

NEW ZEALAND

Department of Scientific and Industrial Research

Geophysics Division

APIA OBSERVATORY

FINAL SEISMOLOGICAL BULLETIN

STANDARD SEISMIC STATION (AFI)

AFIAMALU, WESTERN SAMOA

Latitude:  $13^{\circ} 54' 33.6''S$  Longitude:  $171^{\circ} 46' 38.1''W$

Height above mean sea level: 705.6 metres, 2315 ft.

Geocentric direction cosines: a. - 0.961 070

b. - 0.138 883

c. - 0.238 862

Lithological Foundation: Basaltic Lava Flows

Instruments: World-wide standard seismograph system

Benioff short period seismometers

To = 1.0 sec. Tg = 0.75 sec.

Sprengnether long period seismometers

To = 15 sec. Tg = 100 sec.

Nominal Magnifications: S.P. 12500

L.P. 750

JANUARY 1968 \*

No	Date	Phase		Time (G.M.T.)	Az	Tz	An	Tn	Ae	Te (Deg.)	Remarks
1	1	eP	ZNE	00	03	50					
		eS	ZNE		04	32					
2	1	iP	ZNE	21	48	42					u
		S	ZNE		49	12					
3	2	eP	ZNE	00	28	10				36.0	USCGS: 5.1S, 153.4E. New Zealand region h about 55 km. H = 00 21 10.8 Mag. 5.7-6.0(BRK), 5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (GOL), 5.5(CGS)
		eS	ZE		33	32					
		eSS	ZNE		36	12		5.520.0			
		eL	ZE		38.0						
4	2	iP	ZNE	02	10	37				7.8	d USCGS: 19.3S, 177.6W. Fiji Islands region h about 570 km. H = 02 08 43.2 Mag. 4.2 (CGS)
		eS	ZNE		12	07					
5	3	iP	ZNE	07	19	11					une Samoa Islands region
		S	ZNE			31					
6	3	eP	ZNE	15	07	18					Samoa Islands region
		S	ZNE			39					
7	4	eP	ZNE	00	11	24					
		eS	ZNE		12	21					

2.

No	Date	Phase		Time			Az	Tz	An	Tn	Ae	Te	(Deg.)	Remarks
						(G.M.T.)								
8	4	eP	Z	01	08	28							65.0	USCGS: 52.2N, 171.3W. Fox Islands, Aleutian Islands h about 36 km. H = 00 57 44.4 Mag. 6-6 $\frac{1}{4}$ (PAS), 5.6-5.9(BRK), 6-6 $\frac{1}{4}$ (PAL), 5.7(CGS)
		eS	ZNE		17	16								
		eSSS	E		24.4									
		eL	Z		26.0									
		eL	ZN		27.3									
9	4	eS	ZNE	10	41.1								38.9	USCGS: 9.9S, 148.9E. East New Guinea region h about 19 km. H = 10 27 37.7 Mag. 5.4 (CGS)
		eL	ZNE		44.3									
10	4	iP	ZNE	20	25	42								d
		eS	NE		27	15								
11	4	eP	Z	22	12	35							10.6	USCGS: 21.2S, 179.9W. Fiji Islands region h about 624 km. H = 22 10 17.1 Mag. 4.8 (CGS)
		eS	NE		13	25								
12	5	eP	ZNE	03	41	40								
		eS	ZNE		42	05								
13	5	iP	ZNE	08	01	00.8							3.4	d USCGS: 16.6S, 173.7W. Tonga Islands h about 70 km. H = 08 00 19.2 Mag. 4.5 (CGS)
		S	ZNE			31								
		eT	ZNE		03	14								
14	5	eP	ZNE	10	53	11								
		eS	ZNE			44								
		eT	ZNE		55	29								
15	5	eP	ZNE	14	36	43								
		eS	ZNE		37	14								
16	6	eP	Z	03	36	52								
		eS	ZNE		37	43								
17	6	eP	ZNE	13	16	50								
		e(S)	ZNE		18	21								
18	6	eP	Z	23	40	30							93.0	USCGS: 27.8S, 71.1W. Near coast of Northern Chile. h about 33 km. H = 23 27 21.2 Mag. 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (PAS), 6.0-6.4(BRK), 5.8(CGS)
		ePP	Z		44.3									
		eS	ZNE		51.0									
		eS	ZN		52.8									
		eSS	NE		57.8									
		eL	ZN		00	04.8								
		eL	ZNE			09.5								
19	10	eP	ZNE	09	35	24							16.3	USCGS: 29.2S, 177.6W. Kermadec Islands region h about 64 km. H = 09 31 40.3 Mag. 5.0 (CGS)
		eS	ZNE		38	05								
		eL	ZN		39.3									
		eT	ZNE		49	02								

No	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te	(Deg.)	Remarks
20	10	e(S) eL	E ZN	14	02.5 04.0							49.9	USCGS: 53.7S, 134.3W. South Pacific Cordillera. h about 33 km. H = 13 42 06.2 Mag. 4.8 (CGS)
21	10	e(P)	ZNE	17	49	04							
22	11	e(S)	NE	04	51	12							
23	11	eP e(S)	ZNE NE	15	27 28	07 48							
24	11	eL	ZNE	17	25.6							65.0	USCGS: 6.9N, 126.1E. Mindanao, Philippine Island h about 58 km. H = 16 55 20.7 Mag. 5.3 (CGS)
25	11	e eL	ZN ZNE	18	41.4 46.3								
26	11	iP S T	ZNE ZNE ZNE	23	27 28 29	48.5 08 42							u Samoa Islands region
27	12	eP eS eT	ZNE ZNE ZNE	03	08 10 21	25 48 19						14.4	USCGS: 27.2S, 177.2W. Kermadec Islands h about 90 km. H = 03 05 18.5 Mag. 5.3 (CGS)
28	12	eP S	ZNE ZNE	10	46	34 54							Samoa Islands region
29	12	eP S	ZNE ZNE	15	50	03 23							Samoa Islands region
30	13	eP eS eL eL	Z ZNE NE ZE	07	15 25 35.4 37.7	34 00						75.0	USCGS: 24.1N, 122.2E. Taiwan region Felt at Taipei h about 8 km. H = 07 03 39.2 Mag. 6-6 $\frac{1}{2}$ (GOL), 5.7(CGS)
31	13	eP eS eS eSS e eL eL	Z NE E ZNE ZNE N ZE	16	20 31.9 33.9 38.5 45.5 48.3 53.3	24						97.0	USCGS: 24.2S, 66.9W. Salta Province, Argentina h about 192 km. H = 16 07 04.2 Mag. 5 $\frac{1}{2}$ (PAL), 5.7(CGS)
32	14	eP eS	Z ZNE	05	55 56	21 58							
33	14	eP eS	Z ZNE	05	58 59	09 45						10.4	USCGS: 23.6S, 175.2W. Tonga Islands region h about 33 km. H = 05 55 53.0 Mag. 4.5 (CGS)



4.

No	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te	(Deg.)	Remarks
34	14	eP eS	ZNE ZNE	08 05	03 05	55 54						11.5	USCGS: 22.5S, 179.6W. South of Fiji Islands h about 610 km. H = 08 01 27.8 Mag. 5.2 (CGS)
35	14	eP eS eSS eSSS eL	ZNE ZNE ZNE ZNE ZE	12 12 12 12 12	35 42 47 49 53.5	04 52 24 36						60.0	USCGS: 7.5S, 127.9E. Banda Sea Felt at Darwin h about 115 km. H = 12 25 09.7 Mag. 6 $\frac{1}{4}$ (PAS), 6(PAL)
36	14	eP eS eT	ZNE ZNE ZNE	14 14 14	35 36 42	39 52 06						7.5	USCGS: 21.0S, 173.7E. Tonga Islands h about 33 km. H = 14 33 59.7 Mag. 4.5 (CGS)
37	14	eP eS e(SSS) eL	Z ZNE E ZN	17 18 17 17	53 02 09.9 12.5	56 51						65.0	USCGS: 52.7N, 171.2W. Fox Islands, Aleutian Islands Felt at Nikolski h about 34 km. H = 17 43 10.0 Mag. 6 $\frac{1}{4}$ (PAS), 6 $\frac{1}{4}$ (PAL), 6-6 $\frac{1}{4}$ (GOL), 5.5(CGS)
38	15	eS eL	ZNE ZE	02 02	11.0 13.5							22.0	USCGS: 12.6S, 165.6E. Santa Cruz Islands h about 41 km. H = 02 02 17.9 Mag. 5.0 (CGS)
39	15	eP eiS	ZNE ZNE	05 05	44 45	47 51						6.8	USCGS: 19.7S, 175.1W. Tonga Islands h about 33 km. H = 05 43 09.4 Mag. 4.6 (CGS)
40	16	iP eiS	Z ZNE	00 00	40 41	50.5 16							d
41	16	eP S eT	Z ZNE ZNE	23 23 23	46 47 50	43 22 14							
42	17	eS eL eL	ZE NE ZN	10 10 10	06.5 12.4 15.2							53.0	USCGS: 56.4S, 147 OF West of Macquarie Is. h about 33 km. H = 09 49 50.7
43	17	e e	NE Z	13 14	57.0 00.5								
44	18	eP S	Z ZNE	04 04	18 18	07 25							Samoa Islands region
45	18	eP eS	ZNE ZNE	12 12	05 06	05 12						6.4	USCGS: 14.6S, 178.4W. Fiji Islands region h about 33 km. H = 12 03 37.4 Mag. 5.1 (CGS)



No	Date	Phase		Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te (Deg.)	Remarks
46	19	e(P)	Z	05	16	19							
47	19	eP	ZN	05	20	22							
		S	ZNE		21	15							
		eT	ZNE		25	14							
48	19	eP	ZNE	06	10	40					29.5	USCGS: 9.4S, 158.4E. Solomon Islands Felt at Honiara h about 33 km. H = 06 04 38.2 Mag. 6 $\frac{3}{4}$ (PAS), 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (GOL), 6 $\frac{3}{4}$ (PAL), 6.0(CGS)	
		ePP	ZNE		11	32							
		S	ZNE		15	20							
		iSS	N		16	36							
		iSSS	ZNE		17	36							
		iL	ZN		18	28							
		iL	E		19	00							
49	19	eP	Z	10	42	14							
		eS	ZNE		43	05							
		eT	ZNE		47	05							
50	19	eS	NE	15	02.9						85.0	USCGS: 42.6S, 75.2W. Off coast of southern Chile. h about 22 km. H = 14 39 37.8 Mag. 5.5 (CGS)	
		e(SS)	Z		08.4								
		e	NE		15.3								
		eL	ZNE		18.5								
51	19	iP	ZNE	18	26	36.0						u	
52	20	iP	ZNE	01	15	42.0							une
		S	ZNE		16	05							
53	20	eP	Z	13	56	06							
		eS	ZNE			46							
		eT	ZNE		59	25							
54	20	eP	ZNE	16	43	49					10.0	USCGS: 16.2S, 178.1E. Fiji Islands h about 21 km. H = 16 41 27.1 Mag. 6-6.2(BRK), 5.6(CGS)	
		iS	ZNE		45	32							
55	20	iP	ZNE	17	36	03.3					7.8	d USCGS: 18.9S, 178.0W. Fiji Islands region h about 626 km. H = 17 34 05.4 Mag. 4.5 (CGS)	
		eS	ZNE		37	36							
56	20	iP	ZNE	21	25	13.6					17.5	d USCGS: 29.9S, 179.5W. Kermadec Islands h about 349 km. H = 21 21 31.6 Mag. 6.3-6.5(BRK), 5.8(CGS)	
		e	ZNE		26.5								
		eS	ZNE		28	11							
		eT	ZNE		38	55							
57	20	ei(P)	ZNE	21	32	37							
58	21	eS	ZNE	00	40.3						34.8	USCGS: 5.2S, 154.0E. Solomon Islands h about 113 km. H = 00 28 12.5 Mag. 5.1 (CGS)	
		e(L)	N		43.0								
		eL	ZE		44.6								

## 6.

No	Date	Phase		Time			Az	Tz	An	Tn	Ae	Te	(Deg.)	Remarks
				(G.M.T.)										
59	21	eP	Z	09	13	18							14.0	USCGS: 25.2S, 179.4E. South of Fiji Islands h about 549 km. H = 09 10 26.1 Mag. 4.2 (CGS)
		eS	NE		15	42								
60	21	iP	ZNE	10	27	18								d
		iS	ZNE			55								
61	21	eP	Z	13	47	55							3.0	USCGS: 16.1S, 173.9W. Tonga Islands h about 33 km. H = 13 47 09.6 Mag. 4.2 (CGS)
		S	ZNE		48	27								
		T	ZNE		50	10								
62	21	ePKP	ZNE	17	02	29							154.0	USCGS: 1.2S, 14.0W. North of Ascension Is. h about 33 km. H = 16 42 29.2 Mag. 6.2(PAS), 6.5-6.9(BRK), 6 $\frac{1}{4}$ (PAL)
		eSS	NE		25.5									
		e(SSP)	Z		26.5									
		e	N		31.0									
		eSSS	ZE		31.8									
		eL	ZN		35.5									
		eL	E		39.3									
63	21	eP	ZNE	17	17	39								
64	22	iP	ZNE	04	27	42.9								d
		S	ZNE		28	00								Samoa Islands region
65	22	iP	ZNE	06	44	01								
		eiS	ZNE			28								
66	22	eP	ZNE	14	01	28								
		S	ZNE		02	04								
		T	ZNE		04	01								
67	22	eP	ZNE	18	24	15							38.0	USCGS: 9.8S, 149.0E. East New Guinea region h about 27 km. H = 18 16 49.8 Mag. 5.3 (CGS)
		eS	N		33.5									
		eL	ZE		36.5									
68	23	eP	ZNE	07	54	07								
		eS	ZNE			50								
69	23	eP	ZNE	09	51	38								
		eS	ZNE		52	24								
70	23	eP	ZNE	10	23	01								
		eS	ZNE			48								
71	23	eS	NE	16	26.3								65.0	USCGS: 52.1N, 171.3W. Fox Islands, Aleutian Islands h about 53 km. H = 16 06 50.1 Mag. 5.0-5.4(BRK), 5 $\frac{1}{4}$ -5 $\frac{3}{4}$ (PAL), 5.2(CGS)
		eL	E		34.0									
		eL	N		36.1									
		eL	Z		39.1									
72	24	eP	Z	09	38	08	0.5	1.0					38.9	USCGS: 5.9S, 149.5E. New Britain region h about 97 km. H = 09 30 49.9 Mag. 5.4 (CGS)

No	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te (Deg.)	Remarks	
73	25	eP eS	ZNE ZNE	06 06	42 44	44 18					9.4	USCGS: 22.6S, 175.3W. Tonga Islands region h about 34 km. H = 06 40 37.5 Mag. 4.4 (CGS)	
74	26	eP ePcP eS eL eL eL	ZE ZE ZNE E N ZE	04 04 05 05 05 05	56 56 05 14 15 18.0	32 42 28 32 13					66.0	USCGS: 8.8S, 120.4E. Flores Island region h about 29 km. H = 04 45 41.4 Mag. 6 $\frac{1}{2}$ (PAS), 6.5-6.9(BRK), 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (GOL), 6 $\frac{3}{4}$ -7(PAL), 5.9(CGS)	
75	26	iP iS	Z NE	05	51	10 30.5						u	Samoa Islands region
76	26	iP S	Z ZNE	09 10	59 00	38.1 09						u	
77	26	eP eS	ZE ZNE	06	24 02.5	34	1.0	1.1			20.6	USCGS: 12.6S, 167.0E. Santa Cruz Islands h about 215 km. H = 12 55 48.2 Mag. 5.0 (CGS)	
78	27	iP S	Z ZNE	11	39	32.5 52						u	Samoa Islands region
79	27	eP	Z	12	56	08	0.5	1.0			21.1	USCGS: 12.5S, 166.5E. Santa Cruz Islands h about 57 km. H = 12 51 23.8 Mag. 4.5 (CGS)	
80	27	eP	Z	14	08	04					75.0	USCGS: 23.2N, 121.6E. Taiwan h about 53 km. H = 13 56 23.8 Mag. 5.2 (CGS)	
81	27	eP e(S)	Z NE	22	13 15	17 13							
82	28	eP eS	ZN NE	11	43 45	21 30					12.6	USCGS: 23.7S, 179.9W. South of Fiji Islands h about 462 km. H = 11 40 36.9 Mag. 4.4 (CGS)	
83	28	eP eS	ZNE ZNE	15	44 46	55 30					8.5	USCGS: 20.1S, 177.7W. Fiji Islands region h about 545 km. H = 15 42 53.2 Mag. 3.4 (CGS)	
84	29	eS eL eL	ZNE N ZE	09	33 39.7 40.6	24					54.0	USCGS: 24.0S, 115.7W. Easter Island Cordillera h about 33 km. H = 09 16 30.5 Mag. 5.0 (CGS)	



No	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te	(Deg.)	Remarks
85	29	eP ZE	10	20	01	0.5	1.0					34.8	USCGS: 5.6S, 153.9E. New Ireland region h about 70 km. H = 10 13 16.5 Mag. 5.3 (CGS)
86	29	eP Z	10	30	06							67.0	USCGS: 43.6N, 146.7E. Kurile Islands h about 40 km. H = 10 19 05.6 Mag. 7.0(PAS), 7.7-7.9(BRK), 7-7 $\frac{1}{4}$ (PAT), 7.0(GOL)
		eP NE			14								
		ePP N		32	44								
		eS ZNE		39	00								
		eSS ZE		43	16								
		eSSS ZE		46	52								
		eL ZNE		49.5									
		M NE		54									
		M ZNE		57									
		M ZN	11	09									
eT ZNE		44	11										
Surface waves lasting 3 hours													
87	29	eP Z	15	48	01	1.0	1.0					21.1	USCGS: 33.8S, 179.3W. South of Kermadec Is. h about 33 km. H = 15 43 19.1 Mag. 5.1 (CGS)
		eS ZNE		51	37								
		e ZNE		52.1									
		eL ZNE		53.2									
		eT ZNE	16	08	46								
88	29	eS ZNE	17	03.2							68.0	USCGS: 43.5N, 147.2E. Kurile Islands h about 36 km. H = 16 42 50.4 Mag. 5.7 (CGS)	
		e NE		09.0									
		eL ZN		13.5									
89	29	eS ZNE	21	13.3							71.0	USCGS: 56.4N, 153.6W. Kodiak Island region h about 6 km. H = 20 52 21.3 Mag. 5.0(GOL), 5.2(CGS)	
		e E		22.0									
		eL ZN		25.4									
90	30	eP ZNE	01	56	12						9.5	USCGS: 20.7S, 178.6W. Fiji Islands region h about 590 km. H = 01 53 59.9 Mag. 4.5 (CGS)	
		eS ZNE		57	56								
91	30	iP ZNE	03	55	03.4	17.9	1.0				75.0	dsw USCGS: 6.1S, 113.3E. Java h about 594 km. H = 03 44 24.4 Mag. 6.2 (CGS)	
		epP ZNE		57	06								
92	30	eP ZNE	06	19	22								
		eS ZNE		21	03								
		eT ZNE		29	10								
93	31	eP ZNE	01	22	34						7.3	USCGS: 17.9S, 178.1W. Fiji Islands region h about 632 km. H = 01 20 44.4 Mag. 4.4 (CGS)	
		eS ZNE		24	02								

9.

No	Date	Phase		Time				Az	Tz	An	Tn	Ae	Te	(Deg.)	Remarks
				(G.M.T.)											
94	31	eP	ZE	03	08	43							57.0	USCGS: 6.9S, 130.3E. Banda Sea h about 22 km. H = 02 58 29.8 Mag. 5.5 (CGS)	

Note:

No readings from 7th to 9th January 1968 - No time marks on records.

NOTE:

- (i) Trace amplitude(A) are expressed in millimetres and periods (T) in seconds.
- (ii) The small letters in the Remarks column indicate the direction of initial movement. u indicates an upwards ground movement, d a downwards one, n,s,e, and w towards north, south, east, and west respectively.
- (iii) \* Readings to be incorporated in the New Zealand Seismological Report for 1968.

P.D. Muller  
OBSERVER-IN-CHARGE

31 OCT 1968

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Latitude:  $13^{\circ} 54' 33.6''$ S Longitude;  $171^{\circ} 46' 38.1''$ W

Height above mean sea level: 705.6 metres, 2315 ft.

Geocentric direction cosines: a. - 0.961 070

b. - 0.138 883

c. - 0.238 862

Lithological Foundation: Basaltic Lava Flows

Instruments: World-wide standard seismograph system

Benioff short period seismometers

To = 1.0 sec. Tg = 0.75 sec.

Sprengnether long period seismometers

To = 15 sec. Tg = 100 sec.

Nominal Magnifications: S.P. 12500

L.P. 750

FEBRUARY 1968

No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
1	1	eP	ZNE	06	44	55								
		S	ZNE		45	41								
2	1	eL	ZNE	13	18	18							68.0	USCGS: 43.2N, 146.9E. Kurile Islands h about 35 km. H = 12 47 23.4 Mag. 5.5 (CGS)
3	1	eP	Z	15	48	52							15.7	USCGS: 29.3S, 178.5W. Kermadec Islands h about 284 km. H = 15 45 30.2 Mag. 4.2 (CGS)
		eS	ZNE		51	28								
4	1	eP	Z	16	29	24							18.7	USCGS: 22.5S, 170.7E. Loyalty Islands region h about 33 km. H = 16 25 12.3
5	1	eP	Z	23	17	51							19.1	USCGS: 18.5S, 169.0E. New Hebrides Islands h about 228 km. H = 23 13 47.2 Mag. 5.1 (CGS)
		epP	Z		18	35								
6	2	eP	ZNE	00	47	55							8.6	USCGS: 19.9S, 178.2W. Fiji Islands region h about 366 km. H = 00 44 02.1 Mag. 4.4 (CGS)





No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
17	4	eP	ZNE	19	19	16							7.4	USCGS: 20.8S, 174.3E. Tonga Islands h about 34 km. H = 19 17 36.5 Mag. 4.7 (CGS)
		eS	ZNE		20	31								
		eL	ZNE		21	30								
		eT	ZNE		26	16								
18	4	eP	ZNE	19	33	53							7.2	USCGS: 20.5S, 174.0W. Tonga Islands h about 33 km. H = 19 32 15.8 Mag. 4.5 (CGS)
		S	ZNE		35	10								
		eL	ZNE		36	00								
		eT	ZNE		41	03								
19	5	eP	Z	20	34	47								
		S	ZNE		35	15								
		eT	ZNE		37	15								
20	6	eP	ZNE	05	54	53								
		e(S)	NE		57	03								
21	6	e(L)	ZNE	12	02	00							92.0	USCGS: 28.5S, 71.0W. Near coast of Central Chile h about 23 km. H = 11 19 23.1 Mag. 5.0-5.2(BRK), 5.7(CGS)
22	6	eP	ZE	14	46	36								
		eS	ZNE		47	33								
23	7	eP	ZNE	07	19	39								Samoa Islands region
		S	ZNE			58								
24	7	eP	ZNE	13	13	50							13.8	USCGS: 25.3S, 179.7E. South of Fiji Islands h about 491 km. H = 13 10 52.3 Mag. 4.5 (CGS)
		eS	ZNE		16	14								
25	8	eP	ZNE	04	03	37								Samoa Islands region
		S	ZNE			56								
26	8	eP	ZNE	10	45	22								
		S	ZNE			47								
		T	ZNE		47	44								
27	9	eP	ZE	18	08	30							9.4	USCGS: 22.6S, 175.1E. Tonga Islands region h about 50 km. H = 18 06 28.2 Mag. 5.0 (CGS)
		S	ZNE		10	09								
28	10	eP	ZNE	05	31	07							7.3	USCGS: 18.0S, 177.9E. Fiji Islands region h about 453 km. H = 05 29 13.8 Mag. 4.2 (CGS)
		S	ZNE		32	39								
29	10	eP	Z	14	04	50								
		S	ZNE		05	43								

A severe tropical storm in the Samoan group disrupted power supply and the batteries ran flat after 12 hours operating. So, there was no recording on 11th and 12th until the power was restored on the 13 February.















No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
66	29	iP eS	ZNE ZNE	09 13	11 07	35							7.6	u? USCGS: 17.8S, 178.6W. Fiji Islands region h about 544 km. H = 09 09 40.4 Mag. 4.7 (CGS)
67	29	iP	ZNE	10	27	41	1.7	1.0					32.6	u USCGS: 6.9S, 155.7E. Solomon Islands h about 80 km. H = 10 21 15.8 Mag. 5.0 (CGS)
68	29	eL	ZN	12	20	48								
69	29	eP	ZN	14	26	35							34.0	USCGS: 9.0S, 153.7E. Dentrecasteaux Islands region h about 14 km. H = 14 19 48.4 Mag. 4.9 (CGS)
90	29	eP S T	ZNE ZNE ZNE	17	47	21 39 08								Samoa Islands region
91	29	P	ZNE	23	40	34							20.5	USCGS: 14.6S, 167.2E. New Hebrides Islands h about 183 km. H = 23 36 08.5 Mag. 4.9 (CGS)

NOTE:

- (i) Trace amplitude (A) are expressed in millimetres and periods (T) in seconds.
- (ii) The small letters in the Remarks column indicate the direction of initial movement. u indicates an upwards ground movement, d a downwards one, n,s,e, and w towards north, south, east, and west respectively.
- (iii) \*Readings to be incorporated in the New Zealand Seismological Report for 1968.

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2.

No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
10	3	eP S	ZNE ZNE	07	59	26 45								Samoa Islands region
11	3	iP eS	ZNE ZNE	12	06 08	05.6 14						12.5	d USCGS: 23.5S, 179.9E. South of Fiji Islands h about 556 km. H = 12 03 29.3 Mag. 4.9 (CGS)	
12	3	iP S	ZNE ZNE	14	02	42.7 56							u Samoa Islands region	
13	3	iP S	ZNE ZNE	14	12 13	50.7 04							Samoa Islands region	
14	3	eP eS eT	Z NE ZNE	23	00 04 21	54 42 32						21.0	USCGS: 33.6S, 179.6W. South of Kermadec Is. h about 132 km. H = 22 56 22.3 Mag. 4.9 (CGS)	
15	3	iP eS e e e	ZNE NE N N N ZN	23	05 14 18 20 21 23	47 08 18 54 48 54		6.013.0				68.0	u USCGS: 1.6N, 122.6E. Northern Celebes h about 435 km. H = 22 55 36.8 Mag. 5.5 (CGS)	
16	4	eP S	ZNE ZNE	13	56	18 37							Samoa Islands region	
17	4	iP	ZNE	15	24	42.9							u	
18	4	iP S	ZNE ZNE	15	25	21.6 40							d	
19	4	P S	ZNE ZNE	23	50 51	45 09								
20	5	eP iS	ZNE ZNE	02	07 08	48 31								
21	5	iP iS	ZNE ZNE	10	57 58	50 09							u Samoa Islands region	
22	5	eiP S T	ZNE ZNE ZNE	14	37 38 43	55 45 32						5.2	USCGS: 18.1S, 174.7W. Tonga Islands h about 137 km. H = 14 36 41.5 Mag. 4.9-5.3(BRK), 5.1(CGS)	
23	5	eP eS eSS eSSS eL eL	Z ZNE ZN ZN ZN ZNE	18	27 36 40 43 46 47	20 06 06 24 00 00						66.0	USCGS: 9.6N, 126.3E. Mindanao, Philippine Islands Felt at Cagayan de Oro and Surigao h about 61 km. H = 18 16 39.6 Mag. 6-6 $\frac{1}{2}$ (GOL), 5 $\frac{3}{4}$ -6(PAL).	
24	5	iP eS eL	ZNE N Z	21	24 28 29	58.0 12 36						18.4	u USCGS: 21.8S, 170.9E. Loyalty Islands region h about 86 km. H = 21 20 49.8 Mag. 5.3 (CGS)	





No	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te	$\Delta$ (Deg.)	Remarks
41	9	eP eS	ZNE ZNE	22 40	38 37	40						10.4	USCGS: 21.7S, 178.9W. Fiji Islands region h about 544 km. H = 22 36 20.2 Mag. 4.5 (CGS)
42	9	eP iS	ZNE ZNE	23	58 59	46 02							Samoa Islands region
43	10	eP S	ZNE ZNE	02	34 35	42 02							Samoa Islands region
44	10	iP S	ZNE NE	06	39 41	58.3 32							d
45	10	iP i eS eL eT	ZNE Z ZNE ZN ZNE	07	16 46 20 22 40	26.6 36 06 23	3.5	1.0				23.5	u USCGS: 36.3S, 179.4E. Off east coast of North Island, N.Z. h about 76 km. H = 07 11 22.1 Mag. 5.4-5.7(BRK), 5.7(CGS)
46	10	iP iS	ZNE ZNE	11	54 53	32.3							u Samoa Islands region
47	10	eP eS	ZNE ZNE	16	20 21	25 18							
48	10	eP eS	ZNE ZNE	23	56	01 45							
49	11	iP	ZNE	08	27	15.5						3.1	une USCGS: 16.2S, 173.9W. Tonga Islands Felt at Apia h about 112 km. H = 08 26 32.8 Mag. 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (PAS), 6-6.3(BRK), 6.0(CGS)
50	11	eP eS	ZNE ZNE	10	07	04 37							
51	11	eP S	ZNE ZNE	13	33 34	18 09							
52	11	eP S e(T)	ZNE ZNE ZNE	15	01 03 12	25 25 10							
53	11	eP eS	ZNE ZNE	18	05	17 47							
54	12	eP eS eT	ZNE ZNE ZNE	01	28 29 31	24 06 42							
55	12	eIP S	ZNE ZNE	08	28	19 41							
56	12	eP (S) e(T)	ZNE ZNE ZNE	09	34 35 41	22 36 25							
57	12	eP S i	ZNE ZNE ZNE	11	56 57 59	56 27 20							
58	12	iP iS T	ZNE ZNE ZNE	18	24 25 28	38 32 45						5.1	u USCGS: 14.9S, 176.9W. Fiji Islands region h about 33 km. H = 18 23 34.1 Mag. 5.3 (CGS)

No	Date	Phase		Time			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
				(G.M.T.)										
59	12	eP eS	ZNE ZNE	19 02 04	13.5 31							13.6	USCGS: 24.3S, 179.0E. South of Fiji Islands h about 472 km. H = 18 59 18.0 Mag. 4.5 (CGS)	
60	12	eS eL	NE Z	21 40 43	40 30							38.3	USCGS: 6.1S, 150.3E. New Britain region h about 47 km. H = 21 24 27.1 Mag. 4.8 (CGS)	
61	13	iP iS	ZNE ZNE	20 27 29	34 10							9.1	u USCGS: 20.5S, 178.1W. Fiji Islands region h about 520 km. H = 20 25 32.1 Mag. 5.1-5.5(BRK), 5.0(CGS)	
62	14	eP iS T	ZNE NE ZNE	09 57 58 10 01 04	42 21 04									
63	14	eP eiS e(T)	ZNE ZNE ZNE	12 39 40 43	48 27 13									
64	14	eP eS	Z NE	18 02 05	30 32							13.8	USCGS: 26.5S, 177.5W. South of Fiji Islands h about 38 km. H = 17 59 25.9 Mag. 4.5 (CGS)	
65	14	iP S eT	ZNE ZNE ZNE	18 48 51 19 01 26	30.6 00 26							14.9	d? USCGS: 27.9S, 176.8W. Kermadec Islands h about 30 km. H = 18 45 11.6 Mag. 5.2 (CGS)	
66	15	eL	NE	07 16 24								88.0	USCGS: 41.9S, 88.4E. Southeast Indian Rise h about 33 km. H = 06 34 31.9 Mag. 5.2 (CGS)	
67	15	eP	ZNE	09 39 36								19.4	USCGS: 21.3S, 169.5E. Loyalty Islands region h about 50 km. H = 09 35 10.5 Mag. 4.8 (CGS)	
68	16	iP S	ZNE ZNE	03 46 58	39.7 58									Samoa Islands region
69	16	iP iS	ZNE ZNE	05 11 43	25.2 43									u Samoa Islands region
70	17	e(L) eL	N E	04 14 15	30 48							26.5	USCGS: 10.5S, 161.4E. Solomon Islands h about 39 km. H = 04 03 13.3 Mag. 5.4 (CGS)	
71	17	eP eS	Z ZNE	17 01 03	25 35							13.0	USCGS: 24.0S, 179.7E. South of Fiji Islands h about 577 km. H = 16 58 48.4 Mag. 4.6 (CGS)	



6.

No	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te	$\Delta$ (Deg.)	Remarks
72	17	e(P) ZNE	20	25	04							62.0	USCGS: 3.4N, 128.1E. North of Halmahera h about 62 km. H = 20 14 32.8 Mag. 5.7 (CGS)
73	18	iP eiS ZNE ZNE	07	25 27	41.1 47	3.9	1.8					12.1	d USCGS: 23.2S, 179.8W. South of Fiji Islands h about 522 km. H = 07 23 02.6 Mag. 5.0 (CGS)
74	18	iP S ZNE ZNE	11	05 06	34.1 08								d
75	18	eP eS eT ZNE ZNE ZNE	18	11 12 18	29 39 06								
76	18	eP eS ZE NE	21	46 48	08 00							9.7	USCGS: 15.9S, 178.4E. Fiji Islands h about 33 km. H = 21 43 52.8 Mag. 4.7 (CGS)
77	19	eP (S) ZNE ZNE	01	34 35	48 26								
78	19	P S ZNE ZNE	01	36 37	37 24							3.7	USCGS: 17.4S, 172.8W Tonga Islands region h about 33 km. H = 01 35 49.2 Mag. $6\frac{1}{2}$ - $6\frac{3}{4}$ (GOL), 5.2(CGS)
79	19	eP ZNE	13	13	15								
80	19	iP S ZNE ZNE	19	08 09	43 05							2.2	d USCGS: 15.1S, 173.6W. Tonga Islands h about 33 km. H = 19 08 15.1 Mag. 4.6 (CGS)
81	19	eiP eS eL eT ZNE NE ZNE ZNE	19	20 23 24 34	52 28 20 16				5.221.0			13.5	USCGS: 26.4S, 177.4W. South of Fiji Islands h about 23 km. H = 19 17 46.8 Mag. 5.1 (CGS)
82	20	iP S ZNE ZNE	00	24	29 49								d Samoa Islands region
83	20	iP iS ZNE ZNE	04	11 12	54.8 21								u
84	20	iP S ZNE ZNE	08	57 58	57.4 22								d
85	20	iP S ZNE ZNE	12	54	23.7 43							2.0	d USCGS: 15.1S, 173.4W. Tonga Islands h about 33 km. H = 12 53 59.8 Mag. 4.8 (CGS)
86	21	iP iS ZNE ZNE	16	31	21.6 42								u Samoa Islands region



No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
100	26	eP eiS	ZNE ZNE	21 31	28 55	54 55						17.4	USCGS: 30.3S, 178.0W. Kermadec Islands region h about 60 km. H = 21 24 59.3 Mag. 4.9 (CGS)	
101	27	eiP iS	ZNE ZNE	12	33 34	39 50						7.4	USCGS: 19.9S, 176.1W. Fiji Islands region h about 225 km. H = 12 32 02.6 Mag. 4.5 (CGS)	
102	27	iP eiS	ZNE ZNE	21	13 16	55.4 16	2.0	1.0				14.2	d USCGS: 25.5S, 179.6E. South of Fiji Islands h about 525 km. H = 21 11 00.9 Mag. 5.0 (CGS)	
103	27	eP eS eSS eL eL	ZNE ZN ZN ZN ZE	22	46 54 57 01 03	13 08 24 04 36						55.0	USCGS: 4.3S, 133.3E. West New Guinea region h about 33 km. H = 22 36 43.3 Mag. 5.5 (CGS)	
104	27	iP iS	ZNE ZNE	23	47 48	40.5 15							u	
105	28	e(SKKS)ZE		01	45	36						85.0	USCGS: 15.1N, 92.1W. Mexico-Guatemala border region h about 111 km. H = 01 07 37.6 Mag. 5-5 $\frac{1}{2}$ (PAL), 5.2(CGS)	
106	28	eP i eS eL	ZNE Z ZN ZNE	05	49 50 54 55	59 12 08 40						21.9	USCGS: 10.8S, 166.0E. Santa Cruz Islands h about 42 km. H = 05 45 06.6 Mag. 5.2 (CGS)	
107	28	ePKP	Z	08	00	01						154.0	USCGS: 37.9N, 20.9E. Ionian Sea Felt at Peloponnesus h about 6 km. H = 07 39 57.1 Mag. 5.4 (CGS)	
108	28	eP eS	ZNE ZNE	17	34 36	33 19								
109	29	e(P)	Z	08	37	50								
110	29	eP e(S)	Z NE	15	57 59	37 11								
111	30	eP eiS	ZNE ZNE	00	46 48	38 30	1.6	0.8				10.5	USCGS: 21.5S, 179.4W. Fiji Islands region h about 626 km. H = 00 44 20.9 Mag. 4.6 (CGS)	
112	30	iP iS	Z ZNE	02 03	59 01	34.3 04	8.2	0.9				7.4	d USCGS: 18.0S, 178.2W. Fiji Islands region h about 620 km. H = 02 57 44.0 Mag. 4.2 (CGS)	



9.

No	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te	$\Delta$ (Deg.)	Remarks
113	30	iP eS	ZNE ZNE	08 19	04 32								
114	30	eP S eT	ZNE ZNE ZNE	19 20 21 27	26 44 07						7.6	USCGS: 21.2S, 174.2W. Tonga Islands h about 70 km. H = 19 18 47.5 Mag. 4.6 (CGS)	
115	30	eiP eiS	ZNE ZNE	22 15	25 55								
116	31	eP S	ZNE ZNE	00 41 42	59 36								
117	31	eP S T	ZE ZE ZE	10 44 47	19 52 33								
118	31	eP S	ZE ZE	12 55	30 53								
119	31	eP	ZE	13 54	45	0.6	0.9				19.4	USCGS: 16.3S, 168.4E. New Hebrides Islands h about 243 km. H = 13 50 37.8 Mag. 4.9 (CGS)	

## NOTE:

- (i) Trace amplitude (A) are expressed in millimetres and periods (T) in seconds.
- (ii) The small letters in the Remarks column indicate the direction of initial movement. u indicates an upwards ground movement, d a downwards one, n,s,e, and w towards north, south, east, and west respectively.
- (iii) \* Readings to be incorporated in the New Zealand Seismological Report for 1968.

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OBSERVER-IN-CHARGE

12 Dec 1968

NEW ZEALAND  
 Department of Scientific and Industrial Research  
 Geophysics Division  
 APIA OBSERVATORY

FINAL SEISMOLOGICAL BULLETIN  
STANDARD SEISMIC STATION (AFT)

AFIAMALU, WESTERN SAMOA

Latitude:  $13^{\circ} 54' 33.6''$ S Longitude:  $171^{\circ} 46' 38.1''$ W

Height above mean sea level: 705.6 metres, 2315 ft.

Geocentric direction cosines: a. - 0.961 070

b. - 0.138 883

c. - 0.238 862

Lithological Foundation: Basaltic Lava Flows

Instruments: World-wide standard seismograph system

Benioff short period seismometers

To = 1.0 sec. Tg = 0.75 sec.

Sprengnether long period seismometers

To = 15 sec. Tg = 100sec.

Nominal Magnifications: S.P. 12500

L.P. 750

APRIL 1968 \*

No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks	
1	1	eP	ZE	00	07	41							3.8	USCGS: 16.1S, 175.0W. Tonga Islands h about 280 km. H = 00 06 40.2 Mag. 4.2 (CGS)	
		S	ZE		08	26									
2	1	eP	ZE	00	53	19							71.0	USCGS: 32.5N, 132.2E, Shikoku, Japan 1 killed, 22 injured minor damage on Kyushu. Felt on Shikoku and Southern Honshu. 2.3 meters Tsunami along east coast of Kyushu. h about 33 km. H = 00 42 04.2 Mag. $7\frac{1}{2}$ - $7\frac{3}{4}$ (PAS), 7.3-7.7(BRK), $7\frac{1}{4}$ - $7\frac{1}{2}$ (GOL).	
3	1	eP	ZNE	02	24	30									
		S	ZNE			58									
		eT	ZNE		27	47									
4	1	eP	Z	02	31	50							41.6	USCGS: 5.9S, 146.6E. East New Guinea region h about 60 km. H = 02 24 03.4 Mag. 4.9 (CGS)	
5	1	eP	ZE	06	45	17							54.7	USCGS: 2.9S, 133.9E. West New Guinea region h about 33 km. H = 06 35 48.0 Mag. 5.5 (CGS)	





No	Date	Phase	Time (G.M.T.)			Az Tz An Tn Ae Te						△ (Deg.)	Remarks
23	5	eP eiS	ZNE ZNE	08 25	22 04	45						13.7	USCGS: 25.3S, 179.9W. South of Fiji Islands h about 462 km. H = 08 19 49.8 Mag. 4.4 (CGS)
24	5	iP S	ZNE ZNE	13 03	02 11	52							u
25	5	iP eiS	ZNE ZNE	17 54	52 31	53	2.0	0.8				8.9	u USCGS: 20.3S, 178.2W. Fiji Islands region h about 540 km. H = 17 50 51.3 Mag. 4.2 (CGS)
26	5	eP S eT	ZNE E ZNE	21 22	58 01	17 00 50							
27	6	eP eS	Z ZNE	06	55 06	08						10.9	USCGS: 21.8S, 179.5W. Fiji Islands region h about 610 km. H = 06 52 47.1 Mag. 4.2 (CGS) Samoa Islands region
28	6	eP S	ZNE ZNE	08	49 50	50 09							
29	6	iP	Z	09	19	59.6							d
30	6	iP S	ZNE ZNE	16	57 58	37.8 07						3.1	une USCGS: 16.2S, 173.8W. Tonga Islands h about 96 km. H = 16 56 55.0 Mag. 4.4 (CGS)
31	6	eP S T	ZNE ZNE ZNE	19	02 04	17 44 38							
32	6	iP iS	Z NE	22	33	16.4 33							u Samoa Islands region
33	7	eP eS	ZNE NE	01	33 34	23 20						6.0	USCGS: 16.9S, 177.2W. Fiji Islands region h about 33 km. H = 01 31 57.0 Mag. 5.0 (CGS)
34	7	eS eL	ZNE ZN	05	00 10	00 00						65.0	USCGS: 51.5N, 176.5E. Rat Islands, Aleutian Islands h about 33 km. H = 04 40 19.3 Mag. 5.3 (CGS)
35	8	eP e(S) e(T)	Z NE ZNE	03 04	59 00 03	30 39 44							
36	8	eP S T	ZNE ZNE ZNE	10	35 36 39	48 24 28						3.9	USCGS: 17.5S, 173.1W. Tonga Islands h about 33 km. H = 10 34 56.8 Mag. 4.2 (CGS)
37	8	iP	Z	13	02	21							u



£

No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						△ (Deg.)	Remarks
50	12	iP eiS	Z ZNE	16 37 39	42.2 18							8.7	d? USCGS: 20.3S, 177.9W. Fiji Islands region h about 459 km. H = 16 35 38.3 Mag. 4.6 (CGS)	
51	12	eP eS	Z ZNE	18 20 21	39 50							7.3	USCGS: 19.8S, 176.0W. Fiji Islands region h about 168 km. H = 18 18 56.7 Mag. 4.2 (CGS)	
52	13	iP eS	ZNE ZNE	00 18 19	14 16								d	
53	14	eP eS	Z ZNE	02 29 30	50 45									
54	14	eL	ZN	09 11	30							65.0	USCGS: 33.4N, 141.4E. Off east coast of Honshu, Japan. h about 44 km. H = 08 37 12.2 Mag. 5.4 (CGS)	
55	14	eL	ZN	13 35	00							65.0	USCGS: 33.4N, 141.4E. Off east coast of Honshu, Japan. h about 41 km. H = 13 05 08.0 Mag. 5.4 (CGS)	
56	14	iP S	ZNE ZNE	14 49 50	06 35	3.0	1.0					7.7	dne USCGS: 17.5S, 178.8W. Fiji Islands region h about 550 km. H = 14 47 14.9 Mag. 4.6 (CGS)	
57	14	iP S	Z ZNE	15 10 11	43.2 03								d Samoa Islands region	
58	15	eP iS	Z ZNE	22 01	19 42									
59	16	eP iS	ZNE ZNE	11 50 51	57 21									
60	17	eP eiS	ZNE ZNE	10 58 59	49 14								Samoa Islands region	
61	18	eP eS	ZE NE	04 37 40	43 05							14.0	USCGS: 25.7S, 179.5W. South of Fiji Islands h about 379 km. H = 04 34 40.6 Mag. 4.9 (CGS)	
62	18	e(S) eL	ZN ZN	07 08 14	00 36									
63	18	eiP iS eT	ZNE ZNE ZNE	10 01 03 12	42 55 02							13.0	USCGS: 25.5S, 177.9W. South of Fiji Islands h about 230 km. H = 09 58 53.3 Mag. 5.1 (CGS)	
64	18	eP S	Z ZNE	11 27	04 22								Samoa Islands region	





No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
82	23	iP	Z	20	40	52	2.1	2.0					75.0	d USCGS: 58.7N, 150.0W. Gulf of Alaska. Felt on Kodiak. h about 23 km. H = 20 29 14.5 Mag. 6-6 $\frac{1}{4}$ (PAS), 5.1-6.1(BRK), 6-6 $\frac{1}{4}$ (GOL). 6.3(CGS).
		eS	ZNE		50	28								
		eSSS	E		59	18								
		eL	ZN	21	03	48								
83	23	iP	ZNE	21	27	53								une Samoa Islands region
		S	ZNE		28	13								
84	24	iP	ZE	02	12	07								ue Samoa Islands region
		S	ZNE			27								
85	24	eP	ZNE	08	19	53								Samoa Islands region
		S	ZNE		20	11								
86	24	ePKP	ZNE	08	37	55	0.6	1.0					152.0	USCGS: 39.3N, 24.9E. Aegean Sea Felt on Ayios Efstratios and in northwestern Anatolia. h about 17 km. H = 08 18 02.5 Mag. 5.2 (CGS)
87	24	iP	Z	14	05	58							39.4	u USCGS: 4.6S, 149.4E. Bismarck Sea. h about 565 km. H = 13 59 14.5 Mag. 5.0 (CGS)
88	24	iP	Z	16	24	16								u
		eS	ZNE		25	52								
89	24	eP	ZNE	18	26	37								
		iS	ZNE			59								
90	24	iP	Z	22	38	10							10.0	d USCGS: 20.9S, 179.2W. Fiji Islands region h about 640 km. H = 22 35 53.3 Mag. 4.3 (CGS)
		eS	ZNE		40	00								
91	24	eP	ZNE	23	54	38	0.8	1.0					58.0	USCGS: 6.9S, 129.2E. Banda Sea h about 52 km. H = 23 44 46.2 Mag. 5.1 (CGS)
		e	NE	00	03	00								
		eL	ZE		13	12								
92	25	e(S)	NE	17	27	12							32.3	USCGS: 7.1S, 156.2E. Solomon Islands h about 419 km. H = 17 14 27.7 Mag. 5.0 (CGS)
93	25	eP	ZNE	17	48	15							33.9	USCGS: 4.5S, 155.1E. Solomon Islands h about 476 km. H = 17 42 08.7 Mag. 4.7 (CGS)







No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
109	27	eP eS eL	Z N ZE	11 03 09	19 02 08							22.9	USCGS: 10.5S, 165.1E. Santa Cruz Islands h about 75 km. H = 10 58 21.5 Mag. 5.1 (CGS)	
110	27	iP S	ZNE ZNE	14 00 01	06.8 56	1.0	0.8					10.2	d? USCGS: 21.2S, 179.2W. Fiji Islands region h about 670 km. H = 13 57 50.1 Mag. 4.5 (CGS)	
111	27	eP S	ZNE ZNE	15 04 05	42 00								Samoa Islands region	
112	27	iP eS	ZNE ZNE	16 30 32	55.2 25								d	
113	27	eP eS	ZNE ZNE	18 01 02	15 45									
114	27	eP iS	ZNE ZNE	18 47 07	25								Samoa Islands region	
115	28	e(P) e(S)	Z ZNE	13 24 26	47 24									
116	28	eP S	ZNE ZNE	16 40 29	46								Samoa Islands region	
117	28	eP S	ZNE ZNE	18 20 21	44 02								Samoa Islands region	
118	28	eiP S	ZNE ZNE	21 08 19	40								Samoa Islands region	
119	29	eP eS	ZNE ZNE	09 35 37	15 06							10.4	USCGS: 21.3S, 179.5W. Fiji Islands region h about 640 km. H = 09 32 56.8 Mag. 4.5 (CGS)	
120	30	iP iS	ZNE ZNE	05 46 05.6	27								u Samoa Islands region	
121	30	eP iS	ZNE ZNE	14 03 04	51 11								Samoa Islands region	
122	30	ei(P) (P) eS eS e eT	ZNE ZNE ZNE NE Z ZNE	18 46 47 48 49 54	51 17 11 32 26 03							8.0	USCGS: 21.4S, 174.5W. Tonga Islands h about 197 km, H = 18 45 24.0 Mag. 4.5 (CGS)	

- NOTE:
- (i) Trace amplitude (A) are expressed in millimetres and periods (T) in seconds.
  - (ii) The small letters in the Remarks column indicate the direction of initial movement. u indicates an upwards ground movement, d a downwards one, n,s,e, and w towards north, south, east, and west respectively.
  - (iii) \*Readings to be incorporated in the New Zealand Seismological Report for 1968.









3.

No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						△ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
22	5	eP S	ZNE ZNE	09	00	12 28								Samoa Islands region
23	5	eP	ZNE	09	11	30						28.1	USCGS: 39.3S, 174.7E North Island, New Zealand h about 225 km H = 09 05 56.3 Mag. 5.1 (CGS)	
24	5	eP eS eS	ZE NE Z	10	50	11 36 08						12.4	USCGS: 16.6S, 175.7E Fiji Islands region h about 37 km H = 10 47 15.5 Mag. 5.0 (CGS)	
25	5	eP S	ZNE ZNE	19	52	03 20								Samoa Islands region
26	6	iP eiS	Z ZNE	07	39	58 32	1.1	1.0						d?
27	6	eP S	ZNE ZNE	16	38	14 30								Samoa Islands region
28	6	eP S e	ZNE NE NE	17	42	00 00 16						21.8	USCGS: 34.5S, 179.3W South of Kermadec Islands h about 155 km H = 17 37 22.0 Mag. 4.4 (CGS)	
29	7	e(P)	ZNE	02	52	34								
30	7	eP iS	ZNE NE	04	24	14 07								
31	7	iP	Z	05	19	41.5								d
32	7	eP e(S)	ZNE ZNE	09	57	12 42								
33	7	eP S	ZNE ZNE	10	42	44 05								
34	7	iP S	ZNE ZNE	11	45	27.5 57	5.5	0.5				7.7	u USCGS: 19.2S, 177.6W Fiji Islands region h about 533 km H = 11 43 31.6 Mag. 4.9 (CGS)	
35	7	iP eiS	ZNE ZNE	17	55	45.4 12						7.9	u USCGS: 18.8S, 178.1W Fiji Islands region h about 500 km H = 17 53 54.5 Mag. 4.5 (CGS)	
36	7	eP	ZNE	19	54	39	1.0	1.0						

No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
37	8	eP	ZNE	00	18	04	2.0	1.0					7.6	USCGS: 17.8S, 178.6W Fiji Islands region h about 589 km H = 00 16 08.7 Mag. 4.7 (CGS)
38	8	iP S	Z ZNE	04 12	11 04	47.1								d Samoa Islands region
39	8	iP	Z	07	18	09.1							11.4	USCGS: 21.9S, 179.8E South of Fiji Islands h about 554 km H = 07 15 37.0 Mag. 3.8 (CGS)
40	8	eP eS eSSS eL	Z ZNE NE ZN	11 16 21 23	08 20 36 12	57							51.0	USCGS: 58.0S, 157.7E Macquarie Island region h about 33 km H = 11 00 07.4 Mag. 5 $\frac{3}{4}$ (GOL), 5.7(CGS)
41	8	eP eS eSS e(SSS) eL eL	ZNE ZNE ZNE ZNE NE ZN	12 37 41 45 47 48	28 32 52 24 00 30	22		12.5	22.0				69.0	USCGS: 43.6N, 127.9W Off coast of Oregon h about 33 km H = 12 17 13.4 Mag. 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (PAL), 6.1 (CGS)
42	8	iP eS	Z ZNE	18 33	31 34	31.3								d
43	8	iP S	Z ZNE	18 50	49 00	39								u Samoa Islands region
44	8	iP S eT	Z ZNE ZNE	23 51 00	49 09 27	08.5							13.5	u USCGS: 26.6S, 176.3W South of Fiji Islands h about 33 km H = 23 45 48.8 Mag. 4.7 (CGS)
45	9	eP eS eT	ZNE ZNE ZNE	07 27 42	24 27 18	13							19.1	USCGS: 31.8S, 178.7W Kermadec Islands h about 12 km H = 07 19 55.0 Mag. 5.0 (CGS)
46	9	eP iS	ZNE NE	08 04	03 10	49								Samoa Islands region
47	9	eP	Z	12	33	01							19.8	USCGS: 32.7S, 178.1W South of Kermadec Islands. h about 33 km H = 12 28 31.0 Mag. 4.8 (CGS)
48	9	eiP	Z	13	05	18							89.0	USCGS: 5.3S, 81.7W Near coast of north- ern Peru h about 35 km H = 12 52 24.4 Mag. 5.6 (CGS)





No.	Date	Phase	Time (G.M.T.)	Az Tz An Tn Ae Te	$\Delta$ (Deg.)	Remarks
63	13	eP S eT	ZNE ZNE ZNE	02 56 35 58 40 03 08 03		12.8 USCGS: 25.7S, 176.7W South of Fiji Islands h about 56 km H = 02 53 37.2 Mag. 4.5 (CGS)
64	13	eP eS e	ZE ZNE Z	04 00 26 04 00 05 20		18.9 USCGS: 19.0S, 169.6E New Hebrides Islands h about 13 km H = 03 56 09.2 Mag. 5.1 (CGS)
65	13	eP S T	Z ZNE ZNE	16 00 22 41 02 14		Samoa Islands region
66	14	eP S	Z ZNE	01 15 09 46		
67	14	eiP S	ZNE ZNE	01 16 33 17 21		4.9 USCGS: 18.6S, 172.5W Tonga Islands region h about 39 km H = 01 15 24.9 Mag. 5.0 (CGS)
68	14	eP eS	Z ZNE	04 18 13 19 30		
69	14	eiP S	ZNE ZNE	05 39 32 41 27		11.1 USCGS: 23.8S, 176.9W South of Fiji Islands h about 122 km H = 05 37 05.3 Mag. 4.9 (CGS)
70	14	eiP iPcP iS eSS eSSS eL eL	ZNE ZNE ZNE Z ZNE ZN ZNE	14 16 11 50 25 20 29 42 33 42 35 18 38 24	9.0 19.0	72.0 USCGS: 29.9N, 129.4E Ryukyu Islands h about 168 km H = 14 05 06.0 Mag. 6 $\frac{1}{2}$ (PAS), 5.6-6(BRK), 5 $\frac{1}{2}$ (PAL), 5.9 (CGS)
71	14	eiP	ZE	23 27 10		6.4 USCGS: 14.8S, 178.3W Fiji Islands region h about 339 km H = 23 25 34.0 Mag. 4.2 (CGS)
72	15	eP eS	ZNE NE	02 41 04 42 35		7.6 USCGS: 18.0S, 178.6W Fiji Islands region h about 650 km H = 02 39 12.0 Mag. 4.3 (CGS)
73	15	iPKP	Z	08 10 56	4.0 1.1	145.0 d USCGS: 15.9S, 25.9E Zambia Felt h about 33 km H = 07 51 17.4 Mag. 6.1 (CGS)



No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks	
83	16	eS eL	NE ZNE	09 29	18 36	24 36							69.0	USCGS: 41.4N, 142.7E Hokkaido, Japan region h about 15 km H = 08 58 11.1 Mag. 5.4 (CGS)	
84	16	eP iS iSS i iL eT	ZNE ZNE Z Z Z ZNE	10 11 11 12	50 59 03 07 10 05	08 16 52 00 00 02							69.0	USCGS: 41.5N, 142.7E Hokkaido, Japan region Felt. Hachinohe recorded 1.2 meters Tsunami h about 33 km H = 10 39 01.6 Mag. 7(PAS), 7.3(BRK), 7 (PAL)	
				Surface waves lasting 3 hours.											
85	16	eP	Z	11	18	16									
86	16	eP	Z	13	40	08									
87	16	eP S T	ZNE ZNE ZNE	13	44 46 47	18 46 01									
88	16	eP eS eS eSS e eL	Z ZN E Z NE ZNE	16	24 33 34 38 41 44	40 40 00 00 18 00							67.0	USCGS: 39.7N, 143.6E Off east coast of Honshu, Japan h about 29 km H = 16 13 45.1 Mag. 6.4-6.6 (BRK), 5.6 (CGS)	
89	16	iP S	ZNE ZNE	18	41	28.1 49									u Samoa Islands region
90	16	eS eL	ZN ZNE	19	03 14	24 30							69.0	USCGS: 40.7N, 142.1E Near east coast of Honshu, Japan h about 59 km H = 18 43 21.0 Mag. 5.7 (CGS)	
91	16	eS eL	ZN ZNE	19	37 48	24 18							69.0	USCGS: 41.3N, 142.4E Hokkaido, Japan region h about 42 km H = 19 16 47.2 Mag. 5.5-5.8 (BRK), 5.6 MB 5.4 MS (CGS)	
92	16	eL eL	NE Z	20	08 09	30 36							54.0	USCGS: 12.6N, 141.6E South of Mariana Islands h about 170 km H = 19 45 23.5 Mag. 5.2 (CGS)	
93	16	eS eL	ZNE ZNE	20	42 53	18 30							69.0	USCGS: 41.4N, 142.6E Hokkaido, Japan region h about 39 km H = 20 22 14.9 Mag. 5.4-5.7 (BRK), 5.6 (CGS)	



No.	Date	Phase	Time (G.M.T.)	Az Tz An Tn Ae Te	$\Delta$ (Deg.)	Remarks	
94	16	eP ZNE iS ZNE eSSS ZNE e E eL ZN	23 15 52 24 54 32 32 34 44 35 36	25.5 20.0	67.0	USCGS: 39.8N, 143.1E Off east coast of Honshu, Japan h about 37 km H = 23 04 54.7 Mag. 5.8(CGS), 6.4- 6.7 (BRK)	
		No readings due to time mark failure from 01h 27m on 17th until 00h 11m on 21st.					
95	21	eS NE eL ZNE	00 39 24 50 30		67.0	USCGS: 44.8N, 150.2E Kurile Islands region h about 45 km H = 00 19 34.8 Mag. 5.2 (CGS)	
96	21	eP Z e(S) E	05 56 37.5 58 10				
97	21	eP ZNE eS ZNE eSSS E eL ZN	08 31 09 40 00 47 40 50 40		67.0	USCGS: 44.9N, 150.2E Kurile Islands region h about 33 km H = 08 20 00.9 Mag. 5.7 MB 6.2MS(CGS)	
98	21	e(P) ZNE e ZNE eL ZN	11 14 08 26 08 31 12		67.0	USCGS: 44.7N, 150.2E Kurile Islands region h about 33 km H = 11 00 44.6 Mag. 5.1 (CGS)	
99	21	eL ZN	17 34 08		50.0	USCGS: 63.7S, 171.7E Ballerby Islands region h about 24 km H = 17 11 06.0 Mag. 5.0 (CGS)	
100	21	eS N eL ZNE	19 07 32 18 08		66.0	USCGS: 44.8N, 150.3E Kurile Islands region h about 51 km H = 18 47 30.5 Mag. 5.2 (CGS)	
101	21	e N eL ZE	21 28 40 30 04		23.8	USCGS: 10.8S, 164.0E Santa Cruz Islands region h about 15 km H = 21 18 22.2 Mag. 4.9 (CGS)	
102	22	eP ZNE eS ZNE eL ZNE eT ZNE	00 22 05 25 18 26 18 39 42		17.5	USCGS: 30.4S, 177.8W Kermadec Islands region h about 43 km H = 00 18 05.9 Mag. 4.7 (CGS)	
103	22	eS NE eSSS NE eL ZNE	11 12 12 19 44 23 12		68.0	USCGS: 41.5N, 142.8E Hokkaido, Japan region h about 40 km H = 10 51 53.3 Mag. 6.2-6.6(BRK), 5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (PAL), 5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (GOL), 5.9 MB 6.3 MS (CGS)	





No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						△ (Deg.)	Remarks
114	24	eP eSS eL	ZNE NE ZN	21 11 13	03 12 12	47						31.4	USCGS: 41.8S, 172.0E South Island, New Zealand h about 33 km H = 20 57 27.3 Mag. 5.7 MB MS (CGS)	
115	25	iP S	ZNE ZNE	00 23	22 08	51.0							une Samoa Islands region	
116	25	iP S	ZNE ZNE	06 41	40 09	50							une Samoa Islands region	
117	25	eS eS eSS eSSS eL eL	ZN E Z NE E ZNE	12 17 19 21 23	13 32 24 32 00 52	00						68.0	USCGS: 40.1N, 143.1E Off east coast of Honshu, Japan h about 74 km H = 11 52 57.4 Mag. 5.3 MB 5.2MS (CGS)	
118	25	iP S	ZNE ZNE	15 07	06 06	43.4							u	
119	25	eP eS	ZNE ZNE	21 26	25 23	11								
120	25	eP	Z	23	55	38	0.5	1.0				31.6	USCGS: 42.0S, 171.8E South Island, New Zealand h about 28 km H = 23 49 16.7 Mag. 5.1 (CGS)	
121	26	eP S	ZNE ZNE	09 21	20 58	45						5.8	USCGS: 16.5S, 177.5W Fiji Islands region h about 431 km H = 09 19 17.0 Mag. 4.0 (CGS)	
122	26	eP eS eL	ZNE ZNE ZNE	14 15	50 58 04	56 12 28						50.0	USCGS: 63.3S, 170.7E Balleny Islands region h about 9 km H = 14 41 52.0 Mag. 5.5MB 5.9MS (CGS)	
123	27	iP S	Z ZNE	11 51	50 17	56							Samoa Islands region	
124	27	iP S	ZNE ZNE	15	29 30	23.5							use Samoa Islands region	
125	27	eP eS eS eT	ZNE N ZE ZNE	19 05 11	04 44 47 42	28						7.9	USCGS: 21.3S, 174.5W Tonga Islands h about 100 km H = 19 02 50.0 Mag. 4.7 (CGS)	
126	28	eP eS	Z ZNE	01 35	32 36	26						17.8	USCGS: 30.9S, 177.4W Kermadec Islands region h about 33 km H = 01 28 22.1 Mag. 4.8 (CGS)	





No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						△ (Deg.)	Remarks
138	29	iP eS	Z NE	17 30	25 04	59.1						19.1	u USCGS: 18.6S, 169.0E New Hebrides Islands Felt at Port Vila h about 214 km H = 17 21 52.9 Mag. 5.1 (CGS)	
139	29	iP iS	Z ZNE	21 15	14 26	53.5							u	
140	29	eP S	ZNE ZNE	22 34	33 12	50							Samoa Islands region	
141	30	eP eS e eL	Z ZNE E ZN	05 43 51 54	34 44 42 00	40						66.0	USCGS: 44.7N, 150.3E Kurile Islands region h about 49 km H = 05 23 48.9 Mag. 5.4-5.8(BRK), 5.5MB 5.8MS (CGS)	
142	30	eS e eL	NE NE ZE	10 20 23	13 00 30	30						59.0	USCGS: 6.7S, 129.5E Banda Sea h about 33 km H = 09 55 32.0 Mag. 5.4 (CGS)	
143	30	ei(P)	Z	18	00	23.2	1.6	1.1						
144	30	eP eS L eT	ZNE ZNE ZNE ZNE	19 49 50 20	46 29 00 01	27						18.0	USCGS: 31.0S, 177.6W Kermadec Islands h about 42 km H = 19 42 25.1 Mag. 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (PAS), 5.5- 5.9(BRK), 5.5MB 6.2MS (CGS) Coda lasting 2 hours.	
145	31	iP iS	ZNE ZNE	11 59	58 03	09						4.8	u USCGS: 17.4S, 175.1W Tonga Islands h about 300 km H = 11 57 00.2 Mag. 4.4 (CGS)	
146	31	eP eS eT	Z E ZNE	12 13	46 48 04	16						18.2	USCGS: 31.4S, 176.9W Kermadec Islands h about 33 km H = 12 42 11.4 Mag. 4.8 (CGS)	
147	31	eP ei(S)	Z ZNE	14 50	48 25	35								
148	31	e	E	15	31	30								
149	31	eP eS	Z NE	17 47	46 24	26								
150	31	eP e(S) e e(ScS)	ZNE E N NE	18 27 29 35	25 48 00 48	06						20.5	USCGS: 13.6S, 167.2E New Hebrides Islands h about 205 km H = 18 20 42.7 Mag. 4.9 (CGS)	

No.	Date	Phase	Time (G.M.T.)			Az	Tz	An	Tn	Ae	Te	△ (Deg.)	Remarks
151	31	eP S	Z ZNE	22	45 46	55 49							

- NOTE:
- (i) Trace amplitude (A) are expressed in millimetres and periods (T) in seconds.
  - (ii) The small letters in the Remarks column indicate the direction of initial movement. u indicates an upwards ground movement, d a downwards one, n,s,e, and w towards north, south, east, and west respectively.
  - (iii) \* Readings to be incorporated in the New Zealand Seismological Report for 1968.

P.D. Muller  
OBSERVER-IN-CHARGE





No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
7	2	eP S	Z ZNE	04 21	19 00	40								
8	2	iP i eS e eL	Z ZE ZNE N ZE	08 29 30 32	24 49 28 48 24	39						29.6	d USCGS: 8.1S, 158.6E Solomon Islands Felt at Honiara h about 35 km H = 08 18 36.2 Mag. 5.6 MB 5.2 MS (CGS)	
9	2	eP eS	Z NE	18 19	17 05	06								
10	2	eP S	ZNE ZNE	18 46	44 34	53								
11	2	e(P) e(S)	Z ZNE	19 19	18 39	11								
12	3	iP e(S) e	ZE NE NE	09 31 34	25 24 40	16	4.5	1.0				46.3	uw USCGS: 5.4S, 147.0E East New Guinea region h about 190 km H = 09 17 46.2 Mag. 5.6 (CGS)	
13	3	eP S	Z ZNE	10 47	46 16	56							Samoa Islands region	
14	3	eP S T	Z ZNE ZNE	13 10 14	09 40 39	50								
15	4	eP S	ZNE ZNE	10 07	06 00	45							Samoa Islands region	
16	4	eP S	Z ZNE	19	17 09 36									
17	4	iP S	Z ZNE	21 36	35 15	59.3							u Samoa Islands region	
18	5	iP iS	Z ZNE	00 18	17 24	36.5							u	
19	5	iP S	ZNE ZNE	02	46 04.3 34									
20	5	iP S	ZNE unreadable due to rapid motion	06	51 42.5								une	
21	5	e(P)	ZNE	07	21 41									
22	5	eS e eL	NE N ZE	12 15 18	09 40 12	44	0.5	20.0		0.7	22.0	60.0	USCGS: 12.9S, 111.9E Northern Easter Island, Cordillera h about 33 km H = 11 51 40.0 Mag. 5.3 MB 5.1 MS (CGS)	

3.

No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
23	5	eP	Z	15	19	09							65.0	USCGS: 5.0N, 125.1E Mindanao, Philippine Islands h about 142 km H = 15 08 39.0 Mag. 5.1 (CGS)
24	5	eL	ZN	23	36	04							65.0	USCGS: 52.2N, 174.3E Near Islands, Aleutian Islands h about 41 km H = 23 05 36.8 Mag. 5.0 (CGS)
25	6	iP	Z	01	10	51.6								u
26	6	eP eS eL	Z NE Z	01 30 32	26 48 00								20.4	USCGS: 17.9S, 167.5E New Hebrides Islands h about 12 km H = 01 22 12.3 Mag. 5.0 (CGS)
27	6	eP eiS	ZNE ZNE	02 25	24 35	25								
28	6	iP eS eS eT	Z E ZN ZNE	12 01 05	00 16 28 03								6.2	u USCGS: 19.7S, 173.4W Tonga Islands h about 60 km H = 11 58 39.0 Mag. 4.8 (CGS)
29	6	eL	ZNE	20	18	40							74.0	USCGS: 14.9N, 119.9E Luzon, Philippine Islands Felt at Iba h about 80 km H = 19 44 07.9 Mag. 5.4 (CGS)
30	6	eL	ZNE	21	48	48							70.0	USCGS: 41.3N, 142.6E Hokkaido, Japan region h about 37 km H = 21 17 14.4 Mag. 5.3 (CGS)
31	7	eP iS	ZNE NE	05 28	27 46	40							5.8	USCGS: 17.0S, 176.9W Fiji Islands region h about 53 km H = 05 26 20.0 Mag. 4.6 (CGS)
32	7	eiP iS iL iL	ZNE ZNE N ZE	12 17 26 31	08 40 40 00	34	5.0	1.4					68.0	USCGS: 1.8S, 120.1E Celebes h about 20 km H = 11 57 29.4 Mag. 7.0 (PAS), 5.9 MB 6.7 MS (CGS)
33	7	eP eS	Z ZNE	16 34	32 11	30							9.5	USCGS: 20.6S, 178.6W Fiji Islands region h about 607 km H = 16 30 26.0 Mag. 4.4 (CGS)



No.	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
34	7	eP iS iS	ZNE ZE N	18 25 07	24 02	00						5.6	USCGS: 17.1S, 176.5W Fiji Islands region h about 72 km H = 18 22 47.0 Mag. 4.6 (CGS)	
35	7	eP eS eL	ZE NE ZN	21 22	41 00	51 12						68.0	USCGS: 2.1S, 120.5E Celebes h about 23 km H = 21 30 50.3 Mag. 6 $\frac{1}{4}$ (PAL), 5.5 MB 5.9 MS (CGS)	
36	8	eP eS i eL eL	ZE ZNE N E Z	00 28 29 30 31	22 00 42 48 02	51						30.4	USCGS: 8.8S, 157.6E Solomon Islands Felt at Honiara h about 33 km H = 00 16 39.5 Mag. 5.4 MB 5.7MS (CGS)	
37	8	eS eL	ZNE ZN	05 06	50 00	20 20						67.0	USCGS: 43.4N, 147.1E Kurile Islands h about 43 km H = 05 29 46.5 Mag. 4.8-5.2 (BRK), 5 $\frac{1}{4}$ -5 $\frac{1}{2}$ (PAL), 5 $\frac{1}{4}$ -5 $\frac{1}{2}$ (GOL), 5.3MB 5.3MS (CGS)	
38	8	iP	ZNE	14	30	05							d	
39	8	eiP S (T)	ZNE ZNE ZNE	21 32 37	31 22 10	19						6.1	USCGS: 19.6S, 173.6W Tonga Islands h about 60 km H = 21 30 00.0 Mag. 4.7 (CGS)	
40	8	ePP eSS eSSS e eL	ZN ZN ZN E ZN	23 00	53 04	16 47 02 52 20						115.0	USCGS: 48.8S, 31.5E South of Africa h about 33 km H = 23 24 05.2 Mag. 6 $\frac{1}{4}$ (PAL), 5.6MB 6.0MS (CGS)	
41	9	eP eS e	ZNE NE Z	02 37 38	36 52 10	40	0.7	1.0						
42	9	eP e(S)	ZNE ZNE	04 40	38 14	40								
43	9	eiP S	ZNE ZNE	09 22	20 38	21						13.8	USCGS: 24.1S, 178.5E South of Fiji Islands h about 580 km H = 09 17 31.7 Mag. 5.1 (CGS)	
44	9	eP eS eT	Z ZNE ZNE	10 11	59 03 43	54 08						18.2	USCGS: 31.2S, 177.6W Kermadec Islands h about 16 km H = 10 55 43.6 Mag. 4.7 (CGS)	



No.	Date	Phase		Time			Az	Tn	An	Tn	Ae	Te	$\Delta$ (Deg.)	Remarks
				(G.M.T.)										
57	12	iP S	ZE NE	21 10	09 37	56								u
58	12	eS eS eSS eL eL	N ZE Z ZNE ZE	22 21 27 28	17 00 28 47 04	36							68.0	USCGS: 39.3N, 142.8E Near east coast of Honshu, Japan Felt h about 36 km H = 21 57 41.3 Mag. 5.0-5.4(BRK), 5.7MB 5.3MS (CGS)
59	12	eS eSSS eL eL	ZNE N Z ZE	23 23 27 29	47 28 48 56	00							72.0	USCGS: 13.8N, 120.7E Mindoro, Philippine Islands h about 141 km H = 23 26 30.6 Mag. 5.0 (CGS)
60	13	eS eL	E ZE	07 08	56 11	36 28							81.0	USCGS: 0.3S, 91.5W Galapagos Islands h about 33 km H = 07 33 50.5 Mag. 5-5 $\frac{1}{2}$ (PAL), 5-5 $\frac{1}{4}$ (GOL), 5.3 (CGS)
61	13	eS eL	N ZN	12	16 28	30 12							67.0	USCGS: 39.2N, 143.0E Off east coast of Honshu, Japan h about 33 km H = 11 56 23.4 Mag. 5.3 (CGS)
62	13	eP eS	Z NE	16	29 31	25 02								
63	13	iP S	Z ZNE	21	14 37	10.7								
64	13	eS eL eL	NE E ZN	21	31 38 41	00 40 00							67.0	USCGS: 39.4N, 142.9E Near east coast of Honshu, Japan h about 29 km H = 21 10 35.4 Mag. 5.3-5.8(BRK), 5.5MB 5.2MS (CGS)
65	13	eP S eT	Z ZNE ZNE	23	38 39 41	38 13 50								
66	14	eS eL	NE ZNE	03	38 48	48 52							67.0	USCGS: 39.4N, 142.8E Near east coast of Honshu, Japan h about 38 km H = 03 18 17.3 Mag. 5.0MB 5.0MS (CGS)
67	14	eP eS eL	Z ZE ZE	04	21 31 46	20 36 12							81.0	USCGS: 0.2N, 91.6W Galapagos Islands h about 33 km H = 04 09 08.0 Mag. 4.6 (CGS)







No.	Date	Phase		Time			Az Tz An Tn Ae Te						△ (Deg.)	Remarks
				(G.M.T.)										
89	16	eP	Z	13	12	28							81.0	USCGS: 0.3S, 91.7W Galapagos Islands h about 33 km H = 12 59 57.6 Mag. 4.7 (CGS)
		eS	ZE		22	36								
		eL	ZE		37	00								
90	16	eL	ZE	14	32	16							67.0	USCGS: 4.0S, 104.1W Northern Easter Island, Cordillera h about 33 km H = 14 01 22.0 Mag. 4.5 (CGS)
91	16	eP	Z	16	32	32							81.0	USCGS: 0.4S, 91.4W Galapagos Islands h about 33 km H = 16 20 14.9 Mag. 5 $\frac{1}{2}$ (PAL), 4.7(CGS)
		eS	ZE		43	00								
		eSS	E		49	40								
		eL	ZE		59	16								
92	16	iP	ZNE	19	19	11								u
		S	ZNE			36								
		T	ZNE		21	27								
93	16	ePKKP	Z	19	43	00							115.0	USCGS: 53.9S, 8.7E Bouvet Island region h about 33 km H = 19 14 05.0 Mag. 5.7MB 5.7MS (CGS)
		eSS	ZNE		49	28								
		e	E		58	00								
		eL	ZN	20	06	20								
94	17	eP	Z	02	27	04							81.0	USCGS: 0.7S, 91.8W Galapagos Islands h about 33 km H = 02 14 49.0 Mag. 5(PAL), 4.7MB 4.6MS (CGS)
		eS	E		35	32								
		eS	E		37	24								
		eL	ZE		51	52								
95	17	eP	Z	04	40	36							81.0	USCGS: 0.2S, 91.5W Galapagos Islands h about 33 km H = 04 28 22.0 Mag. 4.5 (CGS)
		eS	E		51	00								
		eL	ZE	05	04	40								
96	17	eP	ZNE	12	04	00							68.0	USCGS: 41.ON, 143.OE Hokkaido, Japan region Felt h about 48 km H = 11 53 00.4 Mag. 6 $\frac{1}{2}$ (PAL), 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (GOL), 5.7MB 6.1MS (CGS)
		iS	ZN		13	08								
		iS	E			32								
		eSS	ZE		17	08								
		eSSS	ZNE		21	00								
		eL	ZNE		24	00								
97	17	iP	ZNE	17	57	23.4	2.5	1.1					41.5	d? USCGS: 6.3S, 146.6E East New Guinea region Felt at Lae Saidor and Kerema h about 110 km H = 17 49 43.6 Mag. 5.1 (CGS)



No.	Date	Phase		Time									$\Delta$ (Deg.)	Remarks
				(G.M.T.)			Az	Tz	An	Tn	Ae	Te		
98	17	iP iS	ZNE ZNE	18 18	14 20	22.3 20	6.4	1.2					20.9	u USCGS: 12.3S, 166.7E Santa Cruz Islands h about 33 km H = 18 09 34.1 Mag. 6(PAS), 6 $\frac{1}{2}$ (PAL), 5.5MB 6.1MS (CGS)
99	17	eS eS eL eL	N E E ZN	19 19 25 27	17 28 12 48	20							67.0	USCGS: 38.7N, 143.6E Off east coast of Honshu, Japan h about 17 km H = 18 57 27.5 Mag. 4.9 MB 5.8 MS (CGS)
100	18	eP eS eL	Z E ZE	02 02 02	35 20 52	02							81.0	USCGS: 0.2S, 91.5W Galapagos Islands h about 33 km H = 02 22 45.5 Mag. 5 $\frac{1}{4}$ (PAL), 4.7MB 5.6MS (CGS)
101	18	eP eS eL	Z E ZE	04 04 04	05 40 00	14							81.0	USCGS: 0.5S, 91.4W Galapagos Islands h about 33 km H = 03 53 00.3 Mag. 5(PAL), 4.6(CGS)
102	18	eP S T	ZNE ZNE ZNE	06 06 06	24 50 15	30								Samoa Islands region
103	18	iP iS	ZNE ZNE	06 06	44 39	45							10.9	d? USCGS: 21.7S, 179.6W Fiji Islands region h about 600 km H = 06 42 21.9 Mag. 5.0(CGS)
104	18	iP iS	ZNE ZNE	16 16	18 52	35								u Samoa Islands region
105	19	eiP ePP eS eS eSS eSSS i iLq iLr	ZNE ZE E ZNE ZE Z ZN E ZE	08 08 08 08 08 08 08 08 08 08	26 36 08 08 59 48 28 00 00	50.7							93.0	USCGS: 5.6S, 77.2W Northern Peru 41 killed and 100 injured. Major <b>property</b> damage at Chachapoyas and Moyabamba h about 28 km H = 08 13 35.0 Mag. 7(PAS), 6.8(BRK), 6.4MB 6.9MS (CGS)
106	20	iP iS	ZNE ZNE	03 03	52 46	26								u Samoa Islands region
107	20	eL	ZNE	21	56	48							16.7	USCGS: 22.8S, 173.3E Loyalty Islands region h about 62 km H = 21 49 40.5 Mag. 4.5 (CGS)



No.	Date	Phase		Time			Az Tz An Tn Ae Te						△ (Deg.)	Remarks
				(G.M.T.)										
123	24	iP iS	ZNE ZNE	12 34 25 44									u Samoa Islands region	
124	25	iP S	ZNE ZNE	00 12 26 47									u Samoa Islands region	
125	25	eP iS eT	ZNE ZNE ZNE	16 20 14 42 22 23										
126	25	eP S	ZNE ZNE	20 56 45 57 00									Samoa Islands region	
127	25	eS eL	N ZN	23 53 16 00 04 00							67.0		USCGS: 39.6N, 143.4E Off east coast of Honshu, Japan h about 16 km H = 23 33 18.0 Mag. 5.3 (CGS)	
128	26	eS e eL eL	ZNE E N Z	02 02 48 10 56 13 00 44							70.0		USCGS: 40.1N, 124.4W Near coast of northern California h about 10 km H = 01 42 19.5 Mag. 5-5 <sup>1</sup> / <sub>4</sub> (PAS), 5 <sup>3</sup> / <sub>4</sub> -6(PAL), 5.5 MB 5.4 MS (CGS)	
129	26	eS eL eL	NE E ZNE	10 45 12 52 00 55 28							69.0		USCGS: 42.1N, 142.7E Hokkaido, Japan region h about 33 km H = 10 23 48.2 Mag. 5.5MB 4.9MS (CGS)	
130	26	eiP eS iS	ZNE ZNE ZNE	15 44 34 47 48 16	2.5	1.1					18.0		USCGS: 22.2S, 171.4E Loyalty Islands region h about 90 km H = 15 40 31.1 Mag. 5.6 (CGS)	
131	27	iP eS	ZNE ZNE	02 04 50 06 33							9.8		d USCGS: 20.8S, 179.0W Fiji Islands region h about 605 km H = 02 02 40.2 Mag. 4.9 (CGS)	
132	27	e eL	ZE ZE	23 49 12 54 20										
133	28	eP S T	ZNE ZNE ZNE	09 25 32 52 27 05									Samoa Islands region	
134	28	iP S	ZNE ZNE	14 55 35 56									u Samoa Islands region	
135	28	iP S	ZNE ZNE	17 27 17 37									u Samoa Islands region	



13.

No.	Date	Phase	Time (G.M.T.)	Az Tz An Tn Ae Te						△ (Deg.)	Remarks
				Az	Tz	An	Tn	Ae	Te		
136	29	eiP ZE	11 12 19	2.0	1.0					21.4	USCGS: 11.6S, 166.4E Santa Cruz Islands h about 123 km H = 11 07 40.5 Mag. 5.0 (CGS)
137	30	e(SS) ZN eL ZN	09 51 44 58 08							41.8	USCGS: 13.ON, 145.2E Mariana Islands Felt on Guam h about 38 km H = 09 35 29.4 Mag. 5.2MB 5.4MS (CGS)
138	30	eP ZNE eS ZNE	19 40 07 41 35							7.5	USCGS: 18.6S, 177.9W Fiji Islands region h about 605 km H = 19 38 19.0 Mag. 4.2 (CGS)
139	30	eL ZN	20 53 16							72.0	USCGS: 17.9N, 105.8W Off coast of Jalisco, Mexico h about 35 km H = 20 21 27.7 Mag. 4.8 (CGS)
140	30	eP ZNE S ZNE T ZNE	21 18 15 38 20 15								

## NOTE:

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- (iii) \*Readings to be incorporated in the New Zealand Seismological Report for 1968.

"
   
P.D. Muller
   
OBSERVER-IN-CHARGE

12 FEB 1970  
12 FEB 1970

NEW ZEALAND

Department of Scientific and Industrial Research

Geophysics Division

APIA OBSERVATORY

FINAL SEISMOLOGICAL BULLETIN

STANDARD SEISMIC STATION (AFI)

AFIAMALU, WESTERN SAMOA

Latitude:  $13^{\circ} 54' 33.6''$  Longitude:  $171^{\circ} 46' 38.1''$ W

Height above mean sea level: 705.6 metres, 2315 ft.

Geocentric direction cosines : a. -0.961 070

b. - 0.138 883

c. - 0.238 862

Lithological Foundation: Basaltic Lava Flows

Instruments: World-wide standard seismograph system

Benioff short period seismometers

To = 1.0 sec. Tg = 0.75 sec.

Sprengnether long period seismometers

To = 15 sec. Tg = 100 sec.

Nominal Magnifications: S.P. 12500

L.P. 750

JULY 1968 \*

No	Date	Phase	Time (G.M.T.)							$\Delta$ (Deg.)	Remarks
				Az	Tz	An	Tn	Ae	Te		
1	1	iP ZNE	00 42 47								u
		iS ZNE	43 17								
2	1	eP ZNE	10 56 06							68.0	USCGS: 36.0N, 139.3E. Honshu, Japan 1 killed, 9 injured and minor damage in Tokyo area. h about 67 km. H = 10 45 11.9 Mag. 5.9 (CGS)
		eS ZN	11 05 00								
		eSS Z	09 00								
		eSSS ZN	12 24								
		eL ZN	16 04								
3	2	iP Z	00 31 12.6								u
		S NE	32 12								
4	2	eP ZNE	03 56 40							76.0	USCGS: 17.6N, 100.3W. Guerrero, Mexico 1 killed and minor damage at Cuajimalpa Felt at Mexico City Acapulco and Cuerna- vaca h about 1.1 km. H = 03 44 48.9 Mag. 5.9 (CGS)
		eS ZNE	04 06 28								
		eSS Z	11 00								
		eSS NE	28								
		eSSS ZNE	14 52								
		eL ZNE	17 36								
5	2	eP ZNE	04 34 41							16.8	USCGS: 29.7S, 177.9W. Kermadec Islands region h about 53 km. H = 04 30 52.7 Mag. 5.6 (CGS)
		S ZNE	37 31								
		eT ZNE	47 35								















No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
62	16	eP eS	ZNE ZNE	05 43 06 45 20								13.1	USCGS: 24.6S, 179.8W. South of Fiji Islands h about 405 km. H = 05 40 10.0 Mag. 4.3 (CGS)	
63	16	eP e e	ZNE ZNE ZE	21 30 33 34 46 44 40								21.0	USCGS: 13.5S, 167.1E. New Hebrides Islands h about 215 km. H = 21 25 41.9 Mag. 4.4 (CGS)	
64	17	eP eS e eL	ZNE ZNE N ZE	05 34 43 50 53 38 08 00 36								63.0	USCGS: 8.8S, 125.0E. Timor h about 25 km. H = 05 24 15.6 Mag. 5.7MB 5.6MS (CGS)	
65	17	iP S	ZNE ZNE	08 28 08 23										u Samoa Islands region
66	18	iP (S)	ZNE ZNE	04 52 03.4 24										une Samoa Islands region
67	18	iP iS	ZNE ZNE	05 06 07 31 39								6.9	d? USCGS: 19.5S, 175.9W. Tonga Islands h about 235 km. H = 05 04 59.8 Mag. 5.0 (CGS)	
68	19	eS eSS eLq eLr	ZE ZE N ZE	05 22 28 37 44 40 12 24 12								97.0	USCGS: 8.7N, 93.6E. Nicobar Islands region h about 33 km. H = 04 56 27.2 Mag. 5.3MB 5.5MS (CGS)	
69	19	eiP eS eL	ZNE ZNE ZE	09 25 29 31 51 52 20	1.4	1.0						21.1	USCGS: 13.0S, 166.5E New Hebrides Islands h about 29 km. H = 09 21 04.8 Mag. 5.3(PAL), 5.1(GOL), 5.1MB 5.3MS (CGS)	
70	19	iP S T	Z ZNE ZNE	12 53 53 55 25										Samoa Islands region
71	19	iP iS	Z ZNE	15 28 29 39 48.3										u
72	20	eP iS	ZNE ZNE	02 46 20 47										
73	20	eP S eT	ZNE ZNE ZNE	08 25 26 32 21 35 10								7.3	USCGS: 20.8S, 174.2W. Tonga Islands h about 33 km. H = 08 23 41.0 Mag. 4.7 (CGS)	
74	21	iP eS	ZNE ZNE	01 32 34 31 35.5								10.8	d USCGS: 21.9S, 179.4W. Fiji Islands region h about 600 km. H = 01 30 14.3 Mag. 4.6 (CGS)	











No	Date	Phase		Time (G.M.T.)			Az Tz An Tn Ae Te						$\Delta$ (Deg.)	Remarks
							Az	Tz	An	Tn	Ae	Te		
111	29	eP S	ZNE ZNE	15 18	16 48	47						12.7	USCGS: 25.3S, 177.9W South of Fiji Islands h about 205 km. H = 15 14 01.3 Mag. 4.5 (CGS)	
112	29	eP S eT	ZNE ZNE ZNE	15 23 28	21 07 30	45						8.0	USCGS: 21.5S, 174.4W Tonga Islands h about 33 km. H = 15 19 57.6 Mag. 5.0MB 5.3MS (CGS)	
113	30	iP iS iSSS eL iL	ZNE ZNE NE ZNE ZNE	00 09 16 20 23	01 50 00 00 00	55.7	3.4	1.2				55.8	u USCGS: 0.2S, 133.4E. West New Guinea region h about 12 km. H = 23 52 15.0 Mag. 6 $\frac{1}{2}$ (PAS), 6 $\frac{1}{2}$ (PAL), 6.1MB 6.0MS (CGS)	
114	30	eiP iS	ZNE ZNE	02 54	52 43	56						10.0	USCGS: 20.9S, 179.2W Fiji Islands region h about 620 km. H = 02 50 41.4 Mag. 5.6-5.8 (BRK), 4.9 (CGS)	
115	30	iP iS eT	ZNE ZNE ZNE	04 13 20	12 47 40	15.2						9.1	USCGS: 22.4S, 175.0W. Tonga Islands region h about 33 km. H = 04 10 12.1 Mag. 5.5-5.7 (BRK), 6 (PAL), 5.5MB 5.7MS (CGS)	
116	30	eP eS	ZNE ZNE	04 30	29 45	15						8.9	USCGS: 22.3S, 174.9W. Tonga Islands region h about 33 km. H = 04 27 14.0 Mag. 4.6 (CGS)	
117	30	eP iS eT	ZNE ZNE ZNE	05 10 17	08 24 50	50						9.4	USCGS: 22.6S, 175.0W. Tonga Islands region h about 33 km. H = 05 06 46.9 Mag. 4.6 (CGS)	
118	30	eP eS	Z ZNE	06 07	59 01	30 02						9.0	USCGS: 22.3S, 175.2W Tonga Islands region h about 33 km. H = 06 57 25.0 Mag. 4.6 (CGS)	
119	30	iP S	ZNE ZNE	10 07	06 27	31							u	
120	30	eP S eT	ZNE ZNE ZNE	18 25 28	24 13 17	31								
121	30	eP eS eSS eL eL	ZNE ZNE ZE ZN ZNE	20 21 08 15 19	51 02 28 16 48	40 12 28 16 48						90.0	USCGS: 6.9S, 80.5W. Near coast of Northern Peru Felt in northern Peru h about 37 km. H = 20 38 42.0 Mag. 6.0-6.2 (BKS), 5 $\frac{1}{2}$ -5 $\frac{3}{4}$ (PAL), 5 $\frac{3}{4}$ -6 (GOL), 5.8MB 6.4MS (CGS)	

No	Date	Phase	Time (G.M.T.)							$\Delta$ (Deg.)	Remarks	
				Az	Tz	An	Tn	Ae	Te			
122	30	iP S	ZNE ZNE	21	18	30 50						u Samoa Islands region
123	30	iP S	Z ZNE	23	07 08	32 32						
124	31	eP S eT	ZNE ZNE ZNE	08	56 57 59	37 15 35						
125	31	iP eS eS	ZNE E N	13	50 54	13 02 52				18.6		d USCGS: 31.5S, 178.1W. Kermadec Islands h about 33 km. H = 13 46 00.1 Mag. 4.7 (CGS)
126	31	e(P)	ZNE	14	15	10						

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