



Instrument	Component	Symbol	To (sec.)	Tg (sec.)	Damping Shunt (ohms)	Paper Speed mm/sec.
Willmore	Vertical	z	1	2	near critical	30
Columbia	Vertical	Z	15	75	100	15
Columbia	N-S	N	15	75	100	15
Columbia	E-W	E	15	75	100	15

Directions of initial movements are indicated by small letters after the last figure of the phase arrival times, as follows:

u = ground movement up  
 d = " " down  
 n = " " to north  
 s = " " to south  
 e = " " to east  
 w = " " to west

Trace amplitudes (A) are in millimetres, and periods (T) in seconds.

Date 1958	Phase		Time (UT) h m s	Az	Tz	An	Tn	Ae	Te	Remarks
JAN. 1	eL	Z	10 33ca							Small irregular tremors on N. Traces
1	e(SS)	Z	15 41ca							
2	e(L)	Z	00 56ca							
2	e	Z	23 28ca							Small tremors
3	iP	Z	17 58 53u	2	15					
	eS	ZE	18 08 55	1	-			3	-	
	e(SS)	ZE	13 28	2	20			4	20	
	eLq	N	20ca			2	25			
	eLr	ZE	22.5	2	35?			3	-	
	M	E	27ca					7	20	
3	M	Z	29ca	5	18					
3	eL	Z	22 50ca							Small waves.
4	e	N	07 47 47							Traces
	e?	Z	50ca							
4	ePKP	Z	08 22 00	1	13					
	e(PKMP)	Z	30 18	2	-					
	eL	ZE	53.0	1	30			2	30	
	M	ZE	58ca	2	17			4	20	
4	e	Z	18 40ca							Traces
4	eL	Z	23 56ca							Traces
5	P	zZ	08 16 28	2	2					
	i(PP)	z	21 53u	1½	2					
	e(SSS)	Z	38.0	1	-					
	e	Z	50 35	2	15					
5	e(SS)	Z	12 15.5							Long coda of small irregular waves.
	e	Z	19.0							
	eL	Z	35.0							
6	i(PKMP)	z	02 25 13u							
6	P	z	13 17 03							Local ? seismic
	i	z	19u							
	(s)	z	32							

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JAN. 8		z	08	50ca								Small tremors; ? seismic.
9	e(L)	Z	11	40ca								Traces.
9	e(PP)	z	18	02 01								Small waves.
	i(PP)	z		20d								
	eL	Z		50ca								
10	i	z	21	56 50u								Small tremors; ? seismic.
11	eL	Z	06	12ca								Series of small waves.
11	iP	zZN	13	27 42un	4 $\frac{1}{2}$	2	2	-				L-waves poorly developed
	ePP	Z		29 42	3	10						
	iS	ZNE		34 37(n)w	10	13	16?	-	29	12		
	e	z		44	2	5						
	iSS	E		38 40e					11	15		
	eSSS	Z		39 40	2 $\frac{1}{2}$	20						
	i	NE		40 05nw			7	25	17	20		
	eLr	Z		43 45	3	20?						
12		z	14	38ca								Small tremors; ? seismic
12	eL	Z	16	09ca								Traces.
12	e(L)	Z	16	38ca								"
13	P	zZ	03	04 51(u)	2	5?						Long period microseisms & artificial dis- turbances on N & E. 13 <sup>d</sup> and 14 <sup>d</sup> microseism interference.
	S	Z		13 03	3	12?						
	Lr	Z		23.5	5	35						
15	iP	zZN	19	27 45 $\frac{1}{2}$ u	25	18	3	-				No E-comp. record
	ePPP	z		33 18	1	5						
	eSKS	N		37 56	8	15						
	e(S)	Z		38 25	16	-						
	e(S)	z		40	2	-						
	eSS	ZN		43 14	14	40	12	40?				
	eSSS	Z		49 46	22	45?						
	e(PcPPKP)	N		50 10			19	40				
	e(HKPPKP)	N		52 40			12	35				
	i(Lq)M	ZN		53 23u	80	35	25	33				
15	eP	z	22	26 45	1	2						Long coda of small waves.
	eP	ZN		46	10	25?	4	-				No E-comp. record.
	iPP	z		55	2	-						
	e	z		27 15	2 $\frac{1}{2}$	2						Long coda.
	eL	N		43 38			3	20				
	eLr	ZN		46ca	13	25	15?	30?				
16	P	z	00	10 25								In coda of previous shock.
	e(S)	zZ		11 30								
	L	ZN		12.0								
16	eP	ZN	11	13 38	2	15?	2	-				Small tremors.on z.
	eS	ZE		21 44	2	-			2?	-		
	iS	N		48			2	20				
	e(SS)	E		28 35					3	-		
	eLr	ZNE		32.8	2	20	2	20	2	20		
	M	ZN		36ca	4	20	2	20				
17	e(L)	Z	04	52ca								Small tremors
17	iP	ZNE	07	21 00u(n)e	4	10?	3	-	4	10		Very large ampl. on N & E.
	i	ZN		22 12u	7	10	3	-				
	eS	N		25 27			2	12				
	iS	Z		30	3	10						
	iS	E		33					23	15?		
	L	ZNE		27.0	10	20?						
	M	ZE		28+	58	-			90+	10		

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JAN. 18	e	ZNE	02	48	ca							Tremors.
18	eP	Z	15	57	30ca							N & E records confused.
	e	Z		28	10ca							
	eLr	ZN		52.6								
19	P	z	09	20	57							
19	iP	zZE	14	21	07u	7	13		4	-		No recordings on N. Traces very confused on Z & E records.
	iPP	zZE		25	04	7	17		4	20		
	(S)	Z		31	27	5	18					
	eS	E			37				15	-		
	e	Z		33	30	7	20					
	(SKPP)	zZ		49	30	13	25					
	Lr	zZ		52	29	65?	30					
	M	Z		56ca		100+	25					Very long coda of large waves.
20	iP	zZ	02	31	04d	2	-					Recording on E confused by overlapping traces. No recordings on N
	ePP	z		34	40	1	5?					
	eS	Z		40	10	2	-					
	eSS	zZ		44	40	2	-					
	i(Lr)	Z		52	29	3	25					
21	eL	Z	10	28	ca							Tremors.
<p>23<sup>d</sup> and 24<sup>d</sup> Z &amp; N records faulty.  25<sup>d</sup> &amp; 26<sup>d</sup> all long-period records disturbed by  artificial movements.  26<sup>d</sup> strong microseisms.  27<sup>d</sup> no records owing to recorder fault.  27<sup>d</sup> to 30<sup>d</sup> microseismic storm.</p>												
31	eS	ZNE	06	44	40	2	-	2	-	1	-	
	iSS	NE		46	53			1	-	3	15?	
	e(SSS)	N		47	25			2	-			
	eSSS	ZN			43	3?	25	3	25			
31	i	ZNE	21	15	55							
	i(L)	ZN		22	50							
	e	ZNE		25.2								
	i	ZN		25	30							

HALLETT STATION

NOAA

72° 19'S, 170° 13'E

SEISMOLOGICAL BULLETIN

February 1958



Instrument	Component	Symbol	To (sec)	Tg (sec)	Damping Shunt (ohms)	Paper speed mm/sec.
Willmore	Vertical	z	1	2	near critical	30
Columbia	Vertical	Z	15	75	100	15
Columbia	N-S	N	15	75	100	15
Columbia	E-W	E	15	75	100	15

Directions of initial movements are indicated by small letters immediately after the last figures of the phase arrival times, as follows:

- u = ground movement up
- d = " " down
- n = " " to north
- s = " " to south
- e = " " to east
- w = " " to west

Trace amplitudes (A) are in millimetres; and periods (T) in seconds.

Date 1958	Phase		Time (UT)			Az	T <sub>a</sub>	A <sub>n</sub>	T <sub>n</sub>	A <sub>e</sub>	T <sub>e</sub>	Remarks
			h	m	s							
Feb. 1	eP	ZN	16	23	55	1½	10	3?	-			
	i	E		25	49					2	10	
	PP	E		27	51					2	10	
	iS	ZNE		34	29 <sup>ne</sup>	3	15	5	15	13	15	
	SS	E		41	56					3	15	
	Lr	E		54	39					5	20	Small waves on z and N
	M	ZE		59 <sup>ca</sup>		33	20			40	20	
1	e(PFS)	Z	21	12	26	2	15					
	e	Z		18	00	1½	25					
	eSS	Z		20	31	1	-					Irregular movements
	eLr	Z		31	26	2	25					
	M	Z		39 <sup>ca</sup>		11	15					
2	eL	ZN	09	09 <sup>ca</sup>								
3	e(L)	ZN	08	52 <sup>ca</sup>								
5	e(L)	ZNE	02	54 <sup>ca</sup>								Irregular waves
5	eP	ZE	20	56	22							
	e(S)	ZE	21	02	36							
	e(L)	ZNE		08	52							
	eL	ZE		10	35							
6	iP	zZN	16	08	15							
	e(PP)	ZNE		09	38							
	e	zNE		11	18							
	S	ZNE		14	42							
	e	z			48							
7	e	Z	01	16 <sup>ca</sup>								Long series of small tremors
8	eL	Z	00	26 <sup>ca</sup>								
11	e(L)	Z	01	20 <sup>ca</sup>								Small irregular waves
12	e	Z	07	09 <sup>ca</sup>								Traces
13	i(SKKS)	zZN	00	11	12 <sup>u</sup>	2	5					
	e(Lr)	ZN			40 <sup>ca</sup>							Small irregular waves. 13 <sup>d</sup> & 14 <sup>d</sup> strong micro seisms.

Date 1958	Phase	Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
		h	m	s							
Feb. 18	eS	zZE	07	51	02						
	e	zZNE		52.1							
	e	zE		53.4ca							
18	e(Lq)	zE		55	37						
	e	zE		56	43						
	e	zZN		57.6							
	e(Lr)	zZN		58.7							
	e(L)	zZNE	08	00.0							
	e	zZ		04.75							
18	e	ZN		07.6							
	iP	zZNE	13	29	19						
	e	NE		30.1							
	ePP	zZNE		31	05						
	iS	zZNE		35	46						
	i	NE		37	09						
	iLq	zZNE		39	15						
iLr	NE		41	32							
18	eL	ZN	20	42ca							
19	(P)	z	19	34	47						
	(S)	z		37	12						
27	e	ZN	22	38	55						Poorly recorded movements
	e	ZNE		42	29						
	e	ZNE		45	33						
	e	ZNE		56	17						
	e	ZNE		59	24						
	e	ZN	23	04	32						
	e	ZN		12	34						
eL	Z		15ca								



International  
Seismological  
Centre

*Feb only*

HALLETT STATION, *M. 2.*

NOAA

72° 19'S, 170° 13'E

SEISMOLOGICAL BULLETIN

March 1958



Instrument	Component	Symbol	To (sec)	Tg (sec)	Damping Shunt (ohms)	Paper Speed mm/sec.
Willmore	Vertical	z	1	2	Near critical	30
Columbia	Vertical	Z	15	75	100	15
Columbia	N - S	N	15	75	100	15
Columbia	E - W	E	15	75	100	15

Directions of initial movements are indicated by small letters immediately after the last figures of the phase arrival times, as follows:


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- n = " " to north
- s = " " to south
- e = " " to east
- w = " " to west

Trace amplitudes (A) are in millimetres; and periods (T) in seconds.


Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
Mar. 9	eP	zNE	10	30	02	1½	3	10?	3	8	3	
	iS	ZNE		36	05rw	2	15	8	13	12	12	
	iSS	NE		39	21ne			6	17	12	25	
	e	Z		41	01	12	25					
20	eL	Z	02	35ca								Small irregular waves
21	e	Z	21	18ca								Traces
22	e?	Z	10	41ca								Small waves.
	eL	Z	11	03ca								
22	eL	Z	12	12ca								" "
24	eL	NE	01	18ca								
24		z	04	14ca								Tremors; ? seismic.
24		z	17	23								" " "
25	e	ZE	23	20ca								Small waves.
28	e	<del>ZNE</del>	05	33	41							
	iL	<del>ZNE</del>		34	35							
	i	E		37	02							
29	iP	z	06	28	35							
	eS	NE		30	16							


Note: Frequent periods of microseismic storms interfered with earthquake recording; especially during the first half of the month.



Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks	
			h	m	s								
APR. 6	eSS e (SSS)	ZE Z ZNE	11	04	57 06 45 08ca							 Local tremors	
6		z	14	09	ca								
7	i(PKP) i(PKP2)	Z ZNE	15	48	45(u) 59 05							Heavy microseism & wind distur- bance 8 <sup>d</sup> heavy micro- seisms decreasing	
	i(PPS)	ZN	16	03	01								
10	iP epP e e(PP)	zZ z zZ z	13	30	25u 58 31 24 32 59	5 2 1½ 4	3 2 3 3						
10	iP i i e e i(S) iS e ePcP eScP iPcS	zZNE ZNE zZNE zZE zZNE E zZN N ZNE ZNE Z	17	08	47 09 02 08u 57 10 21 55w 11 03d 13 05 17 14 47 16 17d								
10	e? e(Lq) e e e(SKKS) e e i e	N zZNE zZNE NE ZN zZ z zZNE zZNE ZE	23	48	33 47 50 07 51 16 28 54 45 55 18 59.4ca 11 02 16s 04 16			2 3 2 2 3 3 3 3	6 30? 5 7 -		1 5 3 -	- 5 7 8 15?	
11	e(PPP) eSKS (PS) eSS (Lr)	z NE ZNE ZN N	23	35	58 38 31 42.0 47 56 24 12ca	2	7	2½ 4 3 3	15 30 15 20	2 3 -	10 -	May be PKS Two shocks about this time. Interpretations doubtful. Local shock.	
12	P	z	03	30	25							Local shock.	
12	P	z	10	54	24							Local shock.	
12	e(Lr) e i e M	ZE Z E E ZE	12	40.0 43	06 22w 44 44 49ca	3 5 7	20 15?			5 10 4 8	20 10? 15 15	Movements on N. comp. small & confused.	
12	eL	Z	14	01	ca								
13	iSKSP e(PKKS) e e(SKKS) iSS e e e eL M	ZN Z N ZN ZNE E E ZNE ZE ZN	13	00	07d 01 06 02 32 05 01 07 12 08 17 11 15 15 43 25 02 33ca	5 2 2 2 3 3 4 3 12	- 10 -	4 7 4 15 20 15 7 15	15 30? 20 25 25 15 15		9 9 2 -	20 20 20 -	Small & irregular " " Small on E. Small on E.
13	e(L)	Z	17	39	ca							Small tremors on z.	
14	eP e e(PP)	ZNE zZNE zZN	21	45	25 46 04 49 30	2½ 2½	15	2½ 1½	5? 6	4	5	Very small on Z. Small on Z.	



Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks	
			h	m	s								
APR.	e(PP)	zZNE	50	07		5	20?					Very small on N & E.	
	i	z	52	44								 International Seismological Centre	
	iS	ZNE	56	52		4	-	6	25?	5	20		
	iPS	NE	57	31s				10	23	15	20		
	iPPS	ZNE	58	52de		10	15	8	15	6	-		
	i(PSPS)	ZNE	22	04	03	4	25?	6	23?	7	12?		Prominent on N.
	(L)	ZNE		11	02	4	15	12	20				
	eL	ZE		13.5	ca	5	30?			3	20		Long coda of prominent waves.
	M	ZNE		19	ca	35	25	16	30	30	25		
	M	ZNE		44	ca	20	18	24	20	13	15		
15	SKS	NE	01	55	12					5	10		
	ePPS	Z		57	11	3	20?						
	iSS	N	02	01	26n			5	20				
	eLq	N		11	13			4	30				
	eLr	ZNE		15	ca	3	30	4	25	3	30		
	M	ZE		19	ca	12	20			12	20	Small on N.	
15	e(PPS)	N	04	21	38			4	30				
	eSS	ZN		25	28	2	-	6	20				
	eLq	N		35.0				10	35				
	e(Lq)	ZE		36 $\frac{1}{2}$		2	20			3	-		
	e	ZE		38.4		3	25			3	-		
	e(Lr)	ZNE		40.5		7	25	6	25	7	30		
	M	ZE		43	ca	13	20			12	20	Small on N.	
	M	ZE		49	ca	12	15			13	15	15 <sup>d</sup> to 17 <sup>d</sup> microseismic storm.	
17	eP	z	15	30	01							Local shock	
17	iP	z	18	15	25							" "	
18	eP	zZNE	08	52	13							Heavy long- period. micro- seisms.	
	e	zZNE		54.3									
	e	N		56	15								
	e	zZN	09	01	06								
19	iP	zZNE	11	00	12							Long-period microseism interference.	
	e	z		01	12								
	e(ScS)	ZN		10	32								
	eLr	ZNE		20.7									
	e?	zZ		27	03							20 <sup>d</sup> and 21 <sup>d</sup> microseismic storm.	
21	P?	z	08	48	44							Local shock.	
21	eP	z	20	24	51							" "	
21	eP	z	22	49	44							" "	
22	iP	z	00	08	19							" "	
23	i(P)	z	07	06	15d							Heavy microseism Strong microseism	
23	e	ZN	15	36	ca							Irregular tremor	
23	eP	z	19	23	36							Small tremors.	
23	e(P)	z	23	44	03							Local shock.	
24	eP	z	00	44	19							Local ? shock.	
24	eP	z	01	18	02							Local, ? seismic	
24	eP	zZNE	13	18	42								
	e(PoP)	N		19	24								
	ePP	zZ		20	40								
	iS	ZNE		25	57e								
	e?	N		27	41								
	iSS	ZNE		29	41								
	i	E		31	02								
	i(Lq)	N			34								
	i(Lr)	ZNE		34.3	ca								

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
APR. 24	eP	zE	17	30	10							
	e(PcP)	zE			26							
	e(PP)	Z		32	30							
	iS	E		38	44							
	e	Z		39	09							
	i(pS)	E			44							
	e(SSS)	ZE		46	34							
	e?	Z		48	40							
26	iP	z	09	35	38d							26 <sup>d</sup> & 27 <sup>d</sup> long-period microseis interference.
26	eP	z	23	33	02							
27	eP	z	18	56	02							Local shock.
27	eL	ZNE	20	01	05							Weak movements.
27	e(P)	z	22	57	16							Very small; local ?
28	e(P)	z	06	14	24							Long periods.
	iP	z			38							
	iS	ZNE		17	26							
	Lq	ZE		18	17							
	eL	Z		21	20							
28	e	z	07	04	41							Irregular local tremors.
	e	z			57							
28	eP	zZE	12	00	26	5	18			2	18	Small & Irregular
	e	zZ		01	40	2	-					
	e	E		03	05					2	15	
	e(PP)	Z			46	2	-					
	e	N		05	20			2	-			
	iS	ZNE		10	55e	3	17			7	15	
	e(PS)	N		12	07			2	12			
	e	E		14	00					4	25	
	e(SS)	NE		16	47			2	12	4	-	
	e	Z		17	28	3	15					
	e	ZN		23.8		5	-	3	35			
	e(Lr)	ZNE		26.8								
	eL	NE						3	20	4	20	
	M	ZE				13	20			15	20	
30	eP	z	12	16	56							Tremors; ? seismic. 30 <sup>d</sup>
30	eP	z	14	26	37							long-period records disturbed
30	eP	z	18	14	35							Small tremors.
30	eP	z	19	21	00							Local ?
30	iP	z	19	39	26d	2	3					

DEC 7 1959

HALLETT STATION

72° 19', 170° 13'E

SEISMOLOGICAL BULLETIN

May 1958



International  
Seismological  
Centre

Instrument	Component	Symbol	To (sec.)	Tg (sec.)	Damping Shunt (ohms)	Paper Speed mm/sec.
Willmore	Vertical	z	1	2	near critical	30
Columbia	Vertical	Z	15	75	100	15
Columbia	N-S	N	15	75	100	15
Columbia	E-W	E	15	75	100	15

Directions of initial movements are indicated by small letters immediately after the last figures of the phase arrival times, as follows:

- u = ground movement up
- d = " " down
- n = " " to north
- s = " " to south
- e = " " to east
- w = " " to west.

Trace amplitudes (A) are in millimetres, and periods (T) in seconds.

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
MAY 1	iP	zZN	00	38	56u	4(z)	-	1½	?			Very <sup>large</sup> <del>long</del> on z.
	i	z		39	25	10	2					
	e(PP)	E		40	29					2½	15	
	ePcS	E		43	10					3	10	
	iS	NE		46	44s			8½	25	4½	15	
	i(ScS)	NE		48	11s			5½	25	5½	15	
	i(SS)	N		50	28			7	40			
	Lr (SKKS)	ZE ZN		56	28	6	-			5	25?	
			01	14	ca.	6	50?	7	-			
1	eP	z	01	08	02							Local
1	eP	z	06	21	26							Local ?
1	eP	z	22	14	36							Local
3	(P)	z	00	43	20							
3	(P) ?	z	04	09	10							
3	eP	z	09	38	27							
3	e(P)	z	12	28	37							
3	(P) i	z	15	14	24							
		z			40							
4	e ?	z	13	26	53							Tremors for 8 mins ca. ? seismic.
5	(P)	z	10	56	58							Local
5	(P)	z	11	01	28							"
5	e e i	E	16	40	21							Confused with microseisms
		E		42	46							
		E	17	02	47							
6	e(P)	z	02	16	14							
7	e(P)	z	01	58	48							
7	e(P)	z	06	07	10							Large tremors follow; ? seismic. ? seismic.

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
MAY 8	e(P)	Z	01	43	27							
	i	Z		49	24							
8	eiP	Z	04	52	53							Large; ? seismic
8	eP	Z	12	46	23							? seismic.
8	iP	ZNE	12	52	19dse	9	10	5	10	5½	10	
	i	Z		53	03u	6	2					
	e	E			14					3	10	
	e?	Z			17	3	-					
	e	N			27			4	-			
	e(pP)	ZZ		54	22	3	-					
	e(sP)	E		55	03					3	10	
	e(sP)	ZN			11	2½	2					
	i	N		56	37s			3	-			
	e(sPP)	NE		58	11			5	35?	4	10	
	e	E		59	55							
	e?	Z	13	00	53							
	e(S)	ZNE		01	51w			3	-	6	-	
	e(SP)	Z		02	26	4	20					
	e(SP)	E			46					5	10	
	e	N		03	31			7	15			
	e(SS)	E		07	15					4	10	
	e(SS)	N			47			5	-			
	(L)	NE		12.5				6	40?	5	-	
9	iP	Z	04	51	29d	2½	2					
	i(sP)	Z		52	13	3½	2					
	i(PP)	Z		53	23	2	2					
	L	E	05	05.2	ca					6	?	
9	eiP?	Z	05	19	18							? seismic.
	(P)	E			23							Traces.
9	eP?	Z	07	16	05							
9	eP	Z	07	32	23							
	(S)	Z			39							
9	eP	Z	08	21	38							
	(S)	Z		22	02							
13	eP	Z	14	34	59							
14		Z	22	12	ca							
15	eP?	Z	05	55	38							
15	eP?	Z	06	08	32							
	e(S)	ZE		12	31							Confused with
	e(SS)	N		13	10							microseisms.
15	eP?	Z	07	12	17							Very small tremors.
15	iP	Z	09	23	54d							
15	e(S)	Z	18	59	03							
15	eP	Z	20	40	54							
16	eP	Z	13	00	10							
16	eP	Z	13	30	44							
	iS	NE		33	13s(e)							
	i(S)	Z			18u							
16	eP	Z	21	21	04							
16	iP	Z	22	41	25							Weak; ? seismic.
17	eP	Z	07	13	44							
	e(L)	Z		40	35							Confused with
	e?	E		41	04							microseisms.



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Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
MAY 17	(P)	z	17	53	15							
18	P	zNE	02	42	57	2	?	2½	15	2?	-	
	i	z		43	12u	5	2					
	ePP	z		45	27							
	e	E			45				2½		-	
	e	N			55							
	iS	NE		51	06se			6	17	8	16	
	iSS	N		54	55s			7	12			
	e(Lq)	E		58	10					10	?	
	eLq	N			36			4	-			
	Lr	N	03	01.2				8	20			
	M	N		05ca				25	20			
18	iP	z	03	41	22d							
18	iP	z	05	36	44d							
18	iP	z	12	31	21u	3½	3?					
	eS	NE		39	33					4	18	
	e(ScS)	NE		41	06					3	15	
	e	N			42.6			11	60?			
	eSS	E		43	45					9	20	
	Lq	E		46	31					8	40?	
	(PKKP)	N			52.2			9	22			
	M	N			54ca			18	18			
18		z	21	51ca								Local tremors.
19	iP	z	00	16	05d							
21	eP	z	13	29	15							
22	eP	z	15	18	20							
	(L)?	N			45ca							Confused with microseisms.
23	e(SKSP)	z	22	40	15							
23	P?	z	23	01	35							Local; ? seismic.
24	e(L)	NE	07	42ca								Confused with large microseisms.
25	eP	z	21	24	59	2	2					
	e(sP)	z		26	02	1	2					
	ePP	z		28	54	1	-					
	eS	z		36	23	½	-					
	eLr	zNE			56ca	1	-	14	22?	15	25	
	M	NE	22	00ca				20	18	17	22	
26	e(P)	z	11	49	18							
27	e(P)	z	00	55	34							? seismic.
27	e(P)	z	23	19	43							? seismic.
27	iP	z	23	43	47u							
	i(PcP)	z		44	07d							
28	e(P)	z	07	56	32							Series of small tremors.
28	e(P)	z	08	09	55							? seismic.
28	e(P)	z	12	37	39							" "
28	eP	z	16	13	48							
28	e	z	17	48	03							Small tremors.
30	e(P)	z	02	46.0								
30	eP	z	06	01	18							



Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
MAY 30	e?	N	18	15.2			4	15			N record very confused with microseisms.	
	ePKP	zN		23 58	$\frac{1}{2}$	1	7	15?				
31	iP	zZE	19	42	18u	11	8		2	-	Long-period traces very confused	
	i	z			30d	18	1					
	e	z		43	50	$4\frac{1}{2}$	-					
	iPP	Z		44	29u	19	?					
	i	z		46	02d	2	10?					
	eS	zZE		50	26	$1\frac{1}{2}$	5		14	15		
	M	E		58					65	25?		
	e(Lr)	N	20	01.0				7?	15			Long coda.
M	ZN		03		55	20	50?	22				
M	N		17				40?	15				

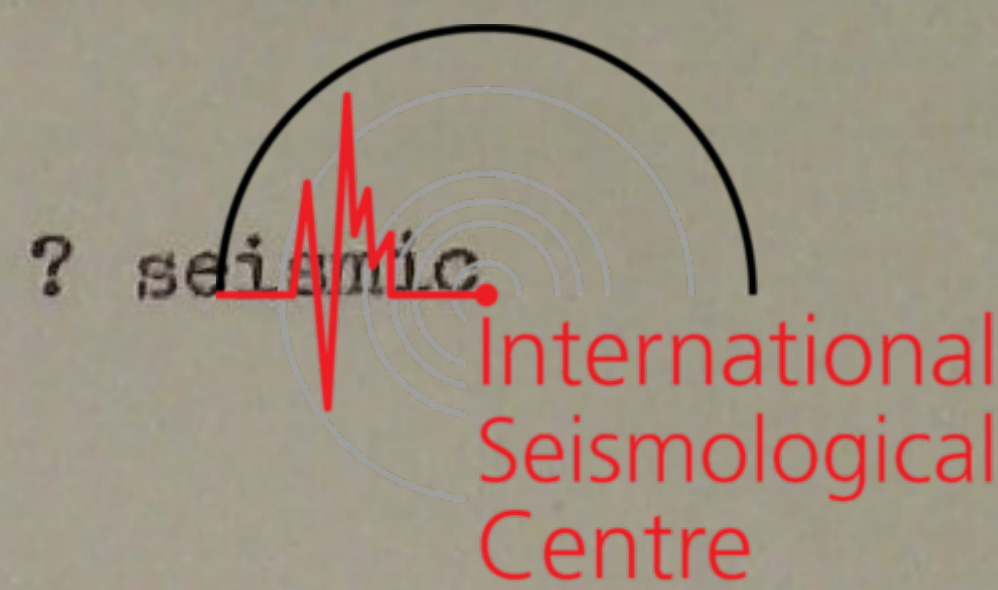
Note: Persistent long-period microseisms interfered with earthquake recording.







Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JUNE 8	e(P)	z	18	54	56							
9	(P)	z	04	32	05							? seismic
9	e(FKPPKS)	z	22	00	21							
10	iP	z	04	08	06d							
10	(FKPPKP)	z	07	37	03							
10	e	z	09	37	55							
	e	z		38	24							
10	(P)	z	09	55	13							
	i	z			21							
11	e	z	03	51	15							
11	e(P)	z	13	46	05							
11	(P)	z	17	13	00							? seismic
12	(P)	z	04	39	00							? seismic
12	e(P)	z	07	26	05							
12	P	ZE	21	19	30dw	3 $\frac{1}{2}$	?			8	?	
	ePP	N		24	06			3	?			
	ePPP	E		25	38					3	?	
	e(SKS)	N		30	10			2	15			
	S	ZN		31	10	6	15	10	20			
	eS	E			16					6	18	
	e(FKKP)	E		35	49					7	25	
	iSS	N		37	29			8	?			
	e	Z		43	58	3 $\frac{1}{2}$	15					
	i(Lq)	Z		46	10	6	3					
	e(SKPP)	E		47	58					4	15	
	eLr	ZNE		51.5	ca	6	20	2	25?	2	17?	
	e	ZNE		54.1	ca	7 $\frac{1}{2}$	?	2 $\frac{1}{2}$	18	5	?	
12	eL	ZNE	22	51	ca							Small irregular waves.
13	(P)	z	03	03	01							
13	iP	z	11	04	56(d)							
	e(PP)	Z		06	04							
	e(ScP)	NE		09	59							
	e	N		10	33							
	e(S)	ZNE		11	13							
	e	N			30							
	e	ZE			45							
	e	ZN			57							
	e	E		12	09							
	e	ZE		13	14							
	e	N		15	44							
	e	Z		16	56							
13	e(P)	z	12	48	15							
13	i(P)	z	19	28	20u							
14	e	z	15	26.5								? seismic
14	e(P)	z	20	52	20							
	i	z			30d							
15	iP	z	02	49	40							
15	eP	z	11	43	17(u)							
15	iP	zZ	15	03	20d	4(Z)	?					Large on z
	iPoP	z		04	14u	3	2					
	ipP	zZ		05	07u	3	12					



Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JUNE	esP	zZE	06	09	u	5	13			2	?	
	iPcS	zZE	08	13		6	12			3	?	
	iS	zZE	10	27	(d)e	4 $\frac{1}{2}$	12			14	12	
	isS	E	13	34	e					6	?	
	e	E	17	19						9	20	
	(PKKP)	E	22	37						7	?	
15	(P)	z	16	22	11							? seismic
15	eP	zE	17	31	29							
	ePP	Z		34	15							
	eSS	ZE		44.2								
	eLq	Z		48	41							
	eLr	ZE		51.6								
15	i(P)	z	18	18	42u							? seismic
16	e(P)	z	00	06	50							
16	e	z	01	42	56							
	i	z		43	09d							
16	iP	z	07	04	28d							
16	iP	z	07	23	28d							
16	eP	z	08	23	05							
	eS	ZNE		31	13							
	eScS	N		33	20							
	e	Z		34	02							
	eSS	Z		35	16							
	eSSS	N		36	31							
	eLq	E		37	40							
	e(Lr)	N		40	30							
	eLr	ZN		41	04							Series of small waves follows.
16	i(P)	z	19	01	06(u)							
17	e	z	02	00	08							? seismic
17	(P)	z	19	53	53							? seismic
	i	z	20	02	50d							Prominent
17	e(P)	z	21	49	25							
18	e(P)	z	06	32	45							? seismic
18	i(P)	z	08	07	31d							Series of tremors
18	e(P)	z	16	21	07							
	(L)	Z		31.5	ca							Small tremors
19	eP	z	01	27	32							
	iP	zN			34dn							
	e(S)	z		32	04							
19	i(P)	z	02	17	03							
19	e(P)	z	03	37	42							
19	ePKP	z	07	36	56	$\frac{1}{2}$	$1\frac{1}{2}$					
19	iP	z	07	56	03a							
	e(SS)	z	08	09	02							
	e(SSS)	z		11	42							
	(Lr)	Z		16.0								
19	eP	z	11	21	08							
19	e?	z	13	30	10							
	i(P)	z		39	06(u)							



Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JUNE 19	iP	z	18	07	33(u)							
	i	z			4.6u							
	iFP	z	08	23	d							
	iS	E	12	00	(w)							
	eSS	zNE	13.9	ca								
	M	NE	16	ca								
20	eP	z	00	57	45							
	ePKKP	z	01	19	02							
	eSKKS	z		26	13							
	e(SKKS)	N		33	ca							Small irregular waves.
20	P	z	17	41	40							
20	e	z	21	20	22							? seismic.
21	e	z	02	54	57							? seismic.
21	e	z	16	46	29							Strong long-period microseisms ? seismic.
22	e	z	13	21	50							? seismic.
23	e	z	05	59	15							? seismic.
	e	z	06	09	20							Large long-period microseisms.
	i	z			23u							
	i	z			28d							
23	iP	z	07	28	44d							
23	iP	z	19	02	00d							
23	P	z	19	26	20							
24	eP	z	00	20	30							
24	e(PKKP)	z	05	07	29							Traces.
24	eP	zZN	06	45	39(d)							
	e(PaP)	N		46	29							
	e(PP)?	E		47	20							
	e(PPP)	NE		48.6								
	iS	ZNE		53	15(s)w							
	(SS)	N		56	14							
	eLq?	N		58	22							
	e(Lr)	NE	07	00	14							
	e(Lr)	Z			36							
	M	ZE		07	ca							
25	e(P)	z	02	33	38							
25	iP	zZN	09	47	52d	3	?	3	?			
	ePP	zE		50	34	1	?			4	10	
	e	zE		51.7		1	?			5	10	
	ePPP	z		52	20	1	2					
	e	zZ		53	44	12	15(Z)					
	iS	zZNE		57	08dne	10?	13	17	22	21	13?	
	e	z		59	45	1 $\frac{1}{2}$	10?					
	eSS	Z	10	02	11	21	?					
	eL	ZNE		07 $\frac{1}{2}$		22	?	40	35	60	25	Max. on E.
	eL	Z		10	50	70	30					
	M	N		13				50	15			
	ePKPKP	z		15	55	1	4?					Long coda of conspicuous waves.
	M	Z		16		105	20					
	25	iP	z	12	54	52d						
25	e(P)	z	21	05	51							? seismic.
25	i(P)	z	23	10	49d							
26	(P)	z	03	29	54							? seismic.



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Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JUNE 26	e(P)	z	04	07	38							
26	ePKP	z	04	57	09	$\frac{1}{2}$	1					
	e	z			40			2				
27	(P)	z	04	03	03							
27	(PKP)	z	05	00	25	1	1					
27	e	z	16	02.8								? seismic.
28	eP	zE	08	42	59							Short-period microseisms from strong winds
	iS	NE		47	25							
	e	E		49	10							
	i	N		51	07							
	e?	N		58	01							
29	P	z	03	37	59	$1\frac{1}{2}$	1					
29	iP	z	09	24	28u							Small irregular waves.
	i	z			45u							
	eS	E		32	25							
	eSSS	E		38.0								
	eLr	E		41.0	0ca							
29	iP	z	12	50	30d							
	i	z			52u							
30	eP	z	04	01	55							
	e(L)	E		04	35							
30	e(P)	z	06	57	01							
	e(L)	ZE	07	00.0								
30	e(P)	z	08	14	28							? seismic.
30	e	z	13	59	20							? seismic.
30	e	z	18	44	45	$\frac{1}{2}$	?					



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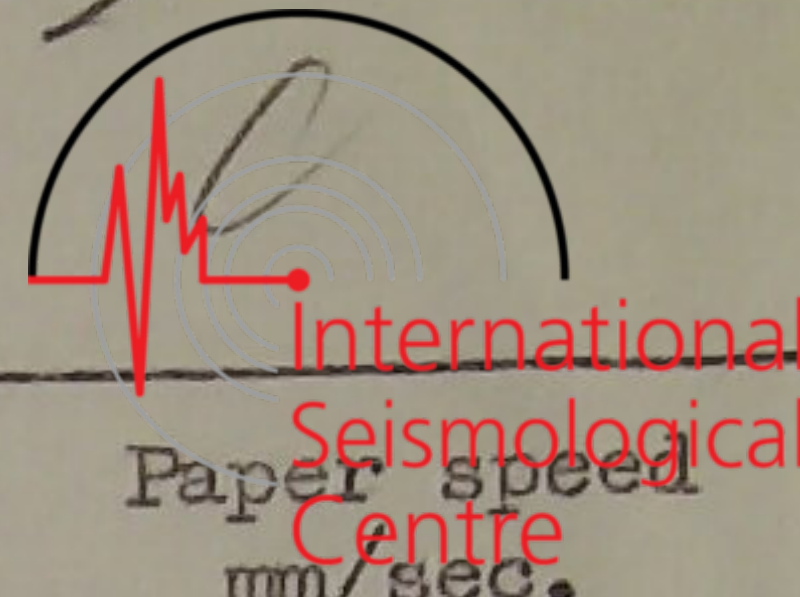
DEC 21 1959

HALLETT STATION

72° 19'S, 170° 13'E

SEISMOLOGICAL BULLETIN

July 1958



Instrument	Component	Symbol	To (sec.)	Tg (sec.)	Damping Shunt (ohms)	Paper speed mm/sec.
Willmore	Vertical	z	1	2	near critical	30
Columbia	Vertical	Z	15	75*	100	15
Columbia	N-S	N	15	75**	100	15
Columbia	E-W	E	15	75	100	15

Directions of initial movements are indicated by small letters after the last figure of the phase arrival times, as follows:

- u = ground movement up
- d = " " down
- n = " " to north
- s = " " to south
- e = " " to east
- w = " " to west

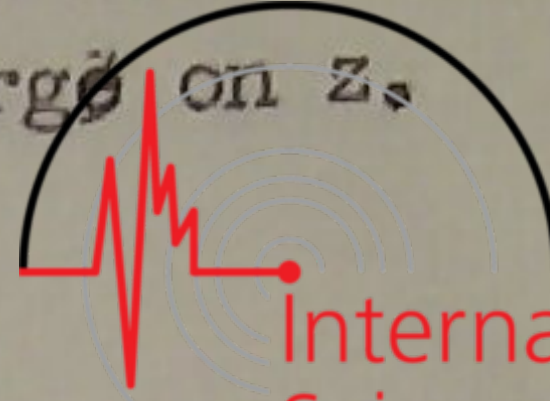
Trace amplitudes (A) are in millimetres, periods (T) in seconds.

\* 60 sec. after July 9<sup>d</sup>  
 \*\* " " " July 17<sup>d</sup>

Date 958	Phase	Component	Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
1	ePKP	z	06	12	06d	1	1					
1	e(P)	z	13	07	23							
1	iP	z	20	10	13(d)							
	e	E		12	15							
1	e(P)?	z	23	45	24							? seismic
	e	z			30							
2	iP	z	04	57	00u							
	ipP	z		58	18d							
	e?(PP)	z			40							
2	eP	z	16	51	05							Small tremors follow
2	e(P)	z	21	50	00ca							
3	eP	z	05	57	16							
3	iP	z	06	35	17u	3 1/2	1?					
	ePcP	z		36	07	1 1/2	?					
	iPP	z		37	14u	3	?					
	ePPP	z		38	28	1	?					
	i	z		40	14d	3 1/2	3					
	eS	z		43	00	1 1/2	4					
	(L)	E	07	07ca					3	?		
	(L)	E		12ca					5	23		
	M	E		36					12	20		
3	eP	z	10	29	32							
	eSS	z			37.5							
	e(Lr)	E			42.0							
	e	E			49.0							
	e	E			52 30							
	i	E	11	05	00(w)							
	M	E			20							Train of waves till 11 23u
3	ePP	z	19	20	02							
	e(SKKS)	z		26	04							
3	e(P)	z	23	55	03							
	e	z			38							

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JULY 4	e	z	00	24	53							? seismic
	(P)	z		28	56							
4	eP	z	02	34	43							
4	e(P)	z	04	31	31							
4	iP	zNE	13	07	56u(s)							Prominent on z.
	i	z		08	08u							
	iS	zNE		09	40(sw)							Max. on E.
	iLr	zN		10	08(s)							" " N.
4	iP	z	18	46	35u							
5	e(P)	E	23	36	15							
	eL	E	24	03ca								
6	e	z	18	46	37							
	e	z		48	48							Traces only
7	(SKKS)	z	00	11	16							? seismic
7	e(P)	z	11	56	06							
7	e(P)	z	14	31	07							
	i	z			18d							? seismic
8	e	z	06	02	37							
8	eP	z	06	15	40							
	ePP	z		17	16							
8	eP	z	19	31	11							
	i	z			25d							
	i	z			30(d)							
	i	z			43d							
	(L)	zNE			34.2ca							Conspicuous on N & E.
8	iP	z	22	58	43u	1	3					
	e(PPP)	z	23	02	30	$\frac{1}{2}$	5					
9	e(P)	z	01	18	12							
9	eP	z	14	02	50							
	iP	z			52d							
9	e(PKPPKP)	z	15	56	24							
	i	z			33u							
10	ePKP	z	06	35	11	$< \frac{1}{2}$	1					
	ePKP	z			20	1	3					
	iPKP	Z			25d	$15\frac{1}{2}$	5					
	e	z			39	$1\frac{1}{2}$	3?					
	i	Z			37 56(d)	18	6					
	e	z			38 01	$2\frac{1}{2}$	2					
	ePKS	z			40	$2\frac{1}{2}$	3					
	iPKS	Z			50(u)	45+	?					
	i(PKS)	z			58	3	5					
	i	z			39 04	5	?					Subsequent movements very large on Z,
	iPPP	z			32	$4\frac{1}{2}$	5					with confused traces. Max. ampl.
	ePS	z			47.0	2	12					130 mm +; light spot frequently
	eSS	z			53.0	1	12					reaching limit of recording.
	eLq	z	07	18ca		1	11					
	M	z			35	10	18					Long coda
11	iP	z	06	25	31d							N & E components faulty.
11	eP	z	18	35	24							
	e	z			30							
	iS	zZNE			38 28ne							
	iL	ZE			39 15ca							
	e(L)	z			50							
	M	ZNE			40ca							Train of conspicuous waves.

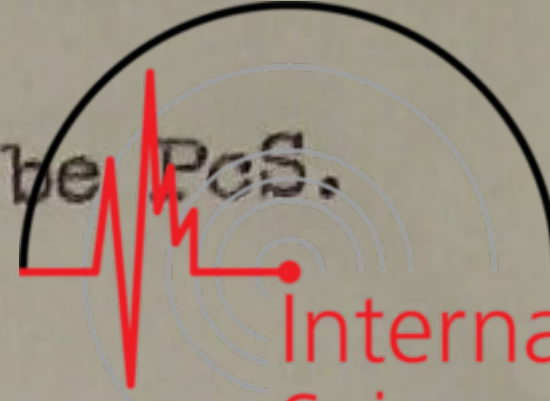


Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JULY 11	iP	zZ	19	22	29	3	1					Large on Z <sub>s</sub> 
	i(PcP)	z			33u	4½	1					
	i(PcP)	z				43d	3½	2				
11	e(P)	z	20	16	27							
11	e(P)	z	20	43	38							
12	eP	zE	01	01	03	< ½	1		7	?		
	e	E		03	00				6	25?		
	ePP	ZE		05	14	5	?		4½	?		
	e(PPP)	E		07	07				4	25		
	i	E		10	13				10	?		
	e(SKS)	E		11	23				6	?		
	eS	ZE		12	19	5	?		3½	?		
	e	Z		15	45	3½	?		9½	35		
	(Lq)	E		28	15							
	eLr	ZE		30.5		5	15?		3ca	?		
12	iP	z	03	42	33u							
12	e(P)	z	17	51	51							? seismic
13	e(P)	z	02	47	00							
13	e	z	07	42	30							Tremors
13	iP	z	12	14	07d							
	i	z			30(d)							
	ipP	z			4.1u							
13	e(L)	NE	23	04ca								Traces
14	e(P)	z	07	07	30							Tremors
15	P	z	15	57	05							
	S	z			17							Conspicuous movements
16	eP	z	13	04	20	1	2					
	iP	Z			25u	4	?					
	i	z			29d	1½	2					
	e(Lq)	Z		19	44	5½	?					
	iLr	Z		21	23							
	(L)	Z		24.4		8	17					Small movements
16	e(P)	z	13	20	53							
16	iP	z	17	04	31u							
	i	z			43							
	eL	Z		21	09							
	e	Z		27	05							
16	iP	z	18	50	34d							
	i	z			47							
16	P	z	20	50	33							
17	P	z	03	07	25							Local ?
17	iPKP	z	05	57	44u							
17	eP	z	10	13	34							Local ?
17	ePKP	z	21	18	21	½	?					
	e	z			36	1	1					
18	ePKP	z	00	58	22							
	e	z		59	00							
18	eP	z	02	00	30							Very small
18	e(P)	z	02	40	28							
18	iP	z	05	32	05d							
	i(S)	z			15							

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks	
			h	m	s								
JULY 19	eP	z	00	57	10u								
	iP!	z			12u								
	eS	zZNE		58	57								
	e(PcP)	zZN	01	02	41								
19	iP	zZE	06	41	25ue	1 $\frac{1}{2}$	2		12	?		Very small on Z.	
	i	z		42	02	4	2						
	epP	z		43	20	2	?						
	ePP	E		44	41				7	?			
	epPP	ZN		46	31	10	?	7	?				
	esFP	Z		47	49							Small	
	e(S)	zNE		51	15	1	5	4	?	small		May be SKS.	
	eSP	NE		52	47			7	20	10	?		
	esFS	zNE		56	02					9	?	Very small on z & N	
	e	Z		57	20	10	25						
	e(sSS)	ZE	07	08.2								Very small	
e	ZE		13+		7	?			6	20			
19	e	z	13	58	30							Tremors, ? seismic	
19	i	z	17	33	02u							? seismic	
19	e(PKP)	z	17	41	30								
19	iP	zZN	18	28	41(u)	4 $\frac{1}{2}$	7(Z), 10	?					
	i	z			48d	3 $\frac{1}{2}$	2						
	i	z			56u	4	2						
	e	zZ		30	15	6	25						
	ePP	zZ		31	32	4	?						
	iPPP	ZN		33	31	5	?	5	20?				
	e	z		34	16	1 $\frac{1}{2}$	?						
	iS	ZNE		38	30	4 $\frac{1}{2}$	20	8	20	10	17		
	e	ZN		39	15	8	20	11	12				
	eSS	Z		43	15	6	?						
	eSSS	zN		46	20			12 $\frac{1}{2}$	20				
	M	E		59						30	20		
M	ZN	19	03		46	18	45	18					
19	e(P)	z	20	06	20								
19	eP	z	22	25	55								
	e	z		32	42							Very small movements	
20	i(PcP)	z	11	55	45u								
	i	z		56	02								
	i	z			30								
20	e	z	18	12ca								Tremors, ? seismic	
21	e(P)	z	03	11	50							? seismic	
21	eiP	z	06	11	17							Local; ? seismic	
21	ePKP	z	07	44.0								Traces only	
21	iPKP	z	14	55	16d	1 $\frac{1}{2}$	1						
21	iP	z	18	42	54u								
22	e	z	12	29	15							? seismic	
23	e	z	14	35	42							Very small movements <sup>/ts</sup>	
24	eP	z	03	03	10							Very small	
24		z	03	50ca								Tremors; ? seismic	
25		z	12	41ca								" "	
26	eP	zZ	06	24	11								
	i	z			23d								
	ePcP	N			36								
	(PP)	Z		26	07								





Date 1958	Phase	Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks	
		h	m	s								
JULY	e	N	27	16							May be P <sub>cs</sub> .  International Seismological Centre	
	(PPP)	Z		50								
	iS	ZNE	32	42w								
	iScS	E	34	10w								
	SS	ZE	36	40								
	i	N	37	47s								
	i(SSS)	N	39	25s								
	i(SSS)	ZE		38w								
	e(Lq)	Z	40	40								
	e(Lq)	E	41.1									
	e(Lr)	Z	42	40								
M	Z	49										
26	eP	zZ	08	38	50						Doubtful on Z.	
	iPP	z			55u							
	iPPP	z		39	07d							
	eS	ZNE		41.4								
	eLr	Z		43	20							
26	e(P)	z	11	54	16						Very small movements.	
	(P)	z			33							
26	eiP	zZNE	17	48	51(a)w	10 $\frac{1}{2}$	7	3	10	9	?	
	i	ZNE		49	05un	10 $\frac{1}{2}$	10	11	-	4	?	
	iPP	zZNE		51	05u	24 $\frac{1}{2}$	8	6	10	6 $\frac{1}{2}$	10	
	ePPP	N		52	28			3	12			
	e?	E			45					17	10?	
	e?	N		53	11			9	?			
	iSKS M	zZNE		58	25dmw	80	10					Max. not readable on N & E owing to large movements & confused traces.
	iS	z			37	5	?					
	i	z			48	6	3					
	i(SP)	z		59	13u	7	?					
	e?	Z	18	00.7		21	?					
	e	E		02	50					20 $\frac{1}{2}$	8	
	i(SS)	zZ		04	00u	31	8					
	e	z		05.9		2	?					Short periods, aftershock?
	i(SSS)	ZE		08	50dw	4.1	?			40	9	
	e(FKPKP)	z		14	30	1	2					
	i	E		16	03w					22	?	
	i	z		17	18d	3 $\frac{1}{2}$	2					
26	e(P)	z	18	35	06							Small short-period movements.
27	eP	z	17	30	10							
	i	z			14u							
	i(PcP)	z			25u							
	eS	E		39.2								
	eSS	ZNE		43	55							
	e(SSS)	N		47.0								May be Lq
	eLr	ZNE		51.3								
28	eP	z	09	21	37							
28	iP	zZ	17	33	14u							Large on z.
	eS	N		40	10							
	e?	N		42	16							
28	iP	z	18	43	56u							
	eS	N		52	19							
	eLr	Z	19	03.0								Traces only on N & E
28	P	z	21	31	42							
29	e(P)	z	09	12	00							? seismic
	e	z		14	14							
29	iP	zZ	10	58	47d	1	3(z)					
	e(PPP)	ZN	11	02	18	1	7					
	S	ZNE		06	21n	1 $\frac{1}{2}$	20	2 $\frac{1}{2}$	?	2	15	
	e(SS)	ZE		10	40	1	12			1 $\frac{1}{2}$	15	
	e(Lq)	ZN		12	26	1	12	1	12			
	e(Lq)	E			51							
	eLr	ZNE		14.0	0ca	5	27	3	25	2	15	L-waves small on E
										3	22	

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
JULY	M	Z	14 $\frac{1}{2}$ ca			7	30					Rather long
	M	N	18					5	20			coda.
29	e(SKS)	z	22	01	44							E component not working.
	e(SKSP)	ZN		06	06							
	eSS	ZN		12	30							
	eLq	ZN		24	50							
	eLr	ZN		30 $\frac{1}{2}$								
29	e(P)	z	22	25	00							Train of small waves.
	e	z			10							Very small
30	iP	z	04	56	20d	1 $\frac{1}{2}$	2					Z component not working.
	iPcP	zN			53	1	2	2	?			
	e	N		57	39			1 $\frac{1}{2}$	16			
	e	z		58	08	1	2					
	iS	E	05	05	45e					3	?	Prominent.
	eS	N			50			1 $\frac{1}{2}$	10?			
	eSS	NE		10	30			1	?	1	?	
	iSSS	E		13	40(w)					1 $\frac{1}{2}$	?	
	e	N		14	05			1 $\frac{1}{2}$	15			
	eLq	E		15	05					2	20	
	eLr	NE		18.0				2 $\frac{1}{2}$	30			
	M	E		20ca						5	25	
	M	N		24+				6 $\frac{1}{2}$	20			
30	i(P)	z	09	43	51d							
30	eP	zE	15	17	50	$\frac{1}{2}$	?					Weak on E.
	i	z			55(u)	1	2					
	i	z		18	08(d)	1	2					
	iS	NE		24	00ne			3 $\frac{1}{2}$	14	3	13	
	eSS M	N		26	50			10	22			
	e(SSS)	E		27	05					3	13	
	L	E		28	32					1 $\frac{1}{2}$	?	
	M	E		30ca						5 $\frac{1}{2}$	17	
31	iP	z	12	11	51u							
31	eP	z	18	30	31							
	e(S)	ZN		32	31							

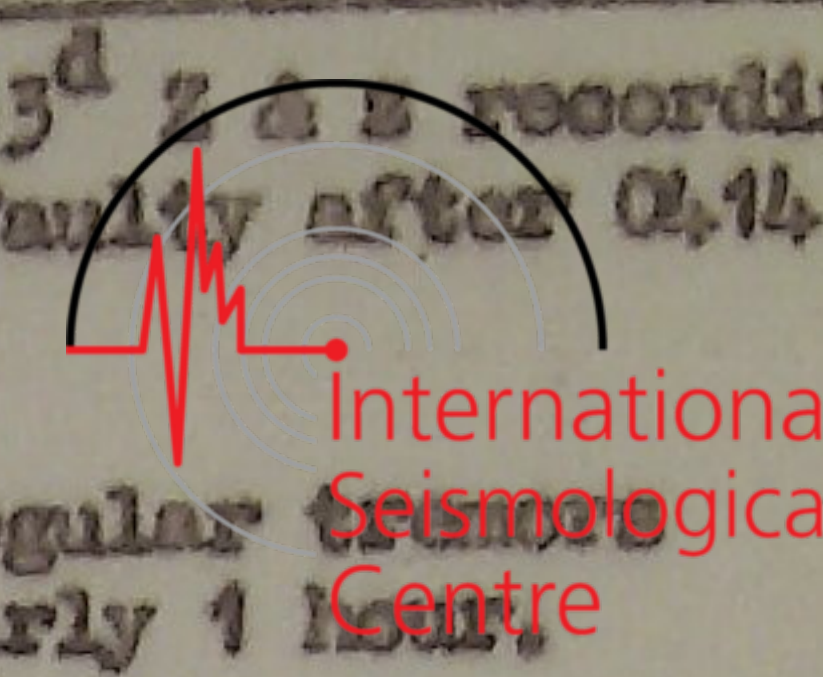




Date 1958	Phase		Time (UT)			As	Tn	An	Tn	As	Te	Remarks
			h	m	s							
AUG. 4	eP e(S)	S ZNE	21	04	31 44							Prominent trains follow.
5	eP eS eLr e	S NE ZN N	15	56	47 51 17 03							
5	eP ePP eSS eLr	SZ Z ZNE Z	17	30	40 21 45 24							
6	e(P)	S	02	34	13							? seismic.
6	eP	S	03	01	18							
6	1P epP	S S	10	02	25u 28							
6	eP	S	14	34	01							
6	1P 1 1 ePcP e e(PP) ePPP 1S e(SoS) SS eLq eLr M M M	SZNE S SZN S SZ SZN ZN SZNE NE ZN ZNE ZNE ZN ZNE ZN	21	18	57u 00a 21u 53 23 21 21 29 49dow 16(w) 30.5 05 35.0 37 42 49	2½ 3 3 2½ 1 2 4 2 2½ 4 2 4 12 9 12	5(Z) 1 ? 2 ?(Z) ? 107(Z) ? 25 25 27 22 17 17	1½ ? 2 ? 2 5½ 1½ 2 2 2 5 6 9	? ? 13 ? 14 107 15 ? 17 ? 17 17	1 ? ? 6 4 ? 2½ 3 4½	? ? ? ? ? ? 15 23 17	
6	e	S	21	49	14							Trenors
6	1P e e(PP)	S S S	22	00	51u 09 26							
6	eL	ZN	23	51ca								Traces.
7	1(P)	S	13	31	21d							? seismic.
7	e(L)	ZN	19	12ca								Traces
7	e(P)	S	22	03	05							? seismic.
8	eSKKS e	S S	01	04	23 29							? seismic.
8	e e	S S	05	42	26 58							? seismic
8	eSKKS	S	13	20	44							
8	e(P)	S	17	12	44							? seismic.
8	e(PKP)	S	20	57	12							Very small.
9	eL	NE	02	28ca								Traces.
9	eP 1(PoP) 1(PoP) ePPP eS ePS eSeS?	S S S Z ZNE N Z	12	57	24 14u 28u 55 26 00 44							

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ao	To	Remarks
			h	m	s							
AUG.	eSS	ZN	10.4									Train of small waves.
	eL	ZNE	17.0									
10	e(P)	S	18	16	24							
	e(P)	S		17	12							
	e(PoS)	N		20	30							
	e	N		22	10							
	e	N		28	33							
	eLq	ZNE		36								
	eLr	ZN		40								
11	eP	S	08	02	42							
	i	S			45u							
	i	S			48u							
11	e(L)?	Z	21	06								Tremors follow.
	e(L)	SN		09								
11	e(P)	S	23	10	53							?
12	eP	S	17	05	17							Small, in micro- seisms.
12	e(P)	S	19	15	29							
	i	S			36d							
	e	S		20	07							
12	iP	SZ	19	37	06u	2 $\frac{1}{2}$	?(Z)					
	iPcP	S			15u	2	2					
	i(PcP)	ZNE			25us	8	?	2	?	2	?	
	i	S			30u	4 $\frac{1}{2}$ ?	2					
	i	S			37u	1 $\frac{1}{2}$	2					
	i	SZ		38	07	4	17(Z)					
	i	S			24d	3	2					
	i(P)	S		40	01(u)	1	2					
	iPP	ZN			11un	3 $\frac{1}{2}$	?	2	?			
	i(P)	E			25e					2	?	
	ePPP	Z		42	02	2	17					
	i(PPP)	N			16s			2	12?			
	iS	ZNE		47	04use	5	15	4 $\frac{1}{2}$	7	4	15	
	e(PPS)	N		48	05			11	15			
	i	E		49	02e					10	?	
	e(SS)	E		51	12					6 $\frac{1}{2}$	?	
	e(SS)	ZN		52.2		12	35	5	35	7 $\frac{1}{2}$	30	
	i(SS)	E		53	11v							
	iSSS	ZE		55	34d	3	?			5	20?	
	e(SSS)	N			49			6	15			
	e	NE		57.3				5	25	7	?	
	eLq	N		58	52			7	?			
	e	Z	20	00	10	8	25					
	e(Lr)	Z		02	36	11	45					
	M	S		05		26	37					
	M	ZNE		08		40	30	15	25	18	30	
12	eIP	S	20	09	21							
	e(SS)	S		24	10							
12	e?	S	21	26.2								Tremors, ? seismic
12	eL	ZNE	22	04ca								Traces
12	e	S	23	27	38							? seismic
13	iP	S	00	22	23u							
	e	S		23	05							
13	iP	S	01	02	36d							Z recording faulty.
	ePP	S		05	25							
	e(Lr)	NE		24.4								
	e(Lr)	N		27.4								
	i(SKKS)	N		32	36							
	e(SKKS)	E		33	20							
	e	N		35.4								Train of small waves, mainly on N

Date 1958	Phase		Time (UT)			As	Ts	An	Tn	Ao	To	Remarks
			h	m	s							
AUG. 13	e	NE	13	34	35							13 <sup>d</sup> Z & E recording faulty after 04.14
	i	E			39e							
	i	N			55n							
13	eL	N	20	51	10							Small, irregular tremors for nearly 1 hour.
13	e(P)	N	22	06	ea							
	e(Lr)	N		29	10							Traces.
14	e	N	03	23								Traces
	e	E		46.5								
14	e(P)	E	03	46	51							Small tremors follow on N.
	i	E			49							
14	eP	E	09	54	09							
	i	E			23(d)							
	eS	N	10	01	27							
	e(FPS)	E			46							
	eLr	N		09	36							
	e	E		12	02							
14	eL	N	12	29.0								Small waves for about 30 mins.
	eL	E		30 $\frac{1}{2}$								
14	iP	E	12	53	27a							
	i	E			39u							
	e(S)	N	13	00	58							
14	ePKP	E	15	14	10	$\frac{1}{2}$	2					No marked max. on E. Coda for nearly 2 hours.
	e	E			26	1	2					
	e	SE			33	1	2					
	e	E			43	$\frac{1}{2}$	2					
	e	E			50	1	3					
	iPP	ZN		16	09u	$2\frac{1}{2}$	20?	$1\frac{1}{2}$	?			
	eSKS	ZN		21	11	$1\frac{1}{2}$	17	$1\frac{1}{2}$	15			
	eSKKS	N		22	48			$2\frac{1}{2}$	20			
	ePKP	Z		24	16	2	12					
	ePS	N		25.6				1	?			
	eSS	E		32.6						2	25	
	iSSP	ZN		33	30da	$3\frac{1}{2}$	30	9	20			
	eSSS	E		36	25					$2\frac{1}{2}$	-	
	e	Z		39	55	$2\frac{1}{2}$	15					
	e	Z		44	37	2	-					
	eL <sub>1</sub>	E		47.4						2	50?	
	e(Lr)	N		52.4				$1\frac{1}{2}$	30			
	eL	Z		53	25	3	30					
	eL	E		54.4						$1\frac{1}{2}$	23	
	H	N	16	02				$5\frac{1}{2}$	18			
	H	Z		07		$8\frac{1}{2}$	18					
14	e	E	17	10	28							Small tremors.
14	e(P)	E	17	34	57							
	e	E		35	04							
14	e(P)	E	22	21	07							
15	eP	E	02	06	22(u)							Local.
15	eP	E	02	37	50							May be PKKS
	eS	2NE		46	50							
	eSS	Z		51	14							
	eLr	Z		59	15							
	e(Lr)	N	03	00	15							
15	e	E	03	28	42							
15	e	N	05	55	ea							Traces
15	eP?	Z	20	11	30	$1\frac{1}{2}$	-					
	ePKP	E		14	36	$\frac{1}{2}$	-					
	e(PKP)	E			44	1	1					
	e(PKP)	Z			44	1	-					
	i(PKP)	E			47u	$1\frac{1}{2}$	-					



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Date 1958	Phase		Time (UT)			As	Ts	An	Tn	Ao	To	Remarks	
			h	m	s								
AUG.	ePP	S	16	30		1	2						
	ePP	ZN	16.7			2½	18	1½	18				
	e(PP)	E	16	55					1½	18			
	ePKS	ZN	18.1			6½	-	3	-				
	eSKS	ZN	21	55		2½	23?	2	-				
	1PKKP	E	24	47e						2	-		
	eSKSP	ZN	26	16		2½	22	2	-				
	1PKKS	E	27	00w						3	23		
	ePP	S	28	07		1	3						
	ePP	Z		09		7½	25						
	1SKKS	Z	31	58d		7	-						
	1SS	ZNE	33	38de		8	30			12	30?		
	1(SKKS)	NE	34	09ne				18	-	6	20?		
	1PKPKS	E	36	26e						10	-		
	eSSS	E	38	10						4	30		
	1SSS	N		25s				16	22				
	e	NE	42.0			14	-	9	32	5	-		
	1	Z	45	25u		12	36						
	iLq	E	48	00e						11	-		
	eLq	Z		20		10½	30						
	1	N	48.9n					10½	40				
	M	E	49½							40	40	Max. movements confused with those of the following earthquake.	
	eLr	Z	52	40		7½	23						
	eLr	N	53.1					3	33				
	e	ZN	55.8			20	-	26	34				
	M	N	58					49	23				
	M	Z	59			71	23						
	15	1P!	S	22	41	06d	9	2					
	15	1P	ZNE			06amr	17	3	4½	-	3½	-	
		1PP	Z			50	10	15?					
		1(pPpP)	E			58				3	12		
		1sP	ZN	42		04		6	12			Large ampl. on z.	
		1(SPpP)	S	42		41(d)							
		1(pPP)	E	45		00e				11½	13		
		1(sPP)	Z			20d	21	-					
		pPPP	E	46		42				10½	-		
		1	ZN	47		00n	17	13		11½	13		
		1(SeS)	S	50		52u	1½	5				May be SP.	
		1(SeS)	ZNE			54uw	18½	20	7	-	> 50	-	Traces confused on N & E.
		eSeS	S	52		17	2½	10					
	SS	E	55.5						24	18			
	1(SS)	Z	56		00u	25½	25						
	eSSS	N	57					13	10				
	(SSS)	Z	57.5			32	13						
	e	N	23		01.4			20	27		Large amplitudes follow on long periods; trace nearly unreadable for some time.		
	e	N			03.6			> 40	-				
	e	E			04.7				> 40	-	Confused with previous earth- quake.		
	e(PKPPKP)	S	07		54	1½	2						
	e	S	11		10	1	-						
	e	E	12		39	2½	-						
	e	N	13.7					10	13				
	e	S	14			1	18						
	e	S	27		52						Very small; possibly a separate shock.		
16	1P	S	11	22	33d	1	4						
	1P	Z			34d	2	10						
	e	N			07			1	10				
	e(PP)	E	24		48					½	9		
	ePPP	ZNE	25		38	1½	10			½	8		
	S	ZNE	29		44w	1½	?	1	9	4	18		
	1	N	30		00s			4½	15				
	eSeS	E	32		18					1½	15		
	SS	NE	33		20w			1½	15	4½	15		
	eSSS	ZN	34.5			1	12	2	12				
	e(Lr)	E	38		50					5	20		
	M	ZN	40			7	20	6	20				
	e?	E	41		57					4½	18		
	M	Z	43			8½	18						
	M	N	44					6½	18				



Date 1958	Phase		Time (UT)			As	Ts	An	In	Ae	Te	Remarks
			h	m	s							
AUG. 16	1	S	13	34	121	1	1					
	ePKP	S		36	52	$1\frac{1}{2}$	2					
	eP	S		37	07	$1\frac{1}{2}$	2					
	ePP	S			56	1	2					
	eP	Z			39	40	1	177				
	eSKS	N			43	58		1	1			
	eSKKS	N			45	34		1	?			
	ePKLP	Z			47	05	1	8				
	e(PKKS)	N			49	50		1	20			
	e(PePKP)	Z			50	17	1	?				
	e(SS)	E			55	27				$1\frac{1}{2}$	?	
	e	N				47		$1\frac{1}{2}$	?			
	e	ZN			56.2		2	-	$2\frac{1}{2}$	22		
	e	E	14		10.2					1	-	
	e(Lq)	Z			16	58	2	25				
	e(Lr)	N			18	03		$1\frac{1}{2}$	13			
e	E			19	13				$\frac{1}{2}$	-		
16	ePKP	S	19	33	01	-	2					
	e(PKP)	S			08	1	1					
	ePP	ZNE		35	20	$1\frac{1}{2}$	20	$\frac{1}{2}$	-	1	20	
	ePKS	S		36	24	1	10?					
	PKS	ZN			27u	6	15	1	-			
	1(PKS)	E			34w					3	-	
	1PPP	Z			27u	$1\frac{1}{2}$	?					
	ePPP	S			37	28	1	6				
	eSKKS	NE			42	15		$1\frac{1}{2}$	-	3	-	
	ePKKP	Z			43	08	$1\frac{1}{2}$	10				
	ePKKS	Z			45	18	3	17				
	1PKKS	E				29e				$3\frac{1}{2}$	15	
	eSoSPKP	Z			47	18	2	15				
	1SoSPKP	E				27(e)				4	18	
	e(SSP)	Z			52	08	3	22				
	e(SKKS)	NE			53.1			$3\frac{1}{2}$	25	$4\frac{1}{2}$	20	
	e(SSS)	E			57	33				6	-	
	1(SSS)	N			58	09u		$5\frac{1}{2}$	-			
	1	Z	20		01	42u	6	30				
	1	N			02	07e		$6\frac{1}{2}$	25?			
	e(Lq)	E			04	14				5	-	
	eL	N			10	33		5	-			
	eL	E			11	09				2	-	
eLr	N			15	05		4	27				
e(Lr)	Z			16	26	10	50					
e(Lr)	E				52				10	28		
M	N			26				36	23			
M	ZE			27		60	25?		40	18		
16	e	S	21	46	05						Small tremors	
16	e	S	22	36.2							" "	
	e	S		38	57							
17	eP	S	02	10	40							
	eS	NE		21	35							
	e	ZN		24.8								
	eSS	ZN		26	50							
	eSSS	E		27	01							
17	e(P)	S	07	30	02							
e	S			35	55							
e	S			39	28							
1	S				37u							
17	e(PKP)	S	09	26	08							
	ePKP	S			27							
	ePPP	N		30	30							
	e(PPP)	Z			36							
	ePKKS	N			39.4							
	e(SoSPKP)	Z			41	15						
	e(SS)	E			43	42						
	e(PKPPKP)	ZN			44.7							
SKKS	N			47	00						May be SKKS	



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Date 1958	Phase		Time (UT)			As	Ts	An	Tn	Ae	Te	Remarks
			h	m	s							
AUG.	e(Lr)	Z	10	07	44							
	e(L)	N		08.7								
	e	E		10	30							
17	e(P)	S	12	31	52							
	e(L)	N		47	37							
	e(L)	Z			57							
	e(L)	E		50.4								
17	1P	sZV	18	12	25d							
	1(P)	S			35d							
	1PeP	S			47(u)							
	1(PeP)	S			58(d)							
	1	S		13	21d							
	e	sZ		14	28							
	ePP	S		15	13							
	ePeS	Z			42							
	ePPP	S		16	38							
	e	E		18	37							
	S	ZNE		21	43n							
	1	E		23	16w							
	e	E		23.7								
	eSS	E		26	04							
	e(SS)	Z			17							
	e(SS)	N		26.5								
	eSSS	E		29.7								
	e(SSS)	ZV		30.0								
	eLq	E		31.0								
	1(FKCP)	N		31	34							
	FKCP	E		32.3								
	e(FKCP)	N		32	33							
	eLr	ZNE		34.9								
	1(FKKS)	N		35	23n							
	M	Z		36								
	(PePPKP)	E		36.8								
	e(PePPKP)	N		37	28							
	1	N		40	23n							
17	1P	S	21	18	18d	2	4?					
	1P	Z			20d	1½	9?					
	1(P)	S			28u	2	2					
	1	S			37u	3	2					
	1	S			58(u)	3	2					
	1	S		19	07(u)	1½	2					
	ePP	Z			24	1	2					
	1(FPP)	sZV			57	1	-	1	10			
	ePPP	E		20	05					1	10	
	1(FPP)	S			21d	1	-					
	ePeP	S		21	07	1½	2					
	e(PeS)	S		23	48	1½	-					
	S	ZNE		24.1		1½	17	4½	13	1	10	
	eSS	E		26	47					5?	15	
	1Lr	Z		29	25d	6	20					
	1(Lr)	N			30e			6½	15			
	M	Z		31		14½	18					
	M	N		32				15	15			
	M	E		34						12	13	
17	e(P)	S	23	35	07							? seismic.
	e	S			30							
	1	S			36(u)							
18	e(FKP)	S	07	01	42							
	e(FKP)	S			45							
18	e	S	15	53	27							Small tremors.
	e	S			45							
19	eP	S	04	55	10							
	ePP	S		57	08							
	eS	NE	05	02	50							
	e	S		04	21							
	eSS	NE		06	30							




Date 1958	Phase		Time (UT)			Az	Ts	An	Tn	As	Ts	Remarks
			h	m	s							
AUG.	eSSS	Z	07	05								
	eLq	ZE	08	38								
	eLr	ZN	10	25								
	e(Lr)	Z	11	25								
	e(Lr)	N		32								
19	e(pPKP)	S	16	50	12							
	i(pPKP)	S			17(u)							
	e	N	54	20								
19	e	S	21	37	19							? seismic.
	i	S			24u							
19	eP	sZN	21	59	37							
	ePP	N	22	02	45							
	e(PP)	Z		03	24							
	ePPP	ZN		04	25							
	eS	ZE		09	06							
	ePFS	N			56							
	SS	Z		13	51							
	e(SS)	N		14	07							
	e(SSS)	E		17	51							
	Lq	N		18	47							
	eLr	E		23	15							
	e(Lr)	N			51							
	(PKPKP)	Z		27	34							
19	e(P)	S	23	06	41							
20	e(P)	S	03	16	03							? seismic.
	e(S)	S		17	13							
	i	S			18u							
20	eP	sZN	03	50	04	1½	10?	½	15			
	i	S			13(d)	2½	1					
	ePP	Z		52	09	1	14?					
	e	S		53	20	1	7?					
	ePoS	ZN		54	20	3	10	2½	11			
	S	ZN		58	10	3½	13	5	25?	6	18	
	e	E	04	01	35					17	10	
	eSS	ZE		02	07	5	27?					
	e(Lq)	N		04	37			3	13			
	eLq	ZE		04.9				4	20	8	30	
	eLr	ZN		07	52	7	31	5	30			Long coda.
	e(PKPKP)	E		10	42					4½	20	
20	e(L)	ZN	09	41								Small tremors.
20	eP	S	17	48	24							
	ePPP	Z		51	03							
	ePoS	N		52.7								
	eS	N		55	45							
	e(PFS)?	S		56	43							
	eLr	Z	18	03.5								
	e(Lr)	N		03.7								
	e(Lr)	E		04.5								
	(PKPKP)	Z		09.0								
	e(PKPKP)	Z		09.22								
21	eIP	S	00	24	36(u)							
	i(pP)	S		25	57a							
21	eP	sZN	01	17	52							
	(P)	S		18	03							
	i	sZ			30(u)							
	ePPP	S		20	32							
	iS	E		25	02w							
	ePS	N			11							
	eSS	N		28	23							
	eSS	E			36							
	eSS	Z			48							
	eSSS	NE		29.9								
	eLr	Z		32.3								

Date 1958	Phase		Time (UT)			As	Ts	Au	Tn	As	To	Remarks
			h	m	s							
AUG.	e(Lr)	N	32.8									
	e?	N	35	58								
21	1P	SE	04	12	18d							
	i(P)	S			31d							
	eS	N	19	44								
	eSS	Z	20.2									
	eLq	E	26.2									
	e	N	30	09								
	e	EN			23							
	(HKS)	Z	38	01								
	e	N	40	35								
21	eP	S	08	37	48							
	(eP)	S		40	22							
21	e	S	12	28	32							? seismic.
	eP?	S		33	21							
	(PKP)	N		37	35							
	e(PF)	S		39	11							
21	1P!	SN	21	08	21d							
	i(P)	S			24u							
	i(P)	S			36d							
	iPeP	S	09		11(d)							
	epP	NE			29							
	i(pp)	S			37(u)							
	e(ppP)	N	11	17								
	e(SoP)	E	12	39								
	i(PoS)	S			55							
	epPoS	N	14	25								
	iS	NE	15	56	ee							
	e(sS)	N	17	12								
	e(sS)	E			20							
	esSoS	E	19	30	(e)							
	eSSS	E	21	55								
	eSSS	N	22	40								
22	eP	S	00	08.0								In min. mark
	i(P)	S		08	07d							
	e	S		12.0								
	eLr	N		16	38							
22		S	01	33.3								Tremors; ? seismic
22		S	02	22.7								" "
22	e(P)	S	10	06	20							Small
	i	S			23(d)							"
	i(pp)	S			46(u)							
22	e	S	16	52	25							? seismic
22	i(SKS)	S	21	21	48(d)							Small
22	eP	S	22	27	35							
	iPeP	S		28	00ea							In min. mark
	e	S		33	43							
22	1P	S	23	28	45u							
	e(PeP)	S		29	12							
23	e	S	01	42	40							Very small tremors
23	1P	S	08	09	24d							
	e	S			38							
23	e	EN	16	36	ea							Traces in microseisms
24	e1P	S	04	34	51(u)							
	i	S			58u							
	eL	Z		55								Small waves
	eL	E		56								

Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ao	To	Remarks
			h	m	s							
AUG.	eL	N	05	00								
24	eL	E	10	45								
24	1P	S	17	07	19a							
25	e(L)	N	08	51ca								Traces
26	e(P)	S	05	13	22							? seismic.
26	1P	S	12	30	41a							
	eS	E		38	56							
	eLr	N		50.0								
	e(Lr)	E		50	35							
	e	ZN		53	02							
	e(PKKS)	E		55.0								
26	eP	SE	12	55	01							In coda of previous shock.
	e(PP)	N		57	32							
	S	E	13	03	05							
	e(Lr)	E		11								
	e(Lr)	ZN		14								
26	eP	S	13	34	35							Small
	e(L)	Z	14	14.1								
	eL	N		14	42							
26	1P	S	16	07	56a							
26	e1P	ZN	18	05	34(a)							
	i	S			39							
	ePcS	N		10	00							
	eS	NE		13	44							
	e	S		14	54							
	eScS	E		15	36							
	e	N		16	10							
	eLq	E		20	27							
	e(Lr)	N		22ca								
	e	N		25	12							Rather long coda of small waves.
26	eP	S	23	33	16							
26	eP	ZN	23	41	33							
	ePPP	S		45	12							
	e(PPP)	S			20							
	eS	NE		49	40							
	eLq	E		56	34							
	e	N	24	01.0								Long series of small waves.
26	eP	S	23	55	07							
	e	S			16							In coda of previous shock.
27	e	S	00	59	40							Small tremors; ? seismic.
27	eP	S	02	38	15							
	eS	N		42	47							
	eSS	NE		54.5								
	eLq	N	03	01.5								
	eLr	E		05.7								Coda of small waves.
27	e(P)	S	13	25	50							
	i	S		26	04							Very weak
27	ePKP	SE	15	36	04							
	ePKS	ZN		39.25		1 1/2	2					
	e	S		40	43	1	3	1				
	eSKKS	N		45.2				1 1/2				
	e	Z		51	42			2		20		
	ePKPPKP	ZN		53	20	2	?	2		17		
	eSKKS	Z		55	00	2	15					
	ePKPPKS	NE		57.55				1 1/2			1	15
	e	E	16	03	35						1	-
	eLq	E		13	11						2	?



Date 1958	Phase		Time (UT)			As	Ts	An	Tn	Ao	To	Remarks
			h	m	s							
AUG.	e(L)	ZE	16	27		1	38			1	-	
	e(L)	N		38				2	20			
	M	Z	42			14	20					
	M	N	45					9	20			
	M	Z	46			11	17					
28	eP	Z	05	11	42							
	e(L)	N		13	40							
	e(L)	ZE		14.3								
28	eP	ZZ	12	34	22d	1	2					
	i	ZN			33d	1½	-					
	i	Z			51u	2	5					
	ePoP	Z		35	13	1	?					
	ePoS	ZN		38	30	1½	9	1	10			
	S	NE		42	30e			1½	?	3½	11	
	e(PS)	Z		43	10	2½	?					
	eSS	N		47.0				2½	12			
	eLq	ZE		49.4		1½	15?			5	?	
	eLr	ZN		52.1		5	30	3	30			
	29	eP	Z	13	01	53						
i(PPP)		Z		04	33d							
30	e(L)	N	10	36								Tremors
30	P	Z	14	42	28							
30	e(PPS)	ZN	19	07	35							Long coda of small waves.
	eLr	Z		30½								
	eL	E		33								
	eL	N		34								
30	eL	NE	20	54ca								Traces
31	1P?	Z	16	30	11d							In microseisms.
31	e(SKKS)	Z	23	36	02	1½	?					Records disturbed by artificial movements and increasing microseisms.
	i(SKKS)	Z			10a	3	2					

HALLETT STATION

DEC 21 1959

72° 19'S, 170° 13'E



SEISMOLOGICAL BULLETIN

September, 1958

✓

Instrument	Component	Symbol	To (sec)	Tg (sec)	Damping Shunt (ohms)	Paper Speed mm/sec
Willmore	Vertical	z	1	2	Near Critical	30
Columbia	Vertical	Z	15	60	100	15
Columbia	N-S	N	15	60	100	15
Columbia	E-W	E	15	75	100	15

Directions of initial movements are indicated by small letters after the last figure of the phase arrival times, as follows:-

- u = ground movement up
- d = ground movement down
- n = ground movement to north
- s = ground movement to south
- e = ground movement to east
- w = ground movement to west

Trace amplitudes (A) are in millimetres; periods (T) in seconds.

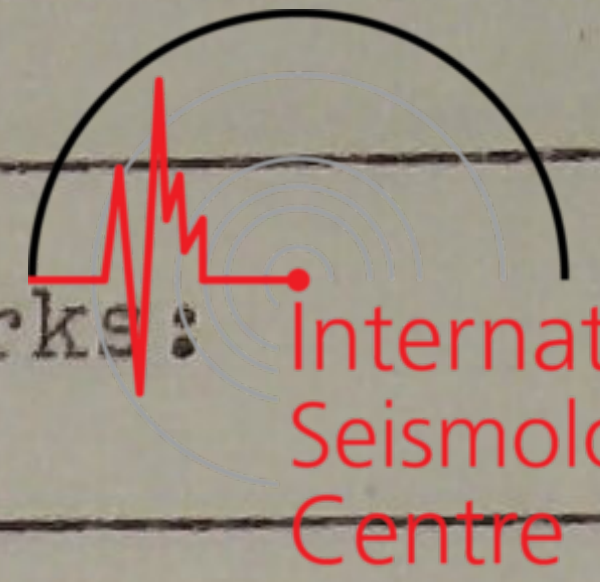


St. No.	Phase		Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
1	eP	z	01 06 03							In microseisms.
1	e	N	22 10							Tremors in microseisms.
2	iP!	z	02 38 03u							Tremors follow.
	i	z	07d							
	eLr?	Z	57.4ca							
	e(PKKP)	ZN	59½							
2	eP	z	03 07 19							Tremors in microseisms.
	e(PcP)	z	28							
	e(Lr)	N	28ca							
	e	Z	33ca							
2		z	05 48ca							Tremors; ? seismic.
2	e	z	06 50.6							Small tremors; ? seismic.
2	i(P)	z	07 12 38d							Local, ? seismic.
2	P	z	14 36 41							2 <sup>d</sup> long-period records disturbed by microseisms.
	iPcP	z	37 11d							
	i	z	21u							
	e	z	39 55							
	ePcS	z	40 10							
2	e(Lr)	Z	20 56							Traces in microseisms.
2	eP	z	22 18 06							Very small tremors.
2	e(P)	z	23 47 05							Tremor; ? seismic.
3	ePP	z	04 03 18							Two shocks superimposed. Long series of irregular waves till about 06.10.
	eSKS	N	09 43							
	e(S)	N	11.0							
	ePS	NE	12 35							
	eSS	E	18 30							
	eSS	zN	18.8							
	e(Lq)	E	29.10							
	e(Lq)	Z	31.3							
	eLr	ZNE	35.0ca							
3	e(P)	z	08 29½							Very feeble movements. Traces.
	e(Lr)	Z	09 06							
4	e	z	06 58 03							Small tremors; ? seismic.
4	eP	z	17 16 15							10 13
	e(PPP)	z	17 31							
	e(S)	N	21 20							
	e(PcS)	N	22.4							
	e(SS)	Z	23 00							
	M	N	24							
4	e	Z	17 33 05							Irregular waves in coda of previous shock.
	e	N	35.0							



Date	Phase		Time (UT)	Az	Tz	An	Tn	Ae	Te	Remarks
1958			h. m. s.							
Sept. 4	eP	z	22 02 01	1?	2?					In time mark.
	i(P)	zZN	08d	7	8	2½	10			No E-comp.
	ePcP	N	38			2½	10			record.
	i	z	03 18	3	?					
	e	N	43			2½	12			
	iPPP	zZ	06 04u	3½	2					
	i(PPP)	z	20u	2½	2					
	i	z	55u	2½	2					
	iS	ZN	10 58(d)s	8	13	6	18			
	i(PPS)	ZN	11 58s	7	13	12	20			Could be ScS.
	i(SS)	Z	15 20u	10½	25?					
	SS	ZN	16.1	9	20	11	13			
	eSSS	ZN	18.7	5½	30	5½	18			
	iLq	N	19 50n			9	28?			
	i(PKKP)	Z	22 17d	15	38					Coda for about
	M	ZN	29	40	18	45	17			3 hours.
	e(PKPPKP)	z	30 35	1	?					) Many belong to
	e	z	31 43	1	2					) a separate
	e(SKKS)	z	34 33	1	?					) shock.
4	iP	z	23 19 05(u)							
5	eP	z	03 52 12							
5	iP	z	06 23 50(d)							
5	e	z	08 20							Tremors; ? seismic.
5	e(SKs)	z	11 24.5							
5	eP	z	13 14 10							
5	eP	z	13 20 15							
5	e(P)	z	14 23 20							
	e	z	45							
6	e	z	13 35 42							Tremors; ? seismic.
7	e(P)	z	03 03 29							
7	e	z	04 37 25							Tremors; ? seismic.
7	eP	z	04 54 15							
	eLr	ZNE	05 12							Series of small waves.
8	iPKP	z	05 44 36d							
	ePP	z	46 20							
	e(SSP)	N	06 03 55							May be ScS.
	eLq	E	19 20							
	eLr	ZN	23							
	M	Z	34	5	25					
8	e(PP)	z	15 12 08							
8	e(P)	z	15 39 57							Tremors.
8	eP	z	22 35 45							
	eLr	ZE	56ca							
	e(L)	N	23 01							
9	e	z	21 35 35							Local; ? seismic.
10	e(P)	z	00 53 05							
	e(L)	NE	01 20ca							Tremors follow.





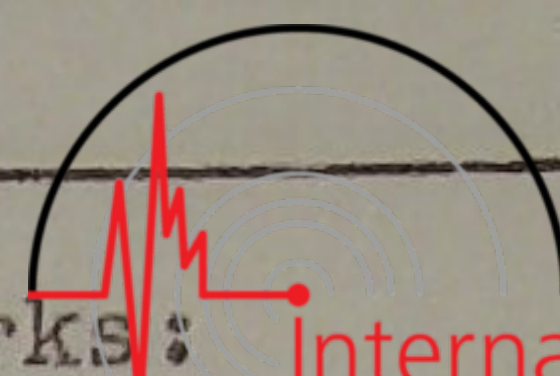
Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks	
Sept. 11	e	zZNE	04 44 22						Series of small waves.	
11	e(P)	z	04 49 25							
11	iP	zNE	18 14 20d							
	e(PcP)	z	38							
	eS	ZN	24 43							
	eScS	E	25 05							
	ePS	ZNE	25 40							
	eSS	N	30 37							
	e	Z	34 40							
	eLq	ZNE	37.1							
	e	E	38 08							
	e(Lr)	N	39½							
	e	ZE	43.4							
	e	E	45.7							
	M	Z	50	3	20					
11	eP	z	23 46 40						Prominent L-waves. Coda for about 1 hour	
12	eP	z	05 46 58							
	i	z	47 12(d)							
	S	ZNE	54 25m(e)							
	eSS	N	58 00							
	eSSS	N	59+							
	eLr	ZE	06 02.2							
	M	N	04			8	18			
	M	Z	08	10	15					
	M	E	09				7	15		
13	i(P)	z	03 44 38						Small tremors in microseisms.	
14	ePKP	z	14 40 51	½	2				Coda of irregular waves.	
	PKS	zN	44 24(d)	1	2	1½	10			
	e	ZE	55 26	1½	?		½	?		
	e	ZNE	56 35	1½	?	1½	15?	2 17		
	e	ZN	15 06 40	3	?	1½	26			
	e	Z	10.3	2	30					
	eLr	Z	23 45	1½	25					
	e(L)	NE	25+			1	?	1 ?		
	4(L)	Z	26.8	2	40					
14	iP	z	18 07 18d						Very small.	
14	eP	z	21 44 43							
	e(PcP)	z	53							
	eS	N	55 26							
	e	N	22 08 15							
	e(SKKS)	N	13.0							
	eLr	ZE	13.8							
	e(L)	N	16 35							
	M	ZE	22	6	17		4	15		
15	e(P)	Z	05 47 30							) Small, very emergent. Traces only on N.
	e(SKKS)	Z	56 45							
	ePKKP	z	06 02 41							
	e(L)	ZE	22ca							
15	iP	z	16 55 47u	1½	2				Small waves.	
	e(PcP)	z	57 57	1	2					
	eS	N	17 01 53			1½	10?			
	eSS	NE	05 10			1½	?	2½ 17		
	eLr	N	06.7	1			?			



Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks	
Sept. 15	iP	zNE	19 56 58	15?	-	3?	12	2½?	-	Z recording faulty.
	i(PcP)	z	57 09d	9	2					
	i	z	25d	6	2					
	epPcP	E	59 21				2	-		
	iPP	z	20 00 13d	2½	2					
	iS!	zNE	06 14ne	1	4	20	12	21½	?	
	i(SKS)	z	27(d)	3	3					
	iSP	zE	49	2	3			4	12	
	i	N	07 20s			7	12			
	isSP	NE	10 18s			7	13	8	?	
	eSS	NE	14.8			3	17	2	12	
	eSSS	N	15 10			3	17			
	e	E	18 45					7	?	
	e	NE	25.4			2	-	4	-	
	i	E	27 42e					5	20	
i	N	32 35n			6½	15				
e	N	34.8			3½	15				
16	iP	z	07 35 18d							
	iPcP	z	24u							
16	e(PKPPKS)	z	13 28 58						? seismic.	
17	e	z	09 59 10						Small tremors; ? seismic.	
17	iP	zZN	15 16 18u							
	(S)	<del>z</del> NE	18 20							
	e	z	44						Large on Z.	
17	eiP	zZN	16 13 04							
	i	z	09u							
	i	z	15u							
	(S)	ZNE	15 05u						Large on Z.	
18	P	z	02 02 00							
18	e(P)	z	03 19 23						Tremors; ? seismic	
18	iP	z	03 44 41							
	e	E	57 20							
	e	Z	04 01 05							
	e	E	02½							
	e	N	05							
	e	Z	06½						Small waves.	
18	eP	z	07 02 38							
	ePKKP	z	22 31						Very emergent.	
	e	NE	24ca							
	eLr	Z	27ca							
	e(L)	NE	28ca						Small waves.	
18	ePKKP	z	15 13 14							
	eLq	ZNE	26 30							
	e(Lr)	<del>Z</del>	32						Prominent on E.	
18	e(L)	E	22 06						Traces.	
19	e	NE	00 38 15						Traces.	
19	e(L)	N	09 00						Small tremors.	
19	i(SKKS)	z	17 47 18d						? seismic.	
20	e(P)	z	02 42 10						? seismic.	



Date 1958	Phase		Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Sept. 20	e(P)	z	05 42 10							Very small and emergent.
20	eL	Z	11 38							Small waves.
	eL	NE	42							
20	iP	zNE	17 20 18us	3½	2	2½	15	1	?	
	i	z	28(d)	4	2					
	iPcP	E	37e					3½	-	
	iPcP	z	45u	4	2					
	iPP	z	22 33d	1	2					
	e(PP)	N	23.0							
	i	E	26 07					3	8	
	S	NE	29 08e			2	15	10	?	
	ScS	NE	30 13n			12	?	4	?	
	e(SS)	N	32 55			2	15			
	iSS	NE	33 45se			7½	20	6	15	
	Lq	NE	37 10e			2	17	5	15?	
	iLq	E	48w					9½	?	
	eLr	NE	40.5			4½	28	2	20	
	M	N	43			9	20			
	M	N	48			10	16			
20	iP	z	17 27 40d							
	e	z	28 05							
	e(PP)	z	29 12							May be PcP.
21	e(P)	z	05 55 44							Interpretation doubtful.
	e	z	56 22							
	e	z	44							
	e	z	57 00							
	e(S)	N	06 01 04							
	L	ZN	02.6							
	L	E	03.0							
	M	NE	04			21	12	10	12	
21	eP	z	13 38 55							
	iPcP	z	39 30u							
	ePP	z	41 10							
	eS	ZNE	46 50							
	e(SSS)	E	53 15							
21	e(ScSP)	z	16 49 04							
	e(SS)	E	57ca							
22	iP	zZNE	19 13 18usw	16	?	8	10	3½	-	V. large on z. Large.
	i	z	28(u)							
	e	ZE	14.0	7	?			3½	7	
	ePP	ZN	14 55	5	?	3½	8			
	i(PcP)	E	15 27w					6	8	
	i(PPP)	z	43d	2½	2					
	e(PcS)	z	18 11	1	5					
	e	E	55					5	?	
	iS	zNE	19 23s(w)	1	?	10	12	8	?	
	iS	Z	31u	19	?					
	SS	ZNE	22 25w	6	17	12	10	43	13	
	(Lq)	Z	23.7	11	?					
	M	ZN	24	55	20?	32	17			
22	iP	z	22 56 43u	1½	?					
	ePP	ZN	58 40	2	18	1	25?			
	eLr	E	23 16ca					1	?	
	e(L)	ZN	18ca	2	27	1	25?			Small waves.



Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Sept. 23	i(PKP)	z 04 10 19u							Small.
23	e	z 07 19 37							Tremors; ? seismic
23	i(P)	z 16 19 04d							Small.
	i	z 08d							
23	e	Z 16 38							Small irregular tremors.
	e	Z 17 03 45							Traces only on N and E.
23	e	Z 17 52ca							Traces; ? seismic.
23	e(P)	z 19 45 40							? seismic.
24	ePKP	z 04 03 25	$\frac{1}{2}$	1					
	e	z 40	$\frac{1}{2}$	5					
	ePKS	z 06 40	$\frac{1}{2}$	4					
	ePPP	ZN 07 35	$3\frac{1}{2}$	12	1	10			
	e(PKPPKS)	ZNE 25.5	$1\frac{1}{2}$	?	2	?	$1\frac{1}{2}$	?	
	e(SSS)	ZN 29.5	1	-	2	-			
	eLr	ZN 46	2	30	2	25			
	eLr	E 47					1	-	Coda for about 2 hours.
24	e	z 13 34 10							Tremors; ? seismic
24	P	z 14 03 56							
25	PKP	z 07 12 43(d)							
	eSKS	z 19 30							
25	e(PKP)	z 07 38 10							Very small and doubtful.
	ePKP	z 50	$\frac{1}{2}$	5					
	e	zN 39.4	$\frac{1}{2}$	5	$\frac{1}{2}$	?			
	eSKKS	NE 46 30			2	?	$2\frac{1}{2}$	?	
	PPS	NE 49 24s			$3\frac{1}{2}$	17	2	?	
	i(SS)	NE 55 24sw			4	?	$8\frac{1}{2}$	?	
	eLq	NE 08 06.3			$3\frac{1}{2}$	30	7	30	Coda of conspicuous waves for about 2 hours.
25	eP	z 15 23 16							
	e(PcP)	Z 25.4							
	eS	zZE 29 29							
	eS	N 50							
	eSSS	E 32 40							
	eLr	Z 35.2							Rather long Coda.
25	iP	z 20 34 28u							
	iPcP	z 36d							
	eS	NE 43 25							
	e	N 49.2							
	eLq	ZE 50.6							
25	e	ZNE 21 02.7							In coda of previous shock.
	eP	z 03 30							
	eS	ZE 09 20							
	i(Lq)	NE 13 00e							
	eLr	Z 15+							
25	eP	z 22 48 08							
	e	z 52 25							
	eLr	ZN 23 00ca							Very small tremors.



DEC 21 1958

HALLETT STATION  
72° 19'S, 170° 13'E



SEISMOLOGICAL BULLETIN

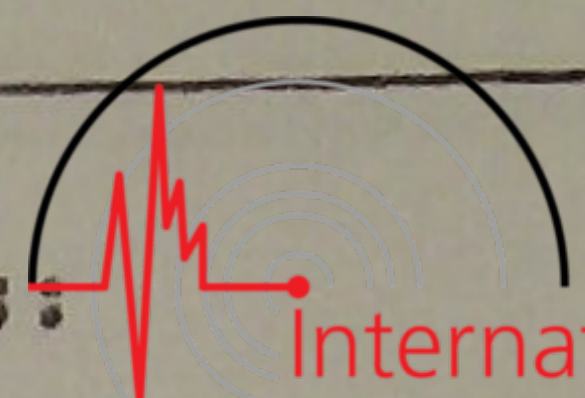
October, 1958

Instrument	Component	Symbol	To (sec)	Tg (sec)	Damping Shunt (ohms)	Paper Speed mm/sec.
Willmore	Vertical	z	1	2	Near Critical	30
Columbia	Vertical	Z	15	60	100	15
Columbia	N-S	N	15	60	100	15
Columbia	E-W	E	15	75	10	15

Directions of initial movements are indicated by small letters after the last figure of the phase arrival times, as follows:-

- u = ground movement up
- d = ground movement down
- n = ground movement to north
- s = ground movement to south
- e = ground movement to east
- w = ground movement to west

Trace amplitudes (A) are in millimetres; periods (T) in seconds.

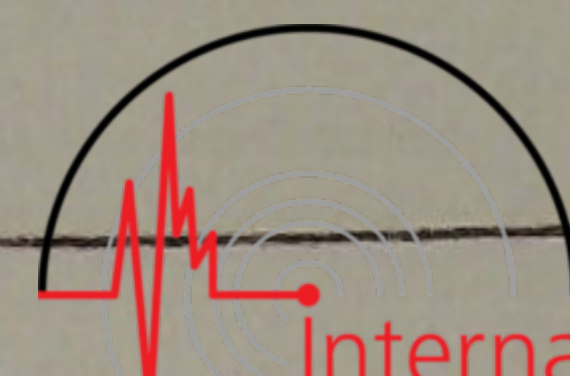


Date	Phase	Time (UT)	Az	Tz	An	Tn	Ae	Te	Remarks:
1958		h. m. s.							
Oct. 1	e(P)	z 06 41 52							
1	eP	z 09 33 52	2	?					
	P	ZNE 52d	5	-	3	-	3	-	
	i	E 55e					9	10	
	i(PP)	ZN 34 00us	16½	-	10	8			
	i(PP)	z 04(u)	5	2					
	iPPP	z 50u	5½	-					
	iS	zZNE 37 22sw	8	-	15	10?	23	8?	Indef. on z.
	i(S)	Z 32 <u>u</u>	21	-					Subsequent traces
	(Lr)	z 40 20	5	12					invisible for some
	M	ZN 40 ca	110	-	110	-			time owing to
	M	E 41 ca					98	-	large ampl.
	i	E 47 33					13	9	Long. coda.
1	e(L)	Z 12 20 ca							Traces only.
1	e(PKP)	z 18 05 20							Very small
	e	z 06 20							movements.
	e(L)	ZN 53 ca							Traces only.
2	iP	z 04 34 22u							
	i	z 37(u)							
	e(PcP)	z 55							
	(S)	ZE 41 35w							
	eS	Z 42 08							
	iScS	E 44 15							
	SS	ZNE 45 25w							
	eSSS	E 48.0							
	eSSS	Z 48 35							
	eLr	Z 51.0							
	e(Lr)	N 52.0							
	M	ZNE 53	22½	14	18	15	14	15	
2	e(P)	z 06 52 46							2nd z recorder
									failed about 11h.
2	e(L)	Z 15 48 ca							Traces.
3	P	z 02 51 50							
3	eP	z 11 37 23							
	e(S)	E 46 34							
	e(Lr)	ZN 58 ca							
	e	E 12 00 ca							
3	e(P)	z 16 44 06							
3	iP	z 17 39 24d							
	e(S)	ZNE 41.3							
3	e(P)	z 18 56 16							
4	eP	z 01 00 42							
	i(PcP)	z 01 07u							
	eS	NE 09 48							
	e(ScS)	Z 10 48							
4	iP	z 04 14 08d							Very small waves.
	eL	ZNE 32 ca							
4	eP	z 04 38 57							

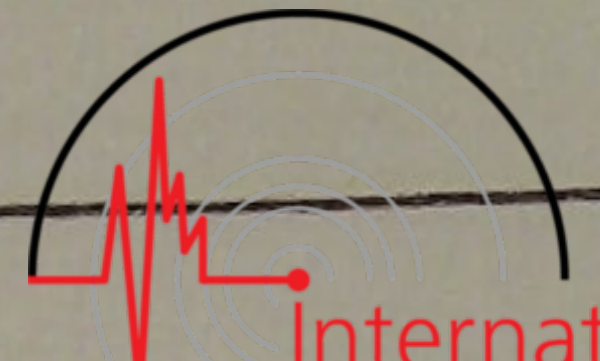


Date 1958	Phase		Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Oct. 4	eP e	z ZN	04 54 34 05 16ca							Traces only.
4	eP	z	05 27 17							
4	eP	z	06 56 41							
4	e(L)	Z	10 45ca							Traces only.
4	eP e(L)	z ZN	11 46 41 12 18ca							Traces.
4	e(P) i	z z	13 14 07 31d							
4	P	z	14 30 30							
4	eiP	z	18 19 39							
5	P e(S)	z ZNE	03 29 49 30.5							
5	P e(S)	z ZNE	09 51 04 53.0							
5	eP e(S)	z ZNE	16 10 59 17 12+							Traces only.
5	e(P)	z	21 20 29							
6	iP eS e(SS)	zZ ZN Z	00 54 41u 01 00 37 03 50							
6	eP e e	z z ZN	02 16 16 43 38ca							Traces only.
6	eP e e(L)	z N ZE	04 39 35 47.5 48.5							Very weak.
6	eP S eL M	z NE N N	07 14 56 20 25 22 20 23				9	15		Coda for nearly 1 hour.
6	e(P) e(L)?	z E	10 21 33 40ca							Very weak. Traces.
6	eP e(L)	z Z	19 11 51 55ca							Very weak. Traces.
7	e(P)	z	01 01 10							
7	eP	z	03 23 08							
7	e(P) e	z z	03 36 28 37 18							
7	eP e	z z	09 24 30 30 02							Very small and emergent.
7	iP	z	11 24 23u							





Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Oct. 7	iP	zNE 12 43 42d	1½	2	1	10?	1	-	Z comp. not recording.
	iPcP	z 55d	1½	2?					
	iS	NE 52 40sw			7	13?	4	12	
	iScS	N 53 57s			6	?			
	eSS	NE 56 30			1½	15	1½	15	
	eLq	N 13 01.0			1½	?			
	eLqM	E 01 20					6	25	
	eLr	N 05 30			4	20			
	M	N 07			7	14			
	M	N 16			7	17			Long coda.
7	e(P)	z 13 12 00							
7	e(P)	z 15 37 38							Very small and emergent.
7	eP	z 18 57 17							
	e(S)	ZNE 58 56							
8	e(P)	z 02 19 12							
	e	z 27 01							
8	iP	z 03 21 25u							
8	e(P)	z 03 32 47							
	e	E 32ca							Traces.
	e	N 34ca							Traces.
8	iP	z 04 52 17u							
	e	NE 05 03ca							Traces.
8	e	z 07 47 33							Tremors.
8	eP	z 10 25 21							
	e	E 37ca							Traces.
8	e(P)	z 11 21 02							
	e(S)	E 31ca							Train of small waves.
	e	N 33ca							
8	e	z 12 55 43							
8	e	z 13 34 05							
8	iP	z 14 11 35d							
	e(PcP)	z 48							
	e(L)	z 32ca							Traces only on E.
8	e(P)	z 14 35 35							Very small.
8	iP	z 15 46 29u							
	e(S)	N 53½							Long train of small tremors.
	e(ScS)	E 56.6							
8	e	NE 18 20ca							Traces.
8	e?	E 22 43 05							? seismic.
	e	NE 47ca							Tremors.
9	e(P)	z 10 13 35							Very weak tremors.



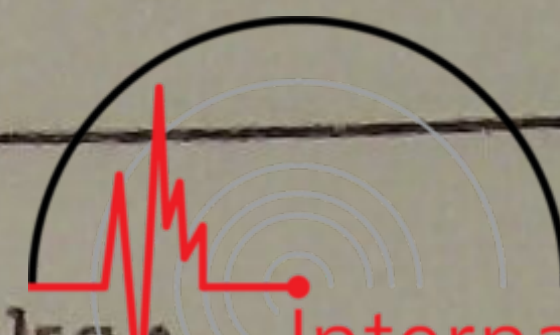
Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Oct. 9	eiP	z 11 29 28(d)	2	2					
	P	ZNE 28d	1½	-	1	-	1	-	
	i	z 36d	2½	2					
	i	z 30 05u	3	2					
	i	z 22d	2½	2					
	iPcP	z 37u	2	2					
	e	z 31 06	1½	2					
	PP	ZNE 35u	4	-	1	-	1½	7	
	S	ZE 36 55w	2½	-			9	20?	
	ePS	N 37 20			6	20			
	eSS	E 40 18					3	15	
	(SS)	ZN 40d	4	17	2½	15			
	eSSS	E 41 42					3	20	
	eLr	ZE 45.2	4	-			4	25	
	eLr	ZN 46.2	5	-	1½	25			
	e(Lr)	E 46 48					5	20	
	i	E 49 52w					10	20	
	e(PKKP)	ZN 50 32	9½	15	5	15			
	M	Z 53	23	18					
	M	E 54					16	17	
	M	ZN 56	23	15	20	15			Coda for
	M	E 57					17	15	over 2 hours.
9	e(P)	z 14 41 38							
	e	z 53 20							
9	e(L)	ZN 17 27ca							Traces.
9	e	ZN 21 30ca							Faint traces.
10	e(P)?	z 01 46 15							? seismic.
	e	NE 56ca							Traces.
10	iPKP	z 08 49 21d							
	eLr	ZN 09 30ca							Series of regular traces.
10	e	N 10 10ca							Faint traces.
10	e	z 11 44 41							? seismic.
	eP	z 47 37							Very emergent.
	e(S)	N 58 05							
	e(SKKS)	N 12 22.7							Traces.
10	e	NE 20 19ca							Small tremors.
11	e(L)	NE 01 25ca							Traces.
11	e(P)	z 02 09 11							Indefinite.
	i(P)	z 51d							
	e	NE 17ca							
	e(L)	E 22ca							Rather long series of small waves.
11	e(P)	z 12 08 15							? seismic.
	i	z 22u							
11	iP!	z 14 49 18d	7	-					
	iPcP	z 23d	2½	1					
	e	z 37	2	1					
	eS	N 58 48			1	8			
	e(PPS)	NE 15 00 20			1	15	1	-	
	e(PKKS)	z 10 46	½	2					



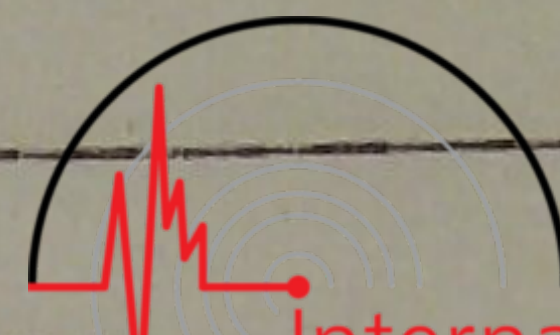
Date 1958	Phase		Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Oct. 11	e	z	18 36 45							? seismic.
11	e	z	19 17 20							? seismic.
11	e	NE	23 12ca							Small tremors.
12	e(P)	z	07 50 50							Very weak.
	e(S)	N	52 50							Small
	E	E	53.0							tremors.
12	e(P)	z	09 54 05							
12	P	z	12 58 55							
	eLr	N	13 21 $\frac{1}{2}$							Small waves.
12	eP	z	15 32 25	$\frac{1}{2}$	1					
	esP	z	33 28	$\frac{1}{2}$	2					
	iPP	z	36 40d	1	2					
	ePP	Z	40	1	8					
	esPP	Z	37 38	1 $\frac{1}{2}$	-					
	SKKS	ZNE	42 43e	1	-	1 $\frac{1}{2}$	12	2 $\frac{1}{2}$	-	
	e( <del>P</del> PS)	ZNE	45.6	1 $\frac{1}{2}$	-	2	-	1	16	
	esSS	ZNE	51.1	1	-	1 $\frac{1}{2}$	15	1	22?	
12	e(P)	z	16 16 26							
12	eP	z	17 37 00							
12	e(P)	z	18 55 47							? seismic.
13	iP	z	05 36 58d							
13	ePKP	z	09 17 24							
	e(PKS)	z	21 25							
14	iP	z	23 34 33u							
15	iP	z	11 39 24u							
15	eP	z	17 12 46							
	e(L)	NE	27ca							Traces only.
16	e(P)	z	12 02 15							? seismic.
16	iP	zN	18 12 11u							
	eS	N	20 20							Small irregular tremors follow.
17	iP	z	10 32 41u							
	i	z	45							
	i	z	33 02u							
17	e(P)	z	15 12 08							Local, seismic?
	i	z	32 52							
18	eL	ZNE	07 25ca							Series of small waves.
18	e(L)	Z	11 17ca							Traces.
18	e(P)	z	16 28 39							? seismic.
18	P	z	17 38 49							
	e	z	39 06							
	eL?	z	54ca							
	e(L)	NE	57ca							
	e	ZNE	18 04ca							



Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Oct. 18	e(P)	z 17 58 27							
18	eP e(L)	z ZN 19 10 08 31ca							
18	eP e(S)	z NE 19 33 17 35 06							
19	eP ePP eS eLq e(Lr) e(Lr) M M	zZNE z NE ZE NE zZ NE Z 01 55 52 57 57 45 58 20 50 59.1 59+ 02 00	26	15	32	-	27	18	Coda for over 1 hour.
19	P i(PKKS)	z E 02 03 37 23 55							In coda of previous shock.
19	e(P)	z 02 24 56							
19	eP i i e(PP) S SS Lq (Lr) M	zZN z z ZN ZNE E ZN Z ZN 11 50 08 15u 24d 56 56 12n 59.1 12 00.0 02.8 07	15	17	10	16			Coda for over 1 hour.
19	eP e(PcS) e(S) e(Lq)	z N Z ZNE 15 27 17 32 10 35.1 47+							Interpretation doubtful. Traces only.
19	eP e(L)	z ZN 21 14 53 34ca							Traces only.
20	iPKP i	z z 01 14 32d 51d							
20	iP iP (PcP) i (PP) iS i(PS) i eSS SS i eSSS eSSS eLr eLr M	z ZNE zZE z ZNE ZNE NE Z E ZN Z N Z ZN E ZE 01 23 55d 55(u) 24 15d 53u 27 05 33 16dne 50ne 34 47u 37 50 38 20s 39 47u 41 20 42 10 46½ 47.1 48	2 2 3½ 3½ 3 4 3 3 1½ 4 2 2 6 15	3? 8? 20 2 13 - - - 10 20 - 40 25	½ ½ 1 5 9	12? 12 14 - 17	1 2 2½ 5½ 9 3½	- 15? 15 - 15? - -	Coda for nearly 3 hours.
20	iP	z 03 09 05u							
20	e e	z z 06 41 14 48 44							Weak. Tremors; ? seismic.



Date	Phase		Time (UT)	Az	Tz	An	Tn	Ae	Te	Remarks:
1958			h. m. s.							
Oct. 21	eL	ZE	01 39ca							Small waves; traces only on N.
21	iP	zE	06 25 56u							
	iPcP	z	26 00u							
	i	z	27 17							
	e(S)	z	34 40							
	S	ZNE	50e							
	ePS	ZNE	35 35							
	eSS	N	39 05							
	eSS	Z	27							
	e(SSS)	ZE	42.9							
	eLq	E	44 10							
21	P	z	15 52 00							
	ePcP	z	09							
	eS	ZN	16 01 20							
	e(PS)	E	02.0							
	eSS	NE	06.0							
	e(Lq)	Z	09.6							
	eLr	ZE	14ca							
21	P	z	17 40 40							
21	eP	z	18 59 32							
21	e	N	19 56.5							Traces on E.
22	eL	Z	09 47ca							Traces only on N and E.
22	e(L)	N	14 54ca							Traces only.
22	P	zZNE	23 52 38u							
	i( <del>p</del> P)	z	47u							
	PcP	z	53 17							
	eS	ZE	24 00 40							
	eLq	E	07 22							
	e(Lr)	Z	10ca							Rather long coda.
23	(PKP)	z	02 48 05							? seismic.
23	iP	z	16 55 10u							
	e(PP)	Z	57ca							Traces only on N.
	e	Z	17 01 07							
	e(Lq)	Z	10ca							
23	eP	zZE	17 55 41							
	e(S)	ZNE	18 00 04							
	eL	ZE	01 07							
	eL	N	25							
24	e(P)	z	09 07 13							Very weak.
24	e	N	16 18 40							
	e	ZE	19.0ca							
24	e	N	18 13 15							
	e	E	42							
	e(L)	Z	14 45							
24	eL	N	18 28 12							
	eL	Z	29.0ca							
	eL	E	29 45							



Date 1958	Phase		Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks	
Oct. 24	e(L) e(L)	N E	21 45ca 52ca							Small irregular movements.	
25	e(L)	N	07 10ca							25 <sup>d</sup> records disturbed by high wind.	
25	eL	N	12 17.0								Tremors.
25	eL	NE	18 51.0								Small waves.
26	P ePP eS e(L)	z z E NE	02 30 10 33 20 40 35 59ca								
26	eP e(L)	z NE	09 21 18 24+								
26	e(P) e(S) e e(L)	z N E NE	12 53 09 13 00 47 04.7ca 10ca							Series of small waves.	
27	eP eS eS	z E N	15 13 40 20 54 21 20							Long series of small waves.	
27	eP eS eL?	z N N	16 11 11 18 34 23ca								
28	eL	NE	01 59 50								
28	P e e(S) iLM	zZNE NE E zNE	04 18 47 20 30 21 28 22 02	2	10	29	15	18	15	In microseisms. Rather long coda.	
28	e(L)	NE	05 22 37								
28	eP e(S)	z NE	07 08 24 11 06							Very emergent.	
28	e(S) L	N NE	08 43 $\frac{1}{2}$ 44 30								
28	ePKP ePP ePS e(PPS) e(SKKS) e(PKPPKS) e(PKPPKS) eLr e(Lr) M M M	z zNE N E E NE N E N E E	11 05 21 06 32 15 23 16 15 23 10 28 10 29 13 44ca 46ca 57 59 12 05			7	16	6 7	17 15	Coda of conspicuous waves.	
28	eP i(PcP)	z z	18 29 08 25(d)								
29	e(L)	N	00 23ca							Small movements; traces only on E.	



Date	Phase	z	Time (UT)	Az	Tz	An	Tn	Ae	Te	Remarks
1958			h. m. s.							
Oct. 29	eP	z	05 55 19							
	e(S)	NE	06 00 15							
	L	ZN	45							
	M	N	02			13	17			
29	eP	zZ	06 01 07							
	e(S)	N	05 46							
	L	ZNE	06 20							
	M	N	07			21	16			
29	eP	z	08 03 10	1	2					
	eP	Z	10	1	10?					
	ePP	ZN	05 05	3	-	1	-			
	i	Z	06 06	3 $\frac{1}{2}$	23?					
	ePKS	z	45	1	-					
	eSKS	zN	10.3	2	18?	3	20			
	iSKKS	N	11 47n			3	20			
	e	Z	12 40	1	20?					
	i(PS)	ZNE	14 55dn	6	-	3	-	1	-	
	iPKKS	Z	16 25d	8	22					
	e(SS)	Z	20 35	4	-					
	e(SSP)	NE	21 35			4	30	4	30	
	eSSS	Z	26 40	4	30					
	i	E	27 18					4	18	
	eLq	E	36 00					7	30	
	eLr	N	40.6			4	20			
	eL	ZNE	42ca	8	25?	5	35	3	25?	Movements
	M	Z	48	23	23					continue till
	M	N	52			12	20			nearly 11h.
	M	E	53					7	20	
30	e	ZNE	03 30ca							Weak tremors.
30	eP	zZN	08 22 48							In microseisms.
	i	z	53(u)							
	eS	ZNE	25 54							
	L	Z	26 37							
31	eP	z	06 15 43							
	e(L)	ZNE	20ca							Tremors.
31	eL	ZE	08 02ca							Train of small regular waves.
31	eL	ZNE	08 53ca							
31	e	ZNE	13 00ca							Traces only.
31	eP	zZN	19 14 15							
	e(PPP)	z	19 07							
	eS	ZNE	23 35							
	e(ScS)	ZN	24.4							
	e	E	25 35							
	eSS	ZN	28 30							
	eLq	E	33 15							
	e	N	34 35							
	Lr	ZNE	36.5ca							Rather long coda.
31	e(P)	z	23 57 20							Very small movements.

HALLETT STATION

72° 19'S, 170° 13'E

SEISMOLOGICAL BULLETIN

November, 1958

JAN 26 1959



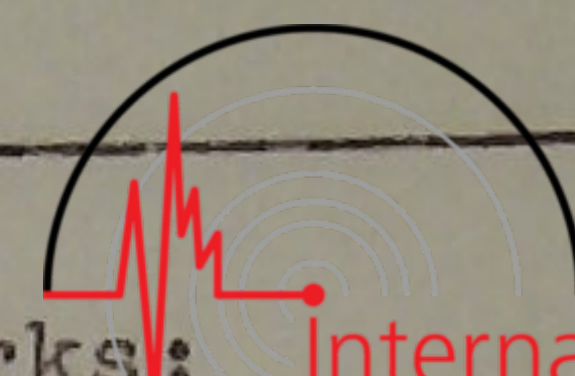
Instrument	Component	Symbol	To (sec)	Tg (sec)	Damping Shunt (ohms)	Paper Speed mm/min.
Willmore	Vertical	z	1	2	Near critical	30
Columbia	Vertical	Z	15	60	100	15
Columbia	N-S	N	15	60	100	15
Columbia	E-W	E	15	75	100	15

Directions of initial movements are indicated by small letters immediately after the last figures of the phase arrival times; as follows:-

- u = ground movement up
- d = ground movement down
- n = ground movement to north
- s = ground movement to south
- e = ground movement to east
- w = ground movement to west

Trace amplitudes (A) are in millimetres; and periods (T) in seconds.





Date	Phase		Time (UT)	Az	Tz	An	Tn	Ae	Te	Remarks:
1958			h. m. s.							
Nov. 1	iP	z	03 49 53d	1½	2					
	P	ZNE	53d	2½	7	1	-	½	-	
	e	z	50 00							In min. mark.
	i(PcP)	z	15u	3	2					
	ePP	z	52 23	1	6					
	ePP	ZN	23	1	8?	1	8			
	e	E	53 28					2	10	
	e(S)	ZN	58 52	2	17	2½	14			
	S	NE	59 07n			7	23	3	-	
	ScS	ZE	42d	5	?			5	-	
	e	E	04 03 13					2½	15?	
	iSS	ZN	32ds	7½	25	5	14			
	e	Z	06 02	3½	30?					
	eSSS	E	44					3	16	
	eLq	ZE	07.9	4	?			5	-	
	(Lq)	Z	09 18	7½	?					Coda for several hours.
	Lr	ZNE	11.0	6½	32	7	25	4	-	
	M	ZN	15	22	20	13	20			
1	eP	z	04 13 45							
	e(S)	z	17 54							
1	eP	z	06 18 06	<1	-					
	e(S)	E	37 10					2½	25?	
	e(S)	Z	37 50	2	-					
	eL	ZNE	40ca	4	40	2	35?	3	25	
1	eP	z	06 27 12							
1	eP	z	12 17 54							
1	eP	zZ	12 25 14							
	i(PcP)	z	40d							
1	eP	z	12 26 06	1	-					
	eP	ZNE	06	2½	-	1	-	½	-	
	iP	z	15d	4½	1					
	iP	ZN	15d	7	-	3½	-			
	i	Z	31 17u	4	12					
	iS	ZNE	33 47dse	7½	13	4½	15	11½	13	
	eS	z	50	1	5					
	ScS	NE	35 55(e)			4	13	15	15	
	eSS	ZE	37.6	2	14?			6	15	
	SSS	E	40.0					6	30	
	eLq	N	40 45			4½	15			
	Lr	Z	42 15	2½	25					
	Lr	N	43 10			5	-			
	M	ZN	50	33	15	25	15			Long coda of prominent waves.
1	i(P)	z	12 38 42d							
1	P	z	15 59 44	1	-					
	P	ZN	44	1	7	1	8			
	e	z	56	2	2					
	i	z	16 00 02d	3½	-					
	e	z	12	2	1					
	iS	ZNE	07 28e	3	11	2	15	4	14	
	iScS	E	09 30w					9½	15	
	(SS)	Z	10 30	1½	10					
	eSS	NE	11.4			2	12	3½	15	
	eLq	E	13 28					4	?	
	e	E	14 35					3	15	
	Lr	Z	15 18	2½	15					
	i	Z	16 38	4	?					
	e	N	20 40			2	20			
	(PKKP)	Z	21 25	3½	16					
	M	ZN	27	15	15	12	15			Rather long coda.







Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:	
Nov. 7	e(P) e e(L)	ZNE NE ZNE	11 54 05 12 00 50 25ca						Long series of small waves.	
7	e(PKP) e(L)	z ZNE	17 53 05 18 30ca						Very weak.	
7	e(P) eP eL	z z ZNE	20 28 27 34 16 51ca						? seismic.	
8	iP S	z z	07 54 17d 28						Large ampl.	
8	eP iPP e(SSP) eSSS e(Lr)	z z ZN NE ZN	09 41 51 43 50d 10 01 05 05.7 22ca	1 19	5? 14				Long series of small waves.	
8	eL	ZE	20 25ca						Traces.	
9	e(P) i(P)	z z	10 33 42 47u						? seismic.	
9	(P)	z	14 51 12						? seismic.	
10	eP e eLr	z z NE	07 10 04 25 12 30ca							
10	eP	z	07 32 22							
10	e(P)	z	11 19 17							
10	P e? eS eSS eLq Lr M	zNE z NE NE N E E	11 25 10 31 34 35 15 40 16 46.5 51.0 54	$\frac{1}{2}$ $\frac{1}{2}$	2 1	$< \frac{1}{2}$	- - 1 1 1	$\frac{1}{2}$ - $1\frac{1}{2}$ $1\frac{1}{2}$ - 3 4	- - - 17 - 22 15	
10	eP	z	12 12 23							
11	e	z	13 12 15						Traces of L-waves on E.	
11	e	z	13 39 45							
11	P e(L) e(L)	z E N	16 16 33 18 10 33							
11	e(L)	NE	18 25ca						Traces only.	
11	eP e(S) eL	z E NE	19 47 49 55 52 20 04ca							
11	iP e(L)	z NE	22 49 46u 23 15ca						Prolonged tremors.	



Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks	
Nov. 12	iP i e e(L) eL	z z ZNE NE Z	03 59 04u 11d 04 04 37 07.5 08.5						Long series of very small waves.	
12	i(PKPP) e(L)	z ZE	06 38 44(u) 07 03ca						Traces only on N.	
12	iP e(PcP) eS eS eSS eLq eLq	zZN z ZN E ZN ZE N	10 50 29(d) 42 59 06 20 11 03.7 07ca 08ca							
12	e(P)	z	17 58 30							
12	e(PKPPKP) eLq	z N	18 22 32 29 09						Traces.	
12	eP ePKP iPP ePKS i e eSKS i i(PKPP) (PKPP) i(SSP) i(SKKS) eLq eLq i(L) Lr Lr M.	NE zE zNE z N z E E N zE NE NE E N E N NE	20 38 36 42 15 43 29s(e) 46 07 47 16s 36 49 15 51 29w 53 10s 24w 59 34sw 21 04 00se 11.3 12.0 12 47w 18½ 19½ 23	½ 1½ 1 1	2 - 3 -	2 8½ 3½	20 17 15	1 1 5	17 18 18	Traces only on z.
13	iP	z	00 25 38d							
13	ePKP e(PPS) e eSKKS e(SKKS)	z NE N NE E	03 15 15 26 15 29.4 33.1 37.2						Very weak.  L-waves poorly developed.	
13	iPKP ePP e ePPS e(SS) e(SKKS) eSKKS (Lr)	z z NE NE NE N NE NE	04 23 26(d) 24 39 32 32 34 28 40 49 41 15 44.9 05 01	½ ½	2 4	½ 2 1 3 ½ 1	15? - - 25 25 25	1 1½ 1½ 1 1	12? 20 -	Coda of small waves for over 2 hrs.
13	(P) iP	z z	08 40 45 41 32d						? seismic.	
13	eL	NE	10 01ca						Small waves; traces only on N.	



Date	Phase		Time (UT)	Az	Tz	An	Tn	Ae	Te	Remarks
1958			h. m. s.							
Nov. 13	eP	z	16 29 49							
	i	z	30 22d							
13	e(PP)	z	23 28 27							Indefinite, Small waves.
	eL	ZNE	24 15ca							
14	iP	z	05 14 02d							
	eP	ZNE	02	1	10	1/2	-	1/2	12	
	i	z	17u							
	e(PcP)	z	15 22							
	S	ZNE	21 53n	1/2	-	2 1/2	14	1 1/2	22	
	eSS	ZN	25.2	1	-	1	12			
	eSSS	NE	27.5			1 1/2	25	1/2	-	
	eLq	ZE	28.6	1 1/2	-			2	18	
	M	N	29			8 1/2	13			
	eLr	Z	30.1	3	25?					
	M	Z	30+	5	22					
	M	E	35					6	15	
14	eP	z	13 59 40	1/2	3					
	eP	ZNE	40	1/2	-	< 1/2	-	1/2	-	
	i(PcP)	z	57	3	-					
	iPcP	z	14 00 05d	2 1/2	2					
	ePcP	ZNE	05	1	17	1 1/2	17	2	15	
	i	z	40d	2 1/2	2					
	e	ZNE	01 18	1	-	1/2	-	< 1/2	-	
	ePPP	ZE	04.3	1	12			1	12	
	iS	ZNE	08 46se	1 1/2	-	4	19	4 1/2	17	
	iPS	ZNE	09 30use	1 1/2	18	6	-	6 1/2	17	
	e	Z	12 00	1 1/2	-					
	eSS	NE	13.3			1 1/2	-	2	12	
	e	ZE	14 35	2 1/2	-			2	-	
	eLq	ZNE	17.5	2	18?	6	45?	3?	20	Coda of prominent waves; no well-defined maxima.
	eLr	Z	22.3	2 1/2	17					
	iPKPPKP	z	27 34d	1	3					
14	e(SKs)	z	15 47 55							Indefinite. Small waves in coda of previous shock.
	e(L)	ZNE	16 10ca							
14	eL	E	23 12ca							Traces.
15	eL	ZNE	04 50ca							Series of small waves.
15	eSKS	Z	09 26 23	1	8					
	eSKKS	N	27 01			1	?			
	e	E	29 20					1	?	
	ePKKP	ZNE	30 28	2 1/2	16	1 1/2	16	1	18	
	ePPS	NE	31 13					1 1/2	-	
	e	Z	32 23	1	?					
	e(PKKS)	E	34 42					1/2	15	
	e(SKKS)	ZNE	37 22	1	?	1	?	1	15	
	eLq	E	49.7					1	?	
	Lr	Z	54.5	1	35					Very small L-waves.
	Lr	NE	55.3			1	40			
15	eP	zZ	19 24 58							
	ePcP	E	25 35							
	ePP	Z	26 56							
	eS	ZNE	33 02							



Date 1958	Phase		Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Nov.	eSS	NE	35.1							
	eLq	E	39 33							
	eLq	N	40 08							
	e(Lq)	E	28							
	eLr	N	41 40							Long series of
	eLr	Z	42.6							small regular waves
16	iP	zZN	09 56 55u							
	iPcP	z	57 14u							
	ePP	zZ	59 26							
	eS	N	10 05 08							
	i(PS)	E	24							
	eScS	N	06 38							
	e	Z	10 39							Long series of
	eSSS	N	11 23							regular waves.
	eLq	ZNE	13 00							Prominent on E.
16	P	z	17 03 57							
	e(S)	N	11 43							
	eL	ZNE	21ca							Very small waves.
16	P	zZ	(18) 54 04							
	eS	NE	(19) 01 30							
	eSS	E	06 01							
	eLq	E	07 $\frac{1}{2}$							
	eLr	ZN	10ca							Rather long series of small waves.
16	e(P)	z	21 19 30							
	e	z	57							
16	eP	z	22 09 02							
	e	NE	15 36							
	e	N	18 48							
	L	N	20ca							
	L	ZE	21ca							
17	e	ZN	10 34ca							Traces.
17	PKP	z	15 53 38							
17	P	zZNE	(17) 54 41(d)e							
	i	z	51(u)							
	e(PcP)	z	55 23							
	ePP	Z	56 49							
	ePPP	ZN	58 20							
	iS	ZNE	(18) 02 38se							
	eScS	Z	04 53							
	eSS	N	06 03							
	eSS	Z	37							Long series of
	eLq	E	08 25							waves.
17	e(P)	z	18 11 40							
17	i(P)	z	19 35 35d							
17	i(P)	z	22 45 40d							? seismic.
	e	ZE	23 30ca							Traces.
18	e(P)	z	05 57 42							
18	eL	ZN	08 44ca							Irregular waves in microseisms.







Date 1958	Phase	Time (UT) h. m. s.	Az	Tz	An	Tn	Ae	Te	Remarks:
Nov. 22	eP	zZE	00 15 39						
	e	E	16 36						
	ePP	zZN	18.4						
	e	ZN	22 52						
	S	ZNE	24 55w						
	e(ScS)	Z	25 46						
	i	N	26 19						
	e	Z	28 39						
	iSS	ZNE	29 29e						Prominent on E.
	eSSS	NE	32 49						
	eLq (Lr)	Z	34 09						
	M	ZNE	36ca						
		ZE	44	6	18		6	18	
22	iP	z	02 08 24d	1	1				
	eP	ZNE	24	1	?	1/2	?	1	12
	iPcP	z	39d	3 1/2	2				
	e	z	54	1	2				
	ePPP	Z	12 42	1	7				
	S	ZNE	17 42	1	?	1 1/2	?	2	?
	e	Z	19 53	1	10				
	e(SS)	Z	26 12	1 1/2	?				
	eLr	Z	31 1/2	1	40?				
	e(L)	NE	33ca			1	?	2	?
	M	ZN	38	7	23	4	23		
23	e	ZE	21 34ca						Traces only.
23	ePKP	z	23 46 44						Very weak.
24	P	zNE	06 57 15						Z comp. not operating.
	e	NE	58 26						
	ePP	NE	59 05						
	ePPP	NE	46						
	S	NE	07 03 58						
	e	NE	06 06						
	eSS	NE	07 04						
	Lr	NE	10 42						Series of prominent waves.
24	eP	z	17 55 03						
25	ePKP	z	02 43 48						
25	e(P)	z	03 39 25						Very small; ? seismic.
25	(P)	z	08 22 43						? seismic.
25	eP	z	13 24 02						Two shocks about this time.
	eP	z	25 58						
	e	z	27 20						
	e	NE	40 06						
	eL	E	49 35						Traces only.
26	e	Z	11 44ca						
26	eP	zZNE	21 37 40						
	e(L)	ZNE	38 50						
	M	N	39+			18	16		
27	e	ZNE	04 58ca						Tremors.
27	iP	zZNE	06 43 40u						
	i(PP)	z	44 05d						



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Date	Phase	Time (UT)	Az	Tz	An	Tn	Ae	Te	Remarks	
1958		h. m. s.								
Nov.	eLr M	ZNE ZNE	45 33 46	10	13	8	13	7	14	
27	iP i(PP) eLr M	zZNE z ZNE ZNE	07 42 10u 27u 44 03 44+	8	15	5	16	4	15	
27	eiP P e(S) Lr M	z ZNE N ZNE ZNE	13 43 52d 52s 45 00 49 46	3½ 2	- 16	5 2	20 15	1 6	18 ?	
				18 67	? 11	15 43	22? 15	34	?	
28	e(P) i(P) L M	ZNE z ZNE ZNE	15 04 06 05 07u 07 03 07+	13	15	9	12	7	12	Possibly, two shocks.
28	iP Lr M	zZNE ZNE ZNE	15 19 31u 21 17 22ca	15	15	12	12	10	12	
29	e	ZNE	01 46ca							Weak tremors.
29	P?	z	04 54 57							In time mark and microseisms.
29	i(P)	z	10 48 34u							
29	eP	z	16 04 59							Tremors; ? seismic
29	e	NE	17 05ca							Traces.
30	eP e(PP) e(S) ePKKP ePKKS e eLr	Z zZ ZNE ZNE Z ZNE ZN	01 46 00 51 20 57 40 02 01 40 04 27 06 40 23ca	<½ 1 ½ 1½ ½ 1½ 1	? 8 - - 13 10 25?	1 1½	11 -	½ ½	10 -	Long series of small waves.
30	e	ZE	08 11ca							Traces.
30	eL	ZE	12 45ca							
30	e	NE	19 32ca							Traces.
30	e(L)	NE	21 11ca							



Date 1958	Phase	Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks	
		h	m	s								
DEC. 4	e	Z	05	10ca							Traces	
4	eL	ZNE	11	20ca							Series of small waves	
4	e(P)	z	12	40 04							Traces	
	e(L)	Z	13	15ca								
4	e	z	13	28 46							? seismic	
4	e	z	19	16 08							Traces, ? seismic	
4	e(PPS)	Z	19	47.2							Series of regular waves	
	e	ZE		53.4								
	eLr	ZNE	20	08ca								
4	eL	Z	21	27ca							Traces	
4	(P)	z	22	28 57							? seismic	
4	e(P)	z	23	00 34								
5	iP	zZ	04	16 19u								
6	e(SKKS)	E	09	58 28				1	-		Long series of small waves.	
	ePPS	E	10	01.0				2	17			
	ePKKS	N		06.2			1	25?				
	eLr	NE		20ca			1	-	2	27		
6	e	Z	21	08ca							Traces	
6	e	z	22	43 05							Traces; ? seismic	
7	eP	z	02	58 10							Traces	
	eS	NE	03	08ca								
7	e	NE	06	45ca							Small tremors	
	e(L)	NE		50ca								
7	e(L)	E	18	48ca							Small irregular waves	
	e(L)	ZE		54.4								
											Microseisms on z	
8	iP	z	03	20 03u								
	i	z		07u								
8	e	ZNE	12	38 16	1	-	1 1/2	-	1	?	Very long series of small waves	
	ePKP	ZN		45.1	1/2	-	1 1/2	25				
	e(PKPPKP)	Z	13	03 45	1	-						
	e	E		05.5				1/2	-			
	e	Z		10ca	1	25?						
	e(L)	N		12ca			1	-				
9	e	N	01	27ca							Traces	
9	eSS	E	02	53 14							Rather long series of waves	
	eLr	NE		56 27								
9	eP	z	08	12 02							Traces	
	e(PKPPKP)	NE		40ca								
9	iP	z	12	27 41u							Series of small waves	
	i	z		47u								
	eS	NE		35 44								
	eLr	N		44 1/2								
9	eL	ZN	23	08ca							Traces	
10	iP	ZNE	07	09 38dn	6	10	4	10	1 1/2	7	z not recording after 05h	
	iPP	ZNE		10 34dnw	16	12	9	15	4 1/2	7		
	ePPP	E		11 26					2 1/2	12		
	iPoP	E		12 13w					5	8		
	i	E		13 18e					6	8?		
	iS	ZNE		14 59(ds)w	28	?	35	?	47	?		
	iSS	Z		17 00(d)	10	14						
	i(SSS)	NE		18 00n(e)			17	?				
												V. large
												Long coda; no clearly defined L-waves



Date	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
	M	ZNE	18+			35	18	64	13	70	15	
10	e(SSS) eLr	NE E	22	31	30							Train of small waves
11	e	NE	03	02	ca							Traces
11	e(L)	N	12	55	ca							? seismic
13	iP ePcP ePP e(SSS) e e(SSS)	zZN z ZN E Z ZNE	09	16	40d 50 35 35 18 32							Two shocks about this time  Series of small waves
13	i(PKP)	z	14	48	09d							
14	iP S iSS e(SSS) SSS Lq M	zE ZNE Z E NE ZE ZN	07	20	58d 48e 45 50 34.7 36.7 37	1 3 5	2 22 ?	2 4	30 35	1 4 4 2 7	- 27 ? 22 ?	
14	e(P)	z	23	01	26							Small
15	iPKKP i	z z	08	16	04 08							15 <sup>d</sup> and most of 16 <sup>d</sup> strong microseisms!
16	e	z	02	28	19							Traces; ? seismic
17	eL	ZN	03	25	ca							Traces only on E.
17	eL	ZNE	16	24	ca							Series of small waves
17	e	Z	17	45	ca							Traces
17	P ePcP ePPP S iPS eLq	zZN Z ZE ZNE ZNE ZNE	20	44	45 24 30 40 24w 03							Weak L-waves
18	e(SSS) e(Lq) i(Lr)	z z z	01	59	40 30 04d							
18	eL	ZNE	05	48	ca							Tremors
18	iP e(L) e(L)	z Z Z	07	39	45d 53ca 16ca							Traces "
18	e(P) e e eL	zZ Z Z ZNE	08	49	23 45 09 12ca							Small & indefinite  Series of small waves
18	eP e(L)	z ZNE	12	34	12 55ca							
18	eL	Z	18	32	ca							Traces
18	iP e(PcP) ePP ePPP eS iSoS eSSS eL	zZN z Z Z ZNE E NE Z	19	33	45u 03 52 00 50 40 47.7 46							Long series of very regular waves



Date 1958	Phase		Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
			h	m	s							
19	eP i e(S)	z z ZNE	00	48	23 38d 50ca							
19	eP eS eSS eLq eLr	zE NE E N E	09 10	59 06	05 51 10 35 41							Indefinite L-waves on Z.
19	iP i(PcP) e ePP e eS e SS	zZ z ZNE ZN Z ZNE Z ZNE	11	26	57u 27 14(u) 21 30.5 36 02 37 10 39 55 52.1							Long series of small waves
19	eL	ZNE	15	30ca								
19	e	Z	18	57ca								Traces
19	eL	ZNE	19	32ca								Long series of small waves
20	e	ZNE	00	40ca								Commenced during change of records
20	e(P)	z	09	30	33							
20	e	Z	18	55ca								Traces; ? seismic
20	e eL	E ZNE	19 20	48 <sup>1</sup> / <sub>2</sub> 08ca								
20	eL	ZNE	21	30ca								
21	iPKP iPKS ePPS e e(SS) e(SKKS) i(SSS) e eLr eLr M	z zZE ZE ZE Z ZE Z E Z N ZE	06	05	46a 09 06d 18 05 21 03 23 31 25.2 27 35 31 20 45 47 56	1 1 <sup>1</sup> / <sub>2</sub> 1 <sup>1</sup> / <sub>2</sub> 1 <sup>1</sup> / <sub>2</sub> 1 1 1 <sup>1</sup> / <sub>2</sub> 1 5 <sup>1</sup> / <sub>2</sub>	- - - - - 13 - - - 23					
22	eP eS eLq Lr	zZ ZE Z ZN	02	28	15 37 03 45 00 47ca							Series of small waves
22	eP e(S) e(S) i eL	zZ ZE N NE ZNE	19	28	27 34.5 35 02 37 41(e) 40ca							Series of regular waves
23	P e(L)	z ZE	03	40	19 55ca							Traces
23	eL	ZE	07	13ca								Long series of small waves; traces only on N.
23	eL	Z	10	30ca								Traces
23	eP e(L) e(L)	z ZNE ZN	19	23	34 35 54ca							Small & indefinite Long series of waves; 2 or 3 shocks confused
24	e	ZE	00	26ca								Traces
24	eL	Z	01	45ca								Traces



Date 1958	Phase	Time (UT)			Az	Tz	An	Tn	Ae	Te	Remarks
		h	m	s							
DEC. 24	e	Z	20	34							Traces
24	eP i eL	Z Z ZN	20	44 50 55u 01ca							Microseismic disturbance on N & E.
24	iP i eL	Z Z ZN	22	20 27d 32u 33ca							Traces
25	iP ePP S iSS eLq eLr M	zNE NE zNE NE E NE N	08	16 36u 19 05 25 30s 30 05 33 30 37ca 45	2½ 1	2 -	1 7 8 4 11	- - - - 35 17	1 3 4 3½ 3½	20? - - 27 22	Z comp. out of action Long coda
26	eP e(L)	Z ZNE	22	43 57 50ca							Small waves.
28	e(P) e SKS ePS e ePKKS eSKKS eL eLr M	Z Z ZE ZE Z E E ZE E ZE	05 06	53 28 54 42 04 36 05.7 06 34 11 09 15 47 31ca 33 42							7 18 6 18
29	eP e(PPS)	zZ ZNE	22 21	51 10 03							Long series of tremors
30	eP iPcP S eScS eScS eSS eSS SSS eL M M	zZ Z ZNE ZN Z E N N ZE N ZE	08	47 26 48 35 55 17n 57 27 46 58 50 59 23 01 02½ 03 04	1 Small 1 1 1	? 11 ?	3½ 1½	11 12	2 ?	22 15?	30 <sup>d</sup> and 31 <sup>d</sup> strong microseisms on all records
31	iP eP ePcP S e(PPS) e e(ScS) eSSS (Lq) e(FKKP)	Z ZNE ZN NE Z NE ZN E ZNE ZN	01 02	54 11(u) 11 55 28 00 55e 01 31 02 26 03 19 05 12 06 14(e) 17ca	2 1 3 2 2 2 1 2 1 2	2 8 ? - - 6 15 - ? 40?	1½ 1½ 2½ - - 3 3 1½ 2	6 6 15 - - 15 - ?	½ - 8½ - - - 2 2	- - 12 - - - - ?	

