Jan Feb Mar 1963 South Africa

1963

Geological Survey Office,
Department of Mines,
Union of South Africa.

SEISMOLOGICAL BULLETIN.

The data herewith give the results from a network of seismographs intended particularly for the study of earthquakes occurring in or near South Africa. This bulletin, however, is prepared regularly and will be sent to interested organisations on request.

Stations	Pretoria (PRE)	Grahamstown (GRH)	Pietermaritzburg (PIE)	Kimberley (KIM)	Windhoek (WIN)
Lat:	25°45.2'S	33°18.6'S	29°37.2'S	28°45.1'S	22°34'S
Long:	28°11.4'E	26°34.5'E	30°23.8'E	24°46.8'E	17°06'E
Lithologic foundation	Weathered Shale (Pretoria series)	Duyka Shale	Soft Ecca Shale	Dolerite boulders embedded in decayed dolerite	Mica Schist
Height:	1350 m.	558 m.	656 m.	1321 m.	1728 m.
Instrument:	Willmore S.P. vertical and horizontal.	Benioff S.P. vertical with short and long period recorders	Benioff S.P. vertical	Benioff S.P. vertical	Benioff S.P. vertical
Seismo. Officer:	The Director	Professor of Physics	Professor of Physics	Rev. Br. T.M. Purcell	Officer in Charge
Institution:	Geological Survey Office	Rhodes University	Natal University	Christian Brothers College	Weather Office

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Bernard Price Institute of Geophysical Research,
University of the Witwatersrand,
Johannesburg.
South Africa.

H.O. Oliver.

Seismological Officer.

January, 1963

Date	Station	Phase	G. M. T.	Arc Dist.	C/R	Remarks.
1	Kim	e	19 41 49			
		i	53		C	
1	Grh	e	20 58 57			
		i	59 26		R	
1	Kim	$iPKP_1$	23 58 50	154°		USCGS H= 23 39 05.6 56.6N, 157.7W Alaska Peninsula Mag. 6½ h= 50Km
3	Kim	i	09 58 29			
3	Kim	i	19 04 17			
3	Kim	i	22 46 59			
4	Kim	iP	00 33 46	± 60°		USCGS H= 00 23 55.1 1.2N, 27.7W 1500 Km South of Cape Verde Is. h= 33Km
5	Kim	i	17 14 15			
5	Kim	iP	17 55 45	72°		USCGS H= 17 43 35.1 7.0S, 72.1W Western Brazil h= 544Km
6	Kim	$e(i)_{PKP_1}$	17 45 21	148°		USCGS H= 17 25 53.8 62.7N, 151.1W Central Alaska h= 116Km
9	Kim	iP	18 27 55	26°		USCGS H= 18 22 33.4 3.3S, 29.4E
	Grh	eP	28(58)	30°		Republic of the Congo h= 33Km
		i	31 27			
10	Kim	e	02 21 41			
		i	22 32			
11	Kim	iP	12 24 09	75°		USCGS H= 12 12 16.2 45.0S, 75.7W Near coast of southern Chile h= 33Km
12	Kim	i	10 42 46			
		i	43 33			
13	Kim	i	10 07 44			
13	Kim	iP	17 32 09	78°		USCGS H= 17 20 22.9 31.8S, 68.2W San Juan Province, Argentine, h= 142 Km
13	Kim	i	19 34 18			
13	Kim	i	22 05 45			
14	Kim	iP	18 45 19	75°		USCGS H= 18 33 25.3 45.7N, 26.6E Rumania h= 132 Km
15	Kim	iPKP	19 44 40	126°		USCGS H= 19 26 34.3 20.5S, 177.9W Fiji Is. h= 496Km
15	Kim	i	21 26 41			
15	Kim	iP	22 24 24	32°		USCGS H= 22 17 50.9 31.3S, 13.4W South Atlantic Ocean h= 33Km
16	Kim	e	14 38 41			
16	Kim	iP	15 20 46	82°		USCGS H= 15 09 16.6 24.0S, 68.2W Northern Chile h= 150 Km
19	Kim	i	07 09 07			
19	Kim	i	19 26 28			
21	Kim	$iPKP_1$	15 06 47	152°		USCGS H= 14 47 05.4 59.5N, 151.2W Kenai Peninsula, Alaska h= 67Km
21	Grh	i	19 42 29		R	
23	Kim	i	10 07 55			
23	Kim	(e)i	12 51 54			
24	Kim	i	14 39 50			
24	Kim	i	16 57 46			
25	Kim	i	13 08 16			
27	Kim	iP	19 46 42	74°		USCGS H= 19 35 14.3 41.2N, 49.8E Caspian Sea. h= 33Km Mag 5½
28	Kim	$iPKP_1$	13 20 40	153°		USCGS H= 13 00 50.7 54.7S, 161.6E Alaska Peninsula Mag 6½ h= 33Km
28	Grh	e	13 23 30			
		i	(47)			
29	Kim	iPKP	09 40 12	128°		USCGS H= 09 21 14.3 49.7N, 154.9E Kurile Is. h= 126Km
29	Kim	iP	20 45 51	82°	R	USCGS H= 20 33 27 21.5S, 68.6W Chile-Bolivian border h= 73Km
30	Kim	i	01 52 25		C	
30	Kim	iP	10 18 01	45°	R	USCGS H= 10 10 04.1 55.6S, 28.3W Sandwich Is. region h= 33 Mag 6½
30	Kim	i	10 53 11		C	
31	Kim	iPKP	05 24 49	124°		USCGS H= 05 06 46 27.9N, 143.2E Ryakyn Is. h= 33Km

January, 1963 (Continued)

Date	Station	Phase	G. M. T.	Arc Dist	C/R	Remarks
31	Kim	i	09 44 11		R	
31	Kim	iP	17 17 32	73°	R	USCGS H= 17 06 04 41.4N, 50.2E Turkmen, U.S.S.R. h= 33Km
31	Kim	e(i)	20 02 46			

A.A. Attridge

4th May, 1963.

February, 1963

Date	Station	Phase	G. M. T.	Arc Dist	C/R	Remarks
4	Kim	i	10 24 03		C	USCGS H= 10 04 03.4 51.6N 176.6W Andreanof Is. h= 33
5	Grh	iP	20 51 12	78°		USCGS H= 20 39 21.6 38.4S 73.2W
	Kim	iP	20	79°	C	Near coast of central Chile h=41 Mag 6½
6	Grh	eP	01 33 19	78°		USCGS H= 01 21 29 38.4S 73.6W Near coast of central Chile h=33 Mag 5½
9	Kim	(e)i PKP_1	08 19 33	152°		USCGS H= 07 59 52.9 51.2N 179.8W Andreanof Is. h=33 Mag 4.5
12	Kim	i	01 44 51			
12	Grh	(e)i	02 38 12			
13	Kim	(e) iPKP	09 08 00	107°		USCGS H= 08 50 02.2 24.5N 121.8E North Formosa h=33 Mag 7¼
		i	19 57			
13	Kim	iPKP	18 32 46	120°		USCGS H= 18 13 55.1 9.9S 160.8E Solomon Is h=29 Mag 6½
13	Kim	e	20 03 01			
13	Kim	i	22 01 38			
14	Grh	iP	07 17 48	98°		USCGS H= 07 04 40.8 7.2S 128.2E
	Kim	iP	59	96°	C	Banda Sea Mag 6½ h=197
14	Kim	i	13 19 18		C	
14	Kim	iPKP	22 26 28	111°		USCGS H= 22 07 54.3 5.0S 144.6E Eastern New Guinea h=80 Mag 6½
16	Kim	iPP	08 53 51	130°		USCGS H= 08 31 17.5 17.7S 178.6W Fiji Is region h= 534 Mag 4.5
16	Kim	iP	10 58 17	70°	R	USCGS H= 10 46 22.0 7.0S 117.3E Flores Sea h= 561 Mag 4.6
16	Kim	iPKP	12 31 06	112°	C	USCGS H= 12 12 39.1 0.6S 147.5E Admiralty Is region h=33 Mag 5
18	Kim	i	14 36 54		C	USCGS H= 14 25 18.9 36.4N 70.9E Hindu Kush h= 225 Mag 4.9
18	Kim	i	15 24 48		R	
19	Kim	iP	16 47 39	44°		USCGS H= 16 39 15.1 55.3S 28.8W Sandwich Is region h= 33
20	Grh	e	06 12 04			
		i	16			
20	Kim	i	10 05 37			
20	Kim	iP	17 19 45	82°		USCGS H= 17 07 32.5 45.7S 78.7W Off coast ofSouthern Chile h=33 Mag 4.6
21	Kim	iP	17 24 47	61°	R	USCGS H= 17 14 35.7 32.7N 20.9E Near Coast of Libya h= 33 Mag 5
22	Kim	(e)iPKP	08 17 14	130°	R	USCGS H= 07 58 57 17.8S 178.8W Fiji Is region h= 550 Mag 5.0
23	Kim	i	16 40 46			
24	Grh	iPKP	13 52 55	122°	R	USCGS H= 13 34 15.7 14.6N 91.4W Central Guatemala h= 135 Mag 5.7
25	Kim	iP	08 20 14	77°	C	USCGS H= 08 08 20.1 28.1S 65.4W San Luis Province, Argentina h=32 Mag 5.3
25	Kim	i	12 47 55			
26	Kim	(e)i	12 42(48)			
26	Kim	i	20 28 25			
26	Kim	i	23 36 23			
28	Kim	i	11 14 01		C	
28	Kim	i	16 33 26			
29	Kim	i	01 38 39			

A.A. Attridge
4th June 1963.

March, 1963

Date	Station	Phase	G. M. T.	Arc. Dist	C/R	Remarks.
1	Kim	i	19 17 48			
1	Kim	i	21 07 48			
2	Kim	e	15 09(51)			
		i	10 23			
3	Kim	iP	18 45 16	54°		USCGS H= 18 36 14.3 0.3 N, 67.1E Maldive Is. region h= 33
4	Kim	iP	15 20 45	64½		USCGS h= 15 10 19.2 35.2N, 25.4E Crete h= 42 Mag 4.8
6	Kim	i	19 08 06		R	
6	Kim	i	23 46 45			
7	Kim	i	12 28 19			
7	Kim	iPKP$_1$	14 02 53	154°		USCGS H = 13 43 01.2 50.8N, 178.6E Rat Is. h=33 Mag 4.1
7	Kim	iP	22 01 14	78°		USCGS H= 21 49 32.6 36.1N, 71.2E Hindu Kush h=202
8	Kim	(e)i	14 37 21			
8	Kim	i	15 16 07		C	
9	Kim	i	01 38 45		C	
		i	45 57		C	
10	Kim	iP	11 03 58	82°	(C)	USCGS H= 10 51 48.1 29.9S, 71.2W Near Coast of Central Chile h= 70 Mag 6
11	Kim	(e)i	01 15 19			
11	Kim	iP	07 38 10	67°	(R)	USCGS H= 07 27 22 38.1N, 29.3E Turkey h=33, Mag 5.5
11	Kim	i	18 51 54		R	
12	Kim	i	12 43 42		R	
13	Kim	i	01 01 43		(R)	
14	Kim	i	10 41 54			
14	Kim	e	12 59 19			
		i	43			
15	Kim	iP	05 59 03	84°		USCGS H= 05 46 32.8 21.7N, 45.4W N. Atlantic Ocean h= 33, Mag 4.9
16	Kim	iPKP	09 03 29	139°		USCGS H= 08 44 48.3 46.5N, 154.7E Kurile Is. region h=26 Mag 7
17	Kim	e	08 22 01			
		i	55			
17	Kim	i	14 47 40			
20	Kim	iP	14 53 38	77°	R	USCGS H= 14 41 48.2 11.9N, 93.1E Andaman Is region h=33, Mag 4.4
24	Kim	iPP	02 20 15	70°	C	USCGS H= 02 07 12.8 9.7S, 120.4E Sumba Is region h=33 Mag 6¼
24	Kim	iPKP$_2$	02 44(48)	155°		USCGS H= 02 24 49.2 51.6N, 173.3W Andreanof Is. h= 55 Mag 4.7
25	Kim	e	18 52 04			
		i	14			
25	Kim	iP	20 29 17	84°		USCGS H= 20 17 03.8 56.3S, 149.9E Macquarie Is. region h=39 Mag 5
25	Kim	iP	22 57 52	73°	R	USCGS H= 22 46 16.2 0.7N, 96.5E Off S.W. coast of Sumatra
26	Kim	i	05 47 38			
		i	49 02			
26	Kim	e	10 03 42			
		i	07 03			
26	Kim	iPKP	13 43 46	117°		USCGS H= 13 25 02.6 29.8S, 177.9W Kermadec Is h= 42 Mag 7
26	Kim	e	13 53 23			
26	Kim	iPKP	21 53 35	128°	R	USCGS H= 21 34 41.1 36.0N, (135.7E) Near East Coast of Honshu. h=33 Mag 6½
27	Kim	i	10 29 28		R	
28	Kim	iPKP	11 31 11	118°		USCGS H= 11 12 31.3 30.2S, 177.8W Kermadec Is. h= 38
30	Kim	iPKP	02 12 05	133°	(C)	USCGS H= 16 51 56.6 44.2N, 148.0E Kurile Is. h=33 Mag 5½
30	Kim	(e)iPKP	17 11 06	122°	(C)	USCGS H= 01 53 28.8 19.1S, 169.1E New Hebrides Is h= 160 Mag 6.1
31	Kim	iPKP	19 41 36	118°	R	USCGS H= 19 22 53.3 30.0S, 178.0W Kermadec Is h= 50 Mag 6½

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Long:	28°11.4'E	26°34.5'E	30°23.8'E	24°46.8'E	17°06'E
Lithologic foundation	Weathered Shale (Pretoria series)	Dwyka Shale	Soft Ecca Shale	Dolerite boulders embedded in decayed dolerite	Mica Schist
Height:	1350 m.	558 m.	656 m.	1321 m.	1728 m.
Instrument:	Willmore S.P. vert-ical and horizontal.	Benioff S.P. vertical with short and long period recorders	Benioff S.P. vertical	Benioff S.P. vertical	Benioff S.P. vertical
Seismo. Officer:	The Director	Professor of Physics	Professor of Physics	Rev. Br. T.M. Purcell	Officer in Charge
Institution:	Geological Survey Office	Rhodes University	Natal University	Christian Brothers College	Weather Office

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South Africa.

H.O. Oliver.

Seismological Officer.

April, 1963.

Date	Station	Phase	h. m. s. G. M. T.	Arc Dist	c/R	Remarks.
1	Kim	i	23 24 48		C	
2	Kim	e	12 42 30			
		i	40			
2	Kim	iPKP$_1$	16 38 29	153°	R	USCGS H = 16.18.55.6 53.2N 171.1W Andreanof Is. h=142 km. Mag.6.
6	Kim	iPKP$_1$	11 38 26	148°	C	USCGS H = 11.19.23.3 63.4N 149.5W Central Alaska h = 39 km. Mag. 5.5
6	Kim	i	12 16 40		R	
7	Kim	(e)i	16 47 29			
7	Kim	i	21 52 01			
7	Kim	i	22 47 54			
8	Kim	i	11 33 12			
9	Kim	iPKP	02 20 31	130°		USCGS H = 02 02 25.1 17.7S 178.7W Fiji Is. region h = 538 Km. Mag. 4.9
11	Kim	eP	09 45 52	88°		USCGS H = 09 33 10.1 9.9S 116.2E South of Sumbawa h = 33 Km.
		i	46 09			
11	Kim	eP	11 53 24	148°		USCGS H = 11 35 5 6 63.7N 148.6W Central Alaska h=70km.
11	Kim	iP	16 53 22	43°	C	USCGS H = 16 45 25.1 60.2S 18.7W Sandwich Is. region h=53 Km.
12	Kim	iP	00 53 31	80°	R	USCGS H = 00 41 27.9 31.9N 78.8E Northern India. h=33 Km. Mag. 5.4
12	Kim	iPKP$_1$	13 57 59	155°		USCGS H = 13 38 03 51.6 N 175.0W Andreanof Is. h=33 Km Mag. 4.2
			58 10			
13	Kim	iPcP	02 34 17	76°	R	USCGS H = 02 20 57.5 6.2S 76.5W Central Peru h=125 Km Mag.7
15	Kim	i	01 43 06			
		i	02 09 03			
17	Kim	(e)iPKP	02 30 24	127°		USCGS H = 02 11 26.1 19.6S 178.6E Fiji Is. h=33 Km. Mag. 6½.
17	Kim	i	08 42 35			
17	Kim	i	18 32 52		C	
19	Kim	iP	07 40 44	64°	C	USCGS H = 07 30 19.2 35.3N 25.2E Crete. h=47Km.
19	Kim	iP	07 48 35	93		USCGS H = 07 35 23.7 35.8N 96.9E Tsinghai Province China. h=33 Km. Mag.7
19	Kim	i	10 05 25			
19	Kim	i	13 17 23			
19	Kim	i	16 25 05		R	
20	Kim	i	06 46 08			
23	Kim	iP	07 28 05	45°	R	USCGS H = 07 19 44.8 60.7S 24.7W Sandwich Is. Region h=33 Km. Mag. 5.2
25	Kim	e	09 33 22			
		i	28			
26	Kim	iP	16 56 35	85°	C	USCGS H = 16 44 12 18.1S 69.0W Peru-Chile border h=110 Km. Mag. 4.7
27	Kim	iP	11 15 44	83°		USCGS H = 11 03 29.1 22.8S 68.9W Northern Chile h=100 Km. Mag. 4.8
27	Kim	iP	19 41 54	80°	C	USCGS H = 19 29 43.7 30.3S 70.3W Central Chile h=59 Km Mag. 4.7

(Contd.)

April, 1963 (CONTD.)

Date	Station	Phase	h. m. s. G. M. T.	Arc Dist.	C/R	Remarks.
28	Kim	e	08 55 42			
		i	56 39			
28	Kim	iP	20 01 56	76°		USCGS H = 19 50 11.4 36.1N 71.3E Hindu Kush h=150 km Mag. 4.6
29	Pie	e	05 45 42			
		i	44			
29	Pie	i	18 57 59			
29	Pie	$iPKP_1$	22 03 57	150°		USCGS H = 21 44 17.1 51.4N 178.6E Andreanof Is. h=60 Km Mag. 6
30	Kim	$iPKP_1$	07 27 41	152°	C	USCGS H = 07 07 55.9 51.6N 178.6E Rat Is. h=64 km. Mag. 5.1

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South Africa.

H.O. Oliver.

Seismological Officer.

January, 1963 (Continued)

Date	Station	Phase	G. M. T.	Arc Dist	C/R	Remarks
31	Kim	i	09 44 11		R	
31	Kim	iP	17 17 32	73°	R	USCGS H= 17 06 04 41.4N, 50.2E Turkmen, U.S.S.R. h= 33Km
31	Kim	e(i)	20 02 46			

A.A. Attridge

4th May, 1963.

May, 1963.

Date	Station	Phase	h. m. s. G. M. T.	Arc Dist	C/R	Remarks.
1	Kim	i	10 04 03			
1	Kim	iPKP	10 21 58	122°		USCGS H = 10 03 20 19.0 S 169.0 E. New Hebrides Is. h=140 Km. Mag. 7.
3	Pie	i	06 15 51		C	
3	Kim	e	08 35 38			
4	Kim	iPKP$_1$	06 15 55	154°		USCGS H = 05 56 04.1 51.8N 175.4W Andreanof Is. h=69 Km
4	Kim	e	17 20 56			
4	Kim	e	21 31 11			
		i	32 10			
5	Kim	i	15 25 20			
6	Kim	iP	08 50 54	83°	R	USCGS H = 08 38 33.3 9.1S 112.5E Near south coast of Java h=84 km. Mag. 5.7
8	Kim	(e)iPKP$_1$	09 10 14	156°		USCGS H = 08 50 56 54.9N 163.9W Unimak Is. h=89km Mag. 5.6
8	Kim	iPKP	10 41 10	127°	R	USCGS H = 10 22 11.2 36.6N 141.0E Honshu h=53 Km Mag. 6.1
8	Kim	i	12 46 27		C	
8	Kim	eP	14 06 43	65°		USCGS H = 13 56 27 58.6S 61.5W Drake Passage h=33 km Mag. 5.8
9	Pie	eP	19 32 39	24°		USCGS H = 19 28 02.3 52.3S 27.5E 1000 km SW of Prince Edward Is. h=33 Km.
		i	59			
	Kim	iP	33 06	25°		
12	Kim	iP	09 55 34	88°	C	USCGS H = 09 42 58.3 57.5S 159.4E Macquarie Is. region h=44 Km. Mag. 6.4
		i	58 44		R	
12	Kim	i	20 28 18		R	
	Pie	i	24		C	
12	Kim	iPKP	20 56 35	141°		USCGS H = 20 37 12.9 55.9N 163.1E Near east coast of Kamchatka h=33 km. Mag. 5.1
13	Kim	iPKP	13 02 49	122°		USCGS H = 12 44 00.7 14.5N 92.9W Mexico-Guatemala border h=60 Km. Mag. 5.6
13	Kim	iP	18 15 41	85°	R	USCGS H = 18 03 04.4 20.6S 70.7W Near coast of N. Chile h=33 Km.
14	Kim	i	12 46 42			
18	Pie	e	12 32 42			
	Kim	i	33 15		R	
18	Kim	i	13 16 13			
19	Kim	iP	01 14 49	77°		USCGS H = 01 03 04.1 46.5S 75.1W Coast of S. Chile h=33 Km. Mag. 6.5
	Pie	iP	15 09	80°	R	
19	Kim	iP	21 48 28	86°	C	USCGS H = 21 35 49.6 23.8N 45.9W N.Atlantic Ocean h=33 Km. Mag. 6½.
	Pie	(e)iP	59	91°		
	Grh	i	49 48	90°	R	
20	Kim	iPKP	11 56 44	117°	R	USCGS H = 11 38 00.9 30.7S 178.3W Kermadec Is. region Mag. 6.2
20	Kim	i	13 07 09		C	
22	Kim	ePKP	14 15 50	139°		USCGS H = 13 56 43 48.6N 154.7E Kurile Is. region h=22 Km. Mag. 6½
		i	16 07			
22	Kim	e	16 00 26			
		i	01 01			

(Contd.)

May, 1963 (CONTD.)

Date	Station	Phase	h. m. s. G. M. T.	Arc Dist.	C/R	Remarks.
22	Kim	i	16 45 55		C	
22	Pie	iP	22 05 21	82°	C	USCGS H = 21 53 02.5 8.2 S 115.7E Java Sea h=33 Km.
	Kim	iP	47	87°		
	Grh	i	06 36	85°	C	Mag. 5.6
23	Kim	iP	12 08 38	77°		USCGS H = 11 56 45.6 44.7S 75.7W Off coast of Chile h = 33 Km. Mag. 5.1
25	Kim	iP	16 16 09	44½°		USCGS H = 16 08 00.8 56.8S 25.0W Sandwich Is. region h=29 Km.
26	Pie	eP	19 28 20	14½°		USCGS H = 19 24 41.8 15.0 S 35.2E Mozambique h=33 Km.
		i	31 50			
	Kim	iP	28 37	16°		Mag. 5.0
27	Kim	e	15 43 17			
29	Kim	eP	00 58 04	63°		USCGS H = 00 47 50.8 28.3N 52.2E W. Iran h=45 Km. Mag. 4.8
29	Kim	ePKP	08 45 36	130°		USCGS H = 08 27 44.5 17.7S 178.8W Fiji Is. h=512 Km. Mag. 4.5
		i	38			
30	Kim	i	07 08 22			
30	Kim	eP	19 06 15	45°		USCGS H = 18 57 53.2 59.4S 26.9W Sandwich Is. h=33 Km.
		i	20			
31	Kim	e	01 05 09			

A.A. Attridge.

Geological Survey Office,
Department of Mines,
Union of South Africa.

SEISMOLOGICAL BULLETIN.

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Lat:	25°45.2'S	33°18.6'S	29°37.2'S	28°45.1'S	22°34'S
Long:	28°11.4'E	26°34.5'E	30°23.8'E	24°46.8'E	17°06'E
Lithologic foundation	Weathered Shale (Pretoria series)	Duyka Shale	Soft Ecca Shale	Dolerite boulders embedded in decayed dolerite	Mica Schist
Height:	1350 m.	558 m.	656 m.	1321 m.	1723 m.
Instrument:	Willmore S.P. vert-ical and horizontal.	Benioff S.P. vertical with short and long period recorders	Benioff S.P. vertical	Benioff S.P. vertical	Benioff S.P. vertical
Seismo. Officer:	The Director	Professor of Physics	Professor of Physics	Rev. Br. T.N. Purcell	Officer in Charge
Institution:	Geological Survey Office	Rhodes University	Natal University	Christian Brothers College	Weather Office

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Johannesburg.
South Africa.

H.O. Oliver.

Seismological Officer.

DATE	STATION	PHASE	h. G.	m. M.	s. T.	Arc Dist.	C/R	REMARKS
1	Kim	i	03	35	17			
1	Kim	iP	11	01	44	78°		USCGS H = 10 49 54.8 36.4 N, 71.5 E h = 70 km. Mag. = 5.3 Hindu Kush
2	Kim	iPKP	10	18	49	120°		USCGS H = 10 00 00.1 6.1 S, 154.4 E h = 49 km. Solomon Is. region
2	Kim	i	12	01	59		R	
2	Kim	i	20	01	17		R	
2	Kim	iP	21	11	59	41°	C	USCGS H = 21 04 24.2 58.5 S, 15.6 W h = 50 km. Mag. = 6
	Grh	iP		12	23	38½°	C	
3	Kim	iP	21	38	47	47°		USCGS H = 21 30 13.3 29.5 S, 27.7 W h = 45 km. Mag. = 5.6 Sandwich Is.
5	Kim	i	00	05	55			
5	Kim	i	05	00	05			
6	Kim	i	21	39	54			
6	Kim	(e)iP	12	12	29	45°	C	USCGS H = 12 04 14.3 38.7 S, 77.9 E h = 33 km. Mag. = 5.6 1500 km. N.E. of Ker- guelen Is.
9	Kim	$iPKP_1$	07	29	18	154°	R	USCGS H = 07 09 28.8 51.0 N, 178.8 E h = 70 km. Mag. = 4.5 Rat Is.
9	Kim	iP	20	49	32	74°	R	USCGS H = 20 37 51.6 10.7 N, 41.9 W h = 33 km. Mag. = 5 Mid-Atlantic Ocean
10	Kim	iP	04	28	59	82°	R	USCGS H = 04 16 37.7 55.4 S, 146.4 E h = 33 km. Mag. = 6 800 km. west of Macquarie Is.
10	Kim	iP	05	26	39	82°		USCGS H = 05 14 15.6 55.2 S, 146.3 E h = 33 km. 800 km. west of Macquarie Is.
10	Kim	iP	06	51	26	82°	C	USCGS H = 06 39 04 55.3 S, 146.1 E h = 18 km. Mag. = 6 800 km. west of Macquarie Is.
11	Kim	$iPKP_2$	13	28	06	146°	R	USCGS H = 13 08 31.4 63.1 N, 151.4 W h = 31 km. Central Alaska
11	Kim	$iPKP_2$	15	43	23	147°		USCGS H = 15 28 42.3 31.8 N, 116.2 W h = 33 km. Mag. = 5.0 Baja California
12	Kim	e	16	53	24			
		i			43			
13	Kim	e	04	14	22			
		i			54			
13	Kim	e	18	45	49			
		i		48	58			
	Pie	e		47	59			

DATE	STATION	PHASE	h. G.	m. M.	s. T.	Arc Dist.	C/R	REMARKS
15	Kim	e	20	52	48			
		i		55	33			
	Pie	e	20	55	17			
		i		56	43			
17	Kim	iP	18	43	24	84°		USCGS H = 18 30 54.1 65.8 S, 179.5 W h = 33 km. Mag. = 5.6 Scott Is. region
17	Kim	iP	18	51	54	148½°	C	USCGS H = 18 32 14.5 60.4 N, 140.8 W h = 33 km. Mag. = 5½ S. W. Yukon
17	Pie	i	18	51	57		C	
17	Pie	iP	23	13	27	77°	C	USCGS H = 23 02 06.6 4.1 S, 102.2 E h = 73 km. Mag. = 6.1 Near S. coast of Sumatra
	Kim	iP			53	72°	R	
18	Grh	i	03	48	43		C	
	Kim			49	45		C	
18	Kim	e(i)	16	33	30			
19	Kim	iP	10	59	25	84°		USCGS H = 10 47 24.7 25.0 N, 92.1 E h = 51 km. Mag. = 5.7 Assam
19	Kim	i	12	17	47			
19	Kim	i	18	40	26			
20	Kim	iP	19	58	45	72°	C	USCGS H = 19 47 41.3 35.8 N, 3.6 W h = 54 km. Mag. = 4.6 Western Mediterranean
20	Kim	iPKP	23	04	57	118°	R	USCGS H = 22 46 18.1 27.9 S, 176.6 W h = 41 km. Mag. = 5.2 Kermadec Is.
21	Kim	iP	12	30	12	83°	C	USCGS H = 12-18-26.9 23.7 S, 66.6 W h = 221 km. Mag. 5.1 Jujuy Province, Argentine
21	Kim	iP	15	38	54	82°	C	USCGS H = 15 26 31 25.2 N, 92.2 E h = 56 km. Mag.= 5.6
22	Kim	i	11	35	33			
24	Kim	$iPKP_1$	04	46	22	150°		USCGS H = 04 26 37.9
	Pie	$iPKP_1$			23	151°	C	59.5 N, 151.7 W
	Grh	$iPKP_1$			33	154½°		h = 52 km. Mag.=5 3/4 Cook Inlet
24	Kim	e	13	15	38			
		i			47		R	
24	Kim	iPKP	13	36	40	124°		USCGS H = 13 18 68.2 25.5 S, 175.6 W h = 238 km. Mag.=4.6 Tonga Is. region
24	Pie	$iPKP_1$	16	37	04	153°	C	USCGS H = 16 17 15
	Kim	$iPKP_1$			06	154½°		52.3 N, 171.2 W h = 33 km. Mag.=5.4 Fox Is.
24	Kim	e	16	40	56			
25	Kim	i	14	44	08			
26	Kim	iP	14	21	25	82°		USCGS H = 14 09 13 36.4 N, 76.9 E h = 33 km. Mag.=5.3 Sinkiang Province, China

DATE	STATION	PHASE	h. G.	m. M.	s. T.	Arc Dist.	C/R	REMARKS
27	Kim	i	07	27	41			
27	Kim	iP	15	44	52	79°		USCGS H = 15 32 53.1 14.4 N, 93.7 E h = 33 km. Mag.=5.2 Andaman Is. region
28	Kim	iP	02	35	53	37°	R	USCGS H = 02 28 51.6 27.5 S, 66.1 E h = 33 km. Mag.= 6 Indian Ocean
28	Pie	i	12	30	25			
28	Kim	iP	13	59	28	75°		USCGS H = 13 47 47.7 1.3 N, 97.4 E h = 50 km. Mag.= 5 Near coast of Sumatra
28	Kim	iPKP	22	14	50	138°		USCGS H = 21 55 38.8 46.5 N, 153.2 E h = 33 km. Mag.= 6 3/4 Kurile Is. region
28	Kim	ePKP i	23	16	19 34	138°		USCGS H = 22 57 03.4 46.4 N, 153.4 E h = 33 km. Mag.= 4.8 Kurile Is. region
29	Kim	iPKP	00	13	18	138°		USCGS H = 23 53 56.1 46.4 N, 153.5 E h = 33 km. Mag.= 5.3 Kurile Is. region
29	Kim	i	13	02	38		R	

A. A. Attridge

JULY '63

Geological Survey Office,
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Lithologic foundation	Weathered Shale (Pretoria series)	Dwyka Shale	Soft Ecca Shale	Dolerite boulders embedded in decayed dolerite	Mica Schist
Height:	1350 m.	558 m.	656 m.	1321 m.	1728 m.
Instrument:	Willmore S.P. vert-ical and horizontal.	Benioff S.P. vertical with short and long period recorders	Benioff S.P. vertical	Benioff S.P. vertical	Benioff S.P. vertical
Seismo. Officer:	The Director	Professor of Physics	Professor of Physics	Rev. Br. T.V. Purcell	Officer in Charge
Institution:	Geological Survey Office	Rhodes University	Natal University	Christian Brothers College	Weather Office

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Seismological Officer.

Date	Station	Phase	h. G.	m. s. M. T.	Arc Dist.	C/R	Remarks
2	Kim	e	12	52 50			
		i		53 23			
3	Kim	e	11	32 33			
		i		34 04			
4	Kim	iPKP	11	16 49	123°	R	USCGS H=10 58 13.2. 26.3 S, 177.7 W Tonga Islands Region. h = 41k. Mag 6¾
4	Kim	(e)iP	23	03 13	36°	C	USCGS H=22 56 15.7 18.5 S, 12.6 W. St.Helena region, h = 33 km. Mag 5½
6	Kim	e	19	00 45			
		i		02 59			
	Grh	e		01(42)			
6	Kim	i	19	11 09			
	Pie	e(i)	20	03 09			
6	Pie	eP	22	36(26)	15°		USCGS H=22 32 31.7 16.3 S, 39.7 E. Near coast of Mozambique. h = 33 k
		i		38 59			
	Kim	iP		36 49	19°	C	
	Grh	iP		37 14	21°		
6	Pie	e	23	43(32)			
6	Pie	e	25	22(16)			
7	Kim	iP	00	10 02	50°	R	USCGS H=00 01 13.3 42.2 S, 84.4 E. Indian Ocean h = 33 k. Mag 5.
8	Kim	i	10	12 52			
	Grh	e		13 33			
9	Pie	e	10	27 44			
		i		31 44			
9	Kim	eP	19	07 35	77°		USCGS H=18 56 12.6 29.1 S, 68.1 W La Rioja Province, Argentine. h = 33k Mag 4.8.
		i		10 16			
	Grh	eP		08(13)	79°		
	Pie	ePP		11 00	84°		
10	Kim	(e)iPKP	05	42 20	138°		USCGS H=05 22 57.1 46.3 N, 152.9 E Kurile Is. region. h = 33 k. Mag 5.6
10	Pie	e	06	21 04			
12	Kim	e	00	28 51			
		i		29 50			
	Grh	e		29(33)			
		i		32			
14	Kim	iP	05	54 55	93°	R	USCGS H=05 41 43 10.4 N, 62.6 W. Off coast of Northern Venezuela. h = 24 k. Mag 5.5
14	Pie	e	01	00 31			
		i		03(41)			
14	Pie	e	06	28(11)			
		i		35(11)			
15	Kim	e	06	13(12)			
		i		18 41			

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/R	Remarks.
15	Kim	iP	08	53	40	146°	C	USCGS H= 08 36 41 61.7 N, 134.9 W Yukon. h = 33 k, Mag 4.2
16	Kim		12	46	08			
		i			41			
16	Kim	iP	18	38	46	74°	C	USCGS H=18 27 18.4 43.1 N, 41.5 E. Georgia, U.S.S.R. h = 33 k. Mag 5.8
	Pie	eP			46	74°		
		i	19	06	(09)			
	Grh	eP	18	39	(36)	78°		
17	Pie	e	03	23	42			
	Grh	i		26	(54)			
17	Pie	(e)i	03	28	37			
	Kim	iP		29	00	23°	C	USCGS H=03 24 37.4 46.9 S, 33.3 E Prince Edward Is. region. h = 33 k.
17	Kim	iP	12	08	35	74°	C	USCGS H=11 57 06.7 41.3 N, 41.5 E. Georgia, U.S.S.R. h = 33k. Mag 5.3
18	Kim	iP	05	06	16	44°	C	USCGS H=04 58 09.2. 61.0 s, 22.3 W. Sandwich Is.region. Mag. 6
18	Pie	e(i)	06	19	09			
19	Kim	i	05	58	58	73°	R	USCGS H=05 45 28. 43.4 N, 8.2 E. Liqurian Sea. h = 33k. Mag 5¼.
20	Kim	i	06	48	30		C	
21	Kim	i	05	38	28		C	
		i			34		C	
23	Kim	e	02	14	(53)			
		i		15	26			
	Grh	e		16	(13)			
		i		17	(03)			
26	Kim	e	03	09	26			
		i			35			
26	Kim	iP	04	28	30	72°		USCGS H=04 17 16.7. 42.1 S, 21.5 E. Southern Yugo-Slavia h = 33 k. Mag 5½
26	Kim	e	09	50	37			
26	Kim	e	14	42	27			
26	Kim	e	15	42	(51)			
		i		45	(28)			
	Pie	e	15	44	49			
27	Kim	$ePKP_2$	06	48	15	159°		USCGS H=06 27 03 43.9 N, 128.3 W Off coast of Oregon h = 33 k. Mag 4.5
27	Kim	e	07	40	(24)			
27	Kim	e	08	08	09			
27	Kim	e	09	06	54			
28	Kim	iP	01	57	14			
		iS_n			22			
		iP_1			52			
		iS_1		58	02			
	Pie	i		06	48			
28	Kim	iP	08	07	45	83°	R	USCGS H=07 55 21.9 11.3 S, 112.1 E Off coast of Java. h = 21 k, Mag 5.1
28	Kim	$iPKP_1$	15	08	15	158°		USCGS H=14 48 07.3 51.9 N, 174.2 W Andreanof Is. h = 33 k. Mag 4.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc. Dist.	C/R	Remarks.
28	Kim	ePKP	19	10	52	138°		USCGS H=18 51 36.7 46.6 N, 153.1 E. Kurile Is. region h=33. Mag 5.
29	Kim	iP	06	20	57	64°	R	USCGS H=06 10 22.6 27.8 N, 55.6 E Southern Iran. h = 37 k. Mag 5.2
29	Kim	ePKP	20	32	50	114°		USCGS H =20 14 07.3 30.2 S, 177.3 W. Kermadec Is. h = 39 k. Mag 6½
		i		35	11			
30	Kim	iPKP	06	04	38	119°		USCGS H=05 45 53.3 29.6 S, 177.3 W Kermadec Is.region h = 33 k. Mag 5.3
30	Kim	ePKP	07	11	(38)	140°		USCGS H = 06 52 22. 7. 51.7 N, 158.1 E Kamchatha. h = 33 k. Mag 5.3
		i			48			
30	.Pie	i	13	59	(57)		R	USCGS H =13 51 57.8 55.9 S, 27.5 W. Sandwich Is. h = 33 k Mag. 6.2
	.Grh	iP	14	00	37	43°		
	.Kim	iP			37	45°	C	
31	Kim	e	15	41	07			
		i			16			

A.A. ATTRIDGE
29th April, 1964.

AUG - SEPT 1963

63

Geological Survey Office,
Department of Mines,
Union of South Africa.

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Lithologic foundation.	Dwyka Shale	Soft Ecca Shale	Dolerite boulders embedded in decayed dolorite
Height:	558 m.	656 m.	1321 m.
Instument:	Benioff S.P. vertical with short and long period recorders	Benioff S.P. vertival	Benioff S.P. vertical
Seismo. Officer:	Professor of Physics	Professor of Physics	Rev. Br. T.N. Purcell
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South Africa.

H.O. Oliver.
Seismological Officer.

August, 1963.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/R	Remarks
4	Grh	i	00	12	14		C	
	Kim	i			25			
5	Kim	iP	15	51	27	88°	R	USCGS H= 15 39 07. 60.7S, 154.3E. h=33Km Macquarie Is region Mag 5.2
8	Kim	iPKP$_1$	02	34	20	156°		USCGS. H=02 14 15.4 52.4N, 168.1E h=33Km Fox Is Mag 5.5
11	Kim	iP	10	15	04	79°	R	USCGS H= 10 03 05.1 38.1S, 73.1W h=60 Km Near Coast of Southern Chili Mag 5.0
12	Kim	e	14	59	(26)			
12	Kim	iP	18	40	16	66°		USCGS H=18 29 39, 25.3N, 62.7E h=33Km Near Coast of W. Pakistan Mag 5.2
	Pie	iPeP			51	64°		
14	Kim	iP	00	18	01	±12°		USCGS H= 00 15 07.1 16.7S, 28.7E h=33Km Nothern Rhodesia
		i		20	14			
		i		21	(30)			
	Pie	iP	00	18	10	± 13°		
	Grh	eP	00	19	00	± 16°		
		i		24				
14	Kim	e	01	56	44			
14	Kim	i	02	31	30			
	Pie	e(i)		33	54			
14	Kim	i	12	18	35			
15	Grh	iP	17	36	29	88°		USCGS H= 17 25 06 13.8S 69.3W h543Km Peru-Bolivia border Mag 7.
	Kim	iP			54	87°		
				37	14			
16	Kim	iP	23	14	02	39°		USCGS H= 23 06 24.6 12.8S 14.5W h=33Km South Atlantic Mag 5.1
18	Pie	i	19	06	07		R	
	Kim	i			11		C	
19	Kim	e	09	28	47			
19	Kim	iP	09	59	47	46°		USCGS H=09 51 25.2 59.8S, 25.9W h=33Km Sandwich Is. Region
24	Kim	i	20	11	17		C	
25	Grh	i	12	36	08		R	
	Pie	i			11			
	Kim	i			18		C	
27	Kim	iP	03	35	24	78°		USCGS H= 03 23 32.6 45.9S, 75.3W h=33Km Near Coast of Southern Chili. Mag5.3
27	Kim	e	19	09	07			
28	Grh	i	00	49	16			
	Kim	i			23			
	Pie	i		50	12			
29	Pie	i	09	05	57			
	Kim	i		06	08		C	
	Grh			07	52			
29	Kim	iP	15	44	20	101°		USCGS H=15 30 31.4 7.1S, 81.6W. h=23Km off Coast of Peru Mag 6½
	Grh	iP			22	102°	R	
29	Kim	i	16	00	35			
31	Kim	(e)i	09	34	44			

A.A.Atridge
3/8/64

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/R	Remarks.
1	Kim	(e)i	06	40	47			
2	Pie	eP	01	46	(15)	75°		USCGS H= 01 34 31.6 33.9N, 74.7E. N.India h=44, Mag5.1
	Kim	iP			30	78°		
4	Kim	i	05	17	37			
	Pie	e			53			
7	Pie	i	08	26	34		R	
7	Kim	iP	08	58	24	39°		USCGS H= 08 50 57.5 11.7S, 13.6W. Ascension Is region h=33Km, Mag 5.3.
7	Kim	i	13	03	11			
8	Grh	i	03	04	31			
8	Kim	ePKP	07	53	(40)	126°		USCGS H= 07 38 15. 20.7S, 178.3W h=573 Km Fiji Is Mag 4.3.
		i		54	59			
8	Kim	iPKP	20	08	25	124°		USCGS H=19 50 29.8 23.6S, 179.8E Fiji Is region h=550Km. Mag5.7.
9	Kim	i	03	04	36		R	
9	Kim	ePKP	13	11	39	123		USCGS H= 12 52 15.4 14.7S,167.4E New Hebrides Is. h=182Km Mag4.4
13	Kim	i	14	35	35			
13	Kim	i	17	19	42			
	Grh	i			51		C	
14	Pie	e	03	07	17			
15	Grh	(e)iPKP	01	05	52	123°		USCGS H=00 46 54. 10.3S, 165.6E Santa Cruz Is h=43, Mag7½.
	Kim	iPKP			54	126°	R	
15	Kim	i	12	38	12			
15	Pie	e	12	40	38			
15	Grh	e	12	42				
17	Kim	i	19	39	12		R	
18	Kim	iP	17	09	18	69°		USCGS H=16 58 12.5 40.9N, 29.2E Turkey h=178Km mag6¼
	Pie	iP			30	70°		
	Grh	iP			46	74°	R	
20	Kim	iP	22	23	51	84°	C	USCGS H=22 11 32.2. 17.8S, 68.8W.Peru-Bolivia border h=171Km Mag5.1
21	Kim	e	04	21	52			
		i		24	04			
		i		[illegible]				
	Pie	e		24	18			
		i		25	09			
24	Pie	iP	09	16	39	13°	C	USCGS H=09 13 38. 16.6S, 28.7E N Rhodesia h=38Km
		i		18	57			
24	Pie	e	19	06	30			
24	Pie	e	20	58	25			
24	Grh	e	21	41	51			
	Pie	e		43	05			
		i			46			
25	Pie	e	01	50	02			
25	Pie	e	03	15	00			
		i			59			
25	Kim	iP	07	06	47	12°	R	USCGS H=07 03 54.6 16.7S, N Rhodesia h=33Km Mag 5.8
		i		09	12			
	Grh	iP		07	42	17°	R	
25	Kim	e	07	34	54			
		i		37	15			
		i		38	34			
	Pie	e		37	30			
		i		38	(39)			
25	Kim	i	09	40	50			
25	Kim	e	16	17	37			
26	Pie	iPKP$_1$	05	47	53	152°		USCGS H=05 28 07 50.4N, 176.9W Andreanof Is. h=33Km Mag 5.2

September, 1963. Cont.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/R	Remarks.
26	Pie	e	16	40	(40)			
		i		46	25			
	Grh	e		41	57			
		i		45	50			
	Kim	i		42	33			
26	Kim	e	16	59	21			
		i	17	01	33			
	Pie	e	17	01	37			
	Grh	e		03	(07)			
27	Kim	e	00	03	55			
27	Kim	e	02	56	44			
		i		58	01			
	Pie	e		57	(00)			
27	Pie	e	05	20	42			
		i		23	(16)			
	Grh	e		24	57			
		i		26	31			
27	Kim	i	06	13	03			
27	Kim	i	19	20	47			
	Grh	e		23	(51)			
27	Kim	i	19	51	57			
	Pie	e		52	09			
		i		54	30			
	Grh	e		53	(00)			
27	Kim	i	21	45	01			
	Pie	e			16			
28	Kim	i	04	07	17			
28	Kim	i	05	28	50			
	Grh	e		29	(50)			
		i		33	(00)			
	Pie	e		31	10			
		i			30			
28	Kim	i	06	12	48			
28	Kim	e	07	08	21			
		i		09	39			
28	Kim	e	07	52	53			
		i		54	09			
	Pie	e		54	06			
28	Kim	e	14	47	52			
	Pie	e		47	50			
28	Kim	e	16	46	52			
	Pie	e		47	06			
28	Kim	e	21	10	23			
29	Kim	iP	22	27	10	65°		USCGS H=22 16 38.6. 36.1N, 18.0E. Ionian Sea h=47Km Mag.5.3
30	Kim	i	22	13	02			
		i		15	13			
		i		16	28			
30	Kim	e	23	56	28			
		i		57	45			

A.A.ATTRIDGE.
10/8/64.

Geological Survey Office,
Department of Mines,
Union of South Africa.

SEISMOLOGICAL BULLETIN.

The data herewith give the results from a network of seismographs intended particularly for the study of earthquakes occuring in or near South Africa. This bulletin, however, is prepared regularly and will be sent to interested organisations on request.

Station	Grahamstown (GRH)	Pietermaritzburg (PIE)	Kimberley (KIM)
Lat:	33°18.6'S	29°37.2'S	28°45.1'S
Long:	26°34.5'E	30°23.8'E	24°46.8'E
Lithologic foundation.	Dwyka Shale	Soft Ecca Shale	Dolerite boulders embedded in decayed dolorite
Height:	558 m.	656 m.	1321 m.
Instument:	Benioff S.P. vertical with short and long period recorders	Benioff S.P. vertival	Benioff S.P. vertical
Seismo. Officer:	Professor of Physics	Professor of Physics	Rev. Br. T.N. Purcell
Institution:	Rhodes University	Natal University	Christian Brothers College

Notes: "Earth tremors" originating in the mining district of the Witwatersrand are recorded several times daily by the Pretoria station, and less frequently by others. These are not dealt with in this bulletin.

Data are occasionally reported herein by courtesy of the Union Observatory, Johannesburg, which operates a 200kg. Wiechert Horizontal seismograph. This station is called J, and is at 26°10.9'S, 28°04.5'E, height 1806 metres.

All times given are G.M.T.

The supervision of this network and bulletin is at present in the hands of the undersigned, to whom all inquiries should be addressed.

Address:

Bernard Price Institute of Geophysical Research,
University of the Witwatersrand,
Johannesburg.
South Africa.

H.O. Oliver.
Seismological Officer.

ADDITIONAL - August-September, 196 3.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc. Dist.	C/R	Remarks.
Aug.	Kim.	e	11	44	38			
28		i		45	08			
28	Kim	i	15	23	38			
		i			46½			
		i		24	16			
		i			24½			
	Pie	e		24	01			
28	Grh	e	20	24	20			
		i			40			
Sep.								
1	Pie	i	19	31	18		R	
2	Pie	i	06	43	37		R	
23	Kim	i	08	13	28	±13°		U.S.C.G.S. H=08 10 35.4 16.7 S, 28.7 E. Northern Rhodesia, h = 33 km
	Pie	e(i)			37	±14°		
23	Kim	i	09	04	50	±13°		U.S.C.G.S. H = 09 01 56.8, 16.6S, 28.8 E Northern Rhodesia Mag 5.8, h = 33 km
	Pie	i			58	±14°	C	
23	Kim	i	09	49	23			
23	Kim	i	12	35	34			
23	Kim	i	12	50	54			
23	Kim	i	15	04	47	±13°		U.S.C.G.S. H=15 02 23.3 16.7 S, 28.4 E. Northern Rhodesia, h = 33 km
	Pie	i		05	24	±14°		
23	Kim	i	16	10	28			
23	Kim	i	16	47	01			
23	Kim	i	22	26	31	±13°		U.S.C.G.S. H=22 23 37.7 16.6 S, 28.7 E. Northern Rhodesia. Mag 5.5. h = 33 km
	Pie	i			38	±14°		
24	Kim	i	00	09	29			
24	Kim	i	09	16	31			
24	Kim	(e)i	09	37	44			
24	Kim	e	10	13	48			
		i		15	15			
24	Kim	iP	16	43	37	97°	C	U.S.C.G.S. H=16 30 16 10.6 S, 78.0 W. Near coast of Peru. Mag 7, h = 80 km.
24	Kim	i	21	40	39			
25	Kim	e	01	49	48			
		i		51	07			
25	Kim	e	03	14	(18)			
		i		15	49			

A.A. Attridge

October, 1963.

Date	Station	Phase	h. G.	m. M.	s. S.	Arc Dist	C/R	Remarks.
3	Kim	iP	15	56	20	45°	C	USCGS H=15 48 17.2 58.5S, 25.1W Sandwich Is h=54Km
3	Kim	eP	18	03	58	45°		USCGS H=17 55 54.2 58.6S, 25.5W. Sandwich Is Mag 5.5 h=33Km
3	Kim	e	22	41	28			
		i		42	36			
5	Kim	iP	15	05	49	43°		USCGS H=14 57 47.4 11.6N, 42.8E. French Somaliland Mag 5.3h=33Km
5	Kim	e(i)	15	19	52			
5	Kim	i	16	57	51	13°	C	USCGS H=16 54 57.7 16.9S, 28.6E. Southern Rhodesia
6	Kim	iP	17	27	25	79°	C	USCGS H= 17 15 33.9 33.9S, 70.0W Central Chili Mag 5.1
7	Pie	e	00	19	00			
8	Kim	i	13	16	27		C	
8	Pie	i	13	19	39			
9	Kim	i	04	34	32			
10	Kim	e	16	24	59			
		i		25	35			
12	Kim	i	05	04	39			
		i		05	15			
12	Kim	ePKP	11	45	59	136°		USCGS H=11 26 57.9 44.8N, 149.0E Kurile Is. Mag 7 h=40Km
		i		46	09			
	Pie	ePKP		46	01	132°		
13	Grh	e(PKP)	05	36	05	136°		USCGS H=05 17 57.1 44.8N, 149.5E. Kurile Is. Mag 8½. h=60km
		i			16			
	Kim	iPKP		37	01	135°		
	Pie	ePKP		37	03	132°		
		i			08			
13	Kim	ePKP	13	17	35	135°		USCGS H= 12 58 21.6 45.0N, 150.1E Kurile Is. Mag 5.4 h=50Km
13	Pie	e	16	19	02			
		i			04			
13	Kim	e	16	27	54			
		i		28	07			
14	Kim	e	13	41	00			
		i			17			
15	Pie	e	09	09	(01)			
		i		30	16			
	Kim	e		24	29			
		i		25	53			
		i		28	44			
		i		29	59			
16	Pie	eP	15	55	04	80°		USCGS H=15 43 00.8 38.6N, 74.3E Tadzhik U.S.S.R. Mag 5.9 h=33Km
	Kim	iP			13	82°		
20	Kim	e	01	12	28	136		USCGS H=00 53 07.2 44.7N, 150.7E Kurile Is Mag 7 h=25Km
		i		13	01			
	Pie	iPKP		12	59	132°	R	
20	Kim	i	01	35	57			
20	Grh	e	01	56	(26)			
		i		57	06			
20	Kim	i	13	09	38			
22	Kim	i	13	43	12			
		i			23			
24	Kim	e	06	31	56			
		i		32	20			
24	Kim	iP	07	38	06	77°		USCGS H=07 26 23.9 4.9S, 102.9E Off Southern Coast of Sumatra Mag6.0 h=50Km
27	Kim	i	00	22	15			
27	Kim	i	21	43	39		R	
28	Kim	i	01	43	27		C	
	Pie	e		45	22			
		i		46	33			

October, 1963 Cont.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/R	Remarks
28	Kim	iPKP	12	22	36	137°		USCGS H=12 03 19.8 52.8N, 159.8E. Off East Coast of Kamchotka. Mag 5 h=33Km
28	Kim	i	21	26	37		R	
29	Kim	iP	16	01	23	82°	R	USCGS H=15 49 10.3 24.8S, 68.6W. Northern Chili Mag 5.0 h=67Km
30	Pie	e	04	17				
31	Kim	iPKP	03	36	48	127°		USCGS H=03 17 42 21.8S, 175.0W. Tonga Is. Mag 6 h=33Km

A.A. ATTRIDGE.

31/8/64

November, 1963. Nov 63

Date	Station	Phase	h. G.	m. M.	s. S.	Arc Dist	C/R	Remarks.
3	Kim	iP	03	23	54	99°		USCGS H=03 10 12.7 3.5S,77.8W Peru-Ecuador Border Mag6½ h=33Km
3	Pic	e	03	37	44			
		i		39				
4	Pic	(e)iP	01	30	22	119°		USCGS H=01 14 32.8 15.1S,167.3E New Hebrides Is. Mag7 h=154Km
4	Kim	e	07	55	58			
		i		58	09			
		i		59	26			
	Pic	e		58	21			
		i		59	43			
6	Pic	e(i)PKP	02	31	45	105°		USCGS H=02 13 16.8 2.6S,138.4E Western New Guinea Mag5.7 h=33Km
6	Kim	i	14	45	56			USCGS
6	Kim	iP	18	45	47			H=18 33 25.9 16.7S, 69.7W Peru-Bolivia Border Mag4.7 h=174Km
7	Kim	ePKP	01	06	20	134°		USCGS H=00 46 53.1 42.7N,149.3E Kurile Is Mag4.1 h=30km
		i			52			
7	Kim	i	12	17	07			
	Pic	i			23			
8	Kim	e	00	46	37			
		i		47	55			
	Pic	e			32			
8	Kim	e	06	03	09			
		i		05	20			
		i		06	36			
	Pic	e(i)		05	30			
8	Pic	(e)i	09	01	40			
8	Kim	e	09	51	53	13°		USCGS H=09 59 24.3 16.5S,28.5E Northern Rhodesia h=33Km
		i	10	02	14			
		i		04	27			
	Pic	(e)i		05	30	14°		
8	Grh	e	10	12	15			
9	Kim	iP	21	27	33	90°		USCGS H=21 15 30.4 9.0S,71.5W
	Pic	iP			59	95°		Western Brazil Mag7 h=600km
		i		28	00			
9	Grh	(e)i	22	03	36		R	USCGS
10	Kim	iP	01	12	40			H=01 00 38.8 9.2S,71.5W Western Brazil Mag6½ h=600Km
10	Grh	i	01	58	14		R	
10	Pic	e	17	39	09			
11	Kim	i	20	08	18			
12	Kim	eP	07	16	59	65°		USCGS H=07 06 31.2 35.5N,29.7E New S.W. Coast of Turkey Mag5 h=69Km
15	Pic	e(i)	21	28				
16	Pic	e	23	44	(50)			? 6h 46m
		i	01	23	(00)			
16	Kim	iP	06	58	59	81°	C	USCGS H=02 13 16.8 41.3S,73.5W Off Coast of Chili Mag5.3 h=11Km
17	Kim	iP	00	58	42 K	70°	R	USCGS H=00 48 02.6 7.6N,37.4W North Atlantic Ocean Mag6½ h=33Km
17	Kim	e	01	18	13			
		i			34			
17	Grh	i	03	43	05			
18	Pic	e(i)	14	58	50			
22	Kim	e	19	46	14			
		i		47	31			
28	Kim	$iPKP_1$	15	33	53	154°		USCGS H=15 13 11 52.2N,174.2E Near Alentian Is Mag5.4 h=33Km
30	Kim	eP	21	52	03	75°		USCGS H=21 40 20.3 6.6N,94.2E Nicobar Is Mag 5.3 h=33Km

A.A. ATTRIDGE
31/8/1964.

December, 1963.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/R	Remarks.
1	Kim	e	13	12	(07)			
2	Pic	i	13	55	(50)			
3	Pic	e	22	13	00			
3	Kim	iP	23	16	10	84°		USCGS H=23 03 41.6 22.4S, 69.3W Northern Chili mag6¼ h=13Km
4	Grh	e	00	58	39			
		i			49			
4	Pie	i	16	46	39			
4	Pie	e	22	14	20			
		i		16	06			
	Kim	e		17	05			
		i		18	34			
10	Kim	iP	06	39	07	45°	R	USCGS H=06 30 54.8 58.1S,26.4W Sandwich Is. h=110km
	Pie	iP			24	47½°	R	
11	Pie	iPKP$_1$	17	28	00	150°	R	USCGS H=17 08 12.3 51.3N,179.3 W.Andreanof Is Mag5.3 h=32Km
	Kim	iPKP$_1$			04	152°	R	
14	Kim	i	08	10	36		R	
15	Grh	i	19	16	24		R	
16	Pie	iP	19	45	35	78°	R	USCGSH=19 34 45.5 4.8S,108.0E Java Sea Mag 6.4 h=650Km
	Grh	eP			55	82°		
	Kim	iP		46	01	83°		
15	Pie	i	19	48	12			
16	Grh	(e)i	01	48	21			
16	Pic	i	02	03	03			
	Kim	i			28		C	
16	Pie	i	02	25	30			
16	Kim	(e)iP	13	58	39	67°		USCGS H=13 47 56.4 37.1N,20.9E Ionian Sea Mag5.6 h=15Km
16	Kim	iP	14	29	52	77°	R	USCGS H=14 18 04.9 49.1S,127.1E 2000Km south of Australia Mag5.3 h=33Km
17	Pie	i	00	49	10			
18	Grh	i	00	34	18		R	
18	Grh	ePKP	00	48	50	119°		USCGS H=00 30 02.6 24.8S,176.6W Tonga Is Mag6.5 h=46Km
		i		50	10			
	Pie	iPKP		48	51	120°		
	Kim	iPKP			55	123°		
19	Kim	e	00	57	34			
		i		58	46			
		i		59	27			
19	Kim	e	17	17	29			
19	Pic	e(i)	17	56	(30)			
20	Pie	e(i)	15	43	(50)			
20	Kim	iP	15	57	35	41°	R	USCGS H=15 49 44.0 12.8S,66.0E Indian Ocean Mag5.6 h=33Km
20	Kim	iP	16	54	02	41°		USCGS H=16 46 14.4 12.6S,66.4E Indian Ocean Mag4.0 h=33Km
24	Kim	iPKP	11	37	10	125°		USCGS H=11 18 15.2 13.1S,166.7 E.Santa Cruz Is. Region Mag5.5 h=61Km
26	Kim	(e)i	20	33	40			
26	Pie	iP	21	01	54	78°		USCGS H=20 50 21.2 36.4N,71.3E Hindu Kush mag4.0 h=140Km
26	Pie	i	21	08	11			
28	Kim	iPKP	09	28	30	115°		USCGS H=09 03 52.0 32.7S,178.9 W. Kermadec Is. Mag5½ h=33Km
28	Kim	iP	18	08	25	58°		US GS H=17 58 33.1 60.4S,51.5W South Shetland Is. region Mag 5.4 h=49Km
28	Kim	(e)i	16	26	(30)			
29	Grh	e	17	51	33			
30	Grh	(e)i	22	57	50		C	
31	Pie	iP	17	46	02	47°		USCGS H=17 37 32.1 56.5S,26.0W Sandwich Is. mag5.4 h=30Km

A.A.AITRIDGE.
31/8/1964.