

SNP

Jan/64

Department of Federal Surveys,
Salisbury,
Southern Rhodesia.

JAN 1964

SEISMOLOGICAL BULLETIN.

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

Stat:	<u>Chileka (CHL)</u>	<u>Bulawayo (BUL)</u>	<u>Broken Hill (BHA)</u>
Lat:	15° 40.8' S	20° 08.6' S	14° 26.46' S
Long:	34° 58.6' E	28° 36.8' E	28° 28.08' E
Litho- logic Founda- tion:	Charnockitic granulites of the Basement Complex	Hornblend schists of of the Bulawayo System	Dolomite and shales of the middle Katanga system
Hgt:	781 metres	1341 metres	1206 metres
Inst:	Vertical and Horizontal Willmore S.P.		
Seismo. officer:	Sen. Met. Officer Chileka	Director, Federal Surveys	Director, Federal Surveys
Obser- ver:	Officer-in-charge Chileka	Officer-in-charge Goetz Observatory	Officer-in-charge Broken Hill Observatory
Inst:	Department of Federal Surveys, Salisbury		

All times given are G. M. T.

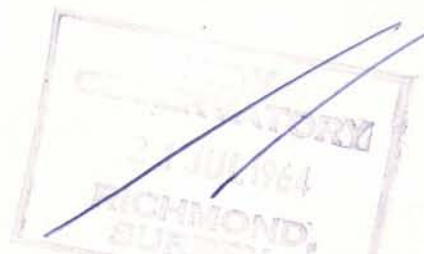
The supervision of this network and bulletin is at present in the hands of the undersigned, to whom all inquiries should be addressed.

H.O. OLIVER

Seismological Officer.

Address.

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



Harriet J.S.
2/7/64

January, 1964.

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/R	Remarks
1	BUL	eP ₁	00	00	23			Kariba
		iS ₁		01	05			
1	BUL	iP _n	15	41	52			Kariba
		iP _n		42	06			
		iS ₁			45			
1	CLK	iP _n	15	43	33			
		iP ₁		44	51			
		iS ₁		45	17			
1	BUL	iP	15	59	13	54	C	USCGS H = 15 49 47.9 55.9 S, 27.1 W. h _± 33 km. Sandwich Islands Mag. 5.4
	CLK	eP	16	00	02	63		
1	CLK	ePKP	17	45	27	120		USCGS H = 17.26 43.5 45.4 N, 151.9 E h _± 45 km. Kurile Isles Mag 3.
	BUL	ePKP			46	128	R	
2	BUL	iP	06	45	44	92	R	USCGS H = 06 32 58.9 21.5 S, 68.2 W h _± 110 km. Chile - Bolivia Mag 5.1. Probably Central Africa.
3	CLK	eP	03	53	17			Probably Central Africa.
		i		56	33			
	BHA	eP		53	50			
		i		56	12			
		i		57	00			
	BUL	eP		58	14			
3	BHA	e	20	08	14		C	
3	BUL	i	21	54	38			
	CLK	i		55	27		R	
	BHA	e			27		R	
3	BHA	iP	22	33	24			Kariba
		iS			50			
	BUL	eP		34	52			
		iS		35	31			
	CLK	traces		37	05			
3	BUL	iS ₁	22	42	23			Kariba
4	BHA	eP	10	05	35			Kariba
		iS		06	00			
4	BUL	e	12	41	30			Witwatersrand tremor.
		i		43	10			
	CLK	traces	12	46	04			
4	CLK	e	13	40	56			
4	BHA	i	21	18	32			C C R
	BUL	i			43			
	CLK	i		19	32			
5	BUL	iS ₁	02	19	26			Kariba
5	BHA	iP	02	55	27			Kariba
		iS			52			
	BUL	traces	02	56	00			
5	BHA	e	10	31	21			R
5	BUL	i	11	19	36			
5	BHA	e	12	09	02			
5	BUL	i	17	47	22			
5	BUL	i	22	47	27			C C R
	CLK	e		48	19			
5	BUL	i	23	52	31			
	CLK	e		53	12			
	BHA	e			21			
6	CLK	eP	18	19	49			Kariba
		iS		20	56			
	BUL	iP	20	19	11			
		iS			24			

January, 1964 contd.

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/R	Remarks.
7	CLK	e	00	04	17		C	
	BUL	e			30		R	
7	BUL	iP ₁	00	18	43			Kariba
7	BUL	ePKP	09	06	16	126		USCGS H = 08 46 48.0 54.0 N, 165.5 W. h ± 80 km ¹ Fox Islands Aleutian Islands. Mag 4.7
7	BHA	eP	09	44	01			
		iS			22			
7	BUL	iP	12	42	12	55	C	USCGS H= 12 32 54.5 56.8 S, 26.1 W. h ± 33 km. Sandwich I's. Mag 5.6
7	BHA	eP	19	25	32			Kariba
		iS			59			
7	BUL	traces	19	29	00			
7	BHA	e	20	57	40		R	
7	BHA	eP	22	01	35			
		iS		02	02			
7	BHA	eP	22	27	47			Kariba
		iS		28	15			
8	BHA	eP	02	53	04			Kariba
		iS			31			
	BUL	traces	02	56	58			
8	BUL	iP _n	06	45	22			
		iP ₁			54			
		iS _n		46	04			
8	CLK	e	20	56	30			Probably Central Africa
		i		58	02			
	BHA	e		56	34			
		i		57	49			
	BUL	e			17			
8	CLK	iP	22	43	13	84	R	USCGS H = 22 30 52.5.
	BUL	iP			41		R	38 S, 119.3 E. h ± 112 km. Celebes
	BHA	iP		44	13	91	R	Mag 5.3
8	BUL	iP _n	23	22	39			Kariba
		iP ₁			49			
		iS ₁		23	35			
	BHA	iP			50			
	CLK	e		23	18			
		i		24	30			
		i		25	01			
9	BHA	eP	01	19	56			Kariba
		eS		20	24			
9	CLK	eP	02	28	12			Probably Tanganyika
		iS _n		29	55			
		iS ₁		30	11			
	BHA	eP		28	42			
		eS		31	00			
	BUL	eP		29	18			
9	BHA	e	10	06	11		R	
9	BHA	iP	12	49	43			
9	BUL	iP ₁	12	50	09			Kariba
		iS ₁			55			
9	CLK	iPKP	18	50	40	118	C	USCGS H = 18 31 52.4
	BHA	iPKP			47	124	C	45.5 N, 150.9 E. h ± 40 km. Kurile Islands. Mag 5.6.
10	CLK	traces	02	31	00			
	BHA	e			17			
		i			37			

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	R/ C	Remarks
10	CLK	ePKP	05	09	30	113	R	USCGS H = 04 50 53.4 42.0 N, 142.6 E h ± 33 km. S. Coast of Hokkaido, Japan. Mag 5.5
	BHA	ePKP			38	118	R	
	BUL	iPKP			45	121	R	
10	BHA	traces	08	50	00			
10	CLK	traces	08	50	53			
10	BUL	traces	14	09	20			
10	BUL	traces	16	56	06			
10	BHA	iPKP	17	16	19	123	R	USCGS H = 16 57 26.5 45.4 N, 150.0 E. h ± 50 km. Kurile I's. Mag. 4.5
	BUL	iPKP			27	121	R	
10	BUL	traces	18	59	00			
11	BHA	e	05	17	02			
11	BUL	traces	05	19	29			
11	BHA	e	10	11	15			
11	BHA	eP	10	33	21	61	R	USCGS H = 10 23 10.9. 11.4 S, 90.9 E. h ± 33 km. Indian Ocean about 600 km. west of Cocos. Seismic local
11	BUL	i	11	23	28			
11	BUL	e	12	32	05			
11	CLK	e	22	14	40		C	
	BHA	e		15	10			
12	BHA	iP	00	11	06			Kariba
		iS			33			
	BUL	eP ₁			32			
		iS ₁		12	20			
12	CLK	traces	01	48	54			
	BHA	traces		49	00			
12	BHA	ePKP	06	19	31	142	C	USCGS H = 06 00 13.2 53.2 N, 136.3 W. h ± 33 km. Fox I's. Aleutian Islands. Mag. 5.5
	BUL	iPKP			48	147	C	
		e		20	23			
12	BHA	traces	09	45	00			
12	BUL	i	12	45	48		C	
	BHA	i		46	21		C	
12	BHA	e	12	54	44		R	
12	BUL			55	19		R	
12	BHA	traces	16	46	00			
12	BHA	traces	18	20	00			
12	BHA	iP	18	29	13			Central Africa
12	BUL	e	18	30	22			
13	BUL	i	19	08	11		C	
	BHA	e			18			
13	BHA	e	20	03	03		R	
13	BHA	traces	21	34	30			
	CLK	traces			55			
13	BUL	traces	21	38	00			
13	BUL	e	22	05	34			Tremor
	BHA	e			43			
14	BUL	i	15	56	43		C	
	BHA	i			46		R	
15	BHA	traces	00	37	00			
15	BHA	traces	03	55	00			
15	BHA	e	05	27	30			± 150 Km from station
		i			46			
15	BHA	eP	09	46	03			Kariba
		iS			22			
15	BUL	traces	10	28	00			
15	BHA	eP	11	15	10			Kariba
		iS			37			
	BUL	iP ₁			38			
		iS ₁		16	22			

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks
15	BUL	traces	14	24	00			
15	CLK	ePKP	21	54	33	109		USCGS H = 21 36 05.0 29.1 N 140.8E h ± 70 Km. South of Honshu Japan. Mag 6 $\frac{3}{4}$.
	BHA	iPKP			44	115		
	BUL	iPKP			48	117		
15	BUL	e	22	05	07		C	
	CLK	e			32			
	BHA	i			44			
16	BHA	eP	09	47	33			Kariba
		iS		48	00			
	BUL	iS ₁			37			
16	BUL	iS ₁	12	49	59			Probably tremor
16	CLK	traces	12	53	00			
16	BUL	i	16	19	39		R	
16	BUL	traces	17	11	24			
17	BHA	ePKP	03	13	17	125		USCGS H=02 54 22.6 45.4 N 151.3 E h ± 55 Km. Kurile Islands. Mag 5.1
	BUL	ePKP			25	127		
17	CLK	e	03	35	16			
	BHA	e			34			
	BUL	i		36	02		R	
17	BHA	iP	09	10	47			Kariba
	BUL	eP		11	05			
		iS.			12			
	CLK	traces		13	00			
17	BHA	eP	11	43	24			Kariba
		iS			52			
18	BHA	eP	06	11	59			Kariba
		eS		12	25			
	BUL	traces			59			
18	BUL	i	09	23	07		C	
18	CLK	eP	12	17	11	92	R	USCGS H=12 04 40 23.1 N 120.5 E h ± 33 Km. Taiwan Mag 6 $\frac{3}{4}$.
		i			48			
	BHA	iP		18	12	98	R	
	BUL	iP			22	99	R	
18	BHA	traces	13	01	00			
19	BHA	eP	01	40	09			Kariba
		iS			36			
	BUL	eP ₁			35			
		iS ₁		41	07			
19	BUL	i	06	59	46		C	
	BHA	e			58			
	CLK	e	07	00	20			
19	CLK	iP	09	22	16	44	R	USCGS H=09 13 53.5, 26.9 N 54.0 E h ± Km near Coast Southern Iran. Mag 5.6
	BHA	eP			31	48	C	
20	CLK	traces	09	03	01			
	BHA	traces		04	00			
20	BUL	e	17	00	18		R	
		i		01	40			
		i		02	33			
20	BHA	traces	17	04	00			
	CLK	e		27	18			
20	BUL	i	17	27	21		R	
	BHA	e			29		C	
21	BHA	eP	10	47	58			
		iS		48	22			

January 1964, contd.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks
22	BHA	traces	01	27	13			
22	BHA	traces	03	21	04			
22	BHA	traces	09	21	00			
22	CLK	iP	16	09	44	69	C	USCGS H=15 58 46.5
	BHA	iP		10	11	74		22.4 N 93.6 E
	BUL	iP			27	77	R	h ± 88 Km Burma Mag 6.1
22	BHA	e	19	24	09		C	
23	BUL	i	00	18	46		C	
	BHA	e			53			
23	CLK	iP	09	07	26	420km		B.F.I. H=09 06 29
		iS			09			19.30 S 34.0 E
	BUL	eP _n			46	560km		Mozambique
		iS _n		08	34			
		iS ₁			57			
	BHA	eP _n			14	800km		
		iS _n		09	28			
23	CLK	traces	09	29	03			
23	BUL	e	10	26	58			
		i		27	35			
23	CLK	iP	10	52	56			Same region as pre- vious Mozambique shock
		iS		53	36			
23	BHA	traces	10	54	50			
23	BUL	iP	15	30	36	70	C	USCGS H=15 19 31.6 33.9 N > 1.2 E h ± 28 km. Hindu Kush region. Mag 4.4
23	BHA	e	22	00	56			
	CLK	traces		01	51			
24	CLK	i	10	00	04		C	
24	BUL	traces	10	06	00			
24	BUL	e	17	36	00			
24	CLK	iP	22	55	01	69		USCGS H=22 44 01
	BUL	iP			39	74	C	7.1 S 106.0 E. h ±
	BHA	iP			42	76		94 Km. Off S. Coast of Java. Mag 5.1
25	BUL	i	01	08	53		R	
25	BHA	i	01	40	09			
	CLK	eP _n			08			
		iS _n		41	15			
		iS ₁			44			
	BUL	iP ₁		40	10			
		iP _n			36			
25	BHA	eP	01	53	53			
		iS		54	19			
25	BUL	traces	01	55	00			
25	BHA	eP	02	31	03			Kariba
		iS			31			
	BUL	iP ₁			28			
		iP _n		32	13			
25	BHA	eP	06	12	43			
		iS		13	08			
	BUL	traces		13	00			
26	CLK	traces	01	38	29			
26	CLK	e	06	49	34			Probably Central Africa.
		i		50	28			
					53			
26	BHA	e		49	46			
26	BUL	iPcP	09	22	41	95	R	USCGS H=09 09 33.9 16.3 S 71.7 W. h ±
								116 Km. Southern Peru. Mag 6.1.
	BHA	ePcP			48	96		
	CLK	iPcP		23	14	102		
26	BHA	e	22	32	52			Probably Central Africa.

January 1964, contd.

Date	Station	Phase	h. G.	m. M.	s T.	Arc Dist.	C/ R	Remarks.
26	BUL	traces	22	39	00			
27	BHA	eP	01	21	04	47	R	USCGS H=01 12 23.5
	BUL	iP			14	50	R	00.0 17.9 W. h ±
	CLK	iP			49	54	C	33 Km. Mid-Atlantic Ocean. Mag 5.3
27	BHA	traces	01	46	00			
28	BUL	traces	09	44	00			
	BHA	traces	09	46	00			
	CLK	traces	09	48	00			
28	CLK	iP	14	19	18	61		USCGS h= 14 09. 17.1
	BHA	iP			34	65		36.5 N 70.9 E. Hindu
	BUL	iP		20	01	69		Kush. h± 207 Km. Mag 61
29	BHA	traces	09	21	17			Kariba
29	BHA	e	21	28	43			Seismic probably
		i		29	18			Local
30	BUL	traces	08	10	00			Witwatersrand tremor
30	BHA	traces	08	12	24			West Rand Tremor
	CLK	traces	08	12	14			
30	BUL	i	09	31	36			Seismic Local
30	CLK	iP	12	50	01	65	R	USCGS H=12 39 23.8
	BHA	i			37	72	R	1.7 N 99.6 E. h ±
	BUL	i			41	72	R	133 Km. Northern Sumatra. Mag 5.4
30	CLK	eP	17	55	12	52		USCGS H=17 45 54.6
	BHA	eP			32	53		37.3 N 29.9 E. h ±
	BUL	eP			40	58		Km. Near S.W. Coast of Turkey. Mag 5.3
31	BHA	traces	09	59	00			

H.O. OLIVER

WINIFRED WAGNER.

E- MAR 1964

Department of Federal Surveys,
Salisbury,
Southern Rhodesia.

SEISMOLOGICAL BULLETIN.

The data herewith give the results for a network of seismomographs intended particularly for the study of earthquakes occurring in the Federation. This bulletin, however, is prepared regularly and will be sent to interested organizations on request.

Stat:	<u>Chileka (CHL)</u>	<u>Bulawayo (BUL)</u>	<u>Broken Hill (BHA)</u>
Lat:	15° 40.8' S	20° 08.6' S	14° 26.46' S
Long:	34° 58.6' E	28° 36.8' E	28° 23.08' E
Litho- logic Founda- tion:	Charnockitic granulites of the Basement Complex	Hornblend schists of of the Bulawayan System	Dolomite and shales of the middle Katanga system
Hgt:	781 metres	1341 metres	1206 metres
Inst:	Vertical and Horizontal Willmore S.P.		
Seismo. officer:	Sen. Met. Officer Chileka	Director, Federal Surveys	Director, Federal Surveys
Obser- ver:	Officer-in-charge Chileka	Officer-in-charge Goetz Observatory	Officer-in-charge Broken Hill Observatory
Inst:	Department of Federal Surveys, Salisbury		

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.

H.O. OLIVER

Seismological Officer.

Address.

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

*Passed to
JSS*



March, 1964

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	R/ C	Remarks
1	CLK	i	00	01	22		C	
	BUL	i			54		R	
1	BUL	iS ₁	19	50	23			Probably tremor
3	BHA	e	13	29	03			Seismic local
		e			34			
3	BUL	iS ₁	14	46	56			Tremor (Witwatersrand)
3	BUL	iS ₁	15	06	52			Tremor (Witwatersrand)
3	BHA	eP	23	49	11			Kariba
		iS			40			
	BUL	eP ₁			37			
		iS ₁		50	22			
4	CLK	traces	09	42	00			
4	BHA	traces	09	43	30			Seismic probably local
4	BUL	traces	19	00	00			
5	BUL	e	01	55	47			
5	CLK	iP	06	10	41	60		USCGS H=06 00 41.3
	BUL	e			(48)	59		45.2 S 96.4 E h ±
	BHA	iP		11	14	64		4P Km, Indian Ocean E
								of Kerquelen Is.
								Mag. 5.5
5	CLK	eP	10	59	52			Central Africa
		i	13	02	20			
		i		03	26			
	BHA	eP	11	00	02			
		e		02	39			
		i		03	50			
5	CLK	traces	12	13	43			
6	BHA	eP	00	48	13			Kariba
		iS			42			
6	BHA	traces	03	26	06			
6	BHA	eP	05	51	02			Kariba
		iS			30			
6	BHA	traces	12	48	16			Probably Kariba
6	BUL	traces	19	16	01			
7	CLK	eP	00	04	41			Seismic local
		iS		05	30			
7	BHA	e	06	02	46			Seismic local
		i		03	25			
7	BHA	iP	07	36	12	71	C	USCGS H= 07 25 03
								93.5 N 97.16 E. h ±
								82 Km, Northern
								Sumatra. Mag. 5.3
7	BHA	e	10	38	48			
	CLK	e		39	23			
8	BHA	i	03	36	51		C	
9	BHA	eP	04	00	43			Kariba
		iS		01	07			
10	BHA	iP	02	14	48			Kariba
		iS		15	15			
	BUL	iP ₁			13			
		iS ₁			56			
10	BHA	eP	02	55	18			Kariba
		iS			45			
	BUL	eP ₁			41			
		iS ₁		56	25			
10	BHA	traces	04	23	27			
10	BHA	iP	17	01	36			Kariba
	BUL	eP _n			53			
		iS ₁		02	46			
	CLK	eP _n			33			
		eS _n		03	43			
10	BHA	iP	20	32	28			Kariba
	BUL	eP _n			47			
		iS ₁		33	43			
	CLK	eS _n		34	38			

March, 1964 contd.

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks
10	BHA	iP	21	39	21			Kariba
		iS			48			
11	BUL	traces		40	00			
11	BHA	ePeP	01	19	35	100		USCGS H= 01 06 00.4 1.8 N 127.1 E h± 58 Km. Molucca Passage Mag. 5.3
11	BHA	eP	01	45	22			Kariba
		iS			48			
11	BHA	eP	06	52	38			Kariba
		iS		53	04			
11	BHA	traces	07	10	00			
11	BHA	eP _n	14	09	36	900Km.		B.P.I. H = 14 07 38 Tanganyika
		iS _n		11	00			
		iS _l			47			
	CLK	eP _n		09	54	1130Km.		
		iS _n		11	40			
		iS _l		12	35			
11	BUL	iS _l	14	34	54			Probably tremor (Witwatersrand)
11	BHA	iP	22	05	18			Kariba
		iS			45			
	BUL	iS _l		06	29			
12	BHA	iP	09	18	48			Kariba
	BUL	iP _n		19	04			
		iP _l			14			
		iS _l			56			
	CLK	eP _n			45			
		iS _n		20	52			
		iS _l		21	27			
12	BHA	iP	09	52	02			Kariba
		iS			29			
	BUL	iS _l		53	08			
12	BHA	eP	16	07	20	830km.		B.P.I. H = 16 05 30 7.0 S 29.0 E Tanganyika
		iS _n		08	36			
		i		09	18			
	CLK	eP _n		07	49	1080		
		iS _n		09	26			
		iS _l		10	29			
	BUL	eP _n		08	41	1500		
		iS _n		11	13			
13	BUL	iPKP _l	06	11	03	143		USCGS H= 05 51 31.2 52.1 N 170.0 W h± 33 Km. Fox I's Aleu- tian I's. Mag. 4.6
13	BHA	e	15	26	02			
13	BUL	traces	15	40	06			
13	BHA	eP	15	50	37			Kariba
		iS		51	00			
	BUL	iS _l			49			
14	BHA	traces	02	02	00			Kariba
14	BHA	iP	07	02	47	63		USCGS H = 06 51 58.6 6.2 S 92.1 E h± 33 Km. Andaman I's region. Mag. 4.7
14	BHA	traces	08	55	46			
14	BUL	iP	16	45	02	45		USCGS H = 16 36 52.1 1.9 S 12.9 W h± 33 Km. Mid-Atlantic Ocean. Mag. 5.4
	CLK	eP			40	49		
14	CLK	traces	17	13	00			
14	BUL	traces	20	01	00			
15	CLK	iP	22	41	09	65		USCGS H = 22 30 26.0 36.2 N 7.6 W h± 27 Km. West Strait of Gibraltar. Mag. 6.4-7.

March 1964, contd.

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/ R	Remarks.
16	CLK	iP	01	17	13	77	R	USCGS H = 01 05 17.6 36.9 N 95.5 E h± 33 Km. Tsinghai Prov. China. Mag. 5.9
16	CLK	eP _n iS _n iS ₁	05	03	57			
				05	37	1100Km		B.P.I. H=03 01 33 Probably Tanganyika
16	BUL	traces	15	18	00			
17	BUL	iS ₁	16	20	19			Probably Kariba
17	CLK	e	23	35	43			
18	CLK	ePKP e	04	55	27	122		USCGS H = 04 37 26.9 52.5 N 153.6 E h± 440 Km. Sea of Okhotsk Mag 5.6
				56	56			
19	CLK	traces	01	17	00			
19	CLK	iP	09	49	39	36	R	USCGS H= 09 42 34.9 14.7 N 56.3 E h± 33 Km. Arabian Sea
	BUL	iP		50	39	44		
19	BUL	ePKP	22	03	25	139		USCGS H = 21.44 03.8 15.1 S 172.6 W h± 33 Km. Samoa I's region Kariba
19	BUL	iP ₁ iS ₁	22	46	41			
				47	17			
20	BUL	e	06	02	12			
	CLK	traces		04	00			
20	CLK	i	19	11	57		R	
	BUL	i		12	41		C	
21	CLK	iP	03	54	47	91	R	USCGS H = 03 42 19.0 6.4 S 127.9 E h± 367 Km. Bonda Sea Probably Nyasaland.
	BUL	iP		55	11	95	C	
21	CLK	e	14	22	27			
		i		23	26			
21	CLK	i	14	46	15			
21	BUL	i	16	46	13		C	
22	BUL	e	07	36	14			Seismic Local
		i			27			
22	BUL	iP	08	47	52	87	C	
	CLK	eP		48	28	95		USCGS H= 08 35 06.4 35.7 S 72.9 W h ± 33 Km. Near Coast Central Chile. Mag. 5.1
22	CLK	traces	12	52	25			
23	CLK	e	14	54	01			
25	CLK	iP iS	22	36	54			Seismic about 160 Km from Station
				37	12			
26	CLK	traces	06	26	59			
26	BHA	e	06	36	26			
26	BHA	e	11	38	46			
26	BHA	iP iS	12	53	38			Kariba
				54	03			
27	CLK	iP	04	41	51	71		
	BHA	iP		42	17	76	C	USCGS H = 04 30 33 25.9 N 95.8 E h ± 93 Km. Northern Burma Probably Tanganyika
	BUL	iP			32	78		
27	CLK	iP _n iS _n iS ₁	05	05	38			
				07	18			
				08	32			
	BHA	iP ₁	05	06	20			
27	BHA	traces	07	29	00			
27	BHA	e	08	31	11			
27	BHA	e	09	22	42			
27	BHA	ePKP	20	40	22	134		USCGS H = 20 22 10.6 23.7 S 179.9 E h ± 520 Km. South of Fiji I's. Mag. 5.0
28	BHA	traces	01	32	00			

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks.
28	BHA CLK	iPKP iPKP	03	55	32 43	133 134		USCGS H= 03 36 10 61.1 N 147.8 W East of Anchorage Alaska Mag. M. 8.2.
28	CLK	e	05	55	03			Anchorage aftershock
28	BHA CLK	e e	07	00	47 49			" "
28	BHA CLK	i i	07	03	20 21			Anchorage Aftershock
28	BHA	i	07	06	00			
28	CLK	e	07	29	38			Anchorage Aftershock
28	BHA	i			43			
28	BHA	e	07	42	33			Anchorage Aftershock
28	CLK	i		43	17			
28	CLK	e	09	20	27			Anchorage Aftershock
28	BHA	i			27			
28	BHA	i	09	23	13			Anchorage Aftershock
28	BHA	e	10	54	51			Anchorage Aftershock
28	CLK	e	10	54	54			Anchorage Aftershock
28	BUL	i		55	02			
28	BUL	i			07			
28	BHA	i	11	27	46			Anchorage Aftershock
28	CLK	iP	11	42	42	88	R	USCGS H = 11 30 09
28	BUL	iP		43	10	94		0.5 N 122.3 E h± 140 Km. Northern Celebes Mag 5.8
28	BHA	iP			12	95		
28	BHA	e	12	40	05			Anchorage Aftershock
28	CLK	i			15			
28	BUL	i			21			
28	BUL	e	13	20	39			
28	BUL	traces	13	30	00			
28	BUL	e	15	06	03			
28	BHA	i			58			
28	CLK	e	15	06	58			
28	BHA	e	17	03	47			
28	BUL	traces	19	38	00			
28	BHA	e	20	48	15			
28	CLK	e			22			
28	BUL				30			
29	BHA	e	00	05	45			
29	CLK	i			45			
29	BUL	e			49			
29	CLK	e	01	28	57			
29	BUL	traces		29	00			
29	CLK	e	01	48	58			
29	BHA	e			58			
29	BUL	e		49	03			
29	BHA	e	01	51	42			
29	BUL	e	02	07	51			
29	BHA	iP	03	55	11			Kariba
29	BUL	iS			58			
29	BUL	traces	03	56	00			
29	BHA	iP	03	59	54			Kariba
29	BUL	iS	04	00	21			
29	BUL	traces	04	01	00			
29	BUL	e	04	05	39			
29	BUL	traces	04	32	00			
29	BUL	e	05	11	28			
29	BUL	e	05	40	46			
29	BUL	traces	05	57	18			
29	CLK	e	06	24	10			
29	BUL	i			16			
29	BUL	e	07	12	52			

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks
29	BHA	traces	08	11	59			
	CLK	e		12	13			
	BUL	e			19			
29	CLK	e	08	14	58			
29	BUL	traces	09	02	00			
29	BUL	e	09	29	28			
29	BUL	e	10	27	26			
29	BHA	eP	10	59	35			Kariba
		iS	11	00	01			
29	BUL	traces	11	59	00			
29	BUL	traces	12	34	00			
29	CLK	e	12	45	29			
29	BUL	i	15	26	51			
29	BHA	iS	15	57	38			Kariba
29	BHA	e	17	00	19			
	CLK	i			21			
	BUL	e			21			
29	BHA	i	18	55	16			
	BUL	i			23		C	
	CLK	i		56	06			
29	BUL	iPKP	21	59	20	121	C	USCGS H = 21 40 32
	BHA	iPKP			25	124	C	6.7 S 155.1 E h ± 68 Km. Solomon I's. Mag. 6.
30	CLK	e	02	36	34			USCGS H = 02 18 05
	BHA	e		37	22			Kodiak I's region
	BUL	i			37		C	Mag. 5.7
30	CLK	e	03	36	15			
30	BHA	e	05	10	45			
30	BHA	e	07	28	54			
30	CLK	e			59			
30	CLK	e	07	31	35			
30	BHA	i	09	53	19			Seismic probably local
		i			57			
	BUL	e		54	48			
30	BUL	e	15	27	13			
30	BHA	i	15	35	56			Seismic. Near to Station
30	BHA	traces	16	26	59			
	CLK	traces		28	42			
	BUL	i		29	00		C	
30	BHA	e	16	31	39			
30	BUL	iS ₁	23	09	32			Kariba
31	BHA	e	00	30	25			
31	BUL	ePKP	00	33	10	127		USCGS H=00 14 11.7. 45.3 N 151.0 E Kurile I's. Mag 5 $\frac{1}{2}$ -5 $\frac{3}{4}$
31	CLK	traces	00	33	00	119		
31	BUL	traces	01	24	00			
31	BUL	iPKP ₁	09	21	10	147		USCGS H=09 01 30.2 50.8 N 130.2 W h± 15 km. Van- couver I's region. Mag. 6
31	BHA	eP _n	15	24	35	950 km		B.P.I. H = 15 22 30 7.0 S 31.0 E. Tanganyika
		iS _n		26	04			
		iS ₁			50			
	CLK	iP _n		24	57	1100 km		
		iS _n		26	42			
		iS ₁		27	38			
	BUL	traces		26	00			

 H.O. OLIVER
 WINIFRED WAGNER.

3 epicentres from JCH

Department of Federal Surveys,
Salisbury,
Southern Rhodesia.

5- APR 1964

SEISMOLOGICAL BULLETIN.

The data herewith give the results for a network of seismomographs intended particularly for the study of earthquakes occurring in the Federation. This bulletin, however, is prepared regularly and will be sent to interested organizations on request.

Stat:	<u>Chileka (CHL)</u>	<u>Bulawayo (BUL)</u>	<u>Broken Hill (BHA)</u>
Lat:	15° 40.8' S	20° 08.6' S	14° 26.46' S
Long:	34° 58.6' E	28° 36.8' E	28° 23.08' E
Litho- logic Founda- tion:	Charnockitic granulites of the Basement Complex	Hornblend schists of of the Bulawayan System	Dolomite and shales of the middle Katanga system
Hgt:	781 metres	1341 metres	1206 metres
Inst:	Vertical and Horizontal Willmore S.P.		
Seismo. officer:	Sen. Met. Officer Chileka	Director, Federal Surveys	Director, Federal Surveys
Obser- ver:	Officer-in-charge Chileka	Officer-in-charge Goetz Observatory	Officer-in-charge Broken Hill Observatory
Inst:	Department of Federal Surveys, Salisbury		

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.

H.O. OLIVER
Seismological Officer.

Address.

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

Handwritten initials: *Handwritten initials*



April, 1964

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks
1	BHA	traces	22	18	00			
1	CLK	i	22	29	12			Seismic Probably local
1	BHA	i	22	45	22			
2	CLK	eP	01	22	15	63		USCGS H=01 11 55
	BHA	iP			52	70	C	5.9 N 95.7 E
	BUL	iP			59	70	C	h \pm 132 km. Near Coast Northern Sumatra. Mag. 5.2
2	BHA	traces	01	43	49			
2	CLK	traces	03	04	03			
2	BHA	i	03	20	47		C	
2	BUL	iP	04	50	45	40		USCGS H=04 43 17.2
	BHA	iP		51	02	41	R	25.8 S 13.8 W h \pm 33 km. South Atlantic. Mag. 5.0
2	CLK	eP			43	48		
	BUL	iPcP	16	10	17	99		USCGS H=15 56 52.6 5.8 N 125.8 E h \pm 179 km. Mindinao Phillipine I's Mag. 5.7
2	BUL	i	23	37	10		C	
	BHA	e			45			
3	BHA	traces	03	08	30			
3	CLK	iP	04	23	09	63		USCGS H=04 12 41.9
	BUL	iP			54	70		4.0 N 96.6 E
	BHA	iP			58	70	R	h \pm 70 km. Near West Coast Sumatra Mag. 5.8
3	BHA	i	04	34	44			
3	BHA	iP	17	55	33			Kariba
3	CLK	e	22	52	57			
	BHA	e			58			
	BUL	e		53	01			
4	BHA	eP	02	11	35			Kariba
		iS		12	03			
4	CLK	i	04	08	32			Seismic Local
4	BHA	i	07	08	07			
4	BHA	i	09	30	21			
4	CLK	i			22			
4	BHA	eP _n	13	14	26			Probably Tangan- yika
		iS _n		15	43			
		iS _l		16	23			
	CLK	eP _n		14	30			
		iS _n		15	50			
		iS _l		16	33			
4	BHA	eP	13	58	28			Kariba
		iS			55			
4	BHA	e	18	05	22			
	CLK	e			27			
	BUL	i			41			
4	BUL	i	18	19	15			
4	BUL	i	18	35	25			
5	BHA	traces	01	41	36			
	BUL	i			46		C	
5	BUL	e	02	01	15			
5	BUL	eP _n	04	21	30			940 km. from station
		iS _n		22	55			
		iS _l		23	41			
5	BHA	traces	14	43	30			Probably Kariba
5	BHA	eP	14	50	38			Kariba
		iS		51	06			
	BUL	eP _n		50	55			
		iP _l		51	03			
		iS _l			45			
	CLK	iS _n		52	38			
		iS _l		53	22			

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc. Dist.	R/ C	Remarks
5	BHA	eP	15	52	47			Kariba
		iS		53	15			
	BUL	traces		54	00			
5	BHA	eP	15	59	06			Kariba
		iS			34			
	BUL	eP _n			25			
		iS ₁	16	00	14			
5	BHA	iP	18	30	04			About 100 Km. from station
		iS			14			
5	BHA	ePKP	19	47	37	136		USCGS H = 19 28 18.1
	CLK	ePKP			40	136		60.2 N 146.7 W h ±
								15 km. Prince William Sound Alaska. Mag. 5.5 $\frac{1}{4}$
6	BUL	eP _n	02	42	04	930km.		B.P.I. H = 02 40 02
		iS _n		43	29			Probably South African
		iS ₁		44	15			
		eP _n		43	15			
		iS _n		45	42			
	BHA	iS ₁		47	10	1600km.		
	CLK	traces			08			
6	BHA	e	03	44	12			
6	BHA	eP	04	46	44			About 100 km. from station
		iS			54			
6	BUL	i	07	11	44			
	BHA	i		12	29			
	CLK	e			38			
6	CLK	traces	07	32	00			Seismic Probably local
	BHA	i			59			
6	CLK	eP	22	52	32			About 150 km. from Station
		iS			48			
7	BUL	traces	06	20	40			
7	CLK	i	08	56	62			Seismic Local
		i		57	25			
7	CLK	iP	13	30	55	88		USCGS H = 13 18 18.9
	BUL	iPcP		31	24	94	C	0.1 N 123.2 E h ±
	BHA	ePcP			25	95	C	150 km. Northern Celebes. Mag. 5.9
7	BUL	i	19	48	01		C	
8		eP	05	42	52			Probably Kariba
		iS		43	24			
8	CLK	iP	08	14	58	34	C	USCGS H = 08 08 11.8
	BUL	eP		15	53	40		6.8 S 38.9 E h ±
								33 km. Chagos Archipelago region. Mag. 5.17
8	BUL	e	09	59	48			
8	CLK	traces	11	16	00			
8	BUL	iS ₁	12	49	40			Witwatersrand tremor
8	BHA	iP	15	05	58			Kariba
		iS		06	27			
8	BUL	eP _n			15			
		iP ₁			25			
		iS ₁		07	07			
8	BUL	traces	15	15	00			
8	BUL	iS ₁	15	21	57			Witwatersrand tremor
	BHA	traces		25	00			
8	CLK	e	20	12	13			
9	CLK	iP	03	19	22			About 200 km. from Station.
		iS			43			Probably Kariba
9	BHA	traces	08	49	00			
9	BHA	ePKP	01	27	24	137	C	USCGS H = 01 08 00.2
	CLK	ePKP			26	137	C	58.4 N 150.6 W h ±
								15 km. Prince William Sound. Mag. 5.5 $\frac{1}{4}$
10	BHA	i	16	46	56			
11	BUL	iS ₁	00	27	29			Witwatersrand tremor
11	BHA	e	01	23	03			
	CLK	i			56		R	

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks.
11	BHA	iPP	01	25	57	130	R	USCGS H = 01 04 30.2 29.0 S 178.9 W h ± 30 km. Kermadec I's Mag. 5.3
11	BHA	iP _n	06	22	23			Probably Tanganyika
		iP ₁		24	26			
		iS ₁		25	15			
	CLK	iP _n		22	49			
		iP ₁		24	59			
		iS ₁		25	55			
	BUL	traces		27	00			
11	BHA	e	12	36	03			<div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block;"> B.P.I H = 13 19 10 20°30' S 33°30' E Mozambique </div>
11	BUL	iP _n	13	20	18	500km		
		iS _n		21	09			
		iS ₁			27			
	BHA	iP _n			09	900km		
		iS _n		22	38			
		iS ₁		23	22			
	CLK	iS ₁		22	09	660km		
11	CLK	iP	16	10	24	56		USCGS H = 16 00 42.8 40.5 N 25.0 E h ± 33 km. Aegean Sea. Mag. 5.1 Probably Kariba
11	BHA	eP	21	16	55			
		iS		17	15			
12	BHA	e	01	43	49			
	CLK	e			51			
	BUL	i		44	02			
12	BHA	iPKP	11	29	46	126	C	USCGS H = 11 10 54.8 33.9 S 179.8 W h ± 89 km. Kermadec I's Mag 5.4 Kariba
12	BHA	eP	12	53	07			
		iS			34			
12	BHA	i	16	33	28			
13	CLK	traces	01	07	00			
13	BHA	traces	01	09	00			
13	CLK	i	03	31	08			
	BHA	e			32			
13	BHA	iP	08	40	11	61		USCGS H = 08 30 03.6 45.3 N 18.1 E h ± 33 km. Northern Yugoslav- ia 420 km. from station
	CLK	iP			27	62		
	BUL	eP			31	67		
		i			48			
13	BHA	eP _n	16	27	26			
		iP ₁			36			
		iS _n		28	03			
		iS ₁			23			
13	BHA	iS ₁	20	58	31			Probably Kariba
14	BHA	eP	09	01	09			Kariba
		iS			37			
14	BHA	eP	19	43	20			Kariba
		iS			47			
14	CLK	iP	20	42	11			About 150 km. from sta- tion.
		iS			26			
14	BHA	traces	23	15	00			
15	BHA	iP	02	11	52			Kariba
		iS		12	20			
	BUL	iS ₁		13	00			
15	CLK	i	06	06	40			Seismic local
		i		07	50			
	BUL	e		06	42			
		i		08	00			
		i			35			
	BHA	eP ₁		07	30			
		iS ₁		10	23			
15	BHA	traces	11	30	27			

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks.
15	BHA	eP	11	53	19			Probably Central Africa
		iS		56	20			
	CLK	traces		53	53			
15	BHA	e	15	50	06			
	BUL	i			18			
15	BHA	e	16	46	58			
	BUL	i		47	15			
15	BHA	eP	18	05	42			Kariba
		iS		06	07			
15	CLK	iP	23	01	54			About 100 km. from sta- tion
		iS	24	00	05			
	BHA	traces	23	27	32			
16	BHA	eP	00	29	19			Kariba
		eS			43			
16	BHA	eP	00	42	07			Kariba
		iS		43	52			
16	BHA	iP	00	55	43			Kariba
		iS		56	12			
	BUL	iS ₁			54			
16	BHA	eP	01	33	22			Kariba
		iS			49			
16	BHA	traces	02	59	00			
16	BHA	iP	03	49	36			Kariba
		iS		50	03			
	BUL	iS ₁			45			
16	BHA	eP	11	10	45			Kariba
		iS		11	12			
16	BHA	eP	11	33	54			Kariba
		eS		34	20			
16	BHA	traces	13	00	00			
16	BUL	i	14	02	44			
16	BHA	e	19	46	10			
	BUL	i			29			
	CLK	traces		47	00			
17	BUL	eP			42	38		USCGS H = 04 44 37
	BHA	eP			54	39		22.5 S 10.8 W h ± 33 km. S. Atlantic Ocean Mag. 5.3
17	BUL	i	05	09	03			
17	BHA	i	05	11	46			
17	BUL	iPKP	06	18	46	120	C	USCGS H = 06 00 00.2
	BHA	iPKP			50	123	R	6.6 S 154.9 E h ± 85 km. Solomon I's. Mag. 5.4.
17	BHA	i	09	28	31			
	CLK	e			32			
	BUL	i			37			
17	BHA	eP	12	49	50			Kariba
		iS		50	18			
17	BHA	traces	16	32	31			
18	BHA	iP	02	28	00			Kariba
		iS			27			
	BUL	traces		29	00			
18	BUL	iS ₁	06	46	57			Witwatersrand tremor
18	BHA	iP	09	20	55			Kariba
		iS		21	24			
	BUL	iS ₁		22	06			
18	BHA	e	13	35	17			
18	BUL	e	20	35	48			
19	BUL	iPcP	05	26	12	92		USCGS H = 05 13 01.6
	BHA	ePcP			32	96		41.7 S 83.9 W h ± 33 km. S. Coast of Chile Mag. 5.5
19	BHA	eP	13	59	18			Kariba
		iS			44			
	BUL	iS ₁	14	00	28			

April 1964, contd.

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/ R	Remarks.
19	BUL BHA	iP eP	14	25	31	70		USCGS H = 14 12 21.9 60.5 S 58.3 W h ± 33 km. Near S. Shetland I's. Mag. 5.4.
20	BHA	iP _n iS _n iS _l	06	25	29			B.P.I. H = 06 23 50 Probably Tanganyika
20	BHA	e	12	15	29			
20	BUL	iP _n iS _n iS_l	18	08	42	650km		B.P.I. H = 18 07 14 18.30 S 35.0 E Near Beira, Mozambique
	BHA	iP _n iS _n iS _n		09	12	900km		
21	BHA	ePKP	05	20	49	134		USCGS H = 05 01 35.7 61.5 N 147.4 W h ± 40 km. Alaska. Mag. 6.
21	BHA	traces	17	23	06			
21	BHA	eP _n iS _n iS _l	19	33	04	800km		B.P.I. H = 19 31 18 Probably Tanganyika
	CLK	iS _l			58			
21	BHA	traces	20	11	00	700km		
22	BHA	iP iS	10	59	04			Kariba
	BUL	traces	11	00	18			
	CLK	traces		01	00			
22	BHA	eP eS	13	40	09			Kariba
22	BHA	eP eS	15	51	20			Kariba
22	BHA	iPKP	20	19	20	130	C	USCGS H = 20 00 22.8 15.5S 167.5 E h ± 123 km. New Hebrides I's Mag. 5.0 Kariba
22	BHA	eP iS	20	43	38			
				44	11			
23	BHA	ePKP	01	50	32	124		USCGS H = 01 31 40.3 6.7 S 155.0 E h ± 72 km. Solomon I's. Mag. 5.0
23	CLK	iPcP i	03	46	14	97	R	USCGS H = 03 32 50.3 5.3
	BHA	ePcP		46	52	104		
23	BHA	traces	04	02	00			
	CLK	i		03	06			
23	BHA	iP _n iS _n iS _l	04	40	33	1300km		B.P.I. H = 04 37 44 Central Africa
				42	31			
	CLK	iP _n iS _n iS _l		41	15	1600km		
				43	48			
				(45	00)			
23	BUL	iS _l	11	44	36			Witwatersrand tremor
23	BHA	eP iS	15	29	29			Kariba
					51			
23	CLK	traces	19	08	00			
23	BHA	eP iS	23	10	05			Kariba
					32			
24	BUL	i	06	14	37			
					42			
24	BHA	eP iS	13	02	52			Kariba
				03	26			
25	BUL	eP _n iS _n iS _l	10	28	51	510km		B.P.I. H = 10 27 42 22.0 S 33.0 E Mozambique
				29	41			
	BHA	eP _n iS _n		29	53	1000km		
				31	17			

April 1964, contd.

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R	Remarks
25	BHA	traces	18	32	00			
26	CLK	eP	14	10	25	69		USCGS H = 13 59 27.7
	BUL	iP		11	00	75		5.8 S 105.0 E h ± 90
	BHA	iP			02	76		km. S. Sumatra Mag. 5.6
26	BHA	ePKP	15	10	25	137		USCGS H = 14 52 07.6
		i		13	21			20.6 S 178.0 W. h ± 490 km. Fiji I's. Mag. 5.1
	BUL	e		12	23			
		i		13	06			
	CLK	i			05			
26	BUL	i	22	44	18			
	BHA	e			53		R	
	CLK	e		45	06			
27	CLK	eP	01	47	55	64		USCGS H = 01 37 12.1
	BHA	eP		48	26	71		0.3 N 98.1 E h ± 33km W. Coast of Sumatra Mag. 5.3
27	CLK	e	06	57	20			
27	BHA	iP	07	38	40			Kariba
		iS		39	08			
	BUL	iP _n		38	57			
		iP _l		39	07			
		iS _n		40	37			
		iS _l			50			
	CLK	iP _n		39	44			
		iS _l		40	54			
28	BHA	e	19	28	39			Probably Central Africa
		i		31	15			
		i		32	(49)			
	CLK	traces		34	00			
28	BHA	i	22	18	49			
29	BHA	e	00	57	40			
29	BHA	traces	03	08	00			Probably Central Africa
	CLK	traces		09	00			
29	BHA	eP	04	30	25	54		USCGS H = 04 21 06.7
	CLK	eP			41	55		39.3 N 23.7 E h ± 33 km. Aegean Sea. Mag. 5.4
29	BHA	traces	16	48	38			
29	BHA	e	17	47	11			
30	BUL	i	11	36	25			
		i			34			
30	BHA	e	15	22	20			
30	BUL	i	16	22	16		R	
30	BHA	i	22	33	36			

H.O. OLIVER
 WINIFRED WAGNER.

AUG 1964

Department of Meteorological Services
Salisbury,
Southern Rhodesia.

SEISMOLOGICAL BULLETIN

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

Stat:	<u>Chileka (CLK)</u>	<u>Bulawayo (BUL)</u>	Broken Hill (BHA)
Lat:	15° 40.8' S	20° 08.6' S	14° 26.46' S
Long:	34° 58.6' E	28° 36.8' E	28° 28.08' E
Litho- logic Found- ation:	Charnockitic gran- ulites of the Basement Complex	Hornblend schists of the Bulawayan System	Dolomite and shales of the middle Katanga system.
Hgt:	781 metres	1341 metres	1206 metres
Instrument:	Vertical and Horizontal Willmore S.P.		
Seismo. Officer:	Head of the Malawi Met- eorological Service, Chileka.	Director, Meteorological Services, Salisbury	Director, Meteorological Services, Salisbury.
Obser- ver:	Officer-in- charge, Chileka.	Officer-in- charge, Goetz Obser- vatory, Bulawayo.	Officer-in-charge, Broken Hill Observatory.
Insti- tution	Department of Meteorological Services, Salisbury.		

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.

H. O. OLIVER
Seismological Officer

Address:

Bernard Price Institute of Geophysical Research,
University of The Witwatersrand,
Jan Smits Avenue,
Johannesburg,
South Africa.

May, 1964.

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/ R.	Remarks.
1	Bha	i	00	22	08		R	
1	Bha	iP	12	03	42			Kariba
		iS		04	05			
1	Bul	traces	14	33	00			Seismic Local
	Bha	e	14	37	44			
		i		38	44			
1	Bha	eP	19	14	41			Kariba
		iS		15	06			
2	Clk	iP	00	30	03			150Km from Station
		iS			20			
2	Bha	traces	04	26	00			
	Clk	traces		28	30			
2	Bul	i	06	50	12			
2	Bul	i	11	27	44		R	
	Bha	e		28	09			
2	Bha	eP	12	45	10			Kariba
		iS			22			
2	Bha	iPKP	16	29	54	124		USCGS H=16 11 00.2 45.5N, 150.3E ht 35Km Kurile Is. Mag5.7
	Bul	iPKP		30	01	127	R	
2	Bha	traces	17	09	06			
2	Clk	e	18	29	47			
2	Bha	iP	23	46	38	81		USCGS H=23 34 28 26.3N, 100.7E ht 33Km Yunnan Province China Mag5.0 About 100 Km from station
3	Clk	iP	03	47	41			
		iS			52			
3	Clk	traces	08	47	30			
3	Clk	iP	15	31	21			About 150Km from Station
		iS			38			
3	Bha	iP	23	23	27			Kariba
		iS			52			
4	Bul	i	00	36	42		C	
4	Bul	i	12	20	16			
		i		23	25			
4	Bul	iP	17	13	20	44		USCGS H=17 05 20 55.8S, 4.4W ht 33Km Bouvet Is region Mag 5.4
	Bha	eP			59	49		
5	Bul	traces	00	33	02			
5	Bul	traces	01	26	00			
5	Bha	iP	01	50	58			Kariba
		iS		51	26			
	Bul	iS ₁		52	11			
5	Bul	iP ¹	11	20	43	44		USCGS H=11 12 52 55.8S, 4.3W. ht 33Km Bouvet Is region Mag4.7
	Clk	eP		21	46	52		About 140Km from station
6	Clk	i	01	40	44			
		i			48			
	Bul	iP	04	36	31	55		USCGS H=04 27 02.4 60.7S, 25.2W ht 33Km Sandwich Is.
	Clk	eP		37	23	63		
6	Bul	traces	14	16	23			
6	Bha	traces	15	46	00			
	Bul	i			08			
6	Bha	eP	20	48	21			Kariba
		iS			46			
7	Bha	i	05	48	22			Probably Tanganyika
	Bul	i		49	26			
7	Bha	traces	07	24	00			Probably Tanganyika
7	Bha	traces	07	53	03			Probably Tanganyika
7	Bha	i	08	16	55			
	Bul	traces		17	00			
	Clk	traces			00			
7	Bha	i	08	27	38			
	Clk	traces			54			
7	Clk	i	11	28	41			
	Bha	i			48			
	Bul	i			55			

May, 1964

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Date	Station	Phase	h:	m:	s:	Arc Dist	C/R	Remarks.
7	Bha	traces	12	57	00			Probably Tanganyika
7	Bha	i	13	00	26			Tanganyika
		i		02	43			
		i			59			
	Bul	e		01	02			
		i		06	44			
7	Bul	i	14	30	36			
		i		31	28			
7	Bha	ePn	17	15	42	630Km		B.P.I.H=14 14 18
		iSn		16	42			9.0S, 28.0E Congo Rhodesian
		iS ₁		17	11			Border
	Clk	iP ₁		16	30	1020Km		
		iS _n		18	07			
		iS ₁		19	01			
	Bul	iP ₁		16	58	1240Km		
		iS _n		18	58			
		iS ₁		20	13			
7	Bha	e	17	59	51			Probably Kariba
7	Bha	ePKP	20	31	29	116		USCGS H=20 49 49.3 40.5N,
	Bul	iPKP			36	120		139.0E h ₁ 33Km W. Coast of
	Clk	traces		32	00			Honshu Japan Mag 5.9
7	Bha	e	20	42	09			
7	Bha	e	21	52	04			Probably Central Africa
		i		55	34			
	Bul	traces			00			
7	Clk	traces	22	19	00			Probably Central
	Bha	i			09			Africa.
8	Bul	traces	01	04	59			
8	Bul	IPKP	16	41	21	148	R	USCGS H=16 21 49.8 56.7N,
								154.0W. h ₁ 25Km Prince
								William Sound Alaska Mag5.3.
8	Bul	i	20	49	41			
8	Bul	traces	22	13	27			
8	Bha	e	23	59	39			
9	Bul	i	00	00	20			
9	Bul	iPKP ₁	02	22	06	150	C	USCGS H=02 02 28.8 52N,
								169.9W h ₁ 25Km. Andreanof Is.
								Aleutian Is. Mag 5.1
								Witwatersrand.
9	Bul	iP _n	12	36	49			Tremor
		iS _n		38	26			
	Bha	iP ₁			04			
		iS _n		40	11			
		iS ₁		41	19			
	Clk	iS ₁			34			
9	Bha	e	18	35	14			
		i			25			
	Bul	i			19			
10	Bul	i	05	58	28			
10	Bul	i	06	48	49			
10	Bul	iP _n	13	11	41			Witwatersrand Tremor.
		iS _n		12	49			
		iS _n		13	16			
		e _n		12	58			
	Bha	traces		16	00			
	Clk	traces						
11	Bha	traces	00	56	48			
11	Bha	e	03	26	14			
11	Bha	i	05	50	13			
11	Clk	i	08	16	23			
11	Bha	iP _n	12	36	05	840Km		B.P.I. H=12 34 15 8.0S,31.0E
		iS _n		37	24			
	Clk	iP ₁		36	17	930Km		Republic of the Congo
		iS _n		37	42			
		iS _n		38	30			
	Bul	iP ₁		37	15	1420Km		
		iS _n		39	25			
		iS _n		40	49			
11	Clk	traces	15	35	00			

May, 1964 Date	Station	Phase	h. G.	m. M.	s. T.	361 Arc Dist	C/R	Remarks.
11	Bha	i	16	27	58			About 370 Km from station
		i		28	31			
		i			48			
11	Clk	traces	19	02	00			Probably Central Africa.
	Bha	i			30			
12	Bha	traces	18	36	00			
	Clk	e			13			
	Bul	i			14			
12	Bha	iP	19	14	05	900Km		B.P.I. H=19 12 06 Republic of the Congo.
		iS ⁿ		15	27			
		iS ⁿ		16	13			
	Clk	eP ¹		14	38	1180Km		
		iS ⁿ		16	22			
		iS ⁿ		17	33			
	Bul	i ¹		15	22	1540Km		
		i		19	10			
13	Bul	iPKP	05	44	17	121		USCGS H=05 25 26.1 32.8S, 178.3W. h=33Km Kermadec Is Region Mag5.3
	Bha	ePKP		45	28	127		
15	Bha	iP						
		iS	00	42	36			Kariba
				44	26			
15	Bha	iP	00	53	33			Kariba
		iS			60			
	Bul	iS ¹		54	41			
15	Bha	i ¹	02	48	59			
15	Bha	iP	04	15	28			Kariba
		iS			59			
	Bul	iP			46			
		iS ⁿ		16	42			
	Clk	traces		17	00			
15	Bha	iP	06	37	54			Kariba
		iS		38	0			
	Bul	iP			18			
		iS ⁿ		39	02			
15	Bul	traces	10	23	28			
15	Bha	traces	16	58	00			Kariba
15	Clk	e	22	41	38			
16	Bha	iP	05	04	52			Kariba
		iS		05	19			
	Bul	iP ¹			18			
		iS ¹		06	02			
16	Clk	iP ¹	06	12	45	75		USCGS H= 06 00 58.1 49.9N, 78.3E. h=0 Kozakh. S.S.R. Mag 5.6
	Bha	iP			56	79	C	
16	Clk	iP	08	49	06	62		USCGS H=08 38 54.0 36.3N, 71.5E. h=122 Km Hindu Kush. Mag 5.3.
	Bha	iP			23	65	C	
	Bul	iP			50	70	C	
16	Bul	i	10	11	15			
16	Bul	ePKP	16	26	39	121		USCGS H=16 07 46.2 32.8S, 178.3W h=33Km Kermadec.Is region Mag 5.4
	Bha	ePKP			48	127		
16	Bha	eP	18	16	00			Kariba
		iS			28			
16	Bha	iP	18	58	44			Kariba
		iS		59	10			
	Bul	eP			01			
		iP ⁿ			11			
		iS ¹			57			
	Clk	iS ¹	19	01	23			
16	Bha	eP ¹	23	02	10			Kariba
		iS			36			
17	Bha	e	05	01	06			
	Clk	traces			10			
	Bul	i			21			
17	Bha	eP	08	47	20			Kariba
		eS			46			
17	Clk	iP	12	33	30			About 220Km from station.
		iS			53			

May. 1964

362.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/R	Remarks.
17	Bul	iS	19	15	54			
17	Bha	i ¹	19	38	23			
	Bul	e			43			
	Clk	e			53			
17	Bha	iP	20	28	13			Kariba
		iS			41			
	Clk	traces		31	00			
17	Bha	traces	23	33	00			
18	Bha	traces	02	27	00			
	Clk	traces		28	00			
18	Bul	i	11	12	18			
18	Bul		11	24	15			Probably Tremor
		iS ₁		25	15			
18	Bha	e ¹	14	30	25			
	Bul	e		31	23			
18	Bha	eP	18	33	34			Kariba
		eS		34	02			
19	Bul	e	16	57	06			
19	Bha	eP	20	24	24			Kariba
		iS			50			
	Bul	iS ₁		25	28			
19	Bul	ePKP	23	22	00	108		USCGS H=23 03 41.8 0.78,
	Bha	ePKP			06	108		80.2W h±54Km Near Coast of Ecuador Mag 5½
	Clk	ePKP			17	115		
20	Bha	traces	01	49	00			
20	Clk	e	02	48	55			
	Bha	e		49	24			
	Bul	e			54			
20	Clk	traces	03	29	00			Seismic Local
20	Bul	ePKP	05	11	24	122		USCGS H=04 53 30.3 31.48. 178.2W h±33Km Kermadec Is. Mag 4.8 About 100Km from station
20	Clk	iP	07	24	54			
		iS		25	06			
	Bul	traces		28	00			
20	Bha	eP	18	02	00			Kariba
		iS			27			
20	Bul	iS ₁	15	59	46			West Rand Tremor.
21	Bul	iS ₁	14	42	41			
21	Bul	iP ₁	15	36	38			West Rand Tremor.
		iS ₁ ⁿ		38	16			
21	Clk	traces	15	41	06			
21	Bha	ePKP	15	55	26	136		USCGS H=15 36 01.5 59.0W, 153.5W. h±15Km Alaska Aftershock Mag 5¼-6
	Bul	ePKP			28	143		Kariba
21	Bha	eP	17	41	06			
		iS			33			
	Bul	traces		42	00			
21	Bha	iP	18	11	52			Kariba
		iS		12	20			
	Bul	iP ₁			20			
		iS ₁		13	05			
	Clk	e ¹			58			
21	Bha	eP	20	36	01			Kariba
		iS			28			
21	Bha	eP	21	17	56			Kariba
		iS		18	23			
	Bul	iP			19			
		iS ₁		19	06			
21	Bha	iP ₁	21	48	35			Kariba
		iS		49	01			
21	Bha	iP	22	28	03			Kariba
		iS			30			
	Bul	iP			31			
		iS ₁		29	16			
21	Bha	iP ₁	22	29	41			Kariba
		iS		30	07			

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.	C/R	Remarks.
21	Bha	iP	22	42	39			Kariba
		iS		43	04			
	Bul	iS ₁			51			
22	Bha	i	16	12	33		R	
	Bul	e			36			
22	Bul	traces	20	00	00			
22	Bha	traces	20	15	00			Probably Local
23	Clk	iP	00	24	13	35	R	USCGS H= 00 17 07.5 14.6N,
	Bha	iP			40	40	C	56.3E h±33Km Arabian Sea.
	Bul	iP		25	14	44	C	
23	Bha	e	00	57	44			Seismic Local
		i		58	17			
23	Bha	iP	04	43	28			Kariba.
		iS			55			
	Bul	iP ₁			44			
		iS ₁			52			
23	Bha	eP ₁	14	58	53			Kariba
		iS		59	22			
	Bul	iS ₁	15	00	04			
23	Bha	eP ₁	15	04	07			Kariba
		iS			38			
23	Bha	iP	18	40	05			Kariba
		iS			31			
23	Bul	iP	20	17	37			Witwatersrand Tremor.
		iS ⁿ		18	45			
	Bha	eP ⁿ	20	18	53			
23	Bha	i ⁿ	22	02	05			Seismic Local.
		i			42			
23	Bha	e	22	46	06			
		i			18			
24	Bha	eP	00	11	48	68		USCGS H=00 00 50.2.3 0.1N,
								82.1E h±33Km Nepal Mag 5.1.
24	Bul	e	04	32	18			
	Bha	e			27			
24	Clk	iP	15	21	09	850 Km		B.P.I. H= 15 29 18. 8.0S,
		iS ⁿ		22	41			33.0E. Tanganyika
		iS ₁		23	12			
	Bha	iP ₁		21	13	850Km		
		iS ⁿ		22	35			
		iS ₁		23	16			
	Bul	iP ₁		21	17	1400Km		
24	Clk	traces	18	00	07			
24	Clk	iP	20	14	48	700Km		B.P.I. H=20 13 14
		iS ⁿ		16	25			Mozambique.
	Bha	iP ₁		15	57	1260Km		
	Bul	eP ⁿ		16	30	1520Km		
25	Bul	e ⁿ	11	48	13			
25	Clk	iP	19	53	22	53Km		USCGS H= 19 44 07.0. 9.1S,
	Bul	iP		54	06	59Km		88.9E. h±33Km Indian Ocean.
	Bha	iP			08	60Km		Mag 5.5.
25	Bha	traces	23	08	00			
26	Bul	iP	11	08	30	55Km	R	USCGS H=10 59 12.3. 27.8W,
	Bha	iP		09	03	60Km	R	56.2S, h±120Km Sandwich Is.
	Clk	iP			20	63Km		MAG 7 ₁ -7 ₁
26	Bha	i	15	52	29			
26	Bha	e	23	50	10			
	Bul	i		52	33			
27	Bul	iP	01	06	02	55Km		USCGS H=00 56 42.5. 56.1S,
	Bha	iP			35	59Km		27.6W. h±105Km Sandwich Is.
	Clk	iP			53	63Km	R	Mag. 5.0
27	Bha	e	01	35	58			
27	Bha	eP	01	53	18			Kariba
		iS			41			
27	Bha	iP	06	40	50	60Km	R	USCGS H=06 30 57.7. 56.2S,
	Clk	iP		41	07	63Km		27.4W h± 116Km Sandwich Is.
								Mag. 5.8
27	Bha	traces	17	46	00			
27	Bha	e	23	47	22			
			11	42	00	52Km		

May, 1964

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Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist.		Remarks
28	Bha	eP	12	42	34	52Km		USCGS H=12 33 10.2. 0.8S, 24.7W. ht 33Km. Mid Atlantic Ocean Mag. 5.2
	Bul	eP			41	53Km		
28	Bul	traces	13	55	00			
	Bha	traces			01			
28	Bul	traces	19	23	00			
	Bha	traces		24	00			
28	Bul	traces	23	02	02			Kariba
28	Bha	e P	23	36	00			
		iS			27			
	Bul	traces		37	00			
29	Bha	e	02	23	07			
		i			29			
29	Bul	i	03	07	11			
29	Bha	traces	04	53	00			
29	Bul	iP	09	13	54	55Km	R	USCGS H=09 04 27.1 56.2S, 27.7W. ht 33Km Sandwich Is region Mag. 5.8
29	Bha	iP		14	30	60Km		
29	Bha	ePKP	10	36	57	134Km		USCGS H= 10 17 34.5. 60.2N, 146.3W. ht 5Km Alaska Aftershock Mag 5½
29	Bul	eP	15	42	21	55Km		USCGS H=15 33 06. 56.3S, 28.0W. ht 120Km Sandwich Is. Mag 5.8
	Bha	eP			57	60Km		
29	Bha	i	18	55	32			
29	Bha	i	19	02	50			
30	Bul	i	14	49	21			
		i			50	54		
	Bha	e			49	28		
30	Clk	e	15	49	18			
		e			59			
30	Bha	e	19	32	49			
30	Bha	e	22	13	15			
31	Bha	i	00	59	26			
		i	01	09	33			
	Clk	i			59	17		
		i	02	00	24			
31	Clk	iP	04	31	46			Seismic Local
		iS			32	04		
31	Bha	e	06	10	04			
		i			11	23		
		i			12	06		
	Clk	i			10	22		
31	Clk	i	13	31	64			
	Bha	i			32	26		
31	Bul	i	16	45	53			
	Bha	i			46	27		
31	Bul	i	17	07	24			

 H.O. SLIVER.
 WILFRED WAGNER.

mp

June 1964

Department of Meteorological Services
Salisbury,
Southern Rhodesia.

JUN 1964

SEISMOLOGICAL BULLETIN

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

Stat:	<u>Chileka (CLK)</u>	<u>Bulawayo (BUL)</u>	Broken Hill (BHA)
Lat:	15° 40.8' S	20° 08.6' S	14° 26.46' S
Long:	34° 58.6' E	28° 36.8' E	28° 28.08' E
Litho- logic Found- ation:	Charnockitic gran- ulites of the Basement Complex	Hornblend schists of the Bulawayan System	Dolomite and shales of the middle Katanga system.
Hgt:	781 metres	1341 metres	1206 metres
Instrument:	Vertical and Horizontal Willmore S.P.		
Seismo. Officer:	Head of the Malawi Met- eorological Service, Chileka.	Director, Meteorological Services, Salisbury	Director, Meteorological Services, Salisbury.
Obser- ver:	Officer-in- charge, Chileka.	Officer-in- charge, Goetz Obser- vatory, Bulawayo.	Officer-in-charge, Broken Hill Observatory.
Insti- tution	Department of Meteorological Services, Salisbury.		

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.

H. O. OLIVER
Seismological Officer

Address:

Bernard Price Institute of Geophysical Research,
University of The Witwatersrand,
Jan Smits Avenue,
Johannesburg,
South Africa.



*Passed to
DSS.*

[Handwritten signature]

June, 1964

Date	Station	Phase	h. G.	m. M.	s. P.	Arc Dist	G/R	Remarks.
1	Bha	e	00	19	18			
1	Bul	i	02	22	52			
	Bha	e		23	25			
1	Bha	oP	11	48	48			Kariba
		iS		49	17			
	Bul	Traces		50	00			
1	Clk	Traces	13	00	00			
1	Bha	Traces	14	00	00			
	Bul	Traces		01	00			
1	Bul	Traces	14	28	00			
1	Bul	Traces	17	55	30			
1	Bul	i	21	38	13			
2	Bha	Traces	04	18	00			
2	Bul	o	05	49	59			
	Bha	i		50	43			
2	Clk	oP	07	39	28			About 250Km from station
		iS			53			
	Bul	i		42	18			
2	Bha	o	13	19	11			
2	Bul	e	16	29	45			
	Bha	o		30	20			
3	Bul	iP	00	53	37	54		USCGS H=00 44 03 55.4S, 24.8W
	Bha	iP		54	10	59		h=33Km Sandwich Is. mag5.5
3	Clk	iP	03	00	31	71		USCGS H=02 49 14.9 25.9N, 95.8E
	Bha	oP			57	77		h=100Km Northern Burma Mag5.5.
	Bul	iP		01	12	79		
3	Bha	oP	08	48	33			Seismic Local
		iS		49	03			
4	Clk	Traces	02	51	09			
4	Bul	Traces	03	08	00			
4	Clk	e	10	30	26			
	Bul	i			54			
	Bha	i			58			
4	Bha	iP _n	19	08	58			Probably Northern Rhodesia.
		iS _n		09	54			About 630Km from Station
		iS ₁		10	29			
	Clk	o		09	00			
4	Bha	oP _n	19	52	05			Probably Northern Rhodesia
		iS _n		53	20			About 630Km from station
		iS ₁		54	00			
	Clk	e		53	16			
4	Bul	oP _n	20	46	44			Witwatersrand Tremor.
		iS _n		47	55			
		iS ₁		48	26			
	Bha	iS ₁			03			
	Clk	e ₁			11			
		i		51	44			
5	Bha	Traces	04	10	30			
5	Clk	o	10	12	26			
	Bha	o		13	25			
5	Bha	iP	11	12	08			Kariba
		iS			35			
	Bul	iS ₁		13	15			
5	Bul	Traces	13	03	59			
5	Bha	oP	14	32	23			Kariba
		iS			51			
	Bul	iP ₁			44			
		iS ₁		33	25			
5	Bha	oP ₁	18	47	58			Kariba
		iS		48	25			
5	Clk	Traces	21	40	00			
5	Bha	Traces	22	26	21			
	Bul	o			21			
5	Bha	o	22	28	57			
	Clk	Traces		29	09			
7	Bha	Traces	04	56	00			
	Clk	Traces			00			
7	Bul	Traces	10	38	00			

June, 1964. Contd.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/ R	Remarks
7	Bha	Traces	10	51	33			
7	Bha	Traces	11	35	40			
7	Bha	Traces	13	13	00			
7	Bha	e	13	19	19			
7	Bul	e	20	22	54			
		i		23	09			
	Bha	e			15			
	Clk	e			40			
8	Bha	eP	03	09	40			Kariba
		iS		10	06			
8	Bul	i	13	11	13		C	
	Bha	i			46		C	
	Clk	iS ₁		12	02			
8	Bha	e ₁	23	11	56			
	Bul	i			57			
8	Bha	Traces	23	43	00			
9	Bha	Traces	02	29	00			
9	Bha	iP	03	01	29			Kariba
		iS			56			
	Bul	Traces		02	00			
9	Bul	e	12	21	19			
9	Bul	eP	13	38	44			
		iS ⁿ		40	16			
9	Bha	iP ⁿ	15	18	32			Kariba
		iS		19	00			
9	Bha	Traces	19	31	00			
9	Bul	iP ⁿ	20	03	46	1150		
		iS ⁿ		05	32			
		iS ⁿ		06	33			
	Bha	eP ⁿ		04	57	1720		
		iS ⁿ		07	41			
		iS ⁿ		09	23			
	Clk	iS ⁿ		10	04	1980		
10	Bul	e ₁	01	18	29			
10	Bha	iP	13	58	03			Kariba
		iS			30			
10	Bul	i	15	01	25			
10	Bul	i	15	23	43			
		i		24	50			
		i		25	25			
10	Clk	Traces	15	28	04			
10	Clk	iP	18	07	08	73	R	USCGS H=17 55 42.9 31.8N, 93.1E
	Bha	iP			30	78	R	ht=71Km Tibet Mag5.0
	Bul	iP			48	81	C	
10	Clk	iP	18	39	06	80		USCGS H=18 26 54.5 9.4S, 117.6E
	Bul	iP			32	85		ht=33Km Sumbawa region Mag5.0
	Bha	iP			37	87		
10	Bul	eP	20	00	05	75		USCGS H=19 48 30.5 6.1S, 104.9E
	Bha	eP			06	76		ht=84Km Near West Coast of Java Mag 5.4
10	Clk	iP	22	29	47	93		USCGS H=22.16 04.3 5.0N 127.4E
	Bha	iP ₂ P		30	15	99		ht=146Km Talaud Is Mag 5.5
	Bul	iP ₂ P			16	99		
11	Bul	iP	00	22	01			About 120Km from station
		iS			14			
11	Clk	iP	05	38	39			About 220km from station
		iS			39	02		
11	Clk	i	07	39	44			
		i			40	03		
11	Bul	Traces	13	39	59			
11	Clk	iP	13	01	05	53		USCGS H=17 51 51.5 9.2S, 99.5E
	Bul	iP			47	59		ht=33Km Indian Ocean 2,000Km east of Chagos
11	Bul	i ^P	21	02	09	350 Km		B.S.L. H=21 01 19 17° 40'S, 26° 30'E
		i			45			
	Bha	e ^P			15	420 Km		Near Livingstone Northern Rhodesia
		i		03	00			

June, 1964. Contd.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	g/R	Remarks
11	Bul	iP	21	37	26	55		USCGS H=21 28 08.2 55.9S, 27.7W
	Bha	iP				60	C	h=135Km
	Clk	iP		38	19	64		Sandwich Is Mag6.1.
11	Bul	oPKP ₁	22	38	17	153		USCGS H=22 18 19.8 40.3N, 126.5W
12	Bul	iP ⁿ	03	35	13			h=33Km Coast N. California
		iP ₁ ⁿ			22			Kariba (Mag5.4)
		iS ₁ ⁿ			52			
		iS ₁ ⁿ		36	06			
12	Bha	iP ₁	03	35	54			Kariba
	Clk	i ₁			54			
		i		37	05			
12	Bha	oP	18	28	05			Kariba
		iS			32			
	Bul	oP			29			
		iS ₁		29	12			
12	Bha	iPKP	18	30	21	127		USCGS H=18 12 20.5 26.5S, 173.3E
12	Bha	i	18	32	46			E. h=648Km South of Fiji Is.
13	Bul	i	11	13	53			Mag5.3
		i		14	24			Probably Kariba.
		i			39			
13	Clk	Traces	17	14	01			
13	Clk	iP	17	47	03	67		USCGS H=17 35 57.8 23.0N, 94.0E
	Bul	iP			44	76		h=61Km Burma Mag5.8
13	Bul	o	22	50	45			
14	Clk	i	12	24	57			
	Bul	i		25	31			
14	Bha	iP	15	49	56			Kariba
		iS		50	22			
14	Bul	iP	20	14	43			About 200Km from station
		iS		15	02			
15	Bha	o	00	06	20			
15	Clk	iP	00	16	15	65		USCGS H=00 05 31.1 5.4N, 97.0E
	Bha	iP		16	47	72		h=33Km N. Sumatra Mag5.5
	Bul	iP			52	72	C	
15	Bha	i	00	59	02			
15	Bha	i	01	02	20			
15	Bha	i	01	18	20			
		i		19	43			
	Bul	i			26			
15	Bul	iP	03	59	48			Probably Kariba
		iS	04	00	30			
16	Bha	iP	02	13	00			Kariba
		iS			26			
	Bul	iP ₁			19			
		iS ₁			30			
		iS ₁ ⁿ		14	11			
16	Bha	oFOP	04	16	38	116		USCGS H=04 01 44.3 38.3N, 139.1
	Bul	iPcP		16	59	119		E. h=57Km Near W. Coast
16	Clk	Traces	07	55	00			Houshu Japan
16	Bul	iP ₁	20	50	40			Probably Kariba
		iS ₁		51	24			
17	Bul	iP ₁	03	57	05			Probably Kariba
		iS ₁			47			
17	Clk	iP ₁	15	14	45			About 100Km from station
		iS		15	03			
17	Bul	iP ₁	15	19	05			Probably Kariba
		iS ₁			46			
18	Bul	iS ₁	02	50	45			Probably Kariba
18	Bul	iP ₁	14	29	36			About 60Km from station
		iS			42			
18	Bul	oP	20	46	40	87		USCGS H=20 33 53.3 39.3S, 74.7W
								h=26Km Coast Central Chili
								Mag5.3
20	Bul	iP ₁	02	44	29			Kariba
		iS ₁		45	18			
	Clk	Traces	02	51	00			

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June, 1964. Contd.

Date	Station	Phase	h. G.	m. M.	s. T.	Arc Dist	C/R	Remarks.
28	Bul	i	13	42	23			
28	Bul	ePKP	19	23	32	143		USCGS H=19 09 05.4 58.3N, 150.2 W. ht 23Km Alaska Mag 5.5
29	Bul	Traces	12	43	00			
29	Bul	e	14	26	58			Probably Kuriba
		i		27	42			
29	Bul	c	21	00	08			
		i			30			
30	Bul	i	13	59	31			
	Bha	c			33			
30	Bha	c	16	05	03			
		i		07	46			
	Bul	c		06	55			
30	Bha	c	20	00	39			
	Bul	i			39			
30	Bul	c	20	26	39			

H.O.Oliver.
Winifred Wagner.