

**UNIVERSITETET I BERGEN**  
**JORDSKJELVSTASJONEN**  
**(Seismological Observatory)**

**Seismological Bulletin**  
**Kongsberg, Norway**  
**Sept. 1, 1962 – Dec. 31, 1963**

**By**  
**SVEIN HALLE**

**BERGEN - NORWAY 1965**

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## Kongsberg (KON), Norway

Latitude: 59° 38' 57" N

Longitude: 9° 37' 55" E

Elevation: 216 meters

Foundation: Gneiss

The station is part of the World-wide Standardized Seismograph Network. The station has a three-component (NS, EW, Z) short and longperiod system as follows:

Instruments	Period sec.		Magnification at $T_s$	Damp. ratio
	$T_g$	$T_s$		
Sp Benioff	0.75	1	50.000	17:1
LP Sprengnether	100	30	1.500	critical

The station is located in an abandoned silver mine, 340 meters down and 2200 meters into the side of the hill. It has been in normal operation since September 1962. The arrival time given for each phase is the earliest onset of that phase on any component. The epicenters listed in this bulletin are the preliminary epicenters reported by the U.S. Coast & Geodetic Survey, except where another source is given.

The logarithm of the amplitude/period ratio,  $\log \frac{A}{T}$ , is given when it is possible. The amplitude A is read from the vertical short-period component and given in millimicrons as the maximum center to peak displacement within the first few cycles of the initial arrival of P or PKP. The predominant period T in the seismogram where A is observed, is given in seconds.

## KONGSBERG 1962.

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September		h m sec	$\log \frac{A}{T}$	h m sec	
1	iP	19 27 35.3			35.6N 50.0E
	iP	20 34 33.2		PP 20 35 51.9	35.3N 49.6E
2	iP	03 13 36.5C			51.3N 179.8W
4	iP	23 05 19.2		LQ 23 12 21	39.9N 44.2E
	pP	05 29.4		Lg <sub>1</sub> 14 08	
	S	10 10.2		Lg <sub>2</sub> 16 09	
10	iP	09 42 07.0		Lg <sub>1</sub> 09 49 18	35.0N 27.1E
	S	46 42		Lg <sub>2</sub>	
	LR	47 41			
	iPKP	16 02 15.1			21.1S 179.2W
12	iP	21 05 06.2		S 21 11 35	36.5N 69.2E
	PP	06 50.6		SS 14 22	
14	iPKP	17 42 06.7			26.6S 178.5W
22	iP	07 02 19.5C		S 07 11 03	26.5N 97.0E
	PP	04 43.2			
	iP	08 14 34.5		pP 08 14 44.4	36.4N 69.0E
23	iP	16 00 43.4			60.1N 151.2W
24	iP	14 49 42.5		PP 14 52 17.2	42.8N 145.3E
25	iPKP	07 49 41.4			24.0S 176.6W
	iP	13 07 30.1			73.3N 55.0E
28	iP	19 08 24.8			5.2N 76.2W
29	iPKP	15 35 04.4			27.0S 63.6W
30	iP	22 09 51.8			18.6N 120.9E
October					
1	iP	12 22 06.5		PP 12 23 50.6	27.9N 54.9E
	pP	22 20.7			
4	eP	07 29 55	1.2	S 07 34 21	42.0N 35.9E
	i	30 04.6			
	iPKP	09 56 17.9	1.5		23.3S 179.0E
	iP	19 51 12.8		PcP 19 54 37.4	38.3N 22.7E
	PP	52 04		S 55 23	
5	iP	17 11 35.3			Explosion Nevada



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## KONGSBERG 1962.

October	h m sec	$\log \frac{A}{T}$		h m sec	
5 eP	20 10 01		PP	20 11 32	35.2N 58.8E
6 eP	03 23 22	1.5			40.8N 29.5W
iPKP	04 42 42.2	1.3	PKS	04 46 21	17.4S 167.7E
eP	05 50 25	1.0		05 50 40.1	26.2N 126.9E
iPKP	08 22 46.7				17.2S 168.0E
iPKP	11 19 40.5	1.9	SKP	11 22 49.8	13.3S 167.3E
8 eP	14 31 06		i	14 31 10.5	41.9N 24.3E
iP	15 15 42.4				41.9N 24.3E
eP	22 08 27		PPP	22 13 20.7	24.3N 121.7E
e	08 36		S	28 46	
PP	11 36.6				
9 iP	16 07 13.8	1.9	PcP	16 08 58.1	36.4N 71.3E
i	07 19.7		PP	09 02.8	
i	08 05.7				
ePs	20 43 32				3.2S 148.4E
ePKP	09 39 06				22.2S 179.6W
10 iPKP	22 11 56.8	1.2			15.1S 173.3W
12 iPKP	19 23 26.3	1.2			28.9S 177.1W
iPKP	20 58 17.9				27.2S 178.0W
13 iP	10 30 31.1		S	10 36 07	35.5N 49.8E
PP	31 54.3				
14 ePKP	00 49 49	1.5			33.4S 179.3W
15 ePPP	03 00 04				74.8N 5.0E
18 iP	10 36 15.3				60.9N 11.9E H=10 35 41 (Uppsala)
ePn	11 53 08		e	11 53 42	59.4N 21.6E H=11 50 25 (Uppsala)
21 iP	02 15 11.8		PcP	02 15 41.2	61.1N 149.7W
i	15 33.2				
22 iP	15 34 30.4		PcP	15 35 14.6	49.8N 155.8E

## KONGSBERG 1962.

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October	h m sec	$\log \frac{A}{T}$		h m sec	
23 iP	00 58 40.5				46.2N 153.2E
iP	12 50 08.0				
29 ePKP	13 39 52	1.4			6.5S 156.3E
November					
1 eP	13 54 40		PP	13 56 27	37.2N 70.0E
iP	23 32 02.6	1.3			43.9N 145.2E
4 iP	11 03 28.1	1.5			40.3N 77.6E
PKP	23 12 31.4	1.7			43.2S 75.6W
5 iPn	11 47 54.6		iSn	11 48 11.0	66.3N 8.0E H=11 46 17 (Uppsala)
6 iP	00 17 56.2	1.7	PP	00 19 39.1	28.0N 55.6E
pP	18 06.5		SS	27 52	
7 22 37 34.9		1.4			51.5N 176.1E
8 iPKP	17 37 36.9	1.5			31.5S 180.0W
9 iP	01 18 02.9	1.4	PP	01 19 26.2	33.5N 47.2E
iP	02 18 41.7				45.7N 26.7E
iP	09 33 18.2	1.6			35.8N 140.3E
10 iP	01 44 33.8		S	01 53 49	43.8N 147.3E
PP	47 11.8				
11 iP	11 40 35.6	1.6	LQ	11 51 37	55.8N 113.1E
PP	42 28.6				
iP	15 24 10.7	1.5	Lg <sub>1</sub>	15 39 25	17.2N 40.7E
S	31 11.0		Lg <sub>2</sub>	40 50	
iPKP	16 29 00.8		iPKS	16 32 22.4	12.9S 166.5E
iPKP	22 33 14.7		Lg <sub>1</sub>	23 19 06	43.2S 76.0W
SS	35 01		Lg <sub>2</sub>	23 09	
12 iP	13 01 22.8	1.4	Rg	13 38 11	26.0N 128.4E
13 iP	09 05 55.1				42.0N 141.9E

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## KONGSBERG 1962.

November		h	m	sec	$\log \frac{A}{T}$		h	m	sec	
14	iP	07	59	52.1			35.7N	140.8E		
16	iP	21	21	43.5	1.9	SS	21	36	13	13.5N 93.2E
	pP		21	51.9		SSS		39	29	
	PcP		21	54.5		Li		46	29	
	PP		24	30		Lg <sub>2</sub>		50	39	
	S		31	36		Rg		55	03	
17	iP	11	19	52.0	1.7		16.3N	98.2W		
20	iP	07	04	25.9	1.5		56.1N	159.1E		
	iP	07	43	00.8			56.2N	159.1E		
22	iPKP	20	52	40.9	1.5		30.2S	178.6W		
23	iPKP	23	24	05.2	1.9	SKP	23	26	50.9	21.5S 179.3W
26	iP	05	37	53.0		Lg <sub>1</sub>	05	53	43	39.8N 77.2E
	PP		39	36.8						
	iPKP	16	18	20.0	1.9		23.8S	175.8W		
27	iP	07	04	48.8	1.9		25.1N	122.9E		
28	iP	05	15	03.1			22.4S	10.5W		
	eP	05	21	38			22.5S	10.7W		
29	iPKP	04	18	04.3	1.1		29.4S	177.9W		
30	iP	22	03	54.5	1.7	LQ	22	31	57	17.6N 99.7W
	pP		04	08.9		Lg <sub>1</sub>		35	53	
	iS		14	21.9						
December										
1	iP	02	01	19.4	1.7	LQ	02	18	23	52.4N 170.1W
	eS		10	52						
	iPKP	04	36	43.6			29.7S	177.7W		
6	iP	04	15	01.5			49.0N	154.4E		
7	iP	14	15	14.8D	2.8	isS	14	27	46.8	29.2N 139.2E
	S		24	51.3		SS		30	13	
8	iP	09	10	08.7	1.4		36.5N	55.0E		
	iPKP	21	44	25.3		SS	21	58	51	25.8S 63.4W
	S		51	18.2						
	iP	23	06	13.0	1.9	pP	23	06	26.8	50.5N 176.8W

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December		h	m	sec	$\log \frac{A}{T}$		h	m	sec	
10	iPKP	17	15	38.5	2.0		27.2S	176.8W		
11	iPKP	18	11	23.6	1.7		24.8S	177.6W		
12	iP	23	09	04.7	1.8		4.6N	96.5E		
13	iP	15	07	14.8	1.7		61.4N	147.2W		
	iP	22	51	10.6	1.2		34.9N	27.8E		
15	iPn	03	50	42.7		Sn	03	51	57.6	67.2N 13.7E
	Pg		51	09.5		Sb		52	41.8	
21	iP	06	38	49.0	1.3		52.5N	168.7W		
	iP	08	53	48.1	2.1	ScS	09	03	02.2	52.4N 168.5W
	iP	09	11	40.8	2.1		52.4N	168.5W		
	iP	09	21	02.5			52.5N	167.5W		
	iP	09	44	34.0	2.7		42.4N	142.3E		
22	iP	15	31	29.5			52.5N	168.8W		
24	iP	11	16	48.2	1.5		73.6N	57.5E		
26	iP	09	03	23.4	1.3	S	09	07	55.2	39.3N 10.6W
	PP		04	04.6		SS		08	52	
	iP	22	35	58.2		PP	22	38	38	53.9N 168.7E
	PcP		36	31.4		S		44	52	
	iP	23	34	28.8	1.5	PcP	23	35	35.1	23.9N 65.4E
	pP		34	31.8		PP		36	04	
	iP	23	56	57.0	2.4	PcP	23	57	26.7	54.0N 168.8E
27	iP	18	30	11.5	1.9		39.9N	142.0E		
29	iP	08	13	37.7	1.0					
	iPKP	10	58	52.8		SS	11	13	30	20.2S 70.3W
	S		11	06	53.4					
	iPKP	15	07	30.6	1.5	ePP	15	11	10	31.2S 177.9W
	ePKP	18	33	51			31.6S	177.8W		
	iPKP	18	39	31.6	1.1	PP	18	43	10.5	31.5S 177.6W
31	iP	08	11	06.3	1.2		52.8N	160.7E		
	iP	21	00	03.2	1.2		47.1N	122.0W		

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January		h m sec	$\log \frac{A}{T}$		h m sec	
1	iP pP PcP	23 49 34.6C 49 49.8 50 10.6	2.8	S LQ LR	23 58 04.5 00 05 52 09 21	56.6N 157.5W
5	iP	00 01 21.8				46.9N 153.8E
	iP	07 16 32.8		PcP	07 17 22.4	47.0N 153.8E
6	eP pP	21 32 06 32 09.0		PcP	21 32 35.7	47.8N 156.0E
9	iPKP	02 22 18.2		pPKP	02 22 35.2	29.0S 177.3W
10	iP	12 39 37.9				
11	ePKP	12 31 15		pPKP	12 31 22.7	44.9S 75.9W
12	iP	06 28 18.6		PPP	06 30 31.8	36.1N 69.9E
14	eP PP	18 37 18 37 42.1		PPP	18 37 52.4	45.9N 26.7E
15	iP iP ePKP	05 26 37.7 15 09 36.1 19 45 00D	1.9	PP	05 26 49.3	69.1N 16.6W 36.0N 23.9E 20.6S 177.9W
17	iP	19 11 14.0				local
19	iP	19 55 25.6		(S)	19 55 45.4	local
24	iP	15 50 24.9				28.2N 57.0E
27	eP P iP i PP	01 19 13 11 57 40.7 19 41 28.9C 41 45.9 42 28.1	2.3	PcP PcP S	11 58 21.0 19 44 24.1 46 30.2	59.4N 153.3W 40.9N 49.7E
28	iP pP iPKP	13 11 34.8C 11 38.3 16 27 07.6	2.9	PcP PP	13 12 05.6 13 04.9	54.7N 161.7W
				pPKP	16 27 18.6	31.2S 177.7W
29	iP	09 31 56.9C	2.2	PcP	09 32 24.9	49.8N 155.0E
31	iP eS iP iP pP	05 18 45.4 28 44 15 12 24.2D 17 12 18.2 12 28.8	1.7	eLR pP PPP	05 44 00 15 12 37.6 17 13 34.8	27.1N 126.7E 36.0N 22.0E 41.0N 49.8E

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February		h m sec	$\log \frac{A}{T}$		h m sec	
4	iP	23 32 05.4		PcP	23 32 31.0	48.7N 155.1E
5	PKP	19 49 16.3		i	19 49 18.6	32.2S 178.9W
10	iP	15 10 38.8		i	15 10 52.1	53.6N 33.4W
12	iP	12 51 36.3		i	12 51 39.1	
13	iP PcP PP	09 02 08.1C 02 13.0 05 11.1	3.6	iS LQ LR	09 12 05.2 21 38 25 33	24.5N 122.1E
	PKP	18 33 05.6		PP	18 34 50.2	9.9S 160.7E
14	eP PKP iP P	07 18 58 23 12.4 12 19 59.0 13 22 40.1		PP PPP eS	07 23 32.1 26 10.2 12 29 12	7.4S 128.2E 0.8N 30.2W
15	iPKP iP	01 08 42.8D 10 23 02.3	1.6			33.3S 179.3W 40.5N 20.1E
16	iP PcP	12 27 24.9 29 13.2		PP	12 30 10.6	36.5N 70.4E
17	iP iPKP iP	08 33 41.6D 19 45 05.5C 20 16 04.5D	1.6 1.8 1.6	iPP	08 34 16.5	42.3N 37.1E 23.8S 179.9E 43.6N 17.0E
18	iP	14 33 12.8		PP	14 35 02.5	36.4N 70.8E
21	P eP	17 20 26.5 20 32 27		i	17 20 53.0	32.6N 21.0E 32.6N 21.0E
22	eP i iP i iP	07 16 44 16 51.5 14 17 29.5 17 32.7 21 25 15.4		eS PP Lg <sub>1</sub>	07 21 48 14 17 48.2 24 08	85.0N 100.4E 40.5N 20.1E 18.1N 71.4W
23	iP	17 23 46.3				49.5N 158.5E
24	iP PP	13 46 27.7C 49 39.5	2.0	eS	13 56 39	14.7N 91.3W
26	PKP PP	20 32 39.5 33 53.9		SKS	20 39 13.8	07.5S 146.1E
28	P	12 52 12.1		i	12 52 17.6	local



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## KONGSBERG 1963.

March		h m sec	$\log \frac{A}{T}$	h m sec	
2	eP	09 37 08			46.4N 153.1E
3	iP	17 13 06.6		pP 17 13 46.7	36.7N 71.4E
4	iP iPP	07 47 02.9 47 36.0		PPP 07 47 50.5	83.0N 06.4W
	eP	13 50 48			24.5N 121.8E
	iP PPP	15 15 53.4 16 45		eS 15 20 31	34.9N 25.2E
7	iPn iSn	04 27 52.4 28 33.4		Rg 04 28 58	61.7N 4.8E H=04 27 02 (Uppsala)
	iPKP	12 35 24.5C	1.7		44.2S 75.4W
	iP	21 57 34.1C	1.8	PPP 21 59 52	36.5N 71.3E
10	iP pP	01 36 35.3C 36 44.3	2.0	PcP 01 37 09.4	56.3N 153.6W
11	iP ipP	07 32 44.1C 32 53.1	2.5	PPP 07 33 34 eS 37 10	37.9N 29.0E
12	iP	08 16 25.0			53.9N 160.5E
	iP	15 21 04.0			72.0N 0.9W
15	eP	00 29 15		i 00 29 28.5	8.3N 126.7E
16	iP iPP	08 56 02.2 58 41.0		iS 09 05 21.3	46.6N 154.8E
17	iP PP	14 22 08.5 22 31.4		PPP 14 22 39.5	39.4N 20.9E
20	iPKP	05 04 03.6		iSKP 05 06 38.5	20.0S 179.1W
22	iP	12 32 17.0			
23	eSn eSb	22 55 08 55 38		eSg 22 56 00	67.0N 14.1E H=22 51 35 (Uppsala)
24	iP pP ePP PPP	12 50 58.1D 51 06.0 52 18 52 32	1.6	eS 12 56 42 LQ 59 04 LR 13 00 14 Rg 04 32	34.3N 47.8E
	iP	21 46 24.5D	1.8	pP 21 46 40.1	51.8N 178.1W
25	iP	22 59 04.2D	2.4	pP 22 59 14.9	0.8N 96.6E

## KONGSBERG 1963.

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March		h m sec	$\log \frac{A}{T}$	h m sec	
26	iPKP iPKS	10 08 04.5C 11 14.3		iPP 10 11 42.3 31 00	29.7S 177.9W
	iPKP	12 05 48.0			30.0S 177.3W
	iPKP	13 11 23.6D		i 13 11 32.5	29.9S 177.6W
	iPKP iPP	13 44 44.8 48 32.9	2.8	SS 14 07 40	29.9S 178.0W
	iP	19 58 51.8D	1.9		44.3N 147.3E
	iP	21 46 21.2D	2.0	PP 21 49 02.2	35.9N 135.7E
28	eP iPP	00 19 17 19 27.9	2.1	iPPP 00 19 39.0 S 22 03	66.1N 20.1W
	iP PP	00 30 42.1 30 53.6	2.1 2.1	PPP 00 31 02	66.3N 20.2W
	iP	01 03 06.9			66.3N 19.6W
	iPKP	11 32 16.8C	2.1		30.2S 177.9W
	iPKP	23 48 56.9D	2.1	i 23 49 12.5	29.6S 177.7W
29	iP	03 14 07.9			40.4N 26.6E
30	iP	17 03 13.4D	2.4	ePcP 17 03 34	44.1N 148.0E
31	iPKP	05 50 32.1		ePKS 05 54 10	29.9S 177.9W
	iPKP	08 32 24.3			29.8S 176.9W
	iPKP	09 27 05.1C	2.1	i 09 27 08.0	30.2S 177.8W
	iP	17 41 40.0D		pP 17 41 49.3	0.7N 96.6E
	iPKP	19 42 38.0C	3.6	ePKS 19 46 12	30.1S 178.2W
April					
1	iP PcP	05 39 21.5 40 14.2		pP 04 40 16.7 eS 48 01	44.8N 141.2E
	eP	09 30 59		pP 09 31 28.9	35.5N 69.8E
	iP	21 36 26.0C		i 21 36 29.5	local
2	iP	02 12 32.5			
	iP	02 15 49.4			
3	iPKP	11 41 32.8		i 11 41 37.8	29.4S 177.1W
4	iPKP	22 20 49.5			29.8S 178.1W

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## KONGSBERG 1963.

April		h m sec	$\log \frac{A}{T}$	h m sec	
6	iP	11 29 00.9D	2.1		63.4N 149.6W
	eP	17 58 10			33.5N 82.4E
	iPKP	18 22 08.1			32.8S 178.8W
7	iPKP	04 16 53.6D	2.5		24.8S 176.6W
	iP	15 38 35.3		epP 15 39 20	53.7N 170.0W
12	iP	00 50 40.6C	1.7		32.0N 78.8E
	iP	19 52 22.0C		eS 19 56 06	79.5N 4.0E
13	iP	02 34 01.0D	1.9	S 02 45 08	6.3S 76.7W
	i	35 17.0			
14	iPKP	05 52 23.6D	1.7	pPKP 05 52 34.6	31.3S 177.7W
16	eP	01 43 26		PP 01 47 10.6	0.9S 128.2E
	iP	18 53 36.0C			35.9N 44.3E
17	iPKP	02 30 46.2		i 02 30 53.0	19.7S 178.3E
19	iP	07 45 17.8D	2.2	iS 07 53 27.8	35.7N 96.9E
	iPP	47 30.0			
21	iP	04 50 29.3		eSS 05 06 00	24.2N 122.3E
	S	05 00 40			
	iP	09 29 15.4			26.5N 128.7E
22	iPKP	07 45 17.1C	1.7		30.0S 177.8W
23	iP	03 00 36.9		Lg <sub>1</sub> 03 24 30	46.7N 103.5E
	Lg <sub>2</sub>	22 15			
	iP	10 06 06.4			25.7N 99.5E
	iP	14 07 08.6			42.2N 19.4E
24	iP	13 44 22.5			26.6N 129.1E
	iPKP	22 01 05.3C	1.5	iSKP 22 03 51.9	20.8S 179.0W
25	eP	04 44 07			
	iP	11 20 28.6			4.1N 62.3E
28	iP	19 58 12.0D	1.3		36.3N 71.3E
29	iP	21 55 18.5C	1.6	ePS 22 05 01	51.3N 178.7E
	PcP	55 43.8		LR 17 09	
	S	22 04 24		Lg <sub>1</sub>	

## KONGSBERG 1963.

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April		h m sec	$\log \frac{A}{T}$	h m sec	
30	iP	03 37 06.2			51.2N 178.6E
	iP	07 18 55.9			51.3N 178.6E
May					
1	iPKP	10 22 26.8	1.9	SKP 10 25 44.6	19.0S 168.9E
	pPKP	23 06.7			
6	iP	19 35 16.0			39.3N 20.4E
8	iP	10 33 55.2C	1.8	iS 10 43 38.6	36.4N 141.0E
	ipP	34 06.9		SS 48 29	
	PP	36 43			
10	iP	22 35 43.5		eS 22 46 18	2.1S 77.6W
	PP	39 16			
12	iPKP	10 03 49.3			57.5S 159.4E
	iP	20 18 00.1D	2.5	eS 20 27 24	57.3N 154.0W
	ipP	18 17.8			
15	iP	12 14 28.4C	1.6		38.0N 26.5W
17	iP	04 17 48.6D	1.9	PcP 04 18 04.8	45.5N 150.9E
	iP	06 21 51.1D		S 06 32 18	15.7N 120.1E
	pP	22 09.9			
	iPKP	07 52 23.9C	1.8	i 07 52 33.8	31.2S 179.7W
	iPKP	22 59 31.0D	2.3	SKP 23 02 30	24.7S 177.3W
26	iP	23 17 20.3C		PP 23 19 44	55.2N 160.1E
	i	17 41.0		eS 25 55	
27	iP	04 09 11.9C	2.0	PP 04 11 26	55.2N 160.1E
	i	09 30.7		SS 21 48	
28	iP	00 19 54.4D	1.7		51.7N 177.6E
	iP	21 15 05.9C	2.2	pP 21 15 22.2	47.5N 152.6E
29	iP	00 55 45.0D		PP 00 57 20.6	28.1N 52.4E
	iP	08 43 32.8		S 08 50 18	27.0N 59.4E
	pP	43 49.8		eSS 53 53	
30	iP	03 55 46.1D	1.5		50.0N 157.4E
	iSg	06 53 38.4			67.5N 32.2E H=06 49 04 (Uppsala)
	ePKP	07 16 26			54.3S 144.1E



14 .

## KONGSBERG 1963.

May	h m sec	$\log \frac{A}{T}$	h m sec	
31 iPKP	14 27 50.3			30.7S 178.2W
June				
1 iP	10 58 10.0D	1.9	iPP 10 59 55.5	36.1N 71.2E
i	58 15.5			
iP	20 40 33.5C	1.7		39.0N 15.0E
ePKP	21 33 19		PKS 21 36 46	15.3S 173.4W
2 iPKP	21 27 04.8C			33.6S 178.6W
3 eP	07 47 50			34.1N 138.7E
eP	12 42 39		PP 12 44 20	39.2N 70.3E
iPKP	19 08 40.8C	1.3	i 19 08 44.0	29.6S 177.8W
4 iPKP	12 13 59.8D	1.8	PKP <sub>2</sub> 12 14 06.8	30.5S 177.8W
iPKP	13 25 47.6D			30.6S 177.4W
iP	22 16 26.9D	1.7		39.0N 20.5E
5. iPKP	05 26 51.2C		e 05 28 02.7	30.7S 177.6W
6 iP	05 31 21.9D		eS 05 41 17	19.9N 120.5E
iPcP	31 32.2			
iP	08 33 32.5		pP 08 33 53.7	6.5N 94.6E
iPKP	11 45 01.1D			30.5S 177.6W
iPKP	18 01 42.7		SKP 18 05 02.1	14.3S 167.3E
7 iP	16 02 32.1		iS 16 12 32.1	18.9N 121.9E
pP	02 52.9			
9 iP	20 48 17.9			10.6N 41.8W
iSg	21 34 42.4			H=21 31 03 (Uppsala)
10 iPKP	04 37 08.1C		ePP 04 40 52	55.3S 146.2E
ePKP	06 59 02		PP 07 03 15	55.2S 146.1E
i	59 31.0		SS 23 05	
eP	10 58 03		PP 11 00 21.7	51.0N 160.1E
11 iP	03 33 52.3C	1.7	PP 03 35 36.3	37.1N 70.1E
iP	13 18 18.2			63.2N 151.4W
iPKP	17 32 09.8			23.2S 179.7W
17 iP	18 42 14.0D		eS 18 50 20	60.5N 140.8W
PcP	42 50.4			

15

## KONGSBERG 1963

June	h m sec	$\log \frac{A}{T}$	h m sec	
17 iP	23 15 29.3C		iPP 23 19 22.9	4.1S 102.2E
18 iP	04 14 40.9D			28.8N 130.0E
19 iP	09 22 46.7			4.7N 126.5E
iP	10 58 09.9C	2.2		25.0N 92.1E
Sg	17 02 21.5			H=17 00 14 (Uppsala)
July				
10 iP	02 20 15.3D		pP 02 20 24.8	36.5N 71.8E
iP	03 25 54.0C		pP 03 26 04.5	46.3N 153.4E
iPKP	04 49 12.1			29.7S 177.2W
iP	05 34 09.1		iS 05 43 33.2	46.3N 152.9E
pP	34 11.6		eSS 47 52	
iPP	36 40.7			
iP	09 59 41.1C			13.4N 44.9W
iPKP	17 08 30.4		i 17 08 46.9	30.2S 177.8W
i	08 34.8			
13 iP	14 09 43.4			44.3N 148.8E
iPn	23 33 27.4		Sn 23 34 13	West coast of Norway H=23 32 (Uppsala)
14 iPKP	00 22 11.5C		iPKP <sub>2</sub> 00 22 23.5	30.5S 177.2W
iPKP	04 19 00.0		PKP <sub>2</sub> 04 19 11.0	30.5S 177.3W
iP	05 53 09.1		iSS 06 07 10.6	10.4N 62.2W
iS	06 02 12.2			
iP	10 59 43.3			36.1N 70.6E
iPKP	14 48 09.3		ePKP <sub>2</sub> 14 48 26	30.2S 177.4W
iPKP	17 26 46.0			39.4S 174.9E
16 iP	18 32 44.9C		iS 18 37 05.3	43.1N 41.5E
iPP	33 15.8		Lg <sub>1</sub>	
iPKP	19 28 16.2			30.6S 177.2W
iP	22 16 51.3			43.3N 41.6E
17 iP	12 02 34.2D		Lg <sub>2</sub> 12 10 59	43.1N 41.5E
eS	07 09		Lg <sub>1</sub> 11 32	

16

## KONGSBERG 1963.

July

		h m sec	$\log \frac{A}{T}$		h m sec		
19	iP	05 49 21.1		iS	05 52 30.6	43.4N	8.2E
	iPPP	49 56.2		SS	52 57		
	iP	09 12 29.3				36 3N	141.0E
20	iP	00 57 22.3		iPP	00 57 57.9	43.4N	41.2E
	ePKP	06 56 08		eSS	07 20 25	57.6S	148.5E
	eSS	07 20 25					
August							
3	iP	10 31 56.8C	2.7	iS	10 40 24.8	7.7N	35.8W
	iPP	34 15.3					
	iP	16 40 41.5C		pP	16 40 53.4	52.0N	174.3W
	iPKP	20 45 52.0C	2.2			30.7S	178.3W
4	ePn	12 52 09.3		iSg	12 52 59.3	61.7N	5.4E
						H-12 51 16	(Uppsala)
5	iPKP	00 12 30.3				17.5S	179.1W
6	iP	13 41 35.6		LR	13 47 08.4	57.0N	33.6W
	iS	45 46.6					
8	iP	02 25 34.6C	2.3	iS	02 34 18.3	54.2N	168.1E
	pP	25 47.8		Lg <sub>2</sub>	46 03		
	iPP	28 10.5					
	iP	11 53 26.2		eSS	12 08 41	27.3N	129.2E
	pP	53 50.9					
9	iP	06 08 11.4		Lg <sub>1</sub>	06 13 03.2	44.5N	11.9E
	i	08 17.4					
12	iP	07 27 57.9				27.7N	53.2E
13	iP	03 37 25.9		pP	03 37 38.2	55.0N	156.4W
	iP	07 11 43.8C		ePP	07 13 28	36.6N	70.9E
	pP	12 32.6					
	iP	13 32 03.9				76.2N	6.4E
	iP	23 12 09.5				27.2N	140.1E
15	iP	06 23 12.7C		eS	06 32 45	37.9N	141.6E
	pP	23 25.5		ePS	33 30		
	iPn	09 27 06.0		Sg	09 27 36.0	local	

## KONGSBERG 1963.

17

August

		h m sec	$\log \frac{A}{T}$		h m sec		
15	iP	17 37 37.1		SKS	17 47 10.5	13.8S	69.3W
	i	37 55.0		iS	48 05.3		
	PP	41 42.0		SP	49 32.1		
	iP	23 59 31.0		S	00 01 23.4	69.8N	8.9E
17	iP	11 24 38.8D		S	11 34 46.7	30.6N	130.9E
18	iP	18 54 27.9D	2.2	eS	19 03 37	50.3N	176.9W
	pP	54 42.0					
	iPKP	20 47 32.1				32.1S	178.1W
19	iPKP	04 43 55.7				32.0S	177.9W
22	iPKP	20 11 24.6		PP	20 13 15.8	9.4S	158.0E
25	iP	06 17 31.2		eS	06 22 33.0	38.9N	38.4E
	iPKP	12 36 24.2		eSKS	12 43 20	17.5S	178.8W
	SKP	39 14.4					
29	iP	09 01 57.3C	2.1	S	09 08 22.0	39.6N	74.2E
	iPP	03 42.0		Lg <sub>1</sub>	14 24.0		
	iP	15 44 05.3		iSKS	15 54 23.0	7.1S	81.6W
	PP	48 13.5					
30	iP	04 54 27.3		Li	05 09 17	44.8N	80.1E
	PP	56 08.0		Lg <sub>1</sub>	11 13		
September							
2	eP	01 43 16.0		ePP	01 45 07	33.9N	74.7E
	iP	23 56 13.7		PcP	23 56 40.3	45.4N	150.8E
3	iP	05 40 53.8				45.4N	150.9E
4	iP	05 11 56.5D		LR	05 19 03	36.1N	5.3E
	iPP	12 49.9		Lg <sub>1</sub>	21 51		
	S	16 23.0					
	iP	13 38 49.1D		S	13 44 16	71.3N	73.1W
	pP	38 59.1		LR	47 42		
	iPP	39 58.4					
6	iP	06 15 19.5		i	06 15 26.4	36.4N	130.6E
	iPKP	10 35 16.4C	1.9	SKP	10 38 09.4	24.0S	179.9E
7	iP	01 28 21.7		LR	01 51 13	36.4N	130.6E
	eS	37 47.0					
	iP	07 24 55.0				45.4N	150.8E
	iP	12 54 28.5C				54.0N	160.3E

18

## KONGSBERG 1963.

September

	h	m	sec	$\log \frac{A}{T}$		h	m	sec	
8 iPKP	01	07	08.4C						28.1S 176.8W
iPKP	20	09	00.0C		SKP	20	11	53.4	23.6S 179.8E
i		09	10.3						
11 ePKP	22	40	34						33.1S 178.2W
12 iP	08	24	52.2		ePP	08	26	05	34.9N 32.2E
13 iP	17	11	36.0C	1.9					Nuclear expl. H=17 00 00.1 Nevada
17 iPKP	19	39	14.3		SKSP	19	51	40	10.1S 165.3E
iPP		41	25.6						
18 iP	17	03	08.7C		S	17	07	39	40.9N 29.2E
PP		03	41.7		Lg <sub>1</sub>		10	34	
20 iP	03	07	31.1		i	03	07	36.6	76.5N 7.9E
22 iP	22	37	15.3						37.5N 20.6E
23 iP	09	12	52.4C						16.6S 28.8E
iP	17	13	41.0D						51.3N 179.2W
iP	18	41	26.8						29.6N 50.9E
24 iP	02	15	40.0C		Lg <sub>1</sub>				41.0N 29.0E
29 iP	13	41	19.6						36.6N 29.2E
iP	22	21	51.3		PP	22	22	13.5	36.1N 18.0E
pP		22	02.0		S		26	08	
October									
2 iP	21	10	45.1	1.5					35.1N 23.5E
3 iSg	02	09	38.6						65.0N 22.2E H=02 05 28 (Uppsala)
iP	23	36	24.5D	1.8	iS	23	46	24.9	32.2N 131.6E
pP		36	34.7		Lg <sub>1</sub>	00	02	06	
PP		39	17.1						
5 iP	15	07	13.6	1.4	iS	15	14	42.3	11.6N 42.8E
7 iPKP	13	32	55.3D	1.2	SKP	13	35	45	23.6S 179.9E
8 iPKP	00	36	10.3	0.8					15.1S 173.2W
iP	05	45	18.1	1.1					39.0N 20.4E
11 iPg	16	40	21.4		Sg	16	40	47.2	58.8N 13.0E H=16 39 39 (Uppsala)

## KONGSBERG 1963.

19

October

	h	m	sec	$\log \frac{A}{T}$		h	m	sec	
12 iP	11	38	14.2		iS	11	47	07.0	44.8N 149.0E
13 iP	01	37	51.2						44.4N 149.3E
iP	05	29	09.2		PcP	05	29	35.9	44.8N 149.5E
pP		29	18.0		S		39	14	
iP	07	14	37.1	1.5					45.5N 150.6E
iP	08	22	49.0	1.4					44.5N 151.6E
iP	09	23	10.6	1.1					43.8N 150.8E
iP	12	40	50.6	1.7					45.9N 151.8E
iP	12	53	27.9	1.8	pP	12	53	40.8	44.4N 149.4E
iP	13	09	37.1	1.3	pP	13	09	48.8	45.0N 150.1E
iP	16	11	04.4	1.8					45.6N 150.5E
14 eP	00	13	05.4		iS	00	23	17.6	45.0N 150.9E
iP	13	32	59.9C	2.1	iS	13	42	11.3	44.8N 151.0E
pP		33	09.3						
15 iP	10	02	54.3		eS	10	05	43	67.2N 18.4W
PP		03	13.0						
iP	18	35	13.3	1.3					45.3N 151.0E
iP	20	52	44.0	1.1					45.4N 151.1E
16 iP	15	51	10.3D	1.5	SS	16	00	27	38.6N 73.4E
PP		52	54.2		LQ		02	16	
iS		57	42.7		Lg <sub>1</sub>		06	04	
iP	21	41	07.2D	1.7					44.4N 150.9E
17 iP	23	35	49.5	1.1	S	23	45	19.0	44.6N 149.0E
pP		36	07.5		Lg <sub>1</sub>	00	04	18	
18 iP	09	04	47.3	1.6	eS	09	14	08	44.8N 150.2E
iP	20	16	19.4	1.5					47.6N 154.3E
iP	21	34	06.8	1.5	pP	21	34	17.2	45.2N 151.1E
19 iP	02	29	46.9D	2.1	Lg <sub>1</sub>	02	52	42	46.8N 153.7E
eSS		44	14						
iP	03	26	13.9D	1.6	pP	03	26	26.2	46.5N 153.9E
iP	03	45	13.6C	2.0	LR	04	08	26	46.6N 153.8E
iS		54	44.4		Lg <sub>1</sub>		10	22	
SS	04	00	48						



20

## KONGSBERG 1963.

October	h m sec	$\log \frac{A}{T}$		h m sec	
19 iP LR	03 58 18.9D 04 17 52	2.1	Lg <sub>1</sub>	04 19 56	46.8N 153.8E
iP	16 26 32.2	1.8	pP	16 26 44.9	44.4N 150.9E
20 iP PcP	01 04 26.0 04 46.9	1.5	PP iS	01 07 08.4 13 44.3	44.7N 150.7E
iP	01 17 49.2	1.2			47.4N 151.1E
iP	01 32 49.7	1.7			45.9N 153.6E
iP	09 22 01.1D		iS	09 31 19.4	44.4N 150.0E
iP iS ScS	12 02 35.3C 12 57.8 13 43.6	1.8	SS Lg <sub>2</sub>	12 17 41.0 32 58	44.7N 150.2E
iP	13 06 59.9	1.8			24.1N 5.1E Nuclear expl.
iP	13 32 27.1	1.7			45.1N 150.5E
iP	17 52 44.4	1.4	pP	17 52 53.6	44.2N 149.0E
21 iP	13 20 20.0	1.4	pP	13 20 32.5	45.2N 151.6E
iP	17 32 05.1	1.5	pP	17 32 18.6	44.1N 150.3E
22 iP	03 36 58.6				43.9N 150.3E
iP	04 40 16.6	1.1	pP	04 40 28.5	51.0N 179.4E
23 iP	09 58 33.3	1.2	pP	09 58 45.5	41.2N 144.2E
24. iP	01 17 43.1	1.5	eS	01 27 05	44.5N 150.3
iP	07 39 46.4		iPP	07 43 44.6	4.9S 102.9E
25 iP	06 12 58.6				52.0N 174.8E
iP	22 59 25.1				36.9N 95.2E
26 iP Lg <sub>1</sub>	04 06 55.5 33 25		Rg	04 37 07	44.5N 150.1E
iP	06 10 59.2	0.2			44.5N 149.8E
iP	11 33 02.6	0.9			44.7N 149.7E
iP	11 43 08.4	0.9			44.6N 149.8E
27 iPKP	18 44 15.5	1.5			24.3S 176.1W
28 iPKP	08 14 44.7	2.5			24.3S 176.0W

## KONGSBERG 1963.

21

October	h m sec	$\log \frac{A}{T}$		h m sec	
28 iP iS	12 14 01.1 22 48.0	1.9	LR Lg <sub>1</sub>	12 36 12 38 31	52.8N 159.8E
iPKP	20 17 49.7	1.5			24.5S 179.9E
29 iPKP	17 15 25.0	0.9			26.5S 177.5W
eSg	18 32 52.1				65.8N 21.5E H=18 28 28 (Uppsala)
iPKP	20 41 51.1				26.2S 177.8W
iP	22 32 30.1	1.7	i	22 34 23.1	
iP	22 42 11.0	1.4			
November					
1 iPn	00 29 04.9		iSg	00 29 53.7	62.9N 4.7E H=00 28 26 (Uppsala)
iPn	01 35 20.5		iSn	01 36 30.7	62.9N 3.3E
iP	04 03 08.6	1.4			51.7N 159.8E
iPKP	21 18 49.2	1.3			22.5S 176.8W
iP	22 52 34.5D	1.4			44.9N 148.9E
2 iSb	22 56 22.5		iSg	22 56 25.4	57.2N 12.2E H=22 54 57 (Uppsala)
3 iP PP SKS	03 23 19.7 26 55 33 04	1.5	SSS LR Rg	03 41 45 47 25 57 47	3.5S 77.8W
iP	14 40 53.1				39.2N 21.1E
4 iP pP	01 31 32.8 31 49.6	1.6	SKS PS	01 42 31 45 43	6.8S 129.6E
6 iPKP	06 47 58.0	1.7			30.8S 179.9E
iP	09 36 02.9	1.5	PcP	09 36 24.8	46.3N 154.8E
iPKP	18 43 47.2	1.3			
7 iPKP	16 13 13.9	1.4			24.2S 176.4W
9 iP	02 51 48.4	1.7			56.8N 34.6W

22

## KONGSBERG 1963.

November

	h	m	sec	$\log \frac{A}{T}$		h	m	sec		
9	iP	21	27	44.3D	1.5	PP	21	31	37.9	9.0S 71.5W
	pP		29	59		SKS		39	31	
10	iP	01	12	52.3	1.2	PP	01	16	45.0	9.2S 71.5W
	pP		15	05.1						
	iP	17	29	00.9	1.8	LR	17	51	30	44.4N 149.0E
	pP		29	10.9		Lg <sub>1</sub>		54	17	
	iPP		31	35.0		Rg <sub>1</sub>		57	11	
	S		38	08						
	eP	18	42	15	1.1					37.3N 20.9E
	iPKP	19	39	09.9C	1.7					26.2S 178.3E
12	iP	07	12	11.0	1.7	PP	07	13	16.6	35.5N 29.7E
15	iP	21	17	48.9	1.6	LR	21	38	09	44.3N 149.0E
	iS		27	05.8		Lg <sub>2</sub>		44	02	
	SS		32	04						
16	iP	11	18	44.5	1.2					26.7N 97.2E
	iPKP	23	02	54.0	1.3					22.3S 175.0W
17	iP	00	58	28.6	2.3	SS	01	11	02	7.6N 37.4W
	PP		01	00		LR		16	12	
	S		06	27		Lg <sub>2</sub>		23	50	
19	iP	11	12	11.4	1.8					44.4N 149.2E
23	iP	22	38	42.8						79.9N 0.9E
24	iP	11	17	56.3		iPP	11	21	11.0	28.2N 140.1E
27	iP	21	20	00.1	1.3					30.8N 79.1E
28	iP	15	24	06.9	1.8					52.2N 174.2E
	iPKP	18	32	55.0	1.5					27.4S 179.1E
29	iSg	09	19	06.7						60.4N 21.0E H=09 16 02 (Uppsala)
30	iP	21	52	35.9	1.2					6.6N 94.2E
December										
1	iP	04	34	17.9	1.2					56.1N 11.8E
2	eP	06	52	08	1.3	eS	06	54	40	47.9N 16.5E
	iP	11	56	40.2						48.1N 154.7E

23

## KONGSBERG 1963.

December

	h	m	sec	$\log \frac{A}{T}$		h	m	sec		
2	iP	21	00	28.5	1.8	iS	21	04	34.7	80.1N 0.6W
	iPP		01	07.8		SR		05	56	
	PPP		01	16.8						
3	iP	00	03	41.4						51.5N 174.0W
	eP	03	55	52	1.1					45.4N 151.6E
	iP	05	20	34.7	1.4					46.2N 153.0E
	iP	08	50	19.4	1.1					46.1N 152.9E
	iPKP	23	22	04.5		LR	23	52	50	22.4S 69.3W
	PPS		32	08		Lg <sub>1</sub>		56	48	
	LQ		47	11		Lg <sub>2</sub>		59	05	
4	iPKP	01	04	31.1						34.0S 179.3W
	iP	01	38	49.0						46.2N 153.1E
	iP	02	38	00.8						31.3N 55.4E
	iP	02	54	41.8	1.3	pP	02	54	56.3	45.9N 153.2E
	iP	08	35	29.4	1.7					46.1N 152.9E
	iPg	13	15	26.5		iSg	13	15	53.5	58.3N 10.8E H=13 14 44 (Uppsala)
	iP	15	56	00.9	1.7	pP	15	56	18.9	46.0N 153.2E
6	iP	03	26	43.0						43.8N 134.9E
	iP	07	03	05.3	1.3					46.5N 152.6E
7	iPKP	04	26	18.6	1.8	SKP	04	29	06	22.1S 179.4W
	iPKP	17	56	48.9D	1.6					29.3S 178.5W
8	iP	08	04	27.3						46.4N 153.0E
9	iP	05	49	10.9	1.6					54.9N 159.4W
	iP	08	44	50.0						44.0N 150.4E
	iPKP	11	12	14.6	1.3	iSKP	11	15	17.4	21.1S 178.0W
	iP	12	33	55.7	1.3					45.2N 151.2E
11	iPKP	01	07	10.0	1.3	Lg <sub>1</sub>	01	59	46	15.1S 173.6W
	LR		51	07		Lg <sub>2</sub>		02	05	04
	Li		54	36						

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December		h m sec		$\log \frac{A}{T}$		h m sec		
11	iPKP	02 49 33.6		1.2	SKP	02 52 26 5		17.8S 178.6W
	iPKP	11 31 03.9		1.6				24.2S 179.3E
	iP	17 19 18.9C		1.5	pP	17 19 34.7		51.2N 179.3W
	iP	17 23 51.3		1.2	LQ	17 42 54.5		51.1N 179.4W
	iP	17 36 17.0		1.2				51.3N 179.5W
	iP	19 24 02.7		1.3				51.3N 179.5W
14	iP	08 00 48.9		1.4	pP	08 01 09.5		62.7N 149.5W
15	iP	19 47 16.5D		2.6	PPP	19 53 40		4.8S 108.0E
	pP	49 40.1			S	57 37		
	PP	51 19.2						
16	iP	02 05 07.4		1.1	Li	02 40 53		6.4S 105 4E
	LQ	34 51			Lg <sub>2</sub>	48 45		
	iP	13 53 08 2		2.9	S	13 57 29.8		37.1N 20.9E
	PP	53 42.9						
17	iP	23 33 08.7		1.3				52.9N 165 4W
18	iPKP	00 49 33.4		1.9	PKS	00 53 03.1		24.8S 176.6W
	iP	03 01 46.0		1.8				45.8N 151.7E
	iP	06 48 35.7		1.7	PP	06 50 33.8		41.7N 82.5E
21	iPKP	12 53 38.4		1.1				21.2S 175.8W
	iP	13 21 45.8		1.4	Lg <sub>2</sub>	13 56 07		16.1N 119.7E
	eS	32 18						
26	iP	08 02 23.8		1.7	S	08 05 53		76.5N 22.4E
	PP	02 32.6			PcP	07 03		
28	iPKP	09 23 44.8		2.3	PKP <sub>2</sub>	09 24 07		32.7S 178.9W
30	iP	13 40 37.8		1.6				45.5N 150.6E