3°S.,63.8°W.
KEW	ZV	iP	02	35	19					h = 589km. Bolivia. USCGS.
13. ESK	Z'	eP	03	07	06.2					02 56 03; 53.9°N.,159.8°E. h = 100km. Near Kamchatka. USCGS.
13.ESK	Z'	eP	21	14	14.2					21 09 16; 39.9°N., 20.7°E. h = 33km. Greece-Albania border. USCGS.
15.ESK	Z'	eP	21	12	47.9					21 01 17.7; 52.3°N.173.2°E h = 10km. Near Is. USCGS.
15.ESK	NE	eL	24	48½	-					23 58 34.4; 4.1°S.135.1°E.
	EN	M	25	00	-	26	2½	2½		h = 33km. New Guinea
	Z	M		13½	-	18			2	region. USCGS.
		F		30	-					Mag.: M = 5¾-6(ESK)
16.ESK	N	eL	12	20	-					11 35 46.0; 5.3°N.125.7°E.
	N	M		39	-	24	2			h = 36km. Philippine Is.
	E	M		39½	-	22		1½		USCGS.
	Z	M		39½	-	23			2½	
		F	13	05	-					Mag.: M = 5¾(ESK)

Met. O. 765

SEISMOLOGICAL BULLETIN

MAY, 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
17.ESK	Z,Z'	eP	17	32	21.2	14			3.5	C. Δ = 89.0° = 9900km. PZ' 1 sec. 0.23 μ
	Z	e		32	50					
	Z	ePP		35	56	12	3.0	3.6	9.4	
	EN	eS		43	05	18	11.2	13.1		17 19 25.9; 22.5°N.121.3°E h = 21km. Taiwan region. USCGS.
	ENZ	e		43	30					
	ENZ	eSS		48	55					
	EN	eLQ		56	-					
	EN	eLR	18	01	-					
	EN	M		08½	-	24	40	62		
	Z	M		14	-	24			67	
		F	20	00	-					Mag.: M = 6.8(ESK)
KEW	ZV	eP	17	32	27					
	ZV	ePP		36	06					
17. ESK	Z'	ePKP	18	25	14.8					18 05 45.4; 21.1°S.175.2°W h = 75km. Tonga Is. USCGS.
17. ESK	Z'	eP	20	32	38.5					20 21 35; 55.1°N.168.5°E. h = 68km. Komandorsky Islands. USCGS.
18. ESK	Z'	eP	01	16	50.1					01 04 14.6; 17.6°S.49.9°E. h = 33km. Malagasay Republic. USCGS.
KEW	ZV	eP	01	16	31					
18. ESK	Z'	eP	22	58	27.8					22 46 31.7; 43.7°N.146.5°E h = 45km. Kurile Is.USCGS.
KEW	ZV	eP	22	58	43					
19. ESK	Z	eP	03	22	36.0					03 11 12.5; 52.4°N.173.4°E h = 49km. Near Is. USCGS
19. ESK	Z'	ePKP	04	41	05.8					04 21 26.7; 22.5°S.176.3°W h = 33km. South of Fiji Islands. USCGS.
19. ESK	Z'	eP	22	18	44.8					22 07 14.1; 51.6°N.175.2°E h = 35km. Rat Islands. USCGS.
19. ESK	Z'	ePKP	23	50	49.9	1			0.21	23 32 14.0; 20.8°S.178.5°W h = 552km. Fiji Is.USCGS.
	Z'			50	51.0					
KEW	ZV	ePKP	23	50	56					
	ZV	i		51	02					
20. ESK	Z	ePKP	00	59	32					Δ = 138.6° = 15400km.
	Z	ePP	01	02	29					
	ZN	ePKS		03	20					
	Z	eSKS		06	40					00 40 10.9; 14.7°S.167.4°E h = 16 km. New Hebrides Islands. USCGS.
	EN	eSS		21	37					
	N	eSSS		26	27					
	E	eLQ		37½	-					
	ZN	eLR		44½	-					
	ZN	M		59½	-	21	27		45	
	E	M	02	00	-	24		25		
		F	04	15	-					Mag.: M = 6¾(ESK)
KEW	ZV	ePKP	00	59	40					
21. ESK	Z'E'N'	iPg	15	30	30.8					Δ = 67 km.
	Z'E'N'	iSg		30	37.9					
	Z'E'N'	i		30	40.9					Local.
	Z'E'N'	M		30	43	0.7	0.14	0.19	0.08	
		F		31	30					
22. ESK	Z'	ePKP	10	50	14.2	0.9			0.24	10 31 39.5; 21.1°S.178.7°W h = 578 km. Fiji Islands. USCGS.
	Z'	i		50	16.4					

Met. O. 765

SEISMOLOGICAL BULLETIN

MAY 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
KEW	ZV	ePKP	10	50	21					
	ZV	i		50	27					
22. ESK	Z'	eP	16	20	38.4					16 09 29.5; 14.1°S.13.8°W. h = 33km. South Atlantic Ridge. USCGS.
KEW	ZV	eP	16	20	17					
23. ESK	Z'	eP	07	57	41.7					07 46 33.7°; 14.1°S.13.9°W h = 33km. South Atlantic Ridge. USCGS.
23. ESK	Z¦Z	iP	23	57	41.2	0.9			0.26	Δ = 73.4° = 8150 km.
	EN	eS	24	07	07					
	N	eScS		08	00					23 46 12.0; 52.2°N.175.0°E h = 22km. Near Islands, Aleutian Islands. USCGS.
	N	eSS		12	16					
	EN	eL		19	-					
	Z	M		31½	-	19			2	
	N	M		32	-	19	1½			
	E	M		32½	-	19		1½		
		F	01	10	-					Mag.: = 5¾-6(ESK)
KEW	ZV	iP	23	58	03					
24. ESK	Z	eP	23	34	50					Δ = 98° = 10900 km.
	Z	ePP		38	51					
	E	eSKS		45	42					23 21 10.6; 13.0°N.124.5°E h = 33km. Philippine Islands. USCGS.
	E	ePS		47	48					
	E	eSS		53	04					
	ENZ	M	24	22½	-	21	3	3	5	
		F	25	00	-					Mag.: M = 5¾-6(ESK)
25. ESK	Z,Z'	eP	13	19	21					Δ = 74.2° = 8240km.
	E	eS		28	51					13 07 49.7; 51.3°N.178.7°E
	EN	eSS		33	28					h = 40km. Rat Islands.
	ZN	M		51½	-	20	1		2	USCGS.
	E	M		51½	-	17		1		
		F	14	35	-					Mag.: M = 5-5¼(ESK)
26. ESK	Z'	eP	05	10	29.1					04 58 39.2; 13.7°N.90.6°W h = 39km. Near coast of Guatemala. USCGS.
26. ESK	Z'	eP	14	05	19.0					13 58 03.0; 35.3°N.44.6°E. h = 54 km. Iraq. USCGS.
26. ESK	Z'	eP	19	27	19.7					19 15 52.6; 52.0°N.175.0°E h = 37km. Rat Is. USCGS.
27. ESK	Z'	eP	12	41	48.0					12 29 45.6; 14.8°N.94.2°W. h = 21km. Off Mexico. USCGS.
27. ESK	Z'	eP	22	41	17.5					22 29 52.7; 52.4°N.173.5°E h = 41km. Near Is. USCGS.
29. ESK	Z'	eP	04	20	32.6					04 14 58.6; 35.4°N.22.6°E. h = 59km. Mediterranean Sea. USCGS.
29. ESK	N	eL	16	44	-					15 36 31.9; 57.8°S.147.3°W
	N	M	17	09	-		1			h = 33km. South Pacific
	E	M		09½	-	20		1		Cordillera. USCGS.
	Z	M		09½	-	18			2	
		F		55	-	20				Mag.: M = 5½-5¾(ESK)

Met. O. 765

SEISMOLOGICAL BULLETIN

MAY 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
31. ESK	Z'	eP	02	14	41.3					
	N	eL		33	-					02 04 42.9; 32.6°N. 78.2°E.
	ZE	M		42½	-	16		1½	2½	h = 33km. Kashmir-Tibet
	N	M		43	-	16	1½			border. USCGS.
		F		55	-					Mag.: M = 5-5¼ (ESK)
KEW	ZV	eP	02	14	36					

D 63145/1/R.72 140 3/66 PD

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR JUNE, 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		15	100		750 at 15 sec.
	E		15	100		
	Z		15	100		
BENIOFF WWSS	N'		1.0	0.75		12500 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z'	eP	04	44	41.0					04 32 45.3; 20.2°N. 94.9°E.
	Z'	ep		45	02.8	0.7			0.05	h = 57km. Burma. USCGS.
1. ESK	Z'	eP	08	03	04.9					07 52 26.1; 28.5°N. 83.2°E.
	Z'	e		03	09.3					h = 33km. Nepal. USCGS.
1. ESK	Z'	eP	15	23	42.2					Δ = 23.4° = 2600km.
	Z'	e		23	49.7					15 18 31.2; 37.8°N. 26.6°W.
	E	eS		27	52	11	0.7	0.9		h = 5km. Azores Is. USCGS.
	EN	M		32½	-	11	0.7	0.5		
		F	15	55	-					Mag.: M = 4¼(ESK)
2. ESK	Z'	iPKP1	05	31	44.8	0.9			0.11	C. Depth = 520km.
	Z'	e		31	49.2					05 12 59.1; 23.5°S. 180.0°E.
	Z'	ePKP2		32	00.6					h = 539km. South of Fiji
	Z'	epPKP1		33	48.5					Islands. USCGS.
	KEW ZV	ePKP1	05	31	52					
	ZV	ePKP2		32	06					
2. ESK	Z'	ePKP1	15	04	16.9					14 45 55.8; 17.9°S. 179.5°W
										h = 637km. Fiji Is. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

JUNE 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
2. ESK	Z'	ePKP$_1$	15	16	53.1					14 58 31.9; 18.0°S.179.4°W h = 621km. Fiji Is. USCGS.
2. ESK	Z,Z'	eP	23	49	27.1	6			1.1	Δ = 53.3° = 5900km.
	Z'	e		49	39.2					
	NE	eS		56	55	17	2.9	3.0		23 40 24.4;16.0°N.46.8°W.
	NE	eLQ	24	02	-					h = 33km. North Atlantic
	NEZ	eLR		04.3	-					Ridge. USCGS.
	NEZ	M		07½	-	17	2.7	2.7	4.3	
		F	25	10	-					Mag.: M = 5.4(ESK)
KEW	ZV	eP	23	49	24					
3. ESK	Z'	iP	07	55	05.1	1			0.05	C. Depth = 40km.
	Z'	ipP		55	16.6					07 43 39.1; 51.9°N.175.8°E
										h = 58km. Rat Is. USCGS.
KEW	ZV	eP	07	55	27					
3. ESK	Z'	eP	11	07	27.5					10 57 08.8; 18.5°N.70.3°W.
	Z'	e		07	39.3					h = 27km. Dominican
										Republic. USCGS.
KEW	ZV	eP	11	07	36					
	ZV	e		07	47					
3. ESK	Z'	eP	18	36	57.1					Δ = 23.9° = 2650km.
	Z'	e		37	01.7					18 31 50.5; 39.7°N.23.2°E.
	NE	eS		41	08					h = 33km. Aegean Sea.
	N	eL		43½	-					USCGS.
	ENZ	M		46	-	15	1.3	1.3	1.0	
		F	19	05	-					Mag.: M = 5¼-5½(ESK)
KEW	ZV	eP	18	36	25					
3. ESK	Z'	eP	20	42	19.1					20 30 26.9; 44.1°N.145.3°E
										h=42km. Hokkaido,Japan.
										USCGS.
4. ESK	Z'	eP	00	56	21.0					00 46 31.1; 0.8°S,16.0°W.
										h = 33km. North of
										Ascension Island. USCGS.
4. ESK	Z'	eP	15	13	51.2					15 02 18.3; 51.1°N.178.5°E
										h = 41km. Rat Is. USCGS.
8. ESK	N	eL	14	14	-					13 39 58.2; 23.3°N.108.5°W
	EN	M		21½	-	20	1.2	0.7		h = 33km. Gulf of
		F		50	-					California. USCGS.
9. ESK	Z'	eP	13	38	18.0					13 26 52.2; 52.6°N.173.2°E
										h = 25km. Near Islands.
										USCGS.
10. ESK	Z'	eP	05	58	00.6					05 49 00.0;35.9°N.70.5°E.
										h = 125km.Hindu Kush.USCGS
10. ESK	Z,Z'	eP	20	38	03.0					Δ= 18.5°= 2060km.
	EN	eS		41	25					20 33 59.3; 46.4°N.27.6°W.
	N	M		42½	-	20	1.6			h = 33km.North Atlantic
	EZ	M		43	-	20		2.1	2.4	Ridge. USCGS.
		F	21	10	-					Mag.: M = 4¼(ESK).
11. ESK	Z'	iP	02	49	04.5	1			0.08	C.
	Z'	e		49	14.2					02 37 34.7;51.8°N.174.1°E.
										h = 35km. Near Islands.
										USCGS.
KEW	ZV	iP	02	49	26					C.
	ZV	e		49	36					

SEISMOLOGICAL BULLETIN

JUNE 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
11. ESK	Z,Z'	iP	03	45	38.3	10			5.8	C. Δ = 78.4° = 8700 km.
	Z,Z'	ipP		45	54.4	12			10.7	Depth = 58km.
	Z	ePP		48	57	16			8.9	PZ' 0.9 sec. 0.24 μ
	Z'	i(Pa)		52	57.4					
	N	eS		55	27					03 33 44.9; 44.7°N.148.7°E.
	EN	e		55	41					h = 47km. Kurile Islands.
	E	ePS		56	00					USCGS.
	E	eLQ	04	06½	-					
	EN	M		20	-	20	47	69		
	E	M		24	-	20		51		
	NZ	M		24½	-	20	70		95	
		F	07	15	-					Mag.: M = 6.7(ESK)
KEW	ZV	iP	03	45	55					C. Depth = 62km.
	ZV	ipP		46	12					
	ZV	e(Pa)		53	14					
11. ESK	Z'	eP	03	56	28.1					Kurile Islands aftershock.
11. ESK	Z'	eP	04	04	52.0					Kurile Islands aftershock.
KEW	ZV	eP	04	05	08					
11. ESK	Z'	eP	04	26	45.6					04 14 51.4; 44.3°N.149.0°E
										h = 48km. Kurile Is.USCGS.
KEW	ZV	iP	04	27	02					
11. ESK	Z'	eP	04	56	49.7	1			0.08	C.
										04 44 53.1;44.5°N.149.2°E.
KEW	ZV	eP	04	57	06					h = 42km. Kurile Islands.
										USCGS.
11. ESK	Z'	eP	06	09	05.4					05 57 09.2; 44.2°N.149.3°E
										h = 46km. Kurile Is.USCGS.
11. ESK	Z'	eP	07	23	00.3					C.
										07 11 05.7; 44.4°N.149.2°E
KEW	ZV	eP	07	23	17					h = 50km. Kurile Is.USCGS.
11. ESK	Z'	eP	07	39	41.1					07 27 45.5; 44.1°N.149.4°E
										h = 61km. Kurile Is.USCGS.
11. ESK	Z'	eP	08	52	55.6					08 41 01.1; 44.3°N.149.0°E
										h = 54km. Kurile Is.USCGS.
11. ESK	Z'	eP	10	28	34.3					10 16 37.3;44.4°N.149.3°E.
										h = 29km. Kurile Is.USCGS.
11. ESK	Z'	eP	10	53	06.3					10 41 10.5;44.1°N.149.3°E.
	Z'	epP		53	19.1					h = 64km. Kurile Is.USCGS.
11. ESK	Z'	eP	12	11	58.0					12 00 00.8;44.2°N.149.1°E.
	E	eL		34	-					h = 33km.Kurile Is.USCGS.
	NZ	M		51	-	20	0.8		1.4	
	E	M		51½	-	17		0.9		
		F	13	15	-					Mag.: M = 5-5¼(ESK)
11. ESK	Z'	eP	12	58	41.0					12 47 03.6;45.9°N.149.5°E.
										h = 140km.Kurile Is.USCGS.
11. ESK	Z'	eP	15	51	29.0					15 39 36.3;44.5°N.149.2°E.
										h = 55km.Kurile Is.USCGS.
11. ESK	Z'	eP	20	56	15.8					20 44 20.3;44.1°N.148.9°E.
										h = 45km.Kurile Is.USCGS.
12. ESK	Z'	eP	03	21	43.1					03 09 44.6;43.9°N.149.1°E.
										h = 33km. Kurile Is.USCGS.
12. ESK	Z'	iP	05	40	36.8					05 28 40.3;44.2°N.149.8°E
										h = 41km.Kurile Is.USCGS.
KEW	ZV	iP	05	40	53					

Met. O. 765

SEISMOLOGICAL BULLETIN

JUNE 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
12. ESK	Z'	iP	05	52	55.1					C.
	E	eL	06	12½	-					05 41 00.3; 44.0°N.149.1°E
	NZ	M		32	-	20	1.4		1.7	h = 64km. Kurile Islands.
	E	M		32½	-	17		1.1		USCGS.
		F	-	-	-					Mag.: M = 5¼(ESK)
KEW	ZV	eP	05	53	11.5					C.
12. ESK	Z'	eP	06	15	29.7					06 03 34.8; 44.3°N.149.0°E
	NZ	M		54½	-	20	0.9		1.6	h = 48km. Kurile Islands.
	E	M		55	-	16		1.1		USCGS.
		F	07	15	-					Mag.: M = 5-5¼(ESK)
12. ESK	Z'	eP	06	58	22.8					06 46 26.4; 44.2°N.149.1°E h = 40km. Kurile Is.USCGS.
12. ESK	Z'	ePKP	18	11	59.0					17 55 09.5; 6.3°S.105.8°E. h = 202km. Sunda Strait. USCGS.
12. ESK	Z'	eP	18	54	35.1					18 42 39.1; 44.0°N.149.1°E h = 61km. Kurile Is.USCGS.
12. ESK	Z'	eP	18	57	41.2					18 45 43.3; 44.1°N.149.0°E h = 41km. ,Kurile Is. USCGS.
12. ESK	Z'	eP	19	03	18.5					Δ = 93° = 10300km.
	Z'	e		03	30.2					
	EZ	eSKS		13	45					18 50 11.3; 20.3°S.68.9°W.
	Z	ePS		15	38					h = 103km. Chile-Bolivia
	NE	eL		29½	-					border. USCGS.
		F	20	00	-					
KEW	ZV	eP	19	03	16					
12. ESK	Z'	eP	22	28	42.0					22 16 46.3; 44.2°N.149.0°E
KEW	ZV	eP	22	28	58					h = 48km. Kurile Is.USCGS.
13. ESK	Z'	eP	02	32	47.9					02 20 52.0; 44.1°N.149.3°E
										h = 50km. Kurile Is.
KEW	ZV	eP	02	33	04					USCGS.
13. ESK	Z,Z'	eP	07	18	16.6	10			1.4	Δ = 79.4° = 8820km.
	E	eS		28	14					
	E	e		28	27					07 06 13.6; 41.9°N.143.4°E
	E	eLQ		39	-					h = 32km. Hokkaido,Japan.
	E	M		51½	-	22		5.2		USCGS.
	N	M		52	-	20	3.0			
	Z	M		53	-	22			3.4	
		F	08	40	-					Mag.: M = 5¾(ESK)
KEW	ZV	eP	07	18	31					
13. ESK	Z,Z'	eP	20	07	39.3					C. Δ = 28.9° = 3200 km.
	EN	eS		12	26					
	N	eL		14½	-					20 01 48.1; 37.8°N.29.4°E
	E	M		18	-	19		7.2		h = 18km. Turkey, 2 killed
	N	M		18	-	20	12			3 injured. USCGS.
	EN	M		21	-	16	9	10		
	Z	M		21	-	15			15	
		F		55	-					Mag.: M = 5.4(ESK).
KEW	ZV	eP	20	07	12					C.
	ZV	e		11	49					
14. ESK	NE	eL	08	15	-					07 30 43.6; 39.8°S.45.8°E.
	E	M		31½	-	18		1.3		h = 33km. Indian Ocean.
	NZ	M		32½	-	20	0.9		1.5	USCGS.
		F		55	-					Mag.: M = 5½(ESK).

Met. O. 765

SEISMOLOGICAL BULLETIN

JUNE 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
14. ESK	Z'	eP	13	27	38.9					13 17 01.7; 32.0°N.87.7°E. h = 37km. Tibet. USCGS.
14. ESK	Z'	eP	16	56	48.6					16 47 21.4; 8.0°N.37.9°W. h = 33km. Mid-Atlantic Ridge. USCGS.
15. ESK	Z'	eP	01	57	10.1					01 45 11.6; 44.1°N.149.2°E h = 33km. Kurile Is.USCGS.
15. ESK	Z'	eP	04	57	54.5					04 46 13.1; 50.1°N.178.2°E h = 28km. Rat Is. USCGS.
KEW	ZV	eP	04	58	15.5					
15. ESK	Z'	eP	15	26	26.7					15 14 59.9; 52.2°N.174.8°E h = 35km. Near Is. USCGS.
15. ESK	Z'	ePKP	23	30	04.3					
	E	eLQ	24	11	-					23 10 25.2;20.9°S.173.7°E. h = 22km. New Hebrides Islands. USCGS.
	ZN	eLR		18	-					
	E	M		37	-	22		2.9		
	Z	M		38	-	21			3.7	
	N	M		39	-	22	3.0			
		F	25	45	-					Mag.: M = 6(ESK)
17. ESK	Z'	iP	03	53	32.0	0.9			0.03	03 44 58.2; 50.0°N.78.1°E. h = 0km. Eastern Kazakh S.S.R. USCGS.
17. ESK	Z'	eP	19	16	34.7					19 05 09.1; 52.0°N.175.0°E h = 67km. Near Is. USCGS.
17. ESK	Z'	eP	20	25	30.0					Δ = 66.6° = 7400km.
	N	eS		34	20					
	N	eL		44	-					
	EN	M		50	-	26	4.2	3.2		20 14 48.6; 32.0°N.87.8°E. h = 8km. Tibet. USCGS.
	N	M		53	-	19	2.9			
	E	M		53½	-	18		2.4		
	Z	M		53½	-	17			2.1	
		F	21	50	-					Mag.: M = 5½(ESK)
18. ESK	Z'	eP	01	29	14.9					01 18 35.2; 32.0°N.87.7°E. h = 19km. Tibet. USCGS.
18. ESK	Z'	eP	08	29	08.0					08 17 37.6; 25.0°N.93.8°E. h = 46km. Eastern India. USCGS.
19. ESK	Z'	iP	06	49	36.9	1			0.08	C. 06 38 12.6; 52.3°N.172.0°E h = 54km. Near Is. USCGS.
19. ESK	Z'	eP	11	13	12.3					11 09 03.6; 55.6°N.35.0°W. h = 33km. North Atlantic. USCGS.
19. ESK	Z'	iP	13	01	27.9	0.9			0.03	12 50 23.0; 53.8°N.160.5°E h = 100km.Near Kamchatka. USCGS.
20. ESK	Z'	iP	02	09	19.4	1			0.08	01 57 24.8; 44.6°N.149.2°E h = 40km. Kurile Islands . USCGS.
KEW	ZV	iP	02	09	36					
20. ESK	Z'	eP	22	03	05.8					21 51 46.9; 52.2°N.158.6°E h = 44km. Near Kamchatka. USCGS.
21. ESK	Z'	eP	00	30	07.0					Δ = 50.2° = 5580km.
	EN	eS		37	15	12	1.6	0.7		
	N	eL		44	-					00 21 14.5; 28.1°N.56.0°E h = 28km. Southern Iran. USCGS.
	Z	M		50½	-	28			2.6	
	N	M		50½	-	26	5.8			

conta.

SEISMOLOGICAL BULLETIN

JUNE 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
contd.										
21. ESK	E	M	00	51	-	26		3.4		
		F	01	35	-					Mag.: M = 5.3(ESK).
KEW	ZV	iP	00	29	50.5					
22. ESK	Z'	iP	05	58	57.9					05 49 18.9; 36.3°N.77.7°E. h = 28km.Kashmir-Sinkiang border. USCGS.
22. ESK	Z	ePP	24	06	23					
	E	eSKS		12	43					Δ = 102° = 11300 km.
	Z	ePS		15	27					
	E	eLQ		35	-					23 48 07.1; 7.1°N.123.5°E.
	ZN	eLR		38	-					h = 60km. Philippine
	E	M		54	-	19		4.9		Islands. USCGS.
	N	M		54½	-	18	4.8			
	Z	M		54½	-	19			7.1	
		F	25	20	-					Mag.: M = 6-6¼(ESK)
23. ESK	Z,Z'	iP	11	19	58.9	15			3.3	C. Δ = 66.2° = 7360km.
	ZN	ePP		22	32	15			2.0	PZ' 1 sec. 0.17μ
	EN	eS		28	44	13	3.2	5.9		11 09 15.3; 56.6°N.152.9°W
	EN	ePS		29	01					h = 36km. Kodiak Island
	E	eScS		29	55					region.
	EN	eSS		33	04					USCGS.
	EN	eLQ		36	-					
	ZEN	eLR		40	-					
	ZN	M		52	-	17	36		42	
	E	M		52½	-	17		23		Mag.: M = 6.3(ESK)
		F	-	-	-					
KEW	ZV	eP	11	20	26					
23. ESK	Z'	eP	12	34	07.3					12 23 22.2; 56.6°N.152.8°W
	ZN	M	13	06	-	17	1.4		2.0	h = 25km. Kodiak Island.
	E	M		06½	-	17		0.7		USCGS.
		F		30	-					Mag.: M = 5-5¼(ESK)
24. ESK	NE	eL	08	34	-					07 45 13.6; 7.0°N.126.2°E.
	ENZ	M		50½	-	23	1.3	2.2	3.0	h = 50km. Philippine Is.
		F	09	05	-					USSCGS.
										Mag.: M = 5¾(ESK)
24. ESK	Z'	ePKP	14	28	06.3					14 08 31.2; 23.6°S.176.7°W h = 91km. South of Fiji. USCGS.
25. ESK	Z'E'	iPg	15	53	00.0					D. Δ = 14 km.
	Z'N'	iP*		53	02.2					
	E'	iSg		53	03.5					Local.
	Z'N'E'	M		53	04.5	0.7	0.42	0.42	0.47	
		F		53	45					
27. ESK	Z'	eP	01	17	09.9					01 04 23.8; 9.2°N.94.1°E.
	Z'	e		17	18.0					h = 8km. Nicobar Is.USCGS.
27. ESK	Z'	eP	11	19	04.0					Δ = 61.0° = 6780 km.
	N	eS		27	21					11 08 55.9; 60.3°N.141.2°W
	ENZ	M		44½	-	18	1.0	0.8	1.8	h = 12 km. Alaska. USCGS.
		F	12	05	-					Mag.: M = 4¾-5(ESK)
27. ESK	Z'	eP	11	48	58.9					Δ = 88.9° = 9900 km.
	NE	eS		59	43					
	NE	eL	12	16	-					11 36 08.6; 23.8°N.121.5°E
	EN	M		24½	-	24	11	13		h = 24km. Taiwan. USCGS.
	ENZ	M		33	-	17	13	6	19	
		F	13	10	-					Mag.:M = 6¼(ESK)
27. ESK	Z'	eP	22	12	20.6					21 59 35; 30.2°N.132.7°E. h =10km.Off Japan.USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

JUNE 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
28. ESK	Z'	ePKP	03	52	36.5					Δ = 125° = 13900km.
	Z	ePP		54	30					
	E	eL	04	29	-					03 33 36.5; 5.1°S.153.0°E
	E	M		50½	-	22		2.2		h = 50km. New Ireland
	NZ	M		51	-	22	2.4		3.0	region. USCGS.
		F	05	55	-					Mag.: M = 5¾-6(ESK).
KEW	ZV	ePKP	03	52	41					
28. ESK	NE	eL	16	28	-					15 44 53.8; 23.9°N.121.6°E.
	ENZ	M		41½	-	17	1.2	0.6	1.7	h = 33km. Taiwan. USCGS.
		F		55	-					Mag.: M = 5-5¼(ESK)
28. ESK	Z'	ePKP	18	16	15.2					17 57 39.7; 21.0°S.178.9°W
										h = 562km. Fiji Is.USCGS.
29. ESK	Z'	eP	02	16	18.3					02 04 22.6; 44.4°N.149.4°E
										h = 33km. Kurile Is.USCGS.
KEW	ZV	eP	02	16	35					
29. ESK	Z'	eP	04	32	28.0					04 27 57.4; 36.5°N.12.2°W.
KEW	ZV	eP	04	31	57					h = 33km. North Atlantic Ocean. USCGS.
29. ESK	Z'	eP	15	46	31.9					15 40 28.7; 34.2°N.26.3°E
										h = 16km. Crete. USCGS.
29. ESK	Z'	eP	16	12	51.5					16 00 57.4; 45.3°N.150.7°E
										h = 21km. Kurile Is.USCGS.
30. ESK	Z	ePP	03	12	40					02 53 14.0; 1.6°S.126.7°E.
	EN	eL		44	-					h = 33km. Molucca Sea.
	ENZ	M	04	01	-	25	1.1	0.9	1.7	USCGS.
		F		30	-					Mag.: M = 5½(ESK)
30. ESK	Z'	iP	08	44	59.0	0.9			0.04	C. Δ = 74.2° = 8240km.
	E	eS		54	26					08 33 31.8; 51.7°N.176.5°E
	N	eSS		59	29					h = 60km. Rat Islands.
	ENZ	M	09	27	-	17	0.6	0.5	0.7	USCGS.
		F		50	-					Mag.: M = 5(ESK)
KEW	ZV	eP	08	45	21					
30. ESK	Z'	eP	12	47	53.9	1			0.04	12 36 40.8; 53.7°N.160.5°E
										h = 33km. Near Kamchatka. USCGS.

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR JULY 19 65

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		15	100		} 750 at 15 sec.
	E		15	100		
	Z		15	100		
BENIOFF WWSS	N'		1.0	0.75		} 12500 * at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

* 25000 from 13th.
100000 on 15th.

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z'	eP	17	53	05.0					17 41 34.3; 50.0°N.158.9°E h = 66km. Kurile Is.USCGS
1. ESK	E	eL	24	22½	-					23 12 45.4; 63.0°S., 163.7°W. h = 33km. South Pacific Cordillera. USCGS. Mag.: M = 6 (ESK).
	Z	M		44½	-	22			2.6	
	E	M		45	-	22		2.2		
	N	M		46	-	22	2.2			
		F	25	20	-					
KEW	ZV	ePKP	23	32	44					
2. ESK	Z'	eP	20	31	08.9	1.2			0.06	20 19 41.8;52.0°N.175.3°E h = 33km. Rat Is. USCGS.
KEW	ZV	eP	20	31	30.5					
2. ESK	Z,Z'	iP	21	09	54.1	11	4.2	1.0	12	C. Δ = 70.9° = 7880 km. Depth = 41km. PZ' 1 sec. 1.3 μ pPZ' 1.1 sec. 3.4 μ
	Z'	ipP		10	06.1	12	6.6	1.7	18	
	EN	iS		19	05	24	35	23		
	EN	eSaS		19	52					
	E	eSSS		26	55					
	E	eLQ		28½	-					20 58 40.0;53.1°N.167.7°W h = 59km. Fox Islands, Aleutian Islands.USCGS.
	ZN	eLR		32½	-					
	ZE	M		34	-	44		75	228	
	N	M		34	-	48	225			

contd.

SEISMOLOGICAL BULLETIN

JULY 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
contd.										
2. ESK	Z'	eP'P'	21	37	40.6					
	ENZ	M		41½	-	25	33	12	39	
		F	23	35						Mag.: M = 7.0 (ESK)
KEW	ZV	iP	21	10	18					C.
	ZV	i		10	29					
3. ESK	Z,Z'	eP	02	26	15.2	12		2.6	2.8	PZ' 1.2 sec.0.32 μ
	Z'	i		26	19.1					Δ = 17.8° = 1980 km.
	NE	eS		29	30					02 22 18.6; 52.7°N.32.1°W.
	ZE	eL		30	-					h = 36km. North Atlantic.
	NE	M		32	-	14	16	5.0		USCGS.
	Z	M		32½	-	14			4.8	
		F	03	15	-					Mag.: M = 4.6(ESK)
KEW	ZV	eP	02	26	43					
	ZV	i		26	46					
3. ESK	Z'	eP	11	38	17.3					11 26 11.6;22.6°N.101.4°E.
	N	eL	12	04½	-					h = 33km. Burma-China
	E	M		10½	-	24		4.7		border. USCGS.
	NZ	M		11	-	24	6.3		2.4	
		F		45	-					Mag.: M = 5¾-6(ESK).
5. ESK	Z'	eP	05	38	22.8					05 34 09; 52.8°N.34.3°W.
										h = 33km. ATlantic Ocean.
										USCGS.
5. ESK	Z,Z'	eP	08	36	11.2	8		3.2	3.8	Δ = 18.3° = 2030km.
	ZE	ePP		36	26					08 31 58.9;52.9°N.34.2°W.
	N	eS		39	31					h = 33km. North Atlantic
	N	eL		40	-					Ocean. USCGS.
	ZEN	M		42½	-	14	11.2	6.4	5.1	
		F	09	30	-					Mag.: M = 5.0(ESK)
KEW	ZV	eP	08	36	38					
6. ESK	Z,Z'	iP	03	23	57.8	7	10	14	23	D. Δ = 24.9° = 2770km.
	N	eS		28	05	11		108		
	E	eS		28	16	11	54			03 18 44.6; 38.7°N.22.6°E.
	N	eL		30	-					h = 28km. Greece. One
	N	M		32½	-	23	88			killed, six injured,
	E	M		33½	-	22		54		considerable damage.
	Z	M		36	-	12			60	USCGS.
		F	05	20	-					Mag.: M = 6.8(ESK)
KEW	ZV	eP	03	23	22					D.
	ZV	e		27	25					
6. ESK	Z'	eP	04	20	23.2					04 08 46.1; 46.7°N.152.4°E
KEW	ZV	iP	04	20	51					h = 35km. Kurile Is.USCGS.
6. ESK	Z'	eP	05	10	01.4					04 58 55.7; 55.1°N.162.1°E
										h = 33km.Near Kamchatka.
										USCGS.
6. ESK	Z'	eP	15	39	55.1					15 28 33.6;52.9°N.171.8°E.
										h = 47km. Near Is.USCGS.
6. ESK	Z'	ePKP	18	54	53.2					18 36 47.3; 4.5°S.155.1°E.
	Z'	ePP		56	55					h = 510km. Solomon Is.
	Z	eSP	19	05	58					USCGS.
	Z	eSPP		07	36					
KEW	ZV	ePP	18	57	03					
	ZV	e		57	31					
6. ESK	Z'	iP	19	04	36.3	1			0.04	

SEISMOLOGICAL BULLETIN

JULY 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
7. ESK	Z'	ePKP	12	28	05.4					12 08 34.3; 49.7°S. 117.1°E.
	Z'	e		28	13.2					h = 33km. South of Australia. USCGS.
7. ESK	Z'	eP	14	33	37.0					14 22 13.1; 52.4°N. 173.4°E. h = 46km. Near Is. USCGS.
7. ESK	Z'	eP	21	51	09.5	1.3			0.08	21 38 50.5; 32.7°N. 138.7°E.
	ZV	eP	21	51	20					h = 218km. South of Honshu, Japan. USCGS.
10. ESK	Z'	eP	08	15	34.0					08 09 49.8; 34.8°N. 23.4°E. h = 33km. Crete. USCGS.
10. ESK	Z'	eP	19	34	07.5					19 22 19.5; 41.6°N. 140.3°E. h = 139km. Hokkaido, Japan. USCGS.
11. ESK	Z'	eP	07	23	35.6					07 12 58.6; 58.0°N. 151.4°W. h = 8km. Kodiak Is. USCGS.
11. ESK	Z'	eP	09	55	30.5					09 52 19; 62.2°N. 25.7°W. h = 33km. Iceland region. USCGS.
14. ESK	Z'	iP	18	07	15.2					17 55 51.1; 52.6°N. 168.6°W h = 8km. Fox Is. USCGS.
15. ESK	Z'E'N'	iPg	12	46	14.5					Dilatation. Δ = 22 km.
	Z'	iPx		46	15.6					
	Z'E'	iSg		46	17.6					Local.
	Z'E'	M		46	19	0.5		0.031	0.044	
	N	M		46	20	0.5	0.029			S.P. Magnification 100000
15. ESK	Z'E'	iPg	12	46	22.0					Dilatation. Δ = 22km.
	E'Z'	iSg		46	25.0					
	Z'	M		46	26	0.5			0.028	Local.
	E'N'	M		46	27	0.5	0.030	0.029		
15. ESK	Z'	iPg	12	46	33.1					Δ = 29km.
	Z;E'	iSg		46	36.9					
	Z'	M		46	38	0.5			0.040	Local.
	E'N'	M		46	39	0.5	0.077	0.045		
		F		47	45					
15. ESK	Z'E'	iPn	15	58	09.8					Δ = 116km.
	E'N'Z'	iPg		58	10.8					
	Z'	iSg		58	24.4					Local.
	N'E'	i		58	27.5					
	E'N'	M		58	29	0.5	0.039	0.031		
		F		59	20					
15. ESK	Z'E'	iPn	16	16	09.9					Δ = 116km.
	Z'E'	iPg		16	10.3					
	Z'	iSg		16	23.8					
	N'E'	i		16	26.9					Local.
	E'N'Z'	M		16	28	0.4	0.057	0.062	0.041	
		F		17	30					
15. ESK	Z'	iP	18	46	29.9	1.3			0.05	C. 18 33 29.9;
	Z'	iPP		50	56.5					7.7°N., 123.8°E. h = 588km. Philippine Islands. USCGS.
15. ESK	Z'	iPKP	20	51	45.7					20 32 59.7; 23.5°S. 179.8°W h = 527km. South of Fiji. USCGS.
17. ESK	Z	ePP	07	42	04	10			0.7	07 20 30.5; 9.7°S. 159.8°E.
	N	ePKS		43	12					h = 23km. Solomon Is.
	N	ePPS		54	02					USCGS.
	E	eL	08	16	-					

contd.

SEISMOLOGICAL BULLETIN

JULY 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
contd.										
17. ESK.	E	M	08	39½	-	22		1.0		
	N	M		40	-	20	0.8			
	Z	M		40½	-	20			1.1	
		F	09	50	-					Mag.: M = 5¼(ESK)
17. ESK	Z'	iPKP	13	19	07.8					12 59 10.7;27.2°S.177.6°W.
	ZE	M	14	25½	-	20		0.7	1.1	h = 27km. Kermadec Is.
	N	M		26	-	20	0.6			USCGS.
		F	15	10	-					Mag.: M = 5½(ESK)
17. ESK	Z'	eP	18	32	38.3					18 21 33.5;54.8°N.161.5°W. h = 30km. Alaska. USCGS.
18. ESK	Z'	eP	22	26	56.2					22 14 59.5;45.4°N.151.3°E. h = 16km. Kurile Is.USCGS.
20. ESK	Z'	eP	11	31	30.3	1			0.03	11 19 47.3;48.7°N.155.6°E. h = 4km. Kurile Is.USCGS.
20. ESK	NE	eL	14	06	-					13 18 27.4;7.5°N.124.3°E.
	E	M		25½	-	20		1.6		h = 45km.Mindanao,
	NZ	M		26½	-	20	0.9		2.1	Philippine Is. USCGS.
		F		40	-					Mag.: M = 5½(ESK)
20. ESK	Z'	eP	20	22	47.8					20 11 42.4;53.9°N.166.6°W. h = 87km. Fox Is. USCGS.
21. ESK	Z'Z	ePKP	03	11	09.3					02 51 39.0;20.8°S.175.8°W.
	E	eL		52	-					h = 57km. Tonga Is.USCGS.
	ZEN	M	04	11	-	20	0.8	1.4	3.1	
		F	05	15	-					Mag.: M = 5½(ESK)
21. ESK	Z'	eP	17	08	19.5					16 56 50; 51.8°N.173.9°E. h = 45km. Near Is. USCGS.
21. ESK	Z,Z'	iP	18	03	51.7	1			0.11	C. Δ = 71.7° = 7970km.
	Z'	i		03	57.8					
	Z'	e		04	03.5					17 52 30.5;53.3°N.170.4°E.
	NE	eS		13	08					h = 26km. Near Is. USCGS.
	N	eSS		18	00					
	NEZ	M		36	-	18	0.5	0.2	0.7	
		F	19	10	-					Mag.: M = 5-5¼(ESK)
KEW	ZV	eP	18	04	12					C.
22. ESK	Z'	eP	01	30	25.1					01 18 50.9;51.0°N.176.0°E. h = 33km. Rat Is.USCGS.
23. ESK	Z'	eP	17	11	22.8					
23. ESK	Z'	eP	20	31	57.8					20 30 17; 61.1°N., 3.6°E. h = 33km. Norwegian Sea. USCGS.
24. ESK	Z'	iP	18	06	31.9	1			0.03	17 57 42.2;36.4°N.71.2°E.
KEW	ZV	iP	18	06	26					h = 234km. Afganistan-USSR border. USCGS.
25. ESK	N	eS	04	05	14					03 40 40.4; 2.0°N.99.3°E.
	N	eL		22½	-					h = 98km. Northern Sumatra
	NEZ	M		41½	-	20	0.7	1.4	1.7	USCGS.
		F	05	10	-					
25. ESK	Z'	iP	13	45	15.7	1			0.08	D. 13 33 05.2; 41.3°N., 146.6°E.h = 33km. Off coast of Hokkaido. USCGS.
KEW	ZV	iP	13	45	30					D.

Met. O. 765

SEISMOLOGICAL BULLETIN

JULY 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
25. ESK	Z,Z'	eP	21	58	16.5	1			0.06	Δ = 74.1° = 8230 km.
	Z'	i		58	22.0					21 46 45.3; 51.4°N. 176.0°E.
	E	eS	22	07	46					h = 37km. Rat Is. USCGS.
	ZE	M		38½	-	20		0.7	0.9	
		F	23	30	-					Mag.: M = 5.0(ESK)
KEW	ZV	eP	21	58	38					
27. ESK	Z'	eP	11	32	00.6					11 20 27.7; 51.2°N. 177.5°E. h = 34km. Rat Is. USCGS.
27. ESK	Z'	iP	21	27	49.4					21 16 02.9; 40.2°N. 139.2°E. h = 199km. Near coast of Honshu, Japan. USCGS.
29. ESK	Z'	iP	03	13	32.4					03 05 02; 50.4°N. 77.9°E. h = 0km. Eastern Kazakh. SSR. USCGS.
29. ESK	Z,Z'	iP	08	40	54.9	10			20	D. Δ = 75° = 8300 km.
	E	eS		50	30	14		14		PZ' 1.6 sec. 2.3 μ
	Z	eLR	09	04	-					08 29 22.1; 51.2°N. 171.3°W.
	Z	M		14½	-	20			47	h = 23km. Fox Is. USCGS.
	E	M		15	-	20		32		
		F	11	55	-					Mag.: M = 7.0(ESK)
KEW	ZV	iP	08	41	18					
	ZV	i		41	24					
29. ESK	Z'	eP	15	20	08.5	0.9			0.03	15 08 37.0; 51.1°N. 171.3°W.
	Z'	i		20	09.4					h = 33km. Fox Is. USCGS.
29. ESK	Z'	iP	15	21	42.6					15 10 14.1; 51.4°N. 170.8°W. h = 33km. Fox Is. USCGS.
30. ESK	Z'	eP	05	58	19.9					05 45 16.1; 18.0°S. 70.6°W. h = 73km. Near coast of Chile. USCGS.
30. ESK	Z'	iP	07	31	22.3	1			0.04	07 20 10.3; 6.7°N. 73.0°W. h = 174km. Northern Columbia. USCGS.
30. ESK	Z'	iP	16	44	42.6					16 32 37.0; 1.5°S. 78.1°W. h = 164km. Ecuador. USCGS.
31. ESK	E	eS	07	59	30	12		0.8		07 36 31.5; 35.9°N. 142.2°E.
	EZ	eL	08	17	-					h = 52km. Off coast of
	ZE	M		31	-	16		0.9	0.8	Honshu, Japan. USCGS.
		F		55	-					Mag.: M = 5-5¼(ESK)

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR AUGUST 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		15	100		750 at 15 sec.
	E		15	100		
	Z		15	100		
BENIOFF WWSS	N'		1.0	0.75		25000 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z'	iP	15	13	52.3	0.8			0.02	15 02 56.1; 46.9°N. 143.8°E. h=400km. Sakhalin. USCGS.
KEW	ZV	iP	15	14	08					D.
1. ESK	Z'	iP	16	51	42.0	0.8			0.07	D. 16 41 13.7; 52.7°N., 153.4°E. h=462km. Off Kurile Is. USCGS.
KEW	ZV	iP	16	52	01					C.
1. ESK	Z'	ePKP	19	47	41.5					19 27 57.6; 24.6°S. 176.8°W. h=33km. South of Fiji Is. USCGS. Mag.: M = 5¼ (ESK).
	ZNE	M	20	52½	-	18	0.5	0.3	0.7	
		F	21	05	-					
1. ESK	Z'	eP	20	20	12.9					20 09 17.9; 32.6°N. 93.3°E. h=32km. Tibet. USCGS.
1. ESK	Z'	ePKP2	24	04	49.0					23 44 28.3; 32.5°S. 178.9°W h = 44km. South of Kermadec Is. USCGS.
	E	eLQ		51	-					
	Z	M	25	09½	-	22			1.3	
	NE	M		09½	-	23	0.8	0.8		
		F	26	00	-					Mag.: M=5½ (ESK).
2. ESK	Z'	eP	05	06	20.8					04 56 19.3; 14.4°N. 53.9°E. h=37km. Arabian Sea. USCGS

SEISMOLOGICAL BULLETIN

AUGUST 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
2. ESK	Z	ePKP1	13	40	03					13 19 54.7; 56.2°S.158.2°E
	Z,Z'	ePKP2		41	25					h = 33km. Macquarie Is.
	E	eSS	14	06	30					USCGS.
	E	eSS		09	14	(via 180°)				N comp. U/S
	ZE	eLR		41½	-					
	Z	M		59	-	22			55	
	E	M		59½	-	22		27		
		F	16	30	-					Mag.: M = 7-7¼(ESK)
KEW	ZV	ePKP	13	40	02					
2. ESK	Z'	iP	14	46	06.1					C. 14 34 21.6; 7.4°N.,
										78.7°W. h = 22km. Panama.
KEW	ZV	eP	14	46	13					USCGS.
2. ESK	Z'	eP	16	54	57.2	1.2			0.05	C. 16 43 09.4;7.4°N.78.7°W
	ZE	M	17	21	-	25		1.4	1.6	h = 2km. Panama. USCGS.
		F		45	-					Mag.: M = 5¼(ESK).
KEW	ZV	eP	16	55	04					
2. ESK	Z'	iP	19	19	40.8					19 07 57.1; 7.4°N.78.8°W.
	ZE	M		48	-	22		0.4	0.7	h = 33km. Panama. USCGS.
		F	20	05	-					Mag.: M = 4¾-5(ESK).
2. ESK	Z'	eP	20	55	11.9					20 43 30.6; 7.5°N.78.4°W.
										h = 33km. Panama. USCGS.
3. ESK	Z'	iP	02	14	47.4	1.2			0.08	02 01 52.2; 7.7°S.81.3°W.
										h = 49km. Off coast of
KEW	ZV	iP	02	14	51.5					Peru. USCGS.
3. ESK	Z'	ePKP	09	55	13.3					09 36 36.6; 21.4°S.179.0°W
										h = 571km. Fiji Is.USCGS.
4. ESK	Z'	iP	01	17	34.2	1			0.07	01 05 53.0;16.8°N.94.5°W.
	Z'	ipP		18	00.2					h = 117km. Oaxaca,Mexico.
KEW	ZV	eP	01	17	48					USCGS. Depth = 100km(ESK).
	ZV	epP		18	14					Depth = 100km.(KEW)
4. ESK	Z'	eP	11	53	27.1					11 49 56.1; 43.9°N.12.3°E.
										h = 33km. Italy. USCGS.
5. ESK	Z,Z'	iPKP	00	26	50.0					Δ = 125.3° = 13900km.
	Z	ePP		28	42					
	NE	ePKS		30	03					00 07 50.5; 5.3°S.151.7°E.
	NE	ePS		38	42					h = 47km. New Britain
	N	eSS		46	20					region. USCGS.
	E	eL	01	02	-					
	ENZ	M		21	-	22	6.1	7.4	11.5	Mag.: M = 6¼(ESK)
		F	02	30	-					
KEW	ZV	ePKP	00	26	54					
5. ESK	Z	eL	21	10	-					19 47 44; 65.5°S.,179.0°E.
	E	M		26½	-	20		0.5		h = 33km. Balleny Is.
	NZ	M		28	-	20	0.6		0.7	USCGS.
		F		45	-					Mag.: M = 5¼(ESK)
6. ESK	NE	eS	02	16	23					01 58 40.8; 0.5°S.19.6°W.
	E	eLQ		22½	-					h = 33km. Mid-Atlantic
	E	M		29	-	16		0.5		Ridge. USCGS.
	NZ	M		29½	-	20	0.6		0.7	
		F		50	-					Mag.: M = 4¾(ESK)

SEISMOLOGICAL BULLETIN

AUGUST 19 55

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
6. ESK	Z'	iP	18	26	03.3	0.8			0.04	D. 18 15 11.3; 41.4°N., 131.2°E. h=560km. Sea of Japan. USCGS.
KEW	ZV	eP	18	26	15					
8. ESK	Z'	iP	05	30	51.1	0.9			0.03	C. 05 19 26.2; 52.6°N., 173.4°E. h=35km. Near Islands. USCGS.
8. ESK	Z'	iP	13	00	49.7	1			0.03	D. 12 49 23.1; 51.9°N., 175.3°W. h=53km. Andreanof Islands. USCGS.
9. ESK	Z'	eP	03	41	08.4					03 29 42.3; 52.1°N. 178.4°W. h=33km. Andreanof Is. USCGS.
9. ESK	Z'	eP	09	18	16.3					09 08 06.8; 5.1°S., 11.6°W. h=33km. Ascension Is. USCGS.
9. ESK	Z'	eP	09	32	57.9					09 22 49.9; 4.9°S. 11.9°W. h=33km. North of Ascension Islands. USCGS.
9. ESK	Z'	eP	10	25	45.7					10 20 53; 48.0°N. 27.7°W. h = 33km. North Atlantic Ridge. USCGS.
	Z'	i		25	49.0					
	ZE	eL		28½	-					
	ZE	M		29½	-	20		0.6	0.9	Mag.: M = 4(ESK).
10. ESK	Z'	eP	04	18	53.1					04 07 21.2; 51.3°N., 171.4°W. h=33km. Fox Is. USCGS.
10. ESK	ZN	eLR	09	27	-					08 06 57; 66.1°S. 178.8°E. h=53km. Balleny Is. USCGS.
	N	M		47	-	20	0.4			
	Z	M		48	-	20			0.6	
	E	M		49	-	20		0.2		
		F	10	05	-					Mag.: M = 5(ESK)
10. ESK	Z'	eP	11	26	44.3					11 15 16.4; 52.1°N. 173.0°E h=26km. Near Is. USCGS.
11. ESK	Z,Z'	ePKP	04	00	17.8					Δ = 138.3° = 15340 km.
	Z,Z'	ePP		03	18.0	20	9.5	1.4	4.9	
	Z	ePKS		04	01					
	Z	ePPS		15	33					03 40 56.2; 15.4°S. 166.9°E h=26km. New Hebrides Islands. USCGS.
	EN	eSS		21	46					
	E	eLQ		38½	-					
	ZN	eLR		47	-					
	E	M	05	00	-	24		24		
	N	M		00½	-	23	29			
	Z	M		08	-	23			22	
	N	M		08	-	22		22		
		F	07	00	-					Mag.: M = 6.9(ESK).
KEW	ZV	ePKP	04	00	24					
11. ESK	Z'	eP	18	39	57.3					Δ = 63.6° = 7070km. 18 29 40.1; 59.6°N. 145.8°W h=25km. Gulf of Alaska.
	NE	eS		48	27	12	0.7	0.5		
	E	eL		57	-					
	NE	M	19	06½	-	17	1.6	1.7		
	Z	M		08½	-	17			2.7	
		F		35	-					Mag.: M = 5.1(ESK)

Met. O. 765

SEISMOLOGICAL BULLETIN

AUGUST 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
11. ESK	Z	ePKP	20	11	49					D. Δ = 138.7°= 15410km.
	Z	ePP		14	46	15	2.6		5.9	
	N	ePKS		15	33					19 52 29.8; 15.7°S.167.1°E
	Z	ePPS		27	16					h = 33km. New Hebrides
	E	eSS		33	03					Islands. USCGS.
	E	eLQ		51	-					
	NZ	eLR		59½	-					
	Z	M	21	12½	-	23			19	
	N	M		13	-	23	13			
	E	M		14	-	23		12		Mag.: M = 6.6(ESK)
		F		-	-					
KEW	ZV	ePKP	20	11	56					
11. ESK	Z,Z'	ePKP	22	51	05					
	Z	ePP		54	09	14	5.1		11	Δ = 140.7° = 15600km.
	E	eLQ	23	30	-					22 31 48.9;15.8°S.167.2°E
	Z	M		51½	-	23			83	h=33km. New Hebrides Is.
	N	M		52	-	23	62			USCGS.
	E	M		53	-	23		39		
	N	M		57½	-	21	69			
	E	M		58	-	19		56		
	Z	M		59	-	21			78	
		F	04	00	-					Mag.:M = 7.1(ESK)
KEW	ZV	ePKP	22	51	16					
12. ESK	Z'	ePKP	01	44	43.7					01 25 00.8;22.9°S.175.8°W
										h = 33km. Tonga Is.USCGS.
12. ESK	Z,Z'	ePKP	08	21	01					
	Z	ePP		24	09	18	2.0		4.3	Δ = 141.7°= 15750km.
	Z	ePPS		36	23					08 01 43.3; 15.9°S.,
	E	eLQ	09	00	-					167.5°E. h = 25km. New
	ZN	eLR		08	-					Hebrides Is. USCGS.
	E	M		18	-	25		9.5		
	N	M		18½	-	23	9.5			
	Z	M		18½	-	24			7.9	
		F	11	10	-					Mag.: M = 6.3(ESK)
KEW	ZV	ePKP	08	21	13					
12. ESK	Z'	ePKP	13	16	09.3					Δ = 127°= 14100km.
	Z	ePP		18	12					
	NE	ePS		28	15					12 57 09.7;5.3°S.152.2°E.
	NE	eSS		35	46					h = 41km. New Britain
	E	eLQ		51½	-					region. USCGS.
	E	M	14	10	-	22		12		
	NZ	M		11	-	24	16		23	
	E	M		12½	-	22		13		
	NZ	M		13½	-	22	20		27	
		F	16	00						Mag.: M = 6.7(ESK)
KEW	ZV	ePKP	13	16	13					
12. ESK	Z	ePKP	18	24	13					Δ = 140.7°= 15600km.
	Z	ePP		27	17					18 04 56.1; 16.0°S.,
	E	eLQ	19	03½	-					167.4°E. h = 45km. New
	E	M		27	-	23		0.8		Hebrides Is. USCGS.
	NZ	M		28½	-	23	0.6		0.8	
		F	20	45	-					Mag.: M = 5¼-5½(ESK)
13. ESK	Z'	eP	01	07	24	1.1			0.05	00 54 42.7; 4.3°S.81.0°W.
	Z'	ipP		07	35	1.1			0.07	h=34km. Peru-Ecuador
KEW	ZV	iP	01	07	28					border. USCGS.
	ZV	epP		07	39					Depth = 37km.(ESK)
										Mag.: M = 5¼(ESK)
										Depth = 37km(KEW)

Met. O. 765

SEISMOLOGICAL BULLETIN

AUGUST 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
13. ESK	E	eLQ	05	40	-					04 40 55.3; 15.9°S. 167.5°E.
	E	M	06	03	-	23		0.3		h = 34km. New Hebrides
	NZ	M		04½	-	23	0.4		0.6	Islands. USCGS.
		F		50	-					Mag.: M = 5¼(ESK)
13. ESK	E	eLQ	12	24½	-					11 24 51.8; 16.0°S. 167.0°E.
	E	M		44½	-	22		0.4		h=33km. New Hebrides Is.
	N	M		45	-	20	0.5			USCGS.
	Z	M		45½	-	20			1.1	
		F	-	-	-					Mag.: M = 5¼(ESK)
13. ESK	Z	ePKP	12	59	44					Δ = 142° = 15800km.
	ZN	ePP	13	02	53	19	5.3	1.4	11.8	
	E	eLQ		38	45					12 40 08.3; 15.9°S. 166.8°E
	ZN	eLR		47	15					h = 33km. New Hebrides
	ZN	M	14	00	-	22	34		39	Islands. USCGS.
	E	M		00	-	23		30		
		F	16	30	-					Mag.: M = 7.0(ESK)
KEW	ZV	ePKP	12	59	49					
13. ESK	E	eLQ	18	54½	-					17 56 27.6; 16.6°S. 167.6°E.
	ZN	M	19	18½	-	20	2.0		2.4	h = 39km. New Hebrides
	E	M		19	-	22		2.2		Islands. USCGS.
		F	20	35	-					Mag.: M = 5½-6(ESK)
13. ESK	NZ	eLR	22	57½	-					21 57 38.7; 6.4°S. 148.5°E.
	E	M	23	14	-	22		2.0		h = 51km. New Britain.
	NZ	M		15	-	21	2.6		3.4	USCGS.
		F	24	25	-					Mag.: M = 5¾-6(ESK)
14. ESK	Z'	iP	04	53	01.0					C. 04 47 55; 38.7°N. 21.8°E.
										h = 56km. Greece. USCGS.
14. ESK	Z	ePKP	11	27	11					Δ = 140° = 15500km.
	Z	ePP		30	10					11 07 47.1; 15.8°S. 166.8°E
	E	eLQ	12	06	-					h = 33km. New Hebrides
	E	M		26½	-	22		0.7		Islands. USCGS.
	NZ	M		27	-	22	0.7		1.4	
		F	13	30	-					Mag.: M = 5¼(ESK)
14. ESK	Z'	iPKP	16	25	15.7					16 06 45.9; 19.6°S. 178.2°W
										h = 581km. Fiji Is. USCGS.
16. ESK	Z,Z'	eP	04	42	43					Δ = 30.7° = 3400km.
	NE	eS		47	42					04 36 37.7; 35.2°N. 35.6°W
	N	e		49	-					h = 33km. North Atlantic
	NE	M		50½	-	20	7.5	4.4		Ridge. USCGS.
	Z	M		51	-	18			5.9	
		F	05	30	-					Mag.: M = 5¼(ESK)
16. ESK	Z'	eP	12	28	43.0	1			0.03	Δ = 77.3° = 8600km.
	E	eS		38	31					12 16 49.9; 5.2°N. 77.5°W.
	N	ePS		38	48					h = 15km. Near coast of
KEW	ZV	eP	12	28	49					Colombia. USCGS.
16. ESK	Z'	eP	12	31	26.3	1.2			0.05	12 19 35.5; 5.0°N. 77.6°W.
										h = 33km. Near coast of
KEW	ZV	eP	12	31	33					Colombia. USCGS.
16. ESK	Z'	iP	12	46	09.4	1.7			0.35	C. Δ = 58.2 = 6470km.
	Z'	ipP		46	22.7	1.3			0.19	
	NE	eS		54	07	20	10.5	3.6		12 36 23.3; 0.6°S. 19.9°W.
	NE	eLQ	13	00	-					h = 33km. Central
	E	M		04½	-	17		8.8		Mid-Atlantic Ridge. USCGS.
	N	M		04½	-	16	7.6			

Contd.

Met. O. 765

SEISMOLOGICAL BULLETIN

AUGUST 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
contd.										
16	EN	M	13	11	-	15	7.0	5.6		
	Z	M		12	-	15			8.8	
		F	14	25						Mag.: M = 5.9(ESK)
KEW	ZV	eP	12	45	49					C.
	ZV	ipP		45	59					
16. ESK	NE	eL	18	11	-					17 01 26.8;61.4°S.154.3°E.
	E	M		40	-	23		0.7		h = 33km. Balleny Is.
	N	M		40½	-	23	0.7			USCGS.
	Z	M		41	-	23			0.9	
		F	19	10	-					Mag.: M = 5¼-5½(ESK)
16. ESK	Z'	eP	19	59	19.0					Δ = 30.4° = 3380km.
	NE	eS	20	04	16					
	NE	eL		06	-					19 53 18; 35.9°N.35.0°W.
	N	M		07	-	19	3.0			h = 33km. Azores Is.
	E	M		07	-	20		1.6		USCGS.
	Z	M		08	-	18			2.6	
		F	20	35	-					Mag.: M = 4¾(ESK)
17. ESK	Z'	eP	00	28	32.4					Δ = 30.5°= 3400km.
	NE	eS		33	30					
	NE	eL		35	-					00 22 23.9; 35.1°N.35.2°W
	N	M		36	-	20	2.3			h = 33km. North Atlantic
	E	M		36	-	21		1.4		Ridge. USCGS.
	Z	M		37	-	19			2.1	
		F	01	00	-					Mag.: M = 4¾(ESK).
17. ESK	Z'	eP	08	57	16.1					08 46 01.3;53.9°N.160.8°E.
										h = 5km. Near Kamchatka.
										USCGS.
17. ESK	Z'	eP	10	48	05.6					C. Δ = 91° = 10100km.
	E	eSKS		58	33					
	N	eS		59	00					10 35 04.1; 5.3°N.96.2°E.
	N	eLQ	11	11½	-					h = 33km. Northern
	Z	M		33	-	22			6.9	Sumatra. USCGS.
	N	M		33½	-	22	5.5			
	E	M		34	-	21		7.1		
		F	12	45	-					Mag.: M = 6-6¼(ESK)
17. ESK	Z'	ePKP	12	33	11.0					12 14 30.9;20.6°S.177.8°W.
										h = 501km. Fiji Is.USCGS.
17. ESK	Z'	ePKP	13	23	24.3					13 04 30.4; 6.6°S.147.2°E
										h = 89km. New Guinea.
										USCGS.
17. ESK	Z'	eP	13	27	40.1					13 16 12.7;52.0°N.175.2°E
										h = 33km. Andreanof Is.
										USCGS.
17. ESK	Z'	iP	14	13	59.0	0.9			0.02	C. 14 02 19; 15.2°N.,
										92.1°W.
										h = 121 km. Mexico-
										Guatemala border.USCGS.
18. ESK	Z	ePKP	15	10	59					14 51 29.3;16.0°S.167.0°E.
	Z	ePP		13	53					h = 5km. New Hebrides
	E	eLQ		50	-					Islands. USCGS.
	NZ	eLR		57½	-					
	ZNE	M	16	08½	-	21	3.0	2.0	3.6	
		F	17	15	-					Mag.: M = 6(ESK)

SEISMOLOGICAL BULLETIN

AUGUST 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
20. ESK	Z'	iPKP	06	13	00.5					Δ = 116° = 12900km.
	Z,Z'	ePP		14	15.2	18			2.1	
	ZNE	eSKS		19	19					PPZ' 2 sec. 0.30 μ
	NE	eS		21	28	15	2.7	2.2		
	ZNE	eSP		23	25					05 54 50.0;5.7°S.,128.6°E.
	N	eSS		30	01					h = 326km. Banda Sea.
	N	eLQ		41	-					USCGS.
	E	M	07	01	-	22		4.4		
	N	M		02	-	20	6.0			
	Z	M		02	-	19			3.9	
		F		45	-					Mag.: M = 6¼(ESK)
KEW	ZV	ePP	06	14	16					
20. ESK	Z'	eP	09	55	45.9	1.4			0.09	D. Δ = 93° = 10300km.
	Z,Z'	epP		56	18.4	1.5			0.16	Depth = 124km(ESK)
	NE	eSKS	10	06	07	14	1.9	3.3		09 42 48.5;19.0°S.69.1°W.
	NE	eSS		12	45					h = 129km. Northern Chile.
		F	11	10	-					USCGS.
										Mag.: M = 5¾(ESK)
KEW	ZV	eP	09	55	44					Depth = 117km(KEW)
	ZV	epP		56	15					
20. ESK	Z'	iPKP	21	41	26.7	0.9			0.10	Depth = 73km.
	Z'	i		41	28.8					
	Z'	ipPKP		41	44.9					21 21 50.9;22.9°S.176.3°W.
	E	eSS	22	03	44					h = 77km. South of Fiji Is
	E	eL		22½	-					USCGS.
	Z	M		49½	-	20			1.8	
	NE	M		50	-	20	1.0	1.0		
		F	23	35	-					
KEW	ZV	ePKP	21	41	35					Depth = 69km(KEW)
	ZV	epPKP		41	55					
23. ESK	Z,Z'	iP	14	14	14.2	1.5			0.15	Δ = 24.7° = 2750km.
	Z'	i		14	20.2					
	NE	eS		18	31	16	2.7	4.2		14 08 58.1;40.5°N.26.1°E.
	N	eLQ		20	-					h = 33km. Turkey. USCGS.
	NE	M		23	-	17	14	12		
	Z	M		24	-	17			8	Mag.: M = 5¼(ESK)
		F	15	00	-					
KEW	ZV	eP	14	13	43					
23. ESK	Z'E'	iPg	14	37	00.1					Δ = 6km.
	Z'N'E'	iSg		37	02.2					Local.
	Z'N'E'	M		37	04	0.5	0.38	0.35	0.50	
		F		38	00					
23. ESK	Z,Z'	iP	19	58	02.6	17	12	57	134	C. Δ = 78.1° = 8680km.
	Z'	i		58	06.3					PZ' 3sec. 14 μ
	Z	iPP	20	01	00	17	13	34	55	
	NE	eS		07	53	20	130	64		19 46 02.9;16.3°N.95.8°W.
	N	eLQ		19	-					h=28km. Oaxaca, Mexico.
	Z	eLR		22½	-					Six killed, slight damage.
	Z	M		34	-	21			330	USCGS.
	N	M		34½	-	21	121			
	E	M		35	-	21		282		
		F	24	40	-					Mag.: M = 8.0(ESK)
KEW	ZV	iP	19	58	16					
	ZV	i		58	21					
	ZV	M	20	35	-	19			385	

Met. O. 765

SEISMOLOGICAL BULLETIN

AUGUST 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
23. ESK	Z'	eP	23	24	24.6					23 12 27.1;16.2°N.95.5°W. h = 33km. Oaxaca,Mexico. USCGS.
23. ESK	Z'	eP	23	25	44.9					23 13 47.2;15.9°N.95.7°W. h = 48km. Oaxaca,Mexico. USCGS.
24. ESK	Z,Z'	iP	01	08	25.3	12			0.8	C. Δ = 80° = 8900km.
	NE	eS		18	28					00 56 21.4; 15.9°N.96.2°W.
	ZE	eL		33	-					h = 12km. Near Oaxaca,
	N	M		43	-	25	1.6			Mexico. USCGS.
	EZ	M		43½	-	24		2.1	2.6	Mag.: M = 5¾(ESK)
KEW	ZV	eP	01	08	39.5					
24. ESK	Z,Z'	iP	01	13	00.5	13			1.0	C. 01 01 00.8;16.2°N.96.2°W
KEW	ZV	iP	01	13	15					h = 31km. Oaxaca,Mexico.
24. ESK	Z'	eP	01	16	42.6					01 11 05.1;35.7°N.23.3°E. h = 33km. Crete. USCGS.
24. ESK	Z'	iPKP	07	25	56.4	1			0.11	D. 07 06 50.0;21.9°S.,
KEW	ZV	ePKP	07	26	06					177.3°W. h=290km.Fiji Is. USCGS.
24. ESK	Z,Z'	eP	13	22	38					Δ = 62.8° = 7000km.
	NE	eS		31	04	12	0.9	0.7		13 12 19.4; 59.4°N.145.6°W
	E	eL		41	-					h = 19km. Gulf of Alaska.
	ZNE	M		50½	-	18	1.4	1.4	2.7	USCGS.
		F	14	15	-					Mag.: M = 5.1(ESK)
25. ESK	Z'	iP	05	03	41.2					
	NE	eL		12	-					04 57 47.5;34.7°N.25.1°E.
	NE	M		14½	-	18	1.2	1.4		h = 26km. Crete. USCGS.
	Z	M		14½	-	18			1.0	
		F		17	-					Mag.: M = 4½(ESK)
KEW	ZV	eP	05	03	08					
27. ESK	Z'	iP	18	33	57.6	0.7			0.02	18 22 02.8;44.6°N.148.9°E.
KEW	ZV	eP	18	34	15					h = 38km. Kurile Is.USCGS.
29. ESK	Z'	eP	01	57	39.2					01 45 57.3;14.1°N.90.5°W.
	ZE	eL	02	22	-					h = 107km. Guatemala.
	ZNE	M		24	-	30	0.8	1.9	2.8	USCGS.
		F		40	-					Mag.: M = 5¼(ESK).
29. ESK	ZN	eL	13	52½	-					12 46 30.1;15.7°S.167.6°E.
	ZNE	M	14	06½	-	23	1.4	1.1	1.6	h = 10km. New Hebrides Is.
		F		45	-					USCGS.
										Mag.: M = 5½(ESK)
29. ESK	Z'	eP	13	44	35.2					13 39 19;39.1°N.23.9°E.
										h=22km.Aegean Sea.USCGS.
29. KEW	ZV	ePKP	14	15	57					13 57 20.2;17.7°S.178.9°W.
										h = 571km. Fiji Island. USCGS.
30. ESK	ZN	eL	04	39½	-					03 22 02.2; 16.9°S.167.4°E
	NE	M		55	-	22	0.7	1.0		h = 15km. New Hebrides Is.
	Z	M		56	-	20			0.9	
		F	05	45	-					Mag.: M = 5¼-5½(ESK)

SEISMOLOGICAL BULLETIN

AUGUST 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
31. ESK	Z'	iP	07	36	25.0	1.3			0.13	Δ = 33.3° = 3700 km.
	NE	eS		41	42	17	0.4	1.6		07 29 47.4; 39.3°N. 40.9°E.
	Z	eL		45½	-					h = 22km. Turkey. 40 injured
	EN	M		53	-	18	6.7	7.0		and extensive property
	Z	M		53½	-	16			6.3	damage. USCGS.
		F	08	35	-					Mag.: M = 5.0(ESK)
31. ESK	NE	eS	09	29	52	20	1.3	0.7		09 12 00.9; 1.0°N. 27.8°W.
	NE	eLQ		36	-					h = 33km. Mid-Atlantic
	ZNE	M		42½	-	18	0.9	0.9	1.8	Ridge. USCGS.
		F	10	00	-					Mag.: M = 4.9(ESK)

D 71970/1(9)/R.72 140 5/66 PD

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR SEPTEMBER 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		15	100		750 at 15 sec.
	E		15	100		
	Z		15	100		
BENIOFF WWSS	N'		1.0	0.75		25000 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z'	iP	04	39	49.2	0.8			0.03	C. 04 29 21.8; 51.3°N., 150.6°E. h=537km. Sea of Okhotsk. USCGS.
KEW	ZV	iP	04	40	07.5					
1. KEW	ZV	ePKP	05	07	31					Depth = 157km. 04 37 34.9 34.6°S., 179.6°E. South of Kermadec Islands. USCGS.
	ZV	epPKP		08	13					
2. ESK	Z,Z'	iP	04	38	06.7	1			0.09	C. Δ = 73.3° = 8140km.
	E	eS		47	32					
	NZ	eLR	05	01	-					04 26 37.3; 51.9°N. 175.5°E h=31km. Rat Islands. USCGS
	Z	M		06½	-	23			0.7	
	N	M		07	-	22	0.6			
	E	M		08	-	22		0.5		
		F		40	-					Mag.: M = 5-5¼(ESK).
KEW	ZV	eP	04	38	28					C.
4. ESK	Z'	eP	08	00	10.3					07 48 45.1; 52.0°N. 170.4°W h=38km. Fox Is. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

SEPTEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
4. ESK	Z'	eP	10	31	41					Δ = 76.9° = 8540km.
	NE	eS		41	25	18	0.7	1.2		
	E	eL		52	-					10 19 51.3; 46.6°N. 153.5°E.
	Z	M	11	11½	-	18			2.7	h=27km. Kurile Is. USCGS.
	N	M		11½	-	17	1.7			
	E	M		11½	-	16		1.4		
		F		40	-					Mag.: M = 5¼(ESK)
KEW	ZV	eP	10	31	59					
4. ESK	Z,Z'	iP	14	43	22.7	22	12.8	4.6	22.2	C. Δ = 64.5° = 7170km.
	Z	ePP		45	44	22	9.6	4.6	10.7	PZ' 1.2 sec. 0.34 μ
	E	iS		51	58	25	17	34		14 32 47.9; 58.2°N. 152.6°W.
	E	eSS		56	07					h = 19km. Kodiak Island
	E	eLQ	15	00½	-					region. USCGS.
	ZN	eLR		03	-					
	ZNE	M		08½	-	26	140	115	183	
	Z	M		14	-	18			146	
	N	M		14	-	19	125			
	E	M		14½	-	17		63		Mag.: M = 7.2(ESK)
		F	18	40	-					
KEW	ZV	eP	14	43	49					C.
5. ESK	NE	M	23	53	-	23	0.9	1.0		23 02 00.6; 20.8°N. 121.4°E
		F	24	05	-					h=105km. Philippine Is.
										Mag.: M=5¼(ESK) USCGS.
6. ESK	NE	eL	04	02	-					03 18 39.1; 21.2°N. 121.4°E
	NE	M		10	-	22	4.5	5.9		h = 33km. Taiwan region.
	Z	M		10½	-	22			1.9	USCGS.
		F		40	-					Mag.: M = 6(ESK)
6. ESK	Z'	eP	11	54	24.5					11 42 36.8; 46.6°N. 152.7°E
										h = 33km. Kurile Is. USCGS.
KEW	ZV	eP	11	54	42					
6. ESK	Z'	eP	21	25	36.5					21 13 30.5; 6.6°N. 84.4°W.
	EZ	eLR		50½	-					h = 21km. Off coast of
	ZNE	M		57½	-	20	0.3	0.5	0.5	Central America. USCGS.
		F	22	15	-					Mag.: M = 4¾(ESK)
7. ESK	Z'	eP	06	21	28.8					06 16 48.4; 35.3°N. 4.4°E.
										h=33km. Algeria. USCGS.
7. ESK	NE	eL	07	43	-					06 57 24.8; 24.3°N. 142.6°E.
	E	M		54½	-	23		0.8		h = 16km. Volcano Islands
	NZ	M		55½	-	22	0.5		0.7	region. USCGS.
		F	08	15	-					Mag.: M = 5-5¼(ESK)
7. ESK	Z'E'	iPn	15	53	04.4					Δ = 115km.
	Z'E'	iPg		53	05.4					
	Z'N'	iSx		53	17.0					Local.
	N'	iSn		53	18.8					
	Z'N'E'	iSg		53	19.5	0.6	0.06	0.03	0.04	
		F		54	15					
8. ESK	Z',Z'	eP	03	36	57.8					Δ = 65.0° = 7220 km.
	NE	eS		45	36					
	NE	eLR		57	-					03 26 20.7; 57.5°N. 152.1°W
	E	M	04	05	-	19		1.1		h=25km. Kodiak Is. USCGS.
	NZ	M		05½	-	19	1.3		1.9	
	ZNE	M		08	-	16	2.1	1.7	3.5	
		F		35	-					Mag.: M = 5¼(ESK)

SEISMOLOGICAL BULLETIN

SEPTEMBER 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
8. ESK	Z'	iP	11	27	26.0	1			0.02	11 16 34.4; 55.7°N.155.4°W
	EN	eS		36	18					h=33km. South of Alaska.
	ZNE	M		59	-	20	1.4	1.5	2.1	USCGS.
		F	12	35	-					Mag.: M = 5-5¼(ESK)
9. ESK	Z'	iP	10	14	33.0	14			1.3	Δ = 79.8° = 8870 km.
	NE	eS		24	32	16	1.2	2.1		PZ' 1.3 sec. 0.15 μ
	ZE	eLR		39	-					
	N	M		45½	-	21	3.9			10 02 25.4; 6.5°N.,84.4°W.
	EZ	M		46	-	21		6.4	6.3	h=27km. Off coast of
	Z	M		54	-	16			7.2	Central America. USCGS.
	E	M		54½	-	16		4.5		Mag.: M = 5.2(ESK)
		F	11	40	-					(Esk - Body waves)
										M=6.1 (Esk - Surface waves)
KEW	ZV	iP	10	14	42					
10. ESK	Z'	iP	19	38	10.2					19 25 52.7; 37.4°N.141.1°E
										h=75km.Near Honshu,Japan.
										USCGS.
11. ESK	Z'	iP	04	54	19.4	0.9			0.04	04 49 19; 39.2°N.22.4°E.
										h = 66km. Greece. USCGS.
11. ESK	Z'	ePKP	07	11	59.8					Δ = 126.9° = 14100km.
	Z	ePP		14	02					
	NE	eSKS		19	20					06 53 01.5; 5.3°S.153.0°E.
	NE	eSKKS		20	49					h = 67km. New Britain
	NE	eSKKKS		21	06					region. USCGS.
	NE	ePS		24	09					
	EN	eLQ		47	-					
	E	M	08	06½	-	22		3.5		
	NZ	M		07	-	23	4.9		5.0	
	E	M		10	-	21		2.9		
	NZ	M		11	-	21	7.3		7.5	
		F	09	50	-					Mag.: M = 6.2(ESK).
12. ESK	Z'	iPKP	08	59	14.0	2			0.28	D. Δ = 126° = 14000km.
	Z	ePP	09	01	12					
	Z	ePKS		02	26					08 40 12.8; 6.3°S.151.6°E.
	NE	eSKKS		08	04					h=48km. New Britain
	Z	ePS		11	03					region. USCGS.
	NE	eLQ		34	-					
	E	M		58	-	22		3.5		
	Z	M		58½	-	21			4.2	
	N	M		59	-	22	2.3			Mag.: M = 6-6¼(ESK)
		F	11	15	-					
12. ESK	Z'	eP	21	36	22.4					21 25 06; 52.9°N.158.5°E.
										h=33km. Near Kamchatka.
										USCGS.
12. ESK	Z'	iP	22	15	14.7	10	0.4	0.9	2.9	D. Δ = 86.4° = 9600km.
	Z	ePP		18	43	12			1.3	PZ' 1.5 sec. 0.19 μ
	E	eSKS		25	36					
	NE	eS		25	52	14	6.6	6.3		22 02 34.3; 6.4°S.70.8°E.
	NE	eSS		31	30					h = 33km.Chagos Archipelago
	N	eLQ		39	-					region. USCGS.
	N	M		54½	-	21	2.8			
	Z	M		55	-	21			2.6	
	E	M		55½	-	20		3.2		
		F	24	10	-					Mag.: M = 6.1(ESK)
13. ESK	Z'	eP	13	18	55.0	1			0.05	
	NE	eS		28	00					
	E	eLQ		37	-					13 07 48.3;55.5°N.165.7°E.
	ZNE	M		43½	-	22	1.5	1.6	2.0	h=23km. Komandorsky Is.
	ZE	M		53	-	18		2.0	1.1	region. USCGS.

contd.

SEISMOLOGICAL BULLETIN

SEPTEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
contd.										
13. ESK	N	M	13	53	-	17	1.4			
		F	14	40	-					Mag.: M = 5¼(ESK).
KEW	ZV	eP	13	19	17					
13. ESK	E	ePS	16	45	52					16 15 44.5; 36.5°S. 97.5°W.
	NE	eSS		52	44					h=33km. Southeast Pacific
	N	eLQ	17	06	-					Ocean. USCGS.
	ZE	eLR		13	-					
	N	M		25	-	22	0.5			
	ZE	M		25½	-	20		0.5	0.8	
		F	18	35	-					Mag.: M = 6¼(ESK)
13. ESK	Z'	ePKP	19	44	02.8					19 25 30.8; 20.9°S. 178.8°W
										h=598km. Fiji Is. USCGS.
13. ESK	Z'	eP	21	43	16.8					21 31 45; 49.1°N. 155.8°E.
										h = 78km. Kurile Is. USCGS.
14. ESK	Z'	eP	08	20	17.5					08 15 04; 37.5°N. 19.6°E.
										h=33km. Ionian Sea. USCGS.
14. ESK	Z	ePP	08	45	40	10			0.6	Δ = 104.5° = 11600Km.
	NE	eSKS		51	54					
	NE	eS		53	07	10	0.8	0.9		08 27 15.9; 8.4°N. 126.8°E.
	Z	ePS		54	42					h=33km. Philippine Is.
	NE	eL	09	16	-					USCGS.
	ZNE	M		27½	-	20	0.9	1.7	1.4	
		F	10	10	-					Mag.: M = 5.8(ESK)
14. ESK	Z'	eP	14	29	39.5					14 18 03.5; 51.4°N. 174.6°E
										h=11km. Near Is. USCGS.
16. ESK	ZE,Z'	eP	04	13	31.8					
	ZE	eL		17½	-					
	ZE	M		18½	-	22		1.2	1.3	
		F		25	-					
16. ESK	Z'	eP	04	21	49.1					04 10 22.6; 40.4°N. 125.7°W
										h=33km. Off coast of
										California. USCGS.
17. ESK	Z'	iP	04	08	32.4	0.8			0.02	03 59 57.5; 49.8°N. 78.1°E.
										h=0km. Eastern Kazakh SSR.
										USCGS.
17. ESK	N'	ePKP	08	38	37.8					08 19 53.8; 23.3°S. 179.3°E.
										h=544km. South of Fiji.
										USCGS.
17. ESK	Z,Z'	iP	11	25	57.4	10			3.1	Δ = 82.8° = 9200km.
	Z'	i		25	59.0					Depth = 190km. (ESK)
	Z,Z'	ipP		26	44.0	10	0.7	2.0	4.7	PZ' 1.4 sec. 0.66 μ
	NE	eS		35	58	20	4.6	8.1		11 13 56.4; 1.4°S. 77.6°W.
	E	e		36	55					h = 190km. Ecuador.
	E	eSS		41	10					USCGS. Mag.: M=5.9(ESK).
	N	eLQ		48½	-					
	ZE	eLR		52½	-					
	ZNE	M		57	-	20	2.6	3.7	5.5	
		F	12	35	-					
KEW	ZV	eP	11	26	02					Depth = 187km. (KEW)
	ZV	ipP		26	48					
17. ESK	Z'	eP	13	11	41.5					12 59 19.3; 36.7°N. 141.2°E.
	ZNE	M		52½	-	22	1.4	1.0	2.2	h=57km. Near Honshu, Japan.
		F	-	-	-					USCGS. Mag.: M=5¼(ESK)

Met. O. 765

SEISMOLOGICAL BULLETIN

SEPTEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
17. ESK	Z'	eP	13	33	24.2					13 20 58.3; 36.5°N.141.4°E.
	ZNE	M	14	14	-	22	1.2	1.0	2.2	h=45km. Near Honshu,Japan.
		F		35	-					USCGS. Mag.: M=5-5¼(ESK).
17. ESK	Z'	eP	14	35	04.9					14 22 36.5;36.5°N.141.4°E.
	ZNE	M	15	16	-	20	1.3	1.5	2.3	h=23km. Near Honshu,Japan.
		F		35	-					USCGS.
	KEW	ZV	eP	14	35	18				Mag.: M = 5¼-5½
17. ESK	Z'	eP	15	31	02.5					15 18 38.4;36.3°N.141.2°E.
	E	e		41	44					h=66km.Near Honshu,Japan.
	ZE	M	16	11½	-	20	1.3	2.2	2.8	USCGS.
	N	M		12	-	20				
		F		30	-					Mag.: M = 5½(ESK)
	KEW	ZV	iP	15	31	15				
17. ESK	Z,Z'	eP	16	33	44.3	14	2.5	1.4	7.5	C. Δ = 84½ = 9400km.
	Z,Z'	i		33	46.3					Depth = 40km. (ESK)
	Z'	epP		33	56.6					PZ' 1.7 sec. 0.46 μ
	Z'	i		33	58.2					PH' 1.7 sec. 0.18 μ
	Z,Z'	ePP		36	56	12			4.0	
	NE	eS		44	07	22	11	20		16 21 21.9;36.3°N.141.1°E.
	E	e		45	15					h=72km. Near east coast of
	N	eSS		49	56					Honshu, Japan. USCGS.
	E	eLQ		56½	-					
	ZNE	M	17	14	-	20	44	33	71	
	ZN	M		15½	-	17	40		84	
	E	M		15½	-	18		28		
		F	19	20	-					Mag.: M = 6.7(ESK)
	KEW	ZV	eP	16	33	57.5				C. Depth = 40km. (KEW)
		ZV	epP		34	09				
18. ESK	Z,Z'	iP	20	56	57.4	10			0.7	Δ = 63° = 7000km.
	NE	eS	21	05	22	10	1.6	1.7		20 46 39.2;59.5°N.145.1°W.
	NE	eL		16	-					h=22km. Gulf of Alaska.
	E	M		24	-	15		2.8		USCGS.
	NZ	M		24½	-	17	3.1		4.3	
		F		55	-					Mag.: M = 5.5(ESK)
18. ESK	NE	eS	22	29	05	10	1.4	1.4		22 03 18.8; 8.2°N.126.8°E.
	E	eL		48½	-					h=85km. Philippine Is.
	ZNE	M	23	03½	-	20	1.3	2.3	1.6	USCGS.
		F		40	-					Mag.: M = 6-6¼(ESK).
19. ESK	Z'	ePKP	01	46	30.8					01 26 52.5;22.1°S.174.9°W.
	ZNE	M	02	56	-	18	0.4	0.9	0.8	h=33km. Tonga Is. USCGS.
		F	03	45	-					Mag.: M = 5½(ESK)
19. ESK	ZE,Z'	eP	03	57	01	10		0.8	0.9	03 52 44.9;53.1°N.35.3°W.
	ZE	eL	04	01½	-					h = 33km. North Atlantic
	ZNE	M		02½	-	19	0.8	1.5	2.1	Ocean. USCGS.
		F		10	-					Mag.: M = 4.0(ESK).
19. ESK	Z'	iP	08	13	08.9	0.5			0.01	08 10 41.8;48.0°N.8.3°E.
										h = 33km. Switzerland.
										USCGS.
19. ESK	Z'	iPKP	10	04	07.1					C. 09 44 46.6;20.6°S.,
										169.8°E.h=126km. New
										Hebrides Islands. USCGS.
19. ESK	ZE	eL	15	09	-					13 55 39.9;54.4°S.135.7°W.
	N	M		24	-	20	0.8			h=33km.South Pacific
	EZ	M		24½	-	18		0.7	0.7	Ocean. USCGS.
		F		55	-					Mag.: M = 5½(ESK).

Met. O. 765

SEISMOLOGICAL BULLETIN

SEPTEMBER 19 65

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
21. ESK	Z,Z'	iP	01	50	50.1	15	2.2	2.1	7.1	Δ = 85.1° = 9460km.
	Z,Z'	ipP		51	40.0					Depth = 205km. (ESK)
	Z	ePP		54	15	15	2.0	2.1	5.5	PZ' 2 sec. 0.61 μ
	NE	eS	02	01	00	15	5.4	7.1		
	NE	ePS		02	20					01 38 30.2; 29.1°N. 128.2°E.
	NE	ePPS		03	26					h=197km. East China Sea.
	NE	eLQ		14	-					USCGS.
	ZNE	M		27½	-	24	5.6	8.6	9.4	
		F	03	15	-					Mag.: M = 6.1(ESK)
KEW	ZV	eP	01	50	58					Depth = 205(KEW)
	ZV	epP		51	48					
21. ESK	Z'	eP	03	33	20.2	1			0.03	03 26 37.2; 40.7°N. 50.0°W.
	NZ	eL		42	-					h = 23km. North Atlantic
	Z	M		43½	-	20			2.1	Ocean. USCGS.
	N	M		44	-	20	1.3			
		F		55	-					Mag.: M = 4½(ESK).
KEW	ZV	eP	03	33	33					
22. ESK	NE	eS	04	47	03					04 24 47.8; 20.8°N. 99.3°E.
	N	eL		58	-					h=35km. Burma. USCGS.
	NE	M	05	09½	-	23	7.5	5.5		
	Z	M		11½	-	20			2.9	
		F		40	-					Mag.: M = 6(ESK)
22. ESK	Z;N;E'	iPg	10	57	37.8					
	N'E'	iSg		57	45.0					Δ = 67km.
	Z'N'E'	M		57	50	0.9	0.07	0.08	0.07	Local.
		F		58	20					
22. ESK	N	eL	13	30	-					12 49 42.9; 32.5°N. 131.4°E.
	ZNE	M		43½	-	20	1.3	1.1	2.2	h=6km. Kyushu, Japan.
		F	14	00	-					USCGS.
										Mag.: M = 5¼(ESK)
22. ESK	Z'	iPKP	20	20	47.3	1			0.04	D. 20 01 49.3; 5.4°S. 151.5°E
	E	eLQ		55	-					h=57km. New Britain region
	ZNE	M	21	14½	-	24	1.4	1.1	1.7	USCGS.
		F	22	10	-					Mag.: M = 5½(ESK)
KEW	ZV	ePKP	20	20	52					
22. ESK	Z,Z'	eP	22	20	27.1	12	1.0		2.7	C. Δ = 84.5° = 9390 km.
	Z,Z'	epP		20	39					PZ' 2.5 sec. 0.52 μ
	NE	eSKS		30	49					Depth = 41km. (ESK)
	NE	eS		31	07	16	2.1	4.0		
	E	eLQ		44	-					22 08 01.1; 36.4°N. 141.3°E
	NE	eLR		48½	-					h=44km. Near east coastof
	ZE	M	23	01	-	20		6.2	14.6	Honshu, Japan. USCGS.
	N	M		01½	-		9.5			
		F	24	05	-					Mag.: M = 5.9(ESK)
KEW	ZV	eP	22	20	40					C. Depth = 45km.(KEW)
	ZV	epP		20	53					
24. ESK	E	eL	24	44	-					23 53 42.1; 13.1°N. 145.3°E
	Z	M		57	-	18			0.7	h=58km. Mariana Islands.
	N	M		57	-	20	0.6			USCGS.
	E	M		57½	-	20		0.8		
		F	25	00	-					Mag.: M = 5¼(ESK)

Met. O. 765

SEISMOLOGICAL BULLETIN

SEPTEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
25. ESK	Z'N'E'	iPg	09	56	13.2					Δ = 55km.
	Z'N'E'	iSg		56	19.1					
	Z'N'E'	M		56	24	0.9	0.11	0.11	0.12	
		F		57	00					Local.
25. ESK	ZE	eL	12	08½	-					
	ZE	M		09½	-	20		0.6	0.7	11 59 54; 53.3°N.33.9°W.
		F		15	-					h = 33km.Atlantic Ocean.
										USCGS. Mag.: M=4(ESK).
25. ESK	Z'	eP	14	49	28.4					Δ = 83.6° = 9290 km.
	E	eS		59	46					14 37 15.4; 39.7°N.143.2°E
	ZNE	M	15	25½	-	20	1.3	2.3	1.1	h=44km.Near Honshu,Japan.
		F	-	-	-					USCGS. Mag.:M=5½(ESK).
25. ESK	Z'	iP	15	05	48.0					14 53 34.9; 39.6°N.143.2°E
	ZNE	M		42	-	20	1.0	1.7	1.1	h=43km. Near Honshu,Japan.
		F	16	10	-					Mag.: M=5¼(ESK).
25. ESK	Z'	iP	15	56	58.6					15 47 58.4;41.3°N.74.9°E.
	ZE	M	16	20	-	17		0.9	0.8	h=33km. Kirgiz SSR.USCGS.
	N	M		21	-	18	0.8			
		F		30	-					Mag.: M = 4¾(ESK).
KEW	ZV	eP	15	56	56					
25. ESK	NE	eL	17	43	-					16 52 09.6;12.9°N.145.3°E.
	N	M		55½	-	18	0.6			h=42km. Mariana Is.region.
	E	M		56	-	20		0.8		USCGS.
	Z	M		58	-	20			1.1	
		F	18	30	-					Mag.: M = 5¼(ESK).
25. ESK	ZE	eP	20	14	22	10		1.0	0.9	Δ = 19.1° = 2120 km.
	ZE	ePP		14	43	10		1.4	1.4	
	N	eS		17	50					20 10 06.6;54.1°N.35.2°W.
	ZE	eL		19	-					h = 33km. Atlantic Ocean.
	ZNE	M		20	-	21	1.0	5.6	7.6	USCGS.
		F		40	-					Mag.: M=4¼(ESK)
KEW	ZV	eP	20	14	52					
26. ESK	ZE	eP	10	07	33	11		1.5	1.5	Δ = 19.0° = 2110km.
	N	eS		11	00	20	1.7			10 03 18.4;54.3°N.35.2°W.
	ZE	eL		11½	-					h=33km.Atlantic Ocean.
	ZNE	M		13	-	20	2.6	0.8	4.3	USCGS.
		F		30	-					Mag.: M=4¼(ESK).
26. ESK	N	ePS	22	03	00					21 33 54.4;54.8°S.38.2°W.
	N	eSS		09	42					h=33km. South Georgia
	ZN	M		42½	-	18	1.2		1.4	Island region. USCGS.
	E	M		43½	-	18		0.7		
		F	23	10	-					Mag.: M = 5½(ESK)
27. ESK	Z'	iP	05	20	41.3	1			0.06	C. 05 09 13.3;51.9°N., 175.5°E. h=41km. Rat Is. USCGS.
28. ESK	Z'	ePKP2	05	26	43.2					05 06 36.8;28.0°S.178.1°W.
	E	eSS		49	44					h=33km. Kermadec Islands.
	E	eLQ	06	11	-					USCGS.
	ZNE	M		29	-	22	3.7	5.5	8.7	
		F	08	00	-					Mag.: M = 6¼(ESK).
28. ESK	Z'	ePKP	08	42	38.6					08 24 07; 21.5°S.180.0°W.
										h=642km. Fiji Is. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

SEPTEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
29. ESK	Z,Z'	iP	23	24	39.0	6	0.7	1.3	1.5	Δ = 20.0° = 2220km.
	N	eS		28	17	12	1.2	0.8		PZ' 1.1 sec. 0.07 μ
	ZNE	eL		29	-					23 20 19.0;45.1°N.28.2°W.
	N	M		29½	-	24	0.9			h=33km.North Atlantic
	EZ	M		30½	-	20		1.5	1.9	Ocean. USCGS.
		F		55	-					Mag. : M = 4.2(ESK)
KEW	ZV	eP	23	24	46					
30. ESK	Z'	iPKP	07	25	06.3					07 06 35.3;21.1°S.179.3°W.
										h=625km. Fiji Is. USCGS.
30. ESK	Z'	eP	23	57	59.0					Δ = 63.9° = 7100 km.
	Z'	i		58	23.8					
	N	eS	24	06	32					23 47 40.7;59.7°N.143.4°W.
	NE	ePS		06	41					h=19km.Gulf of Alaska.
	E	eLQ		13½	-					USCGS.
	ZN	eLR		16½	-					
	E	M		22	-	24		14.0		
	N	M		22½	-	20	6.8			
	Z	M		22½	-	25			10.8	
	N	M		24½	-	20	4.3			
	E	M		25	-	20		11.3		
	Z	M		25	-	21			11.2	
		F	25	40	-					Mag.: M = 6.0(ESK).

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR OCTOBER 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		15	100		750 at 15 sec.
	E		15	100		
	Z		15	100		
BENIOFF WWSS	N'		1.0	0.75		25000 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z'	eP	09	03	45.8	12	4.8	0.9	10.0	D. Δ = 75.6° = 8400km.
	Z'	i		03	46.7					PZ' 1.1 sec. 0.37μ
	NE	eS		13	23	16	10.2	4.6		
	N	eSS		18	25					08 52 05.8; 50.1°.,
	ZN	eLR		27½	-					178.3°E. h=32km. Rat Is.
	E	M		31½	-	27		10.0		Aleutian Islands. USCGS.
	NZ	M		32½	-	25	12.4		12.3	
	E	M		34½	-			8.4		
	NZ	M		35	-		6.0		10.0	
		F	11	50	-					Mag.: M = 6.4(ESK).
KEW	ZV	eP	09	04	07					D.
1. ESK	Z'	iPKP	13	41	03.1	1			0.21	13 22 28.5; 20.0°S. 174.4°E h=553km. New Hebrides Islands. USCGS.
KEW	ZV	ePKP1	13	41	09					
	ZV	iPKP2		41	19					
1. ESK	ZN	ePS	23	04	06					22 34 25.5; 60.7°S. 24.9°W.
	NE	eLR		29	-					h=33km. South Sandwich
	ZNE	M		40½	-	20	0.6	0.4	0.7	Islands. USCGS.
		F	24	10	-					Mag.: M = 5-5¼(ESK)

(34977)

ZV	eS	20	36					h=33km. Switzerland. USCGS.
ZV	M	21	16	1.7			0.7	
ZV	F	26	00					

Met. O. 765

SEISMOLOGICAL BULLETIN

OCTOBER, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
3. ESK	NE	eSS	05	35	37					05 12 22.5;38.2°S.48.4°E.
	ZNE	eLR	06	01½	-					h = 20km.Atlantic-Indian
	ZNE	M		16	-	22	0.9	0.8	1.1	Rise. USCGS.
		F		30	-					Mag.: M=5¼(ESK)
3. ESK	Z'	iP	10	57	39.9	1			0.03	C. 10 46 16.7;52.6°N.,
										170.6°W. h=22km. Fox Is.
										USCGS.
3. ESK	Z'	iP	14	57	02.1	1	0.12	0.05	0.22	C. Δ = 74.2° = 8240km.
	N	eS	15	06	32					PZ 8 sec. 2.4 μ
	ZN	eLR		21.3	-					14 45 26.8;49.5°N.156.5°E.
	ZN	M		29	-	22	1.9		3.0	h=33km. Kurile Islands.
	E	M		29	-	20		1.5		USCGS.
		F	16	10	-					Mag.: M = 5.8(ESK)
KEW	ZV	iP	14	57	21					C.
3. ESK	ZNE	ePS	16	44	13					16 14 54.9;42.9°S.75.4°W.
	N	eSS		50	36					h=28km. Off coast of
	ZNE	M	17	22	-	20	2.4	1.9	4.6	Chile. USCGS.
	ZNE	M		25½	-	18	3.5	3.9	6.2	
		F	18	15	-					Mag.: M = 6(ESK).
4. ESK	Z'	iP	00	13	58.7	1			0.02	00 02 32.9;52.3°N.173.0°E.
										h=33km. Near Islands.USCGS.
4. ESK	Z'	ePKP	00	32	21.0					00 13 25.8;6.4°S.,147.4°E.
										h=75km. New Guinea.USCGS.
4. ESK	NE	eL	02	13	-					
	NE	M		15½	-	20	0.6	1.1		No USCGS or BCIS PDE
	ZN	M		23	-	16	1.3		1.9	
		F		25	-					
5. ESK	Z'	iP	00	26	35.9	0·9			0·03	00 17 10.5;65.4°N.134.0°W.
	NE	eL		41	-					h=8km.Yukon,Canada.USCGS.
	ZNE	M		46	-	22	0.6	0.6	0.5	
		F	01	00	-					Mag.: M=4½-4¾(ESK)
6. ESK	Z'	eP	08	14	23.8					08 03 03.2;29.2°N.96.1°E.
										h=27km.India-China border.
										USCGS.
6. ESK	Z'	eP	15	43	52.8	1			0.02	15 35 04.1;36.5°N.70.2°E.
										h=203km. Hindu Kush.USCGS.
6. ESK	Z'	eP	18	08	52.6					18 02 14; 43.1°N.46.4°E.
										Caucasus. BCIS.
6. ESK	Z'	eP	18	41	26.7					18 37.5; 71¼°N.21°W. Near
	ZN	eL		45	-					coast of Greenland.BCIS.
	ZNE	M		46½	-	18	0.6	0.5	0.7	
		F		55	-					
7. ESK	Z,Z'	ePKP	01	28	41.2					01 09 07.2;21.7°S.174.3°W.
	E	eSS		50	55					h=48km. Tonga Is. USCGS.
	ZNE	M	02	33½	-	20	0.4	0.4	0.5	
		F	03	20	-					
7. ESK	Z'	eP	02	48	57.8					02 37 09.1;16.2°N.94.7°W.
										h=131km. Oaxaca,Mexico.
										USCGS.

SEISMOLOGICAL BULLETIN

OCTOBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
7. ESK	Z'	eP	03	49	20.8					Δ = 93.3° = 10370km.
	Z	ePS	04	01	50					
	E	eSS		06	53					03 35 59.6;12.6°N.114.5°E.
	N	eLR		21	-					h=17km. South China Sea.
	Z	M		31	-	22			2.2	
	N	M		31½	-	22	0.8			
	E	M		32	-	22		1.3		
		F	05	00	-					Mag.: M = 5¼(ESK)
KEW	ZV	eP	03	49	23					
7. ESK	Z'	iPKP1	07	17	15.5					06 58 11.3;24.5°S.179.1°W.
	Z'	ePKP2		17	20.9					h=378km. South of Fiji Islands. USCGS.
8. ESK	Z'	iP	06	08	32.6	0.9			0.04	C. 05 59 58.6;49.9°N., 78.0°E.h=0km.Kazakh SSR. USCGS.
KEW	ZV	eP	06	08	36					Mag.: M = 4.8(ESK)
10. ESK	Z'	eP	00	47	24.8					00 35 58.7;51.9°N.175.3°W. h=42km. Andreanof Is.USCGS
10. ESK	ZN	eL	11	07	-					10 21 00.7;26.3°N.128.1°E.
	ZNE	M		19	-	16	0.7	0.7	1.3	h=33km. Ryukyu Is. USCGS.
		F		35	-					Mag.: M = 5-5¼(ESK).
10. ESK	ZN	ePS	17	55	15					17 25 44.0;59.1°S.24.8°W.
	Z	eLR	18	18½	-					h=55km. South Sandwich Is.
	ZNE	M		22½	-	23	0.7	0.2	1.0	USCGS.
		F	18	55	-					
11. ESK	Z'	eP	20	13	25.5					20 01 27;44.4°N.149.6°E. h=33km. Kurile Is. USCGS.
12. ESK	Z'	ePKP	07	47	20.5					07 27 42.1;22.9°S.171.0°E. h=48km.Loyalty Is. USCGS.
12. ESK	Z,Z'	eP	13	51	45.5	1			0.04	Δ = 66.5° = 7390km.
	Z'	e		51	54.8					13 40 55.9;56.3°N.153.7°W.
	NE	eS	14	00	35	15	0.7	0.9		h=11km.Kodiak Is. USCGS.
	E	eL		12	-					
	E	M		22	-	19		2.8		
	NZ	M		22½	-	19	2.8		3.5	
		F	15	15	-					Mag.: M = 5¼(ESK)
KEW	ZV	eP	13	52	12					
12. ESK	Z'	eP	18	39	44.7					18 33 45;34.4°N.26.3°E. h = 33km. Crete. USCGS.
13. ESK	Z'	eP	03	57	18.3					Δ = 18.2° = 2020km.
	NE	eS	04	00	37					03 53 16.7;71.2°N.19.9°W.
	ZN	eL		01½	-					h=33km.Jan Mayen Island
		F		10	-					region. USCGS.
KEW	ZV	eP	03	58	06					
13. ESK	Z,Z'	iPKP	15	06	05.2					14 46 25.0;22.6°S.171.0°E.
	Z	i		06	06.5					h=24km. Loyalty Is.USCGS.
15. ESK	Z'	iP	14	30	59.7	1			0.03	14 18 39.8;14.4°N.93.7°E. h=33km.Andaman Is. USCGS.
16. ESK	Z'	eP	14	34	44.8	1			0.04	14 22 55.5;9.0°N.83.5°W. h=50km.Costa Rica. USCGS.
KEW	ZV	iP	14	34	54					
16. ESK	Z'	1P	19	45	34.5	0.9			0.02	19 33 25.0;17.5°N.94.7°E. h=33km. Burma. USCGS.

Met. O. 765

SEISMOLOGICAL BULLETIN

OCTOBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
16. ESK	Z'	eP	20	12	53.5					20 01 52.5;56.2°N.164.7°E.
	Z'	e		12	58.3					h = 33km. Komandorsky Is.
	Z'	e		13	00.3	1			0.06	USCGS.
16. ESK	ZNE	M	23	31½	-	20	0.8	0.8	1.1	22 14 15.3; 15.1°S.,173.5°W
		F		45	-					h=45km. Tonga Islands.
										Mag.: M = 5½(ESK).USCGS.
17. ESK	Z'	eP	11	29	37.3					11 23 04.5;38.1°N.38.5°E.
										h=33km. Turkey. USCGS.
18. ESK	Z'	eP	02	47	46.3					No USCGS or BCIS PDE
18. ESK	Z'	iP	05	10	31.8					04 58 00.6;1.4°N.85.3°W.
										h=21km.Off coast of
KEW	ZV	iP	05	10	39					Ecuador. USCGS.
18. ESK	Z'	ePKP	08	42	07.2					08 22 28.6;22.5°S.170.9°E.
										h=33km. Loyalty Is.USCGS.
18. ESK	Z'	iP	10	30	55.3					10 21 47.5;42.0°N.77.7°E.
	Z'	ipP		31	02.0	0.9			0.03	h=33km. Kirgiz-Sinkiang
	ZNE	M		54½	-	16	1.2	1.1	1.7	border region. USCGS.
		F	11	05	-					Mag.: M=4¾-5(ESK)
18. ESK	Z'	eP	14	38	23.7					14 32 45; 38.8°N.27.7°E.
										h=33km. Turkey. USCGS.
18. ESK	N	eS	22	17	40					
	NE	eSS		25	20					21 50 04.5;1.1°S.127.9°E.
	N	eLQ		39	-					h=33km. Halmahera.USCGS.
	Z	M		53	-	28			12	
	N	M		53½	-	28	17			
	E	M		54½	-	25		13		
	ZNE	M		59½	-	20	7.0	6.7	10.0	
		F	24	30	-					Mag.:M=6½(ESK)
18. ESK	Z'	iP	23	02	39.7	1			0.03	22 50 41.9;15.7°N.95.4°W.
										h=36km.Near coast of
KEW	ZV	eP	23	02	53.5					Oaxaca, Mexico. USCGS.
19. ESK	Z'	iP	21	00	12.2	1.2			0.10	Δ = 73.1° = 8120km.
	E	eS		09	35					
	N	eSS		14	25					20 48 47.4;52.3°N.174.3°E.
	E	eLQ		20	-					h=48km. Near Islands,
	ZNE	M		31½	-	20	2.0	2.0	2.8	Aleutian Islands.USCGS.
	ZNE	M		35	-	18	3.6	2.3	3.7	
		F	22	10	-					M.: M = 5½(ESK)
KEW	ZV	eP	21	00	34					
20. ESK	Z'	iP	24	06	29.9	1			0.08	D.
	ZE	eLR		30.0	-					23 54 29.9;12.5°N.87.4°W.
	E	M		33	-	24		3.3		h=70km. Near coast of
	N	M		33	-	25	1.1			Nicaragua. USCGS.
	Z	M		33½	-	25			4.7	
		F	25	00	-					Mag.: M = 5½
KEW	ZV	iP	24	06	41					D.
21. ESK	Z'	eP	02	14	37.3					02 04 38.3;37.5°N.91.0°W.
										h=22km.Eastern Missouri.
										USCGS.
21. ESK	Z'	eP	16	06	06.8					15 56 32.6;43.8°N.87.1°E.
	Z'	E		06	11.3					h=33km.Sinkiang Province,
										China. USCGS.

22nd to 1600 hours on 24th no ESK records due to annual inspection, maintenance and calibration.

24. KEW	ZV	ePn	12	18	45					12 16 58.6;46.4°N.7.7°E.
	ZV	eS		20	36					h=33km.Switzerland.USCGS.
	ZV	M		21	16	1.7			0.7	
	ZV	F		26	00					

SEISMOLOGICAL BULLETIN

OCTOBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
24. ESK	Z'	eP	16	46	23.9					16 41 11.4;37.9°N.20.6°E. h=33km. Ionian Sea.USCGS.
24. ESK	Z'	iP	18	26	32.9	0.9			0.07	C. 18 15 04.9;49.7°N., 156.1°E. h=30km.Kurile Is.
KEW	ZV	iP	18	26	58					USCGS.
24. ESK	Z'	eP	18	57	30.1					18 45 38.3;45.0°N.149.3°E. h=48km. Kurile Is. USCGS.
25. ESK	Z'	iPKP	08	58	08.0					08 38 30.6;22.2°S.170.3°E. h=33km.Loyalty Is.USCGS.
25. ESK	Z'	iP	16	17	09.6					16 05 21.3; 17.2°N.94.3°W. h=33km.Chiapas,Mexico. USCGS.
25. ESK	Z'N'E'	iPg	16	36	12.0					Δ = 26km.
	Z'N'	iP*		36	14.3					
	Z'N'E'	iSg		36	15.6					Local.
	Z'N'E	M		36	16	0.7	0.22	0.23	0.24	
		F		36	50					
25. ESK	Z,Z'	iP	22	46	00.1	12	4.5	2.1	14	C. Δ = 77.5° = 8600km.
	Z	epP		46	40					Depth = 160km(ESK)
	Z	esP		46	58					
	NE	eS		55	36	14	9.3	5.6		PPZ 14 sec. 3.7 μ
	ZE	eSP		56	25					PZ' 0.8 sec. 0.44 μ
	NE	esS		56	44					PH' 0.8 sec. 0.22 μ
	N	eSS	23	01	10					22 34 24.3;44.2°N.145.3°E.
	ZN	eLR		11	-					h=180km.Hokkaido,Japan.
	Z	M		22	-	21			5.9	USCGS.
	NE	M		22	-	18	4.5	5.7		
		F	24	30	-					Mag.: M = 6.3(ESK)
25. KEW	ZV	iP	22	46	15.5					C.
26. ESK	Z'	iPKP	10	41	17.8	0.9			0.03	10 21 46.1;20.1°S.168.8°E. h=37km.Loyalty Is.USCGS.
28. ESK	Z'	iP	01	58	12.2					01 46 45.9;51.8°N.176.5°E. h=65km. Rat Is. USCGS.
28. ESK	Z'	eP	04	32	26.8					04 27 10.6;38.4°N.22.3°E. h=15km. Greece. USCGS.
29. ESK	Z'	iP	21	11	32.3	0.9	0.05	0.03	0.14	C. 21 00 00.1;51°26'17"N. 179° 10'57"E. h = 0km. Amchitka Island "Longshot".Rat Is. USCGS.
KEW	ZV	iP	21	11	54.5					C. Mag.: M = 5.6 (ESK)
31. ESK	Z'	iP	23	21	30.7					23 12 27.1;38.0°N.72.5°E. h = 65km. Tadzhik SSR. USCGS.

Met. O. 765

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR NOVEMBER 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		15	100		} 750 at 15 sec.
	E		15	100		
	Z		15	100		
BENIOFF WWSS	N'		1.0	0.75		} 25000 at 1 sec. *)
	E'		1.0	0.75		
	Z'		1.0	0.75		

*) 12500 from 26th

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
1. ESK	Z'	iPKP	18	21	55.2					18 03 09.6; 24.1°S.178.9°E h=522km. South of Fiji Islands. USCGS.
2. ESK	Z'	iPKP	01	08	00.1					00 49 13.4; 23.7°S.179.8°W h = 522km. South of Fiji Islands. USCGS.
2. ESK	Z'	eP	03	32	29.0					03 27 07.2; 39.6°N.25.2°E. h = 11km. Aegean Sea. USCGS.
KEW	ZV	eP	03	31	56					
3. ESK	Z'	iP	01	50	39.3	16	1.1	2.7	5.8	C. Δ = 85.4° = 9490 km.
	E	eSKS	02	00	01					PZ', 2.4 sec. 1.45 μ
	NE,E'	eS		00	21.3	16	10	19		SH 2.4 " 2.00 μ
	ZE	eSP		01	17					01 39 02.5; 9.1°S., 71.4°W.
	E	eSS		06	14					h = 583 km. Peru-Brazil
	N	eLQ		12½	-					border. USCGS.
		F	03	15	-					Mag.: M = 6.2(ESK)
KEW	ZV	iP	01	50	41					C. Δ = 85.2° = 9470km.
	ZV	ipP		52	47					h = 587km(Kew)
	ZV	eS	02	00	22					

Met. O. 765

SEISMOLOGICAL BULLETIN

NOVEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
3. ESK	ZE	eL	08	00½	-					07 53 13; 58.3°N. 32.4°W.
	E	M		01½	-	18		2.7		h = 33km. North Atlantic
	Z	M		02½	-	17			2.8	Ocean. USCGS.
	N	M		03	-	15	2.9			Mag.: M = 5¼(ESK)
3. ESK	ZE	eL	08	04	-					07 57 34.9; 58.4°N. 32.2°W.
	E	M		06	-	18		2.7		h = 33km. N.Atlantic Ocean.
	Z	M		06½	-	17			3.3	USCGS.
	N	M		07	-	15	2.1			
		F		15	-					Mag.: M = 5(ESK)
3. ESK	ZE	eL	08	41	-					08 33 51.6; 58.1°N. 32.1°W.
	E	M		42½	-	18		1.4		h=33km. N.Atlantic Ocean.
	Z	M		43	-	17			2.3	USCGS.
	N	M		43½	-	15	2.1			
		F	08	50	-					Mag.: M = 5(ESK)
3. ESK	ZE	eL	19	20	-					18 21 05.0; 22.3°S.,
	ZN	M		30½	-	18		1.5	2.0	114.1°W. h = 12km.
	E	M		30½	-	17	1.2			Easter Islands. USCGS.
		F		55	-					Mag.: M = 5½-5¾(ESK).
5. ESK	Z'E'	iP*	05	17	28.1					Δ = 91km.
	E'	ePg		17	28.9					
	Z'N'E'	eS*		17	38.9					Local.
	E'	eSg		17	39.9					
	Z'N'E'	iSn		17	41.3					
	Z'N'E	M		17	43	0.5	0.015	0.018	0.018	ML = 1.3
		F		18	15					
6. ESK	Z'	iP	06	48	52.2					06 38 41.5; 60.6°N. 147.3°W.
	Z'	i		48	58.1					h = 37km. Alaska. USCGS.
6. ESK	NE	eL	09	38	-					08 57 12.3; 34.0°N. 138.9°E.
	E	M		48	-	20		1.8		h = 15km. Near Honshu,
	NZ	M		49	-	20	1.6		2.4	Japan. USCGS.
		F	10	10	-					Mag.: M = 5½(ESK)
8. KEW	ZV	iP	02	06	06.5					01 57 25.0; 27.9°N. 57.0°E.
										h = 38km. Southern Iran.
										USCGS.
11. ESK	Z'	ePKP	01	52	35.8					01 32 59.3; 22.8°S. 172.6°E.
										h = 62km. Loyalty Is. USCGS
11. ESK	NE	eLQ	04	01	-					02 51 25; 60.7°S. 154.0°E.
	Z	eLR		11½	-					h = 33km. West of Macquarie
	ZN	M		28½	-	20	3.9		3.9	Is. USCGS.
	E	M		30	-	20		3.8		
		F	05	00	-					Mag.: M = 6-6¼(ESK)
12. ESK	Z,Z'	iP	18	05	17.0	16			2.9	Δ = 89.9° = 10000 Km.
	Z	ePP		08	49	16			2.2	17 52 24.1; 30.5°N. 140.2°E.
	NE	eS		16	05	22	2.5	4.3		h = 40km. South of Honshu,
	N	e		16	41					Japan. USCGS.
	N	eSS		22	04					
	NE	eLR		33½	-					
	N	M		47½	-	17	6.4			
	EZ	M		48	-	17		9.3	6.4	Mag.: M = 6.2(ESK)
		F	19	45	-					
KEW	ZV	iP	18	05	27					

Met. O. 765

SEISMOLOGICAL BULLETIN

NOVEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
12. ESK	Z'	iP	19	03	58.4	0.7			0.04	D. 18 53 34;53.3°N.153.6°E h = 469km. Sea of Okhotsk. USCGS.
13. ESK	Z,Z'	iP	04	43	27.3	9			5.3	C. Δ = 55.8° = 6200 km.
	Z,Z'	ipP		43	41.8	9			5.3	h = 53km.(ESK)
	Z'	i		44	08.5					PZ' 2 sec. 1.8 μ
	Z'	iPcP		44	25.8					pPZ' 2 " 1.4 μ
	NE	eS		51	09	16	9.8	8.5		04 33 53.0;43.8°N.,87.8°E.
	NE	eSS		54	46					h = 59km. Northern
	ZNE	eLR		59½	-					Sinkiang,China. USCGS.
	E	M	05	07½	-	18		36		
	N	M		08	-	18	43			
	Z	M		09½	-	18			50	
		F	06	30	-					Mag.: M = 6.6(ESK)
KEW	ZV	iP	04	43	30					C. Depth = 51km(KEW)
	ZV	ipP		43	44					
	ZV	esP		43	55					
	ZV	i		44	12					
	ZV	iPcP		44	30					
	ZV	i		44	56					
13. ESK	Z'	iPKP	07	24	29.0					17 05 57.1;21.2°S.179.2°W. h = 615km.Fiji Is. USCGS.
14. ESK	Z'	iP	06	06	37.6					05 54 16.7;36.8°N.140.8°E.
	Z'	ipP		06	50.7					h=67km. Near Honshu,Japan.
KEW	ZV	iP	06	06	51					USCGS.
14. ESK	Z'	ePn	08	22	17.6					08 20 35;58.3°N.8.4°E.
	Z'	e		22	37.4					Southern Norway.Uppsala.
	E'Z'	e		23	27.4					
15. KEW	ZV	eP	11	28	13					11 18 49.9;0.3°S.,18.7°W. h=24km. Mid-Atlantic Ridge USCGS.
16. KEW	ZV	iP	15	31	48					15 24 42.9;31.0°N.41.5°W. h=17km. Atlantic Ridge. USCGS.
18. ESK	Z'	iPKP	20	19	02.0	1			0.08	20 00 19.0;18.8°S.177.9°W. h=421km. Fiji Is. USCGS.
KEW	ZV	$iPKP_1$	20	19	13					
	ZV	$ipPKP_1$		20	58					h = 436km. (KEW)
18. ESK	Z'	iP	22	09	27.8	1.1	0.26	0.08	0.67	C. 21 58 12.4;53.9°N.,
	E	eLQ		28½	-					160.7°E. h=12km. Near
	ZNE	M		49½	-	17	1.1	0.9	1.5	coast of Kamchatka.USCGS.
		F	23	10	-					Mag.: M = 6.7(ESK).
KEW	ZV	iP	22	09	48.5					C.
19. KEW	ZV	iP	07	26	28.5					C. 07 14 13.2;45.3°N., 150.9°E.h=13km.Kurile Islands. USCGS.
19. ESK	NE	eL	23	12½	-					22 31 19.8;23.6°N.121.8°E.
	NE	M		20	-	24	3.4	4.1		h=10km. Taiwan. USCGS.
		F		40	-					Mag.: M = 5¾-6(ESK).
21. ESK	Z'	iP	05	06	32.0	0.9			0.08	C. 04 57 57.9;49.8°N; 78.1°E.h=0km.Eastern Kazakh SSR. USCGS.
KEW	ZV	iP	05	06	36.5					C. Mag.: m = 5.9; M = 5.3(ESK).

Met. O. 765

SEISMOLOGICAL BULLETIN

NOVEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
21. ESK	Z'	ePKP	10	50	28.5					Depth = 79km(ESK)
	Z'	epPKP		50	51					
	Z,Z'	ePP		51	49	20			2.2	10 31 49.7;6.1°S.,130.4°E.
	E	eL	11	24	-					h = 93km. Banda Sea.
	ZNE	M		45	-	24	3.4	2.0	5.5	USCGS.
		F	12	10	-					Mag.: M = 5.9(ESK)
KEW	ZV	ePKP	10	50	31					
22. ESK	Z'	iP	20	37	02.3	1.1			0.15	D. Δ = 73.8° = 8200km.
	Z'	i		37	31.3					
	E	eS		46	30					20 25 30.4;51.3°N.179.8°W.
	N	eSS		51	34					h=40km. Andreanof Islands.
	E	eLQ		56½	-					USCGS.
	ZN	M	21	12½	-	20	1.8		1.8	
	E	M		13½	-	20		1.7		Mag.: M = 5½(ESK).
		F	-	-	-					
KEW	ZV	iP	20	37	25					D.
22. ESK	Z'	iP	20	51	23.7	1.1			0.04	D. 20 39 48.0;51.4°N.,
										179.9°W. h=16km.
										Andreanof Islands.USCGS.
23. ESK	N	eS	01	44	50					
	N	eLQ	02	01	-					01 17 31.2;3.0°N.124.8°E.
	N	eLR		09	-					h=45km. Celebes Sea.USCGS.
	NE	M		13½	-	30	9.3	8.5		
	NE	M		17	-	22	6.2	5.8		
	Z	M		19	-	22			3.7	Mag.: M = 6¼(ESK).
		F	-	-	-					
23. ESK	Z'	iP	02	29	19.9	1			0.05	02 17 49.4;51.4°N.179.7°W.
	Z'	M	03	04½	-	18			1.2	h=48km. Andreanof Islands.
	N	M		05	-	18	1.1			USCGS.
	E	M		06	-	18		1.3		
		F	03	35	-					Mag.: M = 5¼(ESK).
25. ESK	Z'	eP	03	46	17.2	1			0.02	03 35 11.7;55.2°N.163.0°E.
										h=33km.Near Kamchatka.
										USCGS.
27. ESK	NE	eL	03	47	-					03 04 20.6;30.6°N.140.2°E.
	N	M		59½	-	18	1.5			h=60km. South of Honshu,
	EZ	M	04	00	-	18		2.2	2.1	Japan. USCGS.
		F		30	-					Mag.: M=5½(ESK)
27. ESK	Z'	iP	08	55	02.7	1			0.06	08 42 24.2;32.9°N.140.6°E.
										h=74km. South of Honshu.
										USCGS.
27. ESK	E	eL	12	58	-					12 01 51.9;9.7°S.159.7°E.
	ZNE	M	13	23	-	20	1.2	1.0	1.9	h=51km. Solomon Islands.
		F	14	00	-					USCGS.
28. ESK	NE	eLQ	04	45	-					03 56 45.9;45.6°S.72.4°W.
	Z	eLR		50½	-					h=33km. Near coast of
	ZNE	M	05	04	-	19	4.8	7.1	11.2	Chile. USCGS.
										Mag.: M = 6¼(ESK).
28. ESK	Z'	iP	05	31	52.6	0.8			0.06	05 26 05.6;36.1°N.27.7°E.
	Z'	iPcS		38	38.2	1			0.07	h=89km. Dodecanese Is.
	N	eLQ		38.2	-					Moderate damage at Rhodes.
	EN	M		42	-	26	6.7	6.1		USCGS.
	ENZ	M		45½	-	20	3.1	2.9	3.9	
		F	06	10	-					Mag.: M = 5(ESK).
KEW	ZV	iP	05	31	23					C. Depth = 64km(KEW)
	ZV	ipP		31	38					

Met. O. 765

SEISMOLOGICAL BULLETIN

NOVEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
29. ESK	Z'	ePKP	04	15	10.6					03 55 52.3;20.7°S.175.6°W. h=164km. Tonga Is. USCGS.
29. ESK	Z'	ePKP	05	07	02.6					04 48 31.7;20.6°S.178.7°W. h=605km. Fiji Is. USCGS.
29. ESK	Z'	iP	09	11	43.1	0.8			0.04	09 00 08.3;45.1°N.146.5°E. h=153km. Kurile Is. USCGS.
KEW	ZV	iP	09	11	59					

D 74190/1/R.72 140 9/66 PD

METEOROLOGICAL OFFICE, UNITED KINGDOM

SEISMOLOGICAL BULLETIN FOR DECEMBER, 1965

1. ESKDALEMUIR OBSERVATORY, LANGHOLM, DUMFRIESSHIRE, SCOTLAND

Lat. 55° 19' 00" N., Long. 3° 12' 18" W. Height above M.S.L. 263m.

Foundation: Llandovery Shales, folded (late Silurian).
Instruments: World-wide standardised seismograms (USCGS).

(i) Long-Period SPRENGNETHER
(ii) Short-Period BENIOFF

CONSTANTS:

INSTRUMENT		DATE FROM WHICH CONSTANTS APPLY	FREE PERIODS PENDULUM Tp sec.	FREE PERIODS GALVANOMETER Tg sec.	DAMPING	V
SPRENGNETHER WWSS	N		15	100		750 at 15 sec.
	E		15	100		
	Z		15	100		
BENIOFF WWSS	N'		1.0	0.75		12500 at 1 sec.
	E'		1.0	0.75		
	Z'		1.0	0.75		

2. KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND

Lat. 51° 28' 6" N., Long. 0° 18' 47" W, Height above M.S.L. 4m.

Foundation: River gravel resting on London clay.
Instruments: Kew-type vertical seismograph, period 1.5 sec.
Direct optical registration (ZV).

Notations: For phases the generally adopted notations are used.
In addition the following symbols are in use:

C = Compression
D = Dilation
Δ = Epicentral distance
h = Depth of hypocenter
Mag. = Earthquake magnitude, determined in the old Gutenberg-Richter scale (M). The mean value for body and surface waves is given, if agreement is good, otherwise the values for body and surface waves are quoted separately.

The bulletin is prepared at Kew Observatory and all enquiries concerning the seismograms for both Kew and Eskdalemuir should be addressed to Kew.

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
2. ESK	Z'	eP	06	10	16.4					05 58 41.5; 51.3°N., 176.3°E. h = 17km. Rat Islands. USCGS.
3. ESK	Z'	eP	21	26	41.0					21 17 33.6; 36.3°N., 69.3°E. h=19km. Hindu Kush region. USCGS.
	Z'	e		26	49.3					
KEW	ZV	eP	21	26	34					
	ZV	e		26	43					
4. ESK	Z'	iP	02	23	23.2	1			0.12	02 11 49.9; 51.3°N., 170.6°W. h=18km. Fox Is. USCGS.
KEW	ZV	iP	02	23	46					
4. ESK	Z'	iP	16	46	01.1					16 39 58.4; 34.2°N., 26.2°E. h=21km. Crete. USCGS.
5. ESK	NE	eL	17	15	-					16 30 59.3; 23.9°N., 121.7°E. h=52km. Taiwan. USCGS. Mag.: M = 5½-5¾(ESK).
	NE	M		19½	-	24	2.1	2.4		
		F		30	-					

SEISMOLOGICAL BULLETIN

DECEMBER, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
5. ESK	Z'	iP	18	26	14.7	0.9			0.15	C. 18 14 50.2;52.6°N., 173.2°E. h=36km. Near
KEW	ZV	iP	18	26	36.5					Islands. USCGS.
6. ESK	Z'	iP	08	06	08.5	0.9			0.04	C. 07 55 03;43.7°N.134.0°E h=349km. Near east coast of Russia. USCGS.
6. ESK	Z,Z'	eP	11	47	17.3	9			4.0	D. PZ' 2 sec. 0.86 μ
	NE	eS		57	32	22	12.1	11.2		Δ = 82.9° = 9200km.
	N	eLQ	12	08½	-					11 34 53.7;18.9°N.107.1°W.
	ZE	eLR		13	-					h=37km. Off coast of
	N	M		23½	-	17	16			Jalisco, Mexico. USCGS.
	E	M		24	-	18		23		
	Z	M		25½	-	18			32	
		F	14	30	-					Mag.: M = 6.6(ESK)
KEW	ZV	eP	11	47	33					
6. ESK	N	eL	19	00½	-					18 42 33.2;18.8°N.107.0°W.
	N	M		31½	-	17	2.0			h=40km. Off coast of
	E	M		32	-	18		2.1		Jalisco, Mexico.
	Z	M		33	-	18			3.1	
		F		55	-					Mag.: M = 5.6(ESK)
7. ESK	E	eL	23	11½	-					22 19 14.8; 6.4°S.146.3°E.
	N	M		21½	-	28	0.9			h=109km.New Guinea region.
	E	M		23	-	26		1.7		USCGS.
	F			45	-					
8. ESK	Z'	epPKP	18	25	51.1					18 05 26.1; 37.1°S.177.5°E h=165km. Near N.Island, N.Z. USCGS.
9. ESK	Z,Z'	iP	06	19	52.9	14		3.5	6.1	C.Δ = 82.7° = 9190km.
	Z	ePP		22	58	14		2.1	3.8	PZ' 1 sec. 0.08 μ
	N	eS		30	07	16	2.2	4.9		
	E	eSS		35	38					06 07 48.6;17.3°N.100.0°W.
	N	eLQ		41½	-					h=57km. Guerrero,Mexico.
	N	M		57	-	18	6.7			USCGS.
	Z	M		58	-	18			16.2	
	E	M		58½	-	18		8.5		
		F	08	10	-					Mag.: M = 6.2(ESK)
KEW	ZV	eP	06	20	07					
9. ESK	Z'	ePKP	13	31	11.8					13 12 55.5;18.0°S.178.2°W
	Z'	i		31	14.4					h=650km. Fiji Is. region. USCGS.
KEW	ZV	ePKP	13	31	19					
	ZV	i		31	25					
9. ESK	Z'	ePKP	13	43	58.3					13 25 40.7;17.7°S.178.3°W. h=650km. Fiji Is. region. USCGS.
9. ESK	Z'	iP	20	37	22.5	0.7			0.04	C. 2026 04.0;27.5°N.92.5°E h=22km.India-China border. USCGS.
12.ESK	Z'	eP	13	46	03.8					13 34 37.5;51.9°N.175.7°E. h=60km. Rat Is. USCGS.
12.ESK	Z'	iP	19	35	50.4	1.0			0.05	C. 19 25 09.1;50.3°N., 149.5°E.h=438km. Sea of Okhotsk. USCGS.
KEW	ZV	iP	19	36	08					C.

SEISMOLOGICAL BULLETIN

DECEMBER, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
13. ESK	Z'	eP	05	10	03.0					04 58 34.3; 52.0°N.173.7°E h=33km. Near Islands. USCGS.
13. ESK	Z'	eP	05	57	11.3					05 45 12.7; 44.1°N.150.2°E h=33km. Kurile Is. USCGS.
13. ESK	Z,Z'	iP	11	04	06.5	8			2.7	C. Δ = 78.8° = 8760km.
	Z'	i		04	18.8					PZ' 1.3sec. 0.15 μ
	NE	eS		14	00	14	1.5	1.7		10 52 08.5;44.7°N.150.1°E.
	N	eSS		19	23					h=35km. Kurile Is. USCGS.
	ENZ	M		38	-	20	2.3	3.7	3.0	
		F	12	20	-					Mag.: M = 5.8(ESK)
KEW	ZV	iP	11	04	21.5					
13. ESK	Z'	iP	14	58	07.9					14 46 10.2;44.7°N.150.2°E.
	ZNE	M	15	32	-	20	1.5	2.2	1.5	h=33km. Kurile Is. USCGS.
		F	16	10	-					Mag.: M = 5½(ESK)
KEW	ZV	iP	14	58	23					
13. ESK	Z'	eP	17	49	00.1					17 44 12;40.3°N.20.0°E. h=33km. Albania. USCGS.
14. ESK	Z'	eP	14	32	25.4					14 21 05.3;14.4°N.89.8°W. h=276km. Guatemala.USCGS.
15. ESK	Z'	iP	04	55	27.1					04 43 47;22.2°N.,94.6°E.
	Z'	ipP		55	50.1	1			0.05	h=106km. Burma. USCGS. h=88km. (ESK)
15. ESK	Z'	ePn	12	08	50.9					12 07 16; 50.5°N., 4.1°E. Belgium, foreshock. BCIS.
15. ESK	Z'	iPn	12	08	51.6	0.5			0.046	C. Δ = 6.2° = 690km.
	Z'	iSn		10	03.3	0.6	0.05	0.10		
	E'N'	iS*		10	30.6					12 07 15; 50.5°N., 4.2°E.
	E'N'	iSg		10	49.9					h=8km. Belgium.Slight
		F		13	00					damage to property.USCGS.
KEW	ZV	iPn	12	08	11.5	1			0.22	D.
	ZV	e(Sn)		08	43.5					
	ZV	M(Sg)		09	22	1.5			0.39	
	ZV	M		09	52	3			1.35	M_L = 3.2 (KEW)
		F	12	12	00					
15. ESK	Z'	iP	23	17	17.8	8			5.1	C. Δ = 77.7° = 8630km.
	NE	eS		27	06	13	6.6	2.3		PZ' 1.3 sec. 0.12μ
	N	eLQ		37	-					23 05 20.7; 7.5°N.82.2°W.
	ZNE	M		45½	-	21	3.9	9.4	13.6	h=15km. South of Panama.
	ZNE	M		56½	-	20	3.8	8.9	12.5	USCGS.
		F	24	40	-					Mag.: M = 6.3 (ESK)
KEW	ZV	iP	23	17	24					
16. ESK	Z'	iPKP	23	25	08.7					23 06 42.4°;17.5°S.179.1°W h=116km. Fiji Is. USCGS.
KEW	ZV	iPKP	23	25	20.5					C.
17. ESK	Z',N'	eP*	15	39	58.6					
	Z',N	iPn		39	59.0	0.4	0.029		0.030	C. Δ = 137km.
	Z'N'E'	eS*		40	14.9					
	Z'E'	iSn		40	15.6					Local.
	Z'N'E'	iSg		40	17.0					
	ZNE	M		40	17.6	0.4	0.073	0.065	0.072	
		F		41	00					ML = 2.3

SEISMOLOGICAL BULLETIN

DECEMBER, 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
18. ESK	Z'	eP	08	42	41.5	1			0.07	08 30 45.8;44.7°N.149.9°E. h=33km.Kurile Is. USCGS.
19. ESK	Z'	eP	13	32	20.9					13 20 23.4;44.3°N.150.2°E. h=36km. Kurile Is.USCGS.
19. ESK	Z'N'	iPg	14	52	27.3					Δ = 63 km.
	Z'E'	eSg		52	33.3					
	Z'N'E'	iSg		52	34.4					Local.
	Z'E'	M		52	38	0.8		0.132	0.156	
	N'	M		52	40	0.7	0.105			
		F		53	10					ML = 1.6
19. ESK	N	eL	22	52	-					22 06 32.7;32.2°S.78.8°E.
	ZN	M	23	18½	-	20	1.0		1.5	h=33km. Mid-Indian Rise.
	E	M		19	-	18		0.8		USCGS.
		F		45	-					Mag.: M = 5½(ESK).
20. ESK	Z,Z'	iP	00	13	27.3	1.2			0.21	C. Δ = 24.3° = 2700km.
	NE	eS		17	41	14	4.9	6.5		
	NE	eL		19½	-					00 08 15.2;40.2°N.24.8°E.
	NE	M		24½	-	16	14.0	7.0		h=33km. Aegean Sea.USCGS.
	Z	M		25	-	15			13.0	
		F	01	00	-					Mag.: M = 5.4(ESK)
KEW	ZV	iP	00	12	55.5					
20. ESK	Z'	iP	07	24	04.6	0.9			0.034	07 12 33.7;50.4°N.156.6°E. h=33km. Kurile Is.USCGS.
21. ESK	Z'	iP	00	43	15.5	0.9			0.038	00 32 00.7;52.6°N.158.8°E h=67km.Near Kamchatka.
KEW	ZV	iP	00	43	35.5					USCGS.
21. ESK	Z'	epP	08	53	11.5					08 41 00.4;16.8°N.98.1°W. h=53km.Near coast of Mexico. USCGS.
21. ESK	Z'	iPn	10	01	45.0					Δ = 7.0° = 780 km.
	NE	eSn		03	04.9					
		F		06	00					10 00 05;50.5°N.5.7°E. h=33km. Belgium. USCGS.
KEW	ZV	eSg	10	02	09					
	ZV	M		02	22	1.8			0.48	
		F		05	-					ML = 3.6 (KEW)
22. ESK	Z'	eP	00	40	11.9					Δ = 73.3° = 8140 km.
	E	eS		49	37					
	E	eL		59½	-					00 28 46.2;52.4°N.160.5°E.
	E	M	01	18½	-	18		0.9		h=33km. Off coast of
	N	M		19½	-	18	1.4			Kamchatka. USCGS.
	Z	M		21	-	17			2.1	
		F	01	50	-					Mag.: M = 5-5¼(ESK).
22. ESK	Z'	eP	07	38	40.7					07 27 20.8;52.5°N.160.2°E. h=33km. Off coast of Kamchatka. USCGS.
22. ESK	Z,Z'	iP	19	51	53.3	1.2			0.21	C. Δ = 64.5° = 7170km.
	Z,Z'	ipP		52	06.9	1.0			0.51	h = 49km. (ESK)
	E	eS	20	00	27	12	2.8	5.7		pPZ = 10 sec. 4.4 μ
	E	eLQ		08½	-					19 41 23.0;58.4°N.153.0°W.
	Z	eLR		12	-					h = 50km.Kodiak Island
	ZNE	M		21½	-	20	6.9	5.5	7.7	region. USCGS.
		F	21	10	-					Mag.: M = 6.3(ESK)

SEISMOLOGICAL BULLETIN

DECEMBER 1965

DATE (STN)	COMPT.	PHASE	TIME (GMT) h.	m.	s.	T s.	AMPLITUDE (μ) N	E	Z	REMARKS
22. KEW	ZV	eP	19	52	20					h = 53km. (KEW)
	ZV	ipP		52	34.5					
23. ESK	Z'	iP	15	33	06.5	0.7			0.025	C. 15 29 07.0; 40.6°N., 14.9°E. h=313km. Italy. USCGS.
23. ESK	Z'	iP	20	57	40.9	1.1			0.14	C. 20 47 37.5; 60.5°N., 141.0°W. h=33km. Alaska. USCGS.
	Z'	epP		57	49.7					
	E	eL	21	13	-					
	E	M		23½	-	18		2.7		h = 29km. (ESK)
	NZ	M		24	-	18	3.0		5.1	
		F		40	-					Mag.: M = 5.4(ESK)
KEW	ZV	iP	20	58	09					
24. ESK	Z'	eP	04	28	28.3					04 17 00.9; 51.7°N., 159.6°E. h = 33km. Near Kamchatka. USCGS.
24. ESK	Z'	eP	05	08	32.7					04 59 58.3; 49.9°N, 78.0°E. h=0km. Eastern Kazakh SSR. USCGS.
25. ESK	Z'	iPKP	03	16	19.5	0.9			0.13	02 57 57.9; 18.0°S. 179.2°W. h=625km. Fiji Is. USCGS.
	Z'	i		16	24.3					
KEW	ZV	iPKP	03	16	32					
25. ESK	Z'	eP	15	15	50.4					15 10 29.4; 37.3°N. 21.1°E. h=5km. Greece. USCGS.
25. ESK	Z'	iPKP	19	39	06.8	0.9			0.06	19 20 45.1; 18.1°S, 179.2°W. h=620km. Fiji Is. USCGS.
KEW	ZV	iPKP	19	39	20					
26. ESK	Z'	ePKP	04	12	06.7					03 53 16.6; 5.5°S, 151.4°E. h=133km. New Britain region. USCGS.
	E	eL		46	-					
	ZN	M		56½	-	40	2.9		3.7	
	E	M		57½	-	36		2.1		
	Z	M	05	03	-	30			2.4	
	NE	M		03½	-	26	1.6	1.6		
		F		30	-					
27. ESK	NE	eL	21	10½	-					20 18 35.4; 3.1°N. 126.9°E. h=66km. Talaud Islands. USCGS.
	N	M		27½	-	24	1.7			
	Z	M		28	-	24			2.0	
	E	M		28½	-	24		1.2		
		F		45	-					
28. ESK	Z'	eP	20	45	30.3					20 32 24.7; 27.8°N., 141.8°E h=36km. Bonin Islands. region. USCGS.
	E	eL	21	15	-					
	N	M		28½	-	22	1.6			
	EZ	M		29½	-	22		1.5	1.2	
		F		50	-					
KEW	ZV	iP	20	45	41.5					h=44km. (KEW)
	ZV	epP		45	55					
	ZV	ePP		49	28					
28. ESK	Z'	iP	22	17	20.7					22 04 52.0; 3.2°S, 77.2°W. h=14km. Peru-Ecuador border. USCGS.
KEW	ZV	eP	22	17	24.5					
30. ESK	Z'	eP	02	17	40.7	0.9			0.04	02 06 31.1; 54.1°N. 164.3°W. h=28km. Unimak Island. USCGS.
30. ESK	Z'	iP	17	08	49.5	0.8			0.02	16 56 56.2; 44.2°N. 148.5°E. h=70km. Kurile Islands.

D77821/1/R72 145 10/66 XL