New Zealand Department of Scientific and Industrial Research
GEOPHYSICS DIVISION

NEW ZEALAND

SEISMOLOGICAL REPORT

1957

SEISMOLOGICAL OBSERVATORY BULLETIN
E – 138

R. E. OWEN, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND—1962

Brian Ferris

New Zealand Department of Scientific and Industrial Research
GEOPHYSICS DIVISION

NEW ZEALAND

SEISMOLOGICAL REPORT

1957

SEISMOLOGICAL OBSERVATORY BULLETIN
E – 138

R. E. OWEN, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND—1962

SEISMOLOGICAL OBSERVATORY, WELLINGTON, NEW ZEALAND.

ALL measurement and interpretation of records is carried out at the central station in Wellington. Communications should therefore be addressed to

The Superintendent,
Seismological Observatory,
P.O. Box 8005,
Wellington, New Zealand.

NEW ZEALAND SEISMOLOGICAL REPORT 1957

CONTENTS

INTRODUCTION

The New Zealand Seismological Report for 1957 is intended to summarise all work of a routine nature carried out by the Seismological Observatory, Wellington, and its associated outstations. Much of this has necessarily to be presented in the form of tabulated figures, but maps and descriptive matter have been added to make the Report of some interest to people other than professional seismologists. It should be noted that all times are given in UT (see the section 'Station Readings'). Dates of shocks occurring in the N.Z. forenoon are therefore one day behind the N.Z. civil date.

The plan of the Report should be apparent from the table of contents, and further explanations will be found at the head of each separate section. On the whole, it follows the style of its two immediate predecessors, but during the latter part of the year readings from stations on Raoul Island and in the Antarctic became available, and have been listed in separate sections of the report. It was not considered desirable to intersperse these readings with those of the main network, partly because of their large geographical separation from it, and partly because it is impossible to delay epicentre determination and other standard measurements until these records reach Wellington.

New Zealand data for 1959 and 1960 is now available at the Observatory, and standard readings have been forwarded to international data centres. The appearance of further E-Bulletins will depend upon the availability of typing and printing services. Reprints of research papers by members of the staff, and material that is not of a routine character are issued as a series of S-Bulletins. The Observatory is prepared to consider agreements to exchange material of this kind with other Observatories.

PRINCIPAL N.Z. EARTHQUAKES IN 1957

Since 1951, seismic activity in New Zealand has been relatively quiet. In 1957, 88 earthquakes were reported felt, 70 in the North Island, and 26 in the South Island. Eight shocks were perceptible in some part of both islands. One of the most interesting phenomena during the year was the occurrence of an 'earthquake swarm' in the vicinity of Moko Hinau. The name swarm is not precisely defined, but is commonly applied to a series of small or moderate earthquakes of similar magnitude occurring in rapid succession. The best known New Zealand example of a swarm affected Taupo in 1922.

Maps showing the distribution of felt intensity have been prepared for four shocks. The first of these, on Feb. 9 (Epicentre 57/20) originated at sea, 275 miles north of East Cape. It had a focal depth of about 85 miles and a magnitude of $6\frac{3}{4}$, and the area of perceptibility extended as far south as Greymouth. Intensities do not seem to have greatly exceeded MM4, and the earthquake does not appear to have been felt far west of a line from Foxton to Whakatane. Isolated minor damage covers most of the eastern North Island. The large shallow shock on Dec. 31 (Epicentre 57/171) has been assigned a magnitude of 6.6. The epicentre lies about 100 miles to the west of Milford Sound, and could not have been satisfactorily located without the help of readings from Australian stations, as our own network does not include any modern short-period recorders south of Kaimata and Gebbies Pass. Since the Australian stations can record only the largest shocks in this region, our studies of the seismicity of Otago and Southland are less advanced than those of other parts of the country. The felt intensities reported are shown on Map 4; but their distribution is so irregular that it has been considered inadvisable to suggest isoseismals. Damage to chimneys occurred as far west as Dunedin; but although there was a doubtful report from Timaru, the shock does not appear to have been felt in South Westland or Canterbury.

Another interesting shock in the south of the country is that listed as Epicentre 57/160. Although this shock has a magnitude of 4.7, and was felt in Dunedin, it has proved impossible to assign a higher accuracy than class D to the epicentre. The uncertainty in position is of the order of 30 miles. The occurrence of a shock of nearly magnitude 5 in this area is very relevant to any discussion of the seismicity of Otago, yet it would almost certainly have gone unlocated, or have been assigned a more westerly position, prior to the establishment of the teleseismic station of Roxburgh during the year. Although the position is now somewhat improved, it must be remembered that the instruments at Roxburgh are not intended to record this kind of shock.

Other widely felt shocks were those of Feb. 22; Mar. 13, and Sept. 26. The first of these (Epicentre 57/26) originated to the west of Tongariro National Park, and was felt over the central and southern parts of the North Island. It was of shallow focal depth, and had a magnitude of 5.5. Considered in terms of damage to property, this was an important shock. Nearly 100 insurance claims were filed by property owners in the Ohakune-Raetihi district, and north to Taumarunui. In most cases, however, the effects were limited to cracked plaster, the fall of objects from shelves, and damage to sanitary fittings. A few instances of fallen chimneys and lesser chimney damage were also reported to the Earthquake and War Damage Commission. Isoseismals have been shown on Map 4.

The other shocks mentioned gave rise to similar but less widespread minor damage. As might have been expected from its deep origin (170 miles) and its magnitude of $6\frac{1}{2}$, the shock of Mar. 13 (Epicentre 57/36) was felt over most of the country between the Bay of Plenty and Greymouth. The centre has been located a few miles north-west of Lake Taupo. As Map 5 indicates, intensities were fairly uniform over a large area, and although no serious damage occurred, minor insurance claims were received from both Auckland and Christchurch.

The shock on Sept. 26 (Epicentre 57/128), with a centre in the South Taranaki Bight, had a magnitude of 6.0 and a depth of 70 miles. Damage was again minor, and seems to have been confined to the North Island coast, between New Plymouth and Wellington; but the felt area extended from Te Kuiti to Banks Peninsula. Isoseismals are shown on Map 6.

The epicentre of the shock on Aug. 21 (Epicentre 57/115) lies in thinly populated country west of Castlepoint. The shock was of shallow origin, and its magnitude was 5.6. The felt area extended as far north as Te Kuiti, but there were no reports from across Cook Strait. A chimney at Masterton was damaged, ceiling plaster cracked in Wellington, and goods displaced from shelves in Levin, but these were isolated occurrences.

Consideration of the remaining earthquakes whose magnitude was greater than 5 reveals that nearly half of them were centred at sea, often several hundred miles from the coast. As a result, they were not felt, or attracted little attention. An earthquake of magnitude 6.6 on July 22 (Epicentre 57/86) initiated a number of aftershocks, seven of which had magnitudes greater than 5. These all occurred within a week of the main shock, and were aligned along the axis of the Kermadec Trench at distances from 200 to 320 miles north-east of East Cape. All of these shocks were of shallow origin. Two other shocks (Epicentres 57/129 and 57/151) on Sept. 26 and Nov. 12 originated close to the main shock; but since the records show some evidence of greater focal depth, the positions are less certain.

The shock of Jan. 12 (Epicentre 57/7) was reported felt only at Gore, although its magnitude was 5.1. The epicentre lay in almost uninhabited country 20 miles east of Lake Te Anau. Similar considerations explain the lack of felt reports from the earthquakes of Aug. 2 (Epicentre 57/95) situated in the Raukumara Ranges, and Aug. 11 (Epicentre 57/110), 15 miles east of Tokaanu. Both were of shallow origin. The cluster of shocks between Gisborne and East Cape (Map 1) is mainly aftershock activity continuing from the previous year, and associated with the magnitude 6.4 earthquake of 1956 Dec. 28 (Epicentre 56/189).

The swarm activity near Moko Hinau already mentioned apparently began on Jan. 21 and 22, when earthquakes were reported by the light-house keeper. They were small, but sufficiently well recorded to be instrumentally located (Epicentres 57/10 and 57/13). On Jun. 2, more shocks were felt, apparently from the same epicentre, or very close to it. The effects are described in a letter from the Principal Keeper :-

> "The tremors continued until late on Wednesday, 6th June.
>
> "The tremors were particularly noisy at times, and caused houses to shake and windows to rattle, and were each approximately of 2 seconds duration. If quietness prevailed at the time, the approach of a shake could be heard coming in the distance. They appear to come from a N. West direction; however we cannot be certain of this.
>
> "To date, no visual damage has been noticed, and I trust that all water pipelines underground are still intact. The first heavy rain will give all clues if any damage has been caused underground.
>
> "It was noticed, however, that the barograph gave incorrect readings at some weather reporting times, and this could be put down to the shakes. The tremors were at roughly 3, 6, and 9 hour intervals."

Seismological literature contains many references to earthquake swarms, but so far, none of them has occurred in a region adequately served by recording stations. The fact that the shocks, although numerous, are usually small and shallow makes it difficult to secure good records. The occurrence of swarms in this area must be considered in any discussion of the limits of New Zealand's seismically active area.

No shocks of exceptional focal depth were recorded, although three (Epicentres 57/4, 57/43, and 57/162) had depths of 300 kilometres (190 miles). The first of these on Jan. 9, had a magnitude of 5.1 and an epicentre near Kinleith. It is perhaps surprising that no felt reports were received. The other two shocks were at sea, in the Western Bay of Plenty and under the Kermadec Trench. Shocks of this depth are common in these places.

The large earthquake in the Aleutian Islands on Mar. 11 was responsible for a tsunami (seismic sea wave) that caused damage in many parts of the Pacific, including some minor damage to harbour works in Rarotonga. The wave was almost unnoticed in New Zealand, but the Oceanographic Institute reported that seiche oscillations one or two feet in amplitude were recorded in Wellington harbour.

Tabulated epicentres and details of felt reports will be found elsewhere in this Report.

STATIONS OF THE NEW ZEALAND NETWORK

The network of stations under the control of the Seismological Observatory, Wellington, may be considered to consist of two sections: first, a set of short-period instruments distributed widely over the country, and intended to yield records of earthquakes originating within New Zealand; and secondly, teleseismic instruments to provide information about distant earthquakes and the physical condition of the earth. These functions interlock, and every seismograph gives some useful information in both fields.

During the year, a number of changes and extensions to the network took place. These were in large measure prompted by the commencement of the International Geophysical Year. Within New Zealand the biggest change was the establishment of the new teleseismic station at Roxburgh. As explained in the 1956 Report, the recording site at Christchurch was situated on an unsuitable geological foundation, and was subject to artificial disturbances. Local earthquake recording was therefore transferred to Gebbies Pass. In 1957 May, the Galitzin instruments were also dismantled, and after an overhaul were moved to Roxburgh and provided with new recording drums. Recording at the new station began on May 12. The instruments are installed in a tunnel lined with several feet of concrete and driven approximately 300 ft. into schist.

The station at Raoul Island became operational on May 12, but in mid-September, trouble with the drum gearing was experienced, and no further recordings were possible after October 16.

There was an interruption of recording at Karapiro from June 10-18, owing to failure of the drum motor, and intermittent troubles were experienced at New Plymouth. There are no New Plymouth records after October 3. Only minor interruptions occurred at other New Zealand stations.

Building alterations at Apia resulted in a loss of Samoan records from May 15-21, and November 26-29. Between these dates, the Wood-Anderson instruments were temporarily installed in an outbuilding, and the Wiecherts were not in operation.

The Antarctic stations at Scott Base and Hallett began operation on March 4 and April 4 respectively. Not all components were put into commission at once, and some experimenting was needed before the best operating conditions were found. The stations were in order for the beginning of the International Geophysical Year in July. A fuller account of the installations, with illustrations is to be found in T. Hatherton: "New Zealand IGY Antarctic Expeditions, Scott Base and Hallett Station" (NZDSIR Bulletin No. 140, 1961)

Instrumental constants, standard abbreviations of the station names (used in the tabular sections of this report), geographical positions and similar information are listed below, in order of increasing southern latitude.

APIA (AP)

Latitude: 13°48'.4S

Longitude: 171°46'.5W

Height above mean sea level: 2 metres, 6 ft.

Geocentric direction cosines:

a.	- 0.961	484
b.	- 0.138	980
c.	- 0.237	132

Lithological Foundation: Coral sand on volcanic rock.

Instrument	Component	Period	Damping	Magnification	Date
Wiechert	N	8 sec	15:1	100	Nominal
(1000 kg)	E	8 sec	16:1	100	"
Wood-Anderson	N	0.75 sec	5:1	2300	(Until
	E	0.80 sec	16:1	2100	(May 18
	NE	0.75 sec	15:1	1800	
	NW	0.72 sec	15:1	1900	
	N	0.80 sec	15:1	2050	(Nov 28
	E	0.80 sec	15:1	2050	(

RAOUL (RL)

Latitude: 29°15.1S

Longitude: 177°55.1W

Height above mean sea level: 110 metres, 350 ft.

Geocentric direction cosines:

a.	- 0.873	304
b.	- 0.031	743
c.	- 0.486	140

Lithological Foundation: Volcanic rock.

Instrument	Component	Period	
Willmore	Z	To = 1 sec	Tg = 0.25 sec

SUVA (SU)

Latitude: 18°09' S

Longitude: 178°27' E

Height above mean sea level: 6 metres, 20 ft.

Geocentric direction cosines:

a.	- 0.950	515
b.	+ 0.025	720
c.	- 0.309	613

Lithological Foundation: Hard, fine-grained calcareous marl.

Instrument	Component	Period	Damping	Magnification	Date
Milne-Shaw	N	12 sec	20:1	250	12/57

ONERAHI (ON)

Latitude: 35°46'.5S

Longitude: 174°21'.7E

Height above mean sea level: 33 metres, 110 ft.

Geocentric direction cosines:

a.	-	0.809	234
b.	+	0.079	892
c.	-	0.582	028

Lithological Foundation: Basalt.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	E	0.8 sec	Critical	2,800	7/56

AUCKLAND (AK)

Latitude: 36°51'.7S

Longitude: 174°46'.7E

Height above mean sea level: 76 metres 250 ft.

Geocentric direction cosines:

a.	-	0.798	694
b.	+	0.072	992
c.	-	0.597	293

Lithological Foundation: Volcanic beds on Tertiary sandstone and mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Milne-Shaw	N	10 sec	20:1	150	7/57

KARAPIRO (KP)

Latitude: 37°55'.6S

Longitude: 175°32'.3E

Height above mean sea level: 61 metres, 200 ft

Geocentric direction cosines:

a.	-	0.788	405
b.	+	0.061	519
c.	-	0.612	072

Lithological Foundation: Greywacke

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	N	0.77 sec	Critical	2800	6/57
		0.79	130:1	2800	6/57

Constants measured before and after overhaul on June 18.

TUAI (TU)

Latitude: 38°48'.4S

Longitude: 177°09'.1E

Height above mean sea level: 292 metres 960 ft.

Geocentric direction cosines:

a.	-	0.780	359
b.	+	0.038	825
c.	-	0.624	126

Lithological Foundation: Thick Tertiary sandstone and mudstone

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	N	0.8 sec	Critical	1400	7/57

NEW PLYMOUTH (NP)

Latitude: 39°04'.0S

Longitude: 174°04'.4E

Height above mean sea level: 34 metres 112 ft.

Geocentric direction cosines:

a.	-	0.774	317
b.	+	0.080	472
c.	-	0.627	660

Lithological Foundation: Volcanic ash on thick Tertiary sandstone and mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	E	0.8 sec	Critical	1400	6/57

TONGARIRO (TO)

Latitude: 39°12'.2S

Longitude: 175°32'.3E

Height above mean sea level: 1131 metres, 3710 ft.

Geocentric direction cosines:

a.	-	0.774	637
b.	+	0.060	444
c.	-	0.629	512

Lithological Foundation: Volcanic ash and lava on Tertiary sandstone and mudstone

Instrument	Component	Period	Damping	Magnification	Date
Jones	Z	0.5 sec	10:1	11,000	Nominal

BUNNYTHORPE (BT)

Latitude: 40°17'.0S

Longitude: 175°38'.1E

Height above mean sea level: 60 metres, 197 ft.

Geocentric direction cosines:

a.	- 0.762	783
b.	+ 0.058	224
c.	- 0.644	028

Lithological Foundation: Gravels, silts and sands.

Instrument	Component	Period	Damping	Magnification	Date
Imamura	NE(X)	8 sec	5:1	2	Nominal
	NW(Y)	8 sec	5:1	2	
	Z	2 sec	5:1	2	

COBB RIVER (CB)

Latitude: 41°05'.2S

Longitude: 172°44'.0E

Height above mean sea level 213 metres, 700 ft.

Geocentric direction cosines:

a.	- 0.749	836
b.	+ 0.095	613
c.	- 0.654	679

Lithological Foundation: Schist

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	E	0.8 sec	Critical	2,800	Nominal

WELLINGTON (WN)

Latitude: 41°17'.2S

Longitude: 174°46'.0E

Height above mean sea level: 122 metres, 400 ft

Geocentric direction cosines:

a.	- 0.750	478
b.	+ 0.068	739
c.	- 0.657	311

Lithological Foundation: Greywacke

Instrument	Component	Period	Damping	Magnification	Date
Milne-Shaw	N	12 sec	30:1	250	
Galitzin-Wilip	Z	To=10.6 Tg=10	Critical	606	9/57
Wood-Anderson	n	0.8 sec	Critical	2,800	

The station has also Wenner and Imamura strong-motion instruments.

KAIMATA (KM)

Latitude: 42°31'.4S

Longitude: 171°24'.6E

Height above mean sea level: 70 metres, 230 ft.

Geocentric direction cosines:

a.	-	0.730	977
b.	+	0.110	420
c.	-	0.673	410

Lithological Foundation: Moraine and alluvium over Tertiary sandstone and mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	NE(X)	0.8 sec	Critical	2,800	Nominal

CHRISTCHURCH (CH)

Latitude: 43°31'.9S

Longitude: 172°37'.3E

Height above mean sea level: 8 metres, 25 ft.

Geocentric direction cosines:

a.	-	0.721	288
b.	+	0.093	401
c.	-	0.686	309

Lithological Foundation: Alluvial sands, silts, and gravels.

Instrument	Component	Period	Damping	Magnification	Date
Galitzin	N	To=Tg=24 sec	Critical	267	11/56
	E	24	Critical	275	
	Z	13	Critical	465	

GEBBIES PASS (GP)

Latitude 43°41'.7S

Longitude: 172°38'.8E

Height above mean sea level: 225 metres, 740 ft.

Geocentric direction cosines:

a.	-	0.719	385
b.	+	0.092	835
c.	-	0.688	380

Lithological Foundation: Rhyolite

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	N	0.8	Critical	2,800	11/56
		0.8	Above critical	1,400	8/67
		0.8	Critical	2,800	9/57

This instrument was operated at half the normal magnification between August 24 and September 12.

ROXBURGH (RX)

Latitude: 42°28'.5S

Longitude: 169°18'.9E

Height above mean sea level: 106 metres, 345 ft.

Geocentric Direction Cosines:

a.	-	0.691	422
b.	+	0.130	458
c.	-	0.710	576

Lithological Foundation: Chlorite schist.

Instrument	Component	Period	Damping	Magnification	Date
Galitzin	Z	To=Tg=14 sec	Critical	217	5/57
	N	24	Critical	323	
	E	24	Critical	305	

HALLETT (HT)

Latitude: 72°18'.8S

Longitude: 170°12'.5E

Height above mean sea level: 3 metres, 10 ft.

Geocentric direction cosines:

a.	-	0.301	224
b.	+	0.051	985
c.	-	0.952	135

Lithological Foundation: Frozen gravel spit.

Instrument	Component	To	Tg	Magnification	Date
Willmore	Z	1	2		Nominal
Columbia	N	15	75	1200	
	E	15	75	1200	
	Z	15	75	1200	

SCOTT BASE (SB)

Latitude: 77°51'.0S

Longitude: 170°12'.5E

Height above mean sea level: 33 metres, 100 ft.

Geocentric direction cosines:

a.	-	0.206	204
b.	+	0.048	510
c.	-	0.977	306

Lithological Foundation: Frozen basaltic debris resting on lava flows.

Instruments	Component	To	Tg	Magnification	Date
Benioff	Z	0.6 sec	25 sec	960	Jul 1 - Nov 21
	N	0.5	10		to Dec. 15
	E	0.6	25		to Dec. 15
	z	0.6	0.2	145000	Jul 1 - Nov 21
	n	0.5	0.2		to Dec. 15
	e	0.6	0.2		to Dec. 15
	Z	1.0	25	1450	Nov 21 -
	N	0.5	10		Dec 15 -
	E	1.0	25		Dec 15 -
	z	1.0	0.2	91700	Nov 21
	n	1.0	0.2		Dec 15 -
	e	1.0	0.2		Dec 15 -

TIMING ARRANGEMENTS

Radio time signals originating in the Seismological Observatory, Wellington are broadcast 15 times daily by station 2YA of the New Zealand Broadcasting Service. These signals can be automatically impressed on the records by an arrangement that has been described by B.H. Olssen in the New Zealand Journal of Science and Technology (Vol. 37B, No. 2, pp 115-8, 1955 Sept.). All New Zealand stations other than Auckland, Bunnythorpe, Cobb River, Monowai, and Wellington have this equipment. At Wellington, the time marks are directly derived from the national time-service. At the other stations, several signals a day are recorded by the operator, who depresses a hand key on hearing the signal. At Suva, Raoul Island, Apia and the Antarctic Stations similar methods are in use. The minute or half-minute marks at the out-stations are provided either by an electric pendulum clock of the Synchronome type, or by a marine chronometer fitted with electric contacts. Scott Base has a quartz crystal clock.

TECHNICAL STAFF 1957

WELLINGTON

Superintendent: R.C. Hayes

Geophysicists: R.R. Dibble, M.Sc.; G.A. Fiby, M.Sc.; M.G. Muir, M.Sc.

Technicians: S.M. Delbridge (From October); B.R. Gibson; A.R. Martin (April to November); J.F.G. Rappange; D. St. John (until February)

APIA

Officer-in-Charge: A.A. Thomson, M.Sc. (until October); J.G. Keys (from October)

SCOTT BASE

Observer: R.H. Orr

HALLETT

Observer: C.E. Ingham

STATION READINGS

The station readings are so arranged that data for the stations within New Zealand and for Suva are given in a single chronological list, and other stations are listed individually. This is partly a question of geographical affinity, and partly one of administrative convenience.

Details of N.Z. earthquakes have been omitted if the Instrumental Magnitude was less than 5; but the epicentres of those with magnitude greater than 4, and details of felt shocks have been listed in separate sections of the Report.

All times in the Report are given in U.T.; that is, the civil time of the Greenwich meridian, beginning at midnight. The New Zealand Standard Time is 12 hours ahead of U.T.

When the horizontal components at a recording station are not orientated north-and-south or east-and-west, the directions are designated X and Y, and the bearings given with the station constants in the section 'Stations of the N.Z. Network'.

The small letters following the time of an 'impetus' phase 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. x and y are horizontal movements as explained above.

Amplitudes are given in microns (1 micron = 10^{-6} metre) and periods in seconds, except for the Antarctic Stations, Samoa, and Raoul Island, where the amplitudes are in millimetres, read in the manner explained at the beginning of each section.

Magnitudes for local earthquakes are a mean of the indications of the Wood-Anderson seismographs of the network.

The accuracy of local earthquake epicentres is indicated by a letter in brackets following the attribution NZ

(A)	Epicentres	are	not	in	error	by	more	than	5	miles, or 8 km
(B)	"	"	"	"	"	"		10	"	16
(C)	"	"	"	"	"	"		15	"	24
(D)	"	more uncertain								

The low accuracy of (D) epicentres generally results from the small magnitude of the shock, or from lack of recording stations in certain azimuths.

In indicating focal depth, a distinction is made between shallow earthquakes (S), whose records show clear crustal phases, and normal earthquakes (N), which probably originate near the base of the crust.

NEW ZEALAND STATIONS AND SUVA

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 1	SU	eL	N	07	42								
1		eL	N	12	42½								
1		eP	N	21	12	08	Deep, No L-waves						
		e(S)	N			30							
2	WN	eL	N	01	28.0								
	CH	eL	NE	01	31		12	20	6	20	6	20	6.3 CH
	SU	eS	N	01	00	01							
		eL	N		11								
	Epicentre:			00	39	22	53N	168½W				USCGS	
2	WN	eSKS	N	02	41	25			7	7			
		e	N		52	25			5	12			
		eL	N		58.4								
		eLr	Z	03	02¾								
	CH	eSKS	N	02	41	56			7	18			
		eL	NE		59				7	18	10	20	6.4 CH
	SU	eS	N	02	38.3								
		eL	N		50								
	Epicentre:			02	17	35	52½	168W				USCGS	
2	WN	e	N	03	37	15							
		eL	N		59.4								
	CH	eL	NE	04	03				8	17	12	18	6.5 CH
		eL	Z		05		25	18					
	SU	eS	N	03	33	32							
		eSS	N		38	05							
	Epicentre:			03	12	52	53N	168W				USCGS	
2	WN	eSKS	N	04	12	39							
		eL	N		33.4								
	Epicentre:			03	48	44	53N	168W				USCGS	
2	SU	P	N	11	27	18	Deep, no L-waves						
		eS	N			50							
	WN	eL	N	11	40								
	CH	eL	ZNE	11	44								
	Epicentre:			10	49	32	52½N	168W				USCGS	
3	TO	eP	Z	02	23	11							
	SU	iP	N	02	18	33	Deep, No L-waves						
		e(S)	N		19	02							
	Epicentre:			02	18	03	Fiji					USCGS	
3	ON	eP	E	13	00	26							
	KP	eP	N	13	00	35							
		epP	N		02	42							
		SKS	N		10	09							
		eS	N			50							
		esS	N		14	49							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 3	TO	eP	Z	13	00	37							
		epP	Z		02	45							
		e	Z		04	25							
	WN	eP	ZN	13	00	47							
		eSKS	ZN		10	18			4	5			
		eS	ZN		11	03			11	10			6.8 WN
		esS	N		14	56			8	10			
	CB	eS	E	13	10	58							
		esS	E		14	51							
	KM	eP	X	13	01	.0							
		eSKS	X		10	17							
		eS	X		11	05							
	GP	eP	N	13	00	55							
		eSKS	N		10	28							
		eS	N		11	20							
	CH	P	Z	13	00	50u	8	7					
		sP	Z		03	57u	5	7					
		e	Z		04	51	7	7					
		iSKS	NE		10	28en			11	10	7	10	
		iS	NE		11	18e			6	10	17	10	7.1 CH
		isS	NE		15	12e			12	8	21	8	
	SU	eP	N	12	59	18							
		esS	N	13	11	55							
	Epicentre:			12	48	27	44N	130E	600km			USCGS	
5	SU	P	N	03	28	08	Deep, no L-waves.						
		eS	N			37							
6	SU	eL	N	04	53								
7	WN	eL	N	19	10¾								
8	ON	e	E	10	55	21							
		e	E			28							
	KP	eS	N		55	51							
	TU	eP	N	10	55	21							
		eS	N			57							
	TO	eP	Z	10	55	30							
		eS	Z		56	13							
	WN	eP	ZN	10	55	52							
		S	ZN		56	50							
	CB	eS	E	10	57	06							
	KM	eS	X	10	57	47							
	Epicentre:			10	54	35	36.4S	177.4E	250km			NZ(C)	5.1 NZ
9	WN	eL	N	06	40	.0							
	CH	eL	Z	06	38								
	Epicentre:			06	15	37	New Britain region					USCGS	
9	ON	eP	E	07	09	55							
	KP	eP	N	07	10	08							
		eS	N		12	51							
	TU	eS	N	07	12	52							
	TO	eP	Z	07	10	21							
		eS	Z		13	12							
	WN	iS	ZN	07	13	42							
	CB	eP	E	07	10	44							
		eS	E		13	45							
	KM	eP	X	07	11	00							
9	WN	eL	N	08	48	.8							
	CH	eL	Z	08	47								
	Epicentre:			07	52	56	53N	167½W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 9	KP	eP	N	21	38	34							
		S	N		39	02							
	TU	eP	N	21	38	38½							
		S	N		39	08							
	NP	e(P)	E	21	38	43							
	WN	eP	ZN	21	38	57							
		S	N		39	40							
	CB	eP	E	21	39	00							
		eS	E			50							
	KM	eP	X	21	39	22							
		eS	X		40	25							
	Epicentre:			21	38	00	38.2S		175.9E		300km		NZ(C) 5.1 NZ
10	WN	eL	N	06	17								
	CH	eL	Z	06	18								
	SU	L	N	06	05	15							
10	WN	e	N	08	26.6								
	CH	eL	Z	08	27								
	SU	e(S)	N	08	12	40							
		eL	N		13	45							
12	KM	eP	X	00	32	29							
		eS	X		33	14							
	CB	eP	E	00	32	51							
		S	E		33	53							
	WN	e(P)	ZN	00	33	12							
		S	ZN		34	16							
	TO	eP	Z	00	33	17							
		eS	Z		35	06							
	KP	e	N	00	33	52							
		e	N		35	24							
	Epicentre:			00	31	30	45.4S		168.0E	N	NZ(D)		5.1 NZ
							Felt Gore MM-1						
14	ON	eP	E	06	38	34							
	KP	eP	N	06	38	44							
14	ON	eP	E	09	52	57							
	KP	eP	N	09	53	04							
	WN	eP	N	09	53	11							
	CB	e	E	09	53	36							
	SU	eP	N	09	50	36							
	Epicentre:			09	49	10	18½S		178W		600km		USCGS
14	ON	P	E	14	23	33e							
		iS	E		26	12w							
	KP	P	N	14	23	48s							
		eS	N		26	40							
	NP	eP	E	14	24	08							
		eS	E		27.1								
	WN	iP	ZN	14	24	16½uw							
		eS	N		27	25							
		ScS	N	34	29								
	CB	eP	E	14	24	41							
		eS	E		27	27							
	KM	eP	X	14	24	44							
		eS	X		27	55							
	SU	eP	N	14	21	42							
		i	N			47							
	Epicentre:			14	20	17	22S		179W				USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 14	AK	eL	N	22	59								
	KP	eL	N	23	00								
	WN	e(L)	N	23	01	7							
	SU	eL	N	22	59								
18	WN	eL	N	01	11	½							
	CH	eL	NE	01	09								
		eL	Z		10								
19	WN	eL	N	03	16	3							
	CH	eL	ZNE	03	15								
19	KP	eP	N	05	20	11½							
		eS	N		23	12							
	TU	e(P)	N	05	20	15							
		eS	N		23	04							
	WN	eP	ZN	05	20	40							
		e	N		23	35							
		eS	ZN			51½							
		eScS	ZN		30	45			4	6			
	CB	eP	E	05	20	43							
		eS	E		23	56							
	KM	eP	X	05	21	03							
		eS	X		24	26							
	SU	eP	N	05	18	06							
		iS	N		19	02s							
	Epicentre:			05	16	36	20½S		179W		600km		USCGS
19	WN	e	N	09	02	44							
19	WN	eL	N	13	21	¼							
		eL	NE	13	19								
21	AK	e	N	16	00	7							
		e	N		05	30							
	WN	e	N	16	05								
		e	N		22								
	SU	eS	N	15	52	20							
		eL	N		54	50							
22	AK	e	N	05	47								
	WN	e	N	05	48								
	SU	iS	N	05	38	50							
		eL	N		40	45							
22	ON	eP	E	12	37	28							
	TU	eP	N	12	37	56							
	WN	eP	N	12	38	13							
		eS	N		43	18							
		eL	N		48								
	CH	eL	NE	12	48								
	SU	e	N	12	36	25							
		S	N		38	55							
	Epicentre:			12	31	55	Santa Cruz Is.						USCGS
23	AK	S	N	17	47	37							
		eL	N		48	5							
	KP	eL	N	17	49								
	WN	eS	N	17	48	43			11	20			5.7 WN
		eL	N		51¾								
	GP	eS	N	17	49	41							
	CH	eL	NE	17	52				5	18	7	18	5.7 CH
		eL	Z		53								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 23	SU	e	N	17	42	19							
		e(S)	N		43	05							
		eL	N		44.2								
	Epicentre:			17	40	19	22S		175W			USCGS	
24	KP	eP	N	01	18	54							
		epP	N		19	20							
	TU	eP	N	01	19	10							
	WN	eP	ZN	01	19	09							
		eS	N		25	26							6.4 WN
	CB	eP	E	01	19	00							
	GP	eP	N	01	19	14							
	CH	eL	Z	01	37								
	Epicentre:			01	11	11	6S		147E	100km		USCGS	
24	WN	eL	N	08	04				7	20			6.3 WN
		eLr	Z		06								
	CH	eL	ZNE	08	02		.9	20	4	20	4	20	6.2 CH
	Epicentre:			07	16	29	12½S		78W			USCGS	
24	AK	eL	N	19	33								
	KP	eL	N	19	34								
	TU	eS	N	19	32	38							
	WN	eLr	Z	19	40ca								
	GP	S	N	19	34	36							
	CH	eL	NE	19	37				10	16	10	14	
		eL	Z		38								
	SU	1	N	19	27	08s							
	Epicentre:			19	25	16	20S		176½W			USCGS	
25	KP	P	N	03	49	47n							
	TU	eP	N	03	49	49							
	WN	eL	ZN	04	23								
	CB	eP	E	03	50	02							
	CH	eL	NE	04	20				20	35	20	35	
		eL	Z		23								
	SU	e(PS)	N	03	57	47							
		e	N		58	00							
	Epicentre:			03	36	47	51½N		177W			USCGS	
26	SU	eL	N	08	20.6								
26	WN	e	N	14	41								
28	ON	eP	E	08	21	33							
		e	E			47							
	AK	eL	N	08	28.0								
	KP	eP	N	08	21	45							
	WN	iP	ZN	08	22	11							
		eL	N		30.7				17	20			5.9 WN
	CB	eP	E	08	22	18							
	KM	eP	X	08	22	32							
	GP	eP	N	08	22	39							
	CH	eL	NE	08	30½				10	25	8	25	5.9 CH
		eL	Z		31½		22	30					
	SU	eP	N	08	18	33							
		S	N		20	11							
	Epicentre:			08	16	19	15½S		173W			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 29	ON	eL	E	15	58								
	AK	eL	N	15	58								
	WN	eL	N	15	59.3				11	20			5.8 WN
	GP	eP	N	15	52	53							
	CH	eL	NE	15	59½						11	20	5.8 CH
		eL	Z	16	00		3	12					
	Epicentre:			15	46	35	16S	176W				USCGS	
30	TO	eP	Z	09	51	50							
	WN	eP	ZN	09	51	58							
		eL	N	10	01.0								
	CH	eL	NE	10	05								
	SU	e	N	09	48	31							
		eS	N		50	05							
	Epicentre:			09	46	05	15S	173W				USCGS	
30	AK	eL	N	15	38.5								
	KP	eP	N	15	33	31							
	TO	eP	Z	15	33	42							
	WN	eP	N	15	34	08½							
		eS	N		38	11			3	6			6.0 WN
		eL	N		40.2								
	CB	eP	E	15	34	16							
		eS	E		38	20							
	GP	eP	N	15	34	35							
		eS	N		39	05							
	CH	eS	NE	15	39	05			4	15	4	15	
		eL	N		42.0				9	15			5.8 CH
	SU	eP	N	15	30	58							
	Epicentre:			15	29	00	20½S	174W				USCGS	
30	SU	e	N	16	56	51							
		eL	N		58	30							
31	SU	eL	N	20	21								
FEB 1	WN	e	N	02	45		Traces						
1	WN	e	N	17	38		Traces						
1	WN	e(P)	ZN	18	51	33							
2	SU	iP	N	11	47	52s							
		i	N		48	26s							
		iS	N		49	00n							
		L	N		50	00							
	AK	P	N	11	49	28							
		S	N		52	26							
		L	N		55	28							
	TU	eP	N	11	49	51½							
		eS	N		53	24½							
	TO	eP	Z	11	49	50½							
	WN	iP	ZN	11	50	13							
		iS	ZN		54	08							
		eL	N		55.9								
	CB	eP	E	11	50	17½							
		eS	E		53	39½							
	KM	eP?	X	11	50	24½							
		(P)	X			32							
		eS	X		54	07							
	GP	P	N	11	50	40							
		eS?	N		54	37							
		(S)	N			59							
	CH	eP	Z	11	50	19½							
		e	NE		52	40							
		S	ZNE		54	44							
		eLq	Z		56.7								
		Lq	N		57.4								
	Epicentre:			11	45	35	2½S	170E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 2	ON	eP	N	04	06	08							
		e	N			11							
	KP	eP	N	04	06	24½							
		eS	N		09	56							
	TO	eP	Z	04	06	31½							
		eS	Z		10	08½							
	NP	eP	E	04	06	36							
	WN	eP	ZN	04	06	54							
		eS	ZN		10	44							
		e	N		11	02							
	CB	eP	E	04	06	56							
		eS	E		10	53							
	KM	eP	X	04	07	12							
		eS	X		11	19							
	GP	eP	N	04	07	19							
		eS	N		11	30							
	Epicentre:			04	02	05	18S		176½W		300km		USCGS
2	ON	eP	N	16	32	38							
	KP	e(P)	N	16	33	00							
	TO	eP	Z	16	33	16							
	WN	eP	N	16	33	33							
	CB	e(P)	E	16	33	32							
	GP	eP	N	16	33	50							
	Epicentre:			16	28	36	18S		168E		100km		USCGS
5	ON	e(P)	N	16	03	00							
	KP	eP	N	16	03	18							
	TO	eP	Z	16	03	31							
	WN	eP	ZN	16	03	47							
	CB	eP	E	16	03	42							
	KM	e(P)	X	16	03	52							
	GP	eP	X	16	03	59½							
5	ON	eP	N	20	14	22½							
	KP	eP	N	20	14	02							
		e	N		17	22							
	TO	eP	Z	20	13	47½							
		e(S)	Z		16	13							
		e	Z			21							
	WN	iP	Z	20	13	22d							
		e	ZN		16	03							
		e(L)	N		16	.5							
		i	N		17	25							
	CB	eP	E	20	13	10							
	KM	eP	X	20	12	49							
		eS	X		14	15							
	GP	eP	N	20	12	41							
		e(S)	N		14	09							
	Epicentre:			20	11	01	49.3S		165½E		NZ(D)		
6	CH	eLr	ZNE	13	51	.2							
	Epicentre:			13	06	13	2N		91W				USCGS 6 PAS
6	KP	e(P)	N	17	30	37							
	TU	eP	N	17	30	37							
	TO	eP	Z	17	30	57							
	WN	eP	ZN	17	31	32							
	CB	P	E	17	31	49							
	KM	P	X	17	32	27							
	GP	P	N	17	32	28							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 9	ON	P	N	02	11	(43)							
	KP	P	N	02	11	48							
		eS	N		12	45							
	TU	eP	N	02	11	46½							
		S	N		12	42½							
	TO	eP	Z	02	11	58							
		i	Z			59							
		(S)	Z		13	10							
	WN	P	NZ	02	12	21							
		S	N		13	47							
	CB	eP?	E	02	12	28½							
		S	E		14	04							
	KM	S	X	02	14	42							
	gP	S	N	02	14	(51½)							
	Epicentre:			02	10	32	34.3S		180.0		h N	NZ(D)	5.2 NZ
9	TO	eP	Z	02	17	14							
	WN	eL	N	02	21	.5							
9	SU	eP	N	13	33	07							
		eS?	N		35	30							
		i(S)	N			55							
		eL	N		38	40							
	ON	iP	N	13	30	(40½)							
		iS	N		31	(42)							
	AK	P	N	13	30	44							
		iS	N		31	48n							
	KP	eP	N	13	30	43							
		iS	N		31	49½s							
	TU	eP	N	13	30	41							
		e	N		31	34							
		iS	N			45½							
		eScS	N		44	28							
	TO	eP	Z	13	30	53							
		e	Z		31	47							
	NP	eP	E	13	31	05							
		e?	E		32	08							
		(S)	E			36							
	WN	eP	ZN	13	31	17½							
		eS	N		32	49							
		i	N		38	31							
		iScP	ZN		41	00							
		iScS	N		44	30							
	CB	eP	E	13	31	29							
		e	E			58							
		e	E		33	09½							
		S	E			10½							
		eScS	E		44	26½							
	KM	e(P)	X	13	31	55							
		(S)	X		33	46							
		S	X			48½							
		eScS	X		44	35½							
	gP	eP	N	13	31	55½							
		e	N		33	43½							
		e	N			54							
		(S)	N			56½							
		iS	N			57							
		ScS	N		44	37½							
	CH	eP	Z	13	31	56							
		e	NE		32	19							
		S	ZNE		33	54							
		i	N		34	08½							
	Epicentre:			13	29	18	34S		180		150Km+	USCGS	6½ PAS
				13	29	20	33.8S		179.8S		135Km	NZ(D)	6½-7 NZ

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 9	ON	eP	N	17	59	(35)							
	SU	eP	N	17	58	01							
		eS	N		59	33							
	KP	eP	N	18	00	46							
		eS	N		04	30							
	TU	e(P)	N	18	01	07							
	TO	eP	Z	18	00	56							
	WN	eP	ZN	18	01	17							
		e(S)	ZN		05	28							
		e	N			54							
		eL	N		09	.0							
	CB	eP	E	18	01	26							
		eS	E		05	45							
	KM	eP	X	18	01	43½							
	GP	eP	N	18	01	50							
		eS	N		06	30							
	CH	eL	NE		08	.0							
	Epicentre:			17	56	00	Tonga					USCGS	
10	KP	e	N	22	43	10							
	TU	eP	N	22	43	22							
	TO	eP	Z	22	43	15							
	KM	e(P)	X	22	43	21							
	GP	eP	N	22	43	22							
	CH	eP	Z	22	43	21							
		eS	NE		52	17							
	Epicentre:			22	32	15	Mindanao				USCGS		6¼-¾ PAS
10	KP	eP	N	23	01	48							
	TU	eP	N	23	01	58							
	TO	eP	Z	23	01	51							
	WN	eS	N	23	10	48							
		iScS	N		11	50							
		eSS	N		15	.0							
		eSSS	N		18	.0							
	KM	e(P)	X	23	01	59							
		eS	X		10	39							
	GP	eP	N	23	01	58							
	CH	eP	Z	23	01	58							
		eS	NE		10	56							
		e(ScS)	E		11	57							
		M	E		34								
	Epicentre:			22	50	52	10½N		126½E			USCGS	6¾ PAS
11	KP	eP	N	01	25	44							
	TU	eP	N	01	25	52							
	WN	eS	N	01	34	40							
		e(ScS)	N		35	35							
		e(SS)	N		39	.3							
		eSSS	N		42	.0							
	KM	e(P)	X	01	25	53							
		eS	X		34	30							
	GP	eP	N	01	25	49							
	CH	e(P)	Z	01	25	52							
		eS	NE		34	43							
		e(ScS)	E		35	47							
		M	E		57¾								
	Epicentre:			01	14	44	1ON		126E			USCGS	6½ PAS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 11	TO	eP	Z	14	36	40½							
	WN	eL	H	15	06	ca							
	CB	eP	E	14	36	31							
	CH	eL	NE	15	07	ca							
	Epicentre:			14	25	28	10N		126E			USCGS	6¼ PAS
13	ON	eP?	E	00	40	34							
	KP	eP	N	00	40	42							
	TU	eP	N	00	40	54							
	TO	eP	Z	00	40	45							
	WN	iP	ZN	00	40	50d							
		eS	N		49	39							
		e	N		50	47							
		eSSS	N		57.0								
	CB	eP	E	00	40	45							
	KM	eP	X	00	40	49							
	GP	eP	N	00	40	55							
	CH	eP	Z	00	40	(52)							
		e(S)	E		49	(42)							
		e	E		50	(52)							
	Epicentre:			00	29	48	10N		126½E			USCGS	
13	ON	eP	E	12	41	08							
	KP	eP	N	12	41	30							
		eS	N		45	01							
	TU	e(P)	N	12	41	44							
		eS	N		45	20							
	TO	eP	Z	12	41	44							
	CB	eP	E	12	41	56½							
	KM	eP	X	12	42	09							
	GP	eP	N	12	42	18							
	Epicentre:			12	36	51	18S		170E			USCGS	
16	KP	eP	N	02	54	25							
	TU	eP	N	02	54	32							
	TO	eP	Z	02	54	23½							
	WN	iP	ZN	02	54	35½							
	CB	eP	E	02	54	30							
	GP	eP	N	02	54	43½							
18	TO	eP	Z	16	15	06							
	WN	iP	ZN	16	14	56							
	CB	eP	E	16	14	58							
	GP	eP	N	16	14	46							
21	SU	eP	N	19	39	30							
		i?	N		40	38							
		S?	N		41	27							
		eL	N		42	31							
	ON	P	E	19	38	15							
	AK	e(P)	N	19	39	00							
		eS	N		40	07							
	KP	eP?	N	19	38	23							
		e(P)	N			32							
		eS	N		40	03½							
	TU	eP	N	19	38	23½							
		S	N		39	57							
	TO	eP	Z	19	38	34							
		eS?	Z		40	09½							
		e(S)	Z			25½							
	WN	eP?	N	19	39	02							
		e(P)	N			06½							
		S	N		41	05½							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 21	CB	eP	E	19	39	25½							
		S	E		41	24							
	KM	eP	X	19	39	42½							
		eS	X		42	03½							
	GP	eP?	N	19	39	34							
		(P)	N			46							
		S	N		42	09½							
	Epicentre:			19	36	05	31S		178W		Kermadec Is.		USCGS
				19	36	24	30½S		178½W		N	NZ(D)	5.8 NZ
22	ON	Pn	E	00	30	11							
		P*	E			14							
		(Sn)	E			56½							
		(S*)	E		32	08							
	AK	P*	N	00	31	00							
		S*	N			(40)							
	KP	iP	N	00	30	34N							
		iS	N			52½							
	TU	eP	N	00	30	40							
		(S)	N		31	03							
	TO	iP!	Z	00	30	17							
		S	Z			(20½)							
	WN	P	ZN	00	30	46							
		S	ZN		31	13							
	CB	P	E	00	30	53							
		iS	E		31	23							
	KM	eP	X	00	31	17							
		(S)	X		32	09							
	GP	eP	N	00	31	21							
		(S)	N		32	14½							
		i(S)	N			19							
	Epicentre:			00	30	11	39.2S		175.1E		S	NZ(C)	5.5 NZ
22	AK	eL	N	07	09	.3							
	WN	e	ZN	07	06	24							
		e(Lr)	ZN		08	.3							
	CH	e(Lr)	ZN	07	05	.2							
22	ON	eP	E	08	16	33							
	SU	iP	N	08	17	19S							
	KP	eP	N	08	16	49							
		eS	N		19	13							
	TU	eP	N	08	16	52							
		eS	N		19	15½							
	TO	eP	Z	08	16	59							
		eS	Z		19	27							
	WN	iP	ZN	08	17	21u							
		eS	ZN		20	08							
	CB	eP	E	08	17	25							
		eS	E		20	17							
	KM	eP	X	08	17	43							
		eS	X		20	42							
	GP	eP	N	08	17	(48)							
		eS	N		20	53							
23	SU	eP	N	20	37	29							
		eS	N		46	.5							
		eLr	N		58	.9							
	ON	eP	E	20	38	15							
	AK	e	N	20	38	45							
		eS	N		48	16							
		eL	N		59	.3							
	KP	eP	N	20	38	22½							
		e(PP)	N		41	30							
		e(S)			48	22							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 23	TU	eP	N	20	38	27							
	WN	iP	ZN	20	38	33d							
		e(sP)	ZN			58							
		eS	N		48	32							
		e(SS)	N		54.0								
		eL	N	21	00.6								
	CB	eP	E	20	38	29							
		e	E		41	30							
	KM	eP	X	20	38	36							
	GP	eP	N	20	38	35							
		e(sP)	N		39	02							
		ePP	N		41	46							
	CH	eP	Z	20	38	34							
	Epicentre:			20	26	12	24N		122E		USCGS		7-7¼ PAS
MAR 2	WN	e	H	01	25								
	CH	eL	Z	01	30								
	Epicentre:			00	27	33	18½N		78W		USCGS		
2	ON	eP	E	08	17	44							
	KP	eP	N	08	18.0								
	WN	e(P)	ZN	08	18	16							
		e	N		20	10							
		eLr	ZN		32								
	KM	eP	X	08	18	16							
	GP	eP	N	08	18	20							
		e	N			39							
	CH	eL	EN	08	28½				6	20	11	20	6.0 CH
		eL	Z		31		15	22					
	Epicentre:			08	10	24	6S		151E		USCGS		
2	WN	e	N	09	49	15							
3	AK	eL	N	01	40								
	WN	eL	N	01	41								
	CB	eL	E	01	43								
	KM	eL	X	01	43								
	GP	eL	N	01	43								
	CH	eL	ZNE	01	40		9	20	9	20	11	20	
3	GP	eP	N	20	56	44							
	Epicentre:			20	49	30	9½S		154E		100km	USCGS	
5	TO	ePKP$_1$	Z	12	44	24							
	GP	ePKP?	N	12	44	49							
	Epicentre:			12	24	35	33N		34½W			USCGS	
5	KP	eP	N	19	08	49							
	TU	eP	N	19	09	00							
	TO	eP	Z	19	09	01½							
	WN	eP	ZN	19	09	15							
	CB	eP	E	19	09	14							
	KM	eP	X	19	09	23							
	GP	eP	N	19	09	34							
	SU	eP	N	19	06	27							
	Epicentre:			19	03	27	14½S		168E			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 7	TU	iPn	N	05	29	37½							
		Sn	N			51½							
	KP	ePn	N	05	29	55							
		e(P*)	N	05	30	04½							
		e	N			13							
		eSn	N			22							
	AK	eP*?	N	05	30	22							
		e	N			38							
		i	N			55							
	TO	ePn	Z	05	29	55							
		i	Z			57½							
		eSn	Z		30	25							
	NP	e(P)	E	05	30	13½							
		i	E			16							
		eSn	E			53							
	WN	ePn	Z	05	30	18							
		iP*	ZN			32							
		e	N			35							
		e	N			42							
		Sn	N		31	05							
	CB	e(P)	E	05	30	36							
		e	E			41							
		e	E			58							
		eSn	E		31	32							
		e	E			46							
	GP	e	N	05	30	58							
		eSn	N		32	10							
	KM	e	X	05	31	07							
		S	X		32	10							
	Epicentre:			05	29	17	38.5S		178.6E		S	NZ(C)	5.0 NZ
7	KP	eP	N	10	51	13							
	TU	eS	N	10	54	16							
	TO	eP	Z	10	51	22							
	WN	eP	N	10	51	41							
		eS	N		55	05							
	CB	eP	E	10	51	46							
	GP	eP	N	10	52	10							
	SU	eS	N	10	49	57							
	Epicentre:			10	47	25	19S		178½W		550km		USCGS
8	TO	ePKP$_1$	Z	12	41	10							
		e	Z			48½							
	WN	ePKP$_1$	Z	12	41	13½u							
		ePKP$_2$	Z		42	05d							
		eL	N	13	51½								
	KM	ePKP$_1$	X	12	41	20							
		e	X			44							
	CH	ePKP$_1$	Z	12	41	18							
		e	Z			42							
		eL	ZNE	13	50								
	Epicentre:			12	21	08	39½N		23E				USCGS
8	KP	eP	N	16	38	23							
		eS	N		40	57							
	TU	eP	N	16	38	27							
		eS	N		41	00							
	TO	eP	Z	16	38	36							
		eS	Z		41	22							
	WN	eP	ZN	16	38	55							
		eS	ZN		41	50							
	NP	eP	E	16	38	40							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 8	CB	eP	E	16	38	56½							
		eS	E		41	55							
	KM	eP	X	16	39	16							
		eS	X		42	23½							
	SU	P	N	16	36	45							
		iS	N		37	59							
	Epicentre:			16	35	11	23S		179E		600km		USCGS
9	KP	eP	N	14	35	35							
		e	N			54							
		e	N		36	14							
		eS	N		46	15							
	TU	e	N	14	36	03							
		e	N			12							
		eS	N		46½								
	TO	eP	Z	14	35	41							
		e	Z		36	03							
		e	Z		37	39							
	WN	e	Z	14	36	02							
		eSKS	N		46	12			100	25			
		eS	N			50			170	20			
		M	N	15	20½				470	20			7.9 WN
	CB	e	E	14	35	58							
		e	E		36	48							
	GP	eP	N	14	36.5								
	CH	eP	Z	14	35	54	34	12	13	14	5½	10	
		iS	N		46	26n			82	16	44	16	7.8 CH
	SU	P	N	14	34	05							
		iS	N		43	02							
	Epicentre:			14	22	27	51N		175W				USCGS
9	KP	eP	N	15	54	46							
		e	N	15	55	10							
	TU	e	N	15	54	51							
		e	N	15	55	37							
	TO	e(P)	Z	15	54	51							
	CB	e	E	15	55	02							
	GP	e	N	15	55	20							
	WN	eSKS	N	21	03	05			14	15			
		S	N			40			8	12			6.9 WN
	CH	eP	Z	20	52	52	4	12					
		SKS	ZNE	21	03	21n	14	17	20	20	11	18	
		S	E		04	05					17	20	
		PS	ZNE		05	25	18	20	14	20	10	20	
		eSS	NE		10	42			11	20	17	30	7.0 CH
		M	NE		21				40	20	65	20	
	SU	P	N	20	50	55							
		eiS	N		59	50							
		PS	N	21	00	15							
		eSS	N		04	12							
		SSS	N		07.0								
		M	N		14½								
	Epicentre:			20	39	15	52½N		169½W				USCGS
10	WN	eSKS	N	03	29	50			7	15			
		eS	N		30	14			5	10			6.4 WN
	CH	SKS	ZNE	03	30	04	7	20	7	20	6	20	
		eS	E			48					5	10	
		iPS	ZNE		32	08	16	20	7	20	6	20	
		iLq	NE		45	14en			13	20	14	18	
		M							14	20	35	20	6.7 CH
	Epicentre:			03	06	02	52N		176W				USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 10	WN	eL	N	05	27								
	CH	eLr	Z	05	25								
		M	NE	05	34				3	18	4	18	6.2 CH
	Epicentre:			04	41	04	52N		170W			USCGS	
10	WN	eL	ZN	13	26½								
	CH	eL	E	13	24								
		M	NE		39				3	18	5	18	6.2 CH
10	WN	eLr	ZN	12	12¾								
	CH	eL	NE	12	11								
		M	NE	12	17				6	20	7	20	6.3 CH
	Epicentre:			11	20	45	52N		171W			USCGS	
10	AK	eL	N	16	12								
	WN	eSKS	N	15	50	04			5	10			
		eS	N			26			3	10			
		eLr	N	16	10.3								
		M	N		18				28	20			6.4 WN
	CH	SKS	NE	15	50	25			7	20	6	20	
		S	E		51	03					9	20	
		PS	ZNE		52	23	7	20	10	22	8	22	
		eLq	E	16	07						13	25	
		M	NE		20				14	20	35	20	6.6 CH
	SU	eS	N	15	46	49							
		PS	N		47	12							
	Epicentre:			15	26	23	52N		173W			USCGS	
10	WN	eL	N	17	50								
	CH	eL	NE	17	50								
		M	NE		55				1½	20	4	20	6.1 CH
	Epicentre:			16	37	45	51½N		173½W			USCGS	
11	KP	eP	N	03	25	38							
		e(S)	N		36	33							
		e	N		37	12							
	AK	eS	N	03	36	12							
		eLr	N		53.3								
	TO	eP	Z	03	25	43							
	WN	eP	Z	03	25	58d							
		i	Z		26	12d							
		eSKS	H		36	40			7	11			
		eS	N		37	13			12	10			
		eLr	Z		56.3								
		M	N		59				60	25			6.9 WN
	CH	eP	Z	03	26	15	5	10					
		SKS	N		36	53			12	15			
		(PS)	N		38	10			10	14			
		eL	E		52								
		eL	Z		56.3								
		M	E	04	00½						40	20	6.7 CH
	SU	iPP	N	03	26	46							
		eS	N		33	05							
		PS	N			38							
		eL	N		43.0								
	Epicentre:			03	12	41	51N		177W			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 11	KP	eP	N	10	11	51							
		eS	N		22	50½							
	AK	iSKS	N	10	22	17½							
		i	N			38½							
		eSS	N		29	00							
		eLr	N		40.	3							
	TU	e(SKS)	N	10	22	36							
	TO	eP	Z	10	11	56							
		e	Z		12	11							
		e	Z		12	11							
	WN	eP	Z	10	12	06							
		ePP	Z		15	57½							
		iSKS	N		22	33n			17	10			
		eS	N		23	16			11	10			7.4 WN
	CH	eP	Z	10	12	20	6	12					
		ePP	Z		16	25	5	10					
		eSKS	NE		22	53			15	14	10	15	
		eS	E		23	39					21	22	
		PS	NE		24	55			13	20	10	20	
		e	NE		40	45			16	17	26	14	
		M	E		50						92	22	7.2 CH
	SU	eS	N	10	19	20							
		PS	N			48							
		SS	N		23	45							
		SSS	N		27½								
	Epicentre:			09	58	42	53N		164½W			USCGS	
11	KP	e	N	12	21								
	TO	eP	Z	12	21	36							
	CB	eP	E	12	21	30							
	KM	eP	X	12	21	41							
	GP	eP	N	12	21	36							
11	KP	eP	N	15	08	16							
		eSKS	N		18	41							
		eS	N		19	05							
		ePS	N		20	10½							
	AK	iSKS	N	15	18	36							
		eS	N			55							
		eSS	N		24	36							
		eLr	N		36½								
		M	N		45½								
	TO	eP	Z	15	08	20							
		e	Z			35							
	WN	eP	Z	15	08	38							
		ePP	Z		12	13							
		iSKS	N		18	58n			33	10			
		iS	N		19	26			12	10			
	WN	ePS	N	15	20	33			15	15			7.1 WN
		eLr	Z		38								
	CB	eP	E	15	08	34							
		e(S)	E		19	27							
	CH	eP	Z	15	08	48½	6	10					
		eSKS	NE		19	14½			21	15	8	15	
		eS	NE			50			9	16	19	18	
		PS	NE		21	03			22	18	13	20	
		eSS	NE		26	15			15	22	11	20	
		M	N		43				77	24			7.0 CH
	Epicentre:			14	55	19	51½N		178½W			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 11	KP	eP	N	15	48	52	Partly obscured by previous shock.						
		e(SKS)	N		59	11							
		eS	N			42							
	AK	eSKS	N	15	59	13							
		eL	N	16	20								
	TO	eP	Z	15	48	56							
	WN	eP	Z	15	49	01							
		e	Z			31							
	CB	eP	E	15	49	09							
	Epicentre:			15	35	58	51½N		178W			USCGS	
12	WN	eL	N	00	41								
		eLr	Z		43								
		M	N		45				7	17			
	CH	eL	NE	00	42½				11	15	26	24	
		eL	Z		46½		7	13					
		M	NE						11	15	36	15	
	SU	iP	N	00	31	44							
	Epicentre:			00	29	50	19S		175½W		100km	USCGS	
12	AK	e(S)	N	07	52	.2							
	KP	eP	N	07	41	48							
	TO	eP	Z	07	42	06							
	WN	eSKS	N	07	52	21			5	15			
	CB	eP	E	07	42	14							
	CH	eP	Z	07	42	41	2½	8					
		eSKS	NE		52	48			4	14	4	15	
		eS	E		53	24					4	18	6.4 CH
		ePS	ZNE		54	48	8	18	4	17	3	20	
	SU	ePS	N	07	49	13							
	Epicentre:			07	28	40	51½N		173½W			USCGS	
12	AK	e	N	08	03								
		eL	N		16								
	KP	e(P)	N	07	52	43							
	WN	eSKS	N	08	03	00			5	15			
		eLr	ZN		18								
		M			23				10	20			
	CB	eP	E	07	52	28							
	Epicentre:			07	39	17	52N		178W			USCGS	
12	AK	e(P)	N	11	57	58							
		eSKS	N	12	08	18							
		e(S)	N			42							
		ePS	N		09	44							
		eL	N		24								
	KP	eP	N	11	57	53							
		eS	N	12	08	29							
	TU	eP	N	11	58	.0							
	TO	eP	Z	11	57	57							
	WN	eP	Z	11	58	06							
		eSKS	N	12	08	42			35	20			
		eLq	N		24				35	30			
		eLr	Z		27								
		M	N		35				57	20			6.9 WN
	CB	eP	E	11	58	04							
		eS	E	12	09	04							
	KM	eP	X	11	58	26							
	CH	P	ZN	11	58	18d	5	11	3	17			
		iSKS	ZNE	12	09	02sw	8	15	14	20			
		eS	EN			31			10	15	18	15	
		iPS	ZNE		11	00s	14	15	24	22	13	15	
		M	NE		35				40	22	53	22	7.1 CH

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 12	SU	eP	N	11	56	10							
		iS	N	12	05	22							
		iPS	N			50							
		eL	N		15.	2							
	Epicentre:			11	44	50	51N		177W				USCGS
12	AK	P	N	16	37	14							
	KP	P	N	16	37	25½							
		i	N			27							
	TU	P	N	16	37	36							
		eS	N		41	54							
	TO	P	Z	16	37	36							
	WN	eP	N	16	37	51							
		eS	N		42	26							
	CB	eP	E	16	37	49							
	KM	eP	X	16	38	00							
	GP	P	N	16	38	09							
	SU	P	N	16	35	05							
		iS	N		37	14							
	Epicentre:			16	32	05	14½S		168E				USCGS
12	KP	eP	N	17	25	22							
	TU	eS	N	17	28	14							
	WN	eP	N	17	25	50							
		eS	N		29	02							
	CB	eP	E	17	25	54							
		eS	E		29	07							
	KM	eS	X	17	29	35							
	GP	eP	N	17	26	15							
		eS	N		29	41							
	SU	P	N	17	23	28							
		iS	N		24	30							
	Epicentre:			17	21	47	21½S		179W		700km		USCGS
12	TU	eS	N	18	36	23							
	WN	eP	N	18	33	22							
		eS	N		36	57							
	CB	eS	E	18	37	03							
	GP	eP	N	18	33	43							
		eS	N		37	40							
	SU	P	N	18	30	22							
		S	N		31	30							
	Epicentre:			18	28	57	18S		178½W		650km		USCGS
12	AK	eP	N	19	15	45							
		S	N		19	27							
	KP	P	N	19	15	23							
		eS	N		19	35							
	TU	eP	N	19	15	56							
		eS	N		19	34							
	TO	eP	Z	19	16	02							
	WN	eP	N	19	16	20							
		eS	N		20	24							
		eScS	N		26	31							
	CB	eP	E	19	16	25							
		eS	E		20	31							
	KM	eP	X	19	16	40							
		eS	X		20	58							
	GP	eP	N	19	16	46							
		S	N		21	07							
		eScS	N		26	44							
	CH	eS	NE	19	21	12							
	SU	iP	N	19	12	46s							
		iS	N		13	53n							
	Epicentre:			19	11	16	16S		176½W		400km		USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 13	WN	eL	N	03	34								
		M	N		40				6	20			6.2 WN
	CH	eL	NE	03	37				3	20	4	20	
		eL	Z		38								6.2 CH
	Epicentre:			02	48	20	52N	171½W				USCGS	
13	AK	iP!	N	09	12	(12)							
	KP	iP!	N	09	12	06.8s							
		iS	N			35.2n							
	TU	P	N	09	12	10.1s							
		S	N			39.4							
		eScS	N		25	54							
	TO	iP!	Z	09	12	06.7							
	WN	iP	ZN	09	12	20.7							
		S	N		13	00							
		eScS	N		25	55							
	CB	iP	E	09	12	24.9							
		S	E		13	08.3							
	KM	P	X	09	12	46.1sw							
		S	X		13	44.3							
	GP	iP!	N	09	12	50.2s							
		S	N		13	54.9							
	CH	iP!	ZNE	09	12	49.8u							
		S	ZNE		13	53½ne							
	SU	P	N	09	15	42							
		eS	N		19	10							
		iPcP	N			35n							
	Epicentre:			09	11	30	38.7S	175.6E		270km		NZ(B)	6½ NZ
							Felt extensively in the North Is., except Northland and Auckland, and in the northern parts of the South Is. Maximum MM5 at Taihape.						
13	KP	eP	N	15	55	04							
		eS	N	16	05	49							
	TU	eP	N	15	55	.1							
	TO	eP	Z	15	55	06							
	WN	iP	Z	15	55	18							
		SKS	ZN	16	05	49			7	7			
		eS	N		06	15			3	7			
		PS	N		07	31			3	7			
		eL	N		24								
		eLr	Z		27								
		Max	N		29				11	22			6.6 WN
	CB	eP	E	15	55	19							
	KM	eP	X	15	55	36							
	CH	eP	Z	15	55	32							
		eSKS	NE	16	06	03			7	10			
		ePS	E		08	42					5	10	
		eL	NE		22								
		eL	Z		26								
		M	ZNE		30		18	20	14	20	11	20	6.5 CH
	SU	eP	N	15	53	14							
		ePP	N		55	38							
		eS	N	16	02	22							
		PS	N			56							
	Epicentre:			15	42	05	51½N	179W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 13	WN	e	N	18	00								
	CH	(SKS)	NE	18	06	53			6	22	7	25	
	Epicentre:			17	43	40	51N	175W				USCGS	
13	WN	eL	N	21	47								
14	ON	eP	E	15	00	35							
		e	E			44							
	KP	eP	N	15	00	41							
		e	N			52							
		eS	N		11	29							
	TU	eP	N	15	00	45							
	TO	eP	Z	15	00	46							
	WN	P	ZN	15	00	54							
		e	Z		04	46							
		eSKS	ZN		11	26			12	12			
		ePS	N		13	39			6	13			
		e	N		18	30			4	15			
		eLq	N		27.0				17	40			
		M	N		44				20	20			
	CB	eP	E	15	00	57							
	CH	eP	Z	15	01	02	4½	12					
		ePP	Z		04	37	7½	12					
		SKS	NE		11	44			13	15	26	16	
		eS	E		12	21					20	20	
		ePS	ZN		13	25	12	15	26	20	20	20	
		eLq	NE		27								
		eLr	Z		32		140	40					
		M	NE		44				65	20	78	20	
	SU	eP	N	14	59	03							
		eS	N	15	08	03							
		ePS	N			34							
		i	N		10	07							
	Epicentre:			14	47	45	51½N	177W				USCGS	7.0 CH
15	SU	eP?	N	02	48	50	Recorded at Noumea and Brisbane.						
		L	N		50	31							
15	AK	eSKS	N	03	15	50							
		eSS	N		22.1								
		eL			35								
	WN	eSKS	N	03	16	03							
		eLr	Z		36.7								
		M	N		40				8	20			6.3 WN
	CH	eSKS	NE	03	16	20			4	15	2½	15	
		eS	E		17	06					3½	20	
		ePS	NE		18	28			4	15	4	15	
		M	NE		53				11	20	8½	20	6.3 CH
	SU	S	N	03	12	54							
		ePS	N		13	36							
		eL	N		25								
	Epicentre:			02	52	08	53N	167E				USCGS	
16	AK	eSKS	N	02	57	36							
		ePS	N		58	52							
		SS	N	03	03	36							
		eL	N		14½								
	KP	eP	N	02	47	10							
		eS	N		58	03							
	TU	e(P)	N	02	47	20							
	TO	eP	Z	02	47	13							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 16	WN	eP	ZN	02	47	35							
		iSKS	N		57	50n			14	12			
		PS	N		59	30			28	20			
		eLr	ZN	03	17								
		M	N		25				43	18			6.7 WN
	CB	eP	E	02	47	25							
	CH	eP	Z	02	47	48	4	9					
		eSKS	ZNE		58	10	12	10	23	15	15	15	
		eS	E			52					27	18	
		ePS	ZNE		59	57	20	15	21	15	13	15	
		eSS	NE	03	05	12			24	22	16	16	
		M	NE		22				100	22	78	22	7.1 CH
	SU	eP	N	02	45	27							
		S	N		54	25							
		eL	N	03	06								
	Epicentre:			02	34	12	52N		179W			USCGS	
16	AK	eL	N	14	00								
	WN	e(S)	N	13	59	43							
		eL	N	14	02								
	GP	e(S)	N	14	00	46							
	CH	eL	NE	14	02½								
MAR 17	WN	e	N	08	51								
	Epicentre:			07	53	51	51N		179W			USCGS	
17	WN	eL	N	23	32.9				3	20			
	CH	eL	NE	23	33.2				17	25	23	25	
		eLr	Z		35.2		9	20					
	SU	eS	N	23	05	33							
		eL	N		19								
	Epicentre:			22	44	44	54N		166W			USCGS	
18	KP	eP	N	19	34	12							
	TU	eS	N	19	37	33							
	TO	eP	Z	19	34	19							
	WN	eP	N	19	34	42½							
		eS	N		38	22							
	CB	eP	E	19	34	34							
		eS	E		38	20							
	KM	eP	X	19	35	00							
		eS	X		38	40							
	GP	eP	N	19	35	04							
		eS	N		38.9								
	SU	P	N	19	31	34							
		iS	N		32	37s							
	Epicentre:			19	30	17	18S		179W	400km		USCGS	
18	TO	eP	Z	21	21	44							
	WN	ePP	N	23	27				6	10			
		eL	N		34.4				19	20			
	GP	eP	N	21	22	04½							
	SU	eP	N	21	20.1								
		eL	N		26								
	Epicentre:			21	14	12	6S		152E			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 19	KP	e(P)	N	13	04	01½							
	WN	eSKS	N		14	55			9	10			
		e(S)	N		15	30			7	10			
		eL	N		35				35	25			
	CH	eSKS	N	13	15	18			40	16			
		eL	NE		35				240	35	240	35	
		eLr	Z		44.3		240	18					
	SU	e(PS)	N	13	11	35							
		i(ScS)	N			39s							
		eL	N		22½								
	Epicentre:			12	50	51	51½N		175W			USCGS	
21	TO	eP	Z	16	43	46							
	Epicentre:			16	35	28	3S		144½E			USCGS	
22	AK	eSKS	N	14	44(23)								
		eSS	N		50	50							
		eL	N	15	02								
	KP	eS	N	14	45	23							
	WN	SKS	N	14	45	00			9	10			
		eSS	N		52	16			24	30			
		eL	N	15	01				46	40			
		M	N		10				34	21			
	CH	eSKS	NE	14	45	22			5	10	7	10	
		eS	E		46	20							
		eLq	NE	15	02								
		eLr	Z		06		45	22					
		M	NE		12				50	22	78	21	7.0 CH
	SU	iS	N	14	42	02							
		ePS	N			45							
		SS	N		46	45							
		eL	N		54								
	Epicentre:			14	21	06	54N		166E			USCGS	
22	WN	eL	N	16	46								
	CH	eL	NE	16	39								
23	ON	e(P)	E	05	21	42							
		epP	E		22	05							
	AK	e	N	05	21	56							
		eS	N		28	57							
		esS	N		29	38							
		eSS	N		34	52							
		eL	N		38								
	KP	P	N	05	21	37n							
		sP	N		22	12n							
		ePP	N		24	03							
		eS	N		29	01							
	TU	eP	N	05	21	49							
		esP	N		22	21							
		eS	N		29	06							
	TO	P	Z	05	21	41							
		sP	Z		22	16							
	WN	iP	ZN	05	21	44d							
		epP	N		22	07							
		isP	Z			19u							
		iS	NZ		28	54			8	6			
		eL	N		34.2								
		M	N		38				50	20			6.9 WN
	CB	P	E	05	21	35							
		epP	E			54							
		eS	E		28	46							
		esS	E		29	25							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 23	KM	eP	X	05	21	36							
		esP	X		22	13							
		eS	X		28	43							
		esS	X		29	26							
	GP	P	N	05	21	45n							
		esP	N		22	21							
		eS	N		29	06							
	CH	eP	Z	05	21	45							
		e	N			51							
		iS	ZE		29	03w	8	10			26	14	
		e	N			24			13	15			
		isS	E			52					23	12	
		eL	NE		38				28	28	48	30	
		M	NE		47				49	15	46	15	7.0 CH
	SU	eP	N	05	21	08							
		ScS	N		30	58							
		SS	N		31	59							
	Epicentre:			05	12	31	5½S		131E		100km		USCGS
24	ON	eP?	E	06	43	28							
		e	E			47							
	AK	eL	N	06	51								
	KP	eP	N	06	43	14							
	TU	eP	N	06	43	.3							
	TO	eP	Z	06	43	01							
	WN	iP	ZN	06	42	40d			6	6			
		e	N		47	.8			35	25			
	CB	eP	E	06	42	40							
	KM	eP	X	06	42	30							
	GP	eP	N	06	42	11							
	CH	iP	Z	06	42	14	18	8					
		P	NE			16			15	12	5	14	
		eL	ZNE		46	50							
		M	NE		48				29	20	23	20	
	Epicentre:			06	37	40	N. of Balleny Is.						USCGS
24	WN	eL	N	12	00								
25	WN	eL	N	21	46	.3							
	CH	eL	Z	21	50		8	18					
27	TU	eS	N	07	38	44							
	TO	eP	Z	07	36	04							
		eS	Z		39	11							
	WN	iP	Z	07	36	20d							
		eP	N			21							
		eS	ZN		39	44							
	CB	eP	E	07	36	27							
		eS	E		39	55							
27	KM	eP	X	07	36	45							
		eS	X		40	32							
	GP	eP	N	07	36	52							
		S	N		40	44							
	SU	eP	N	07	33	39							
		S	N		34	50							
	Epicentre:			07	31	56	22S		177W		150km		USCGS
27	KP	eP	N	13	07	50							
	TO	eP	Z	13	07	57							
		epP	Z		08	13½							
	WN	P	ZN	13	08	08							
	CB	eP	E	13	08	01							
	KM	eP	X	13	08	08							
	Epicentre:			13	00	27	5S		153½E		100km		USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 28	ON			S-P = 57 sec			no timing.						
	KP	eP	N	09	50	33							
		eS	N		51	32							
	TU	eP	N	09	50	27							
		e	N			32							
		eS	N		51	25							
	TO	eP?	Z	09	50	36							
		e	Z		51	02							
		eS	Z			55							
	WN	eP?	ZN	09	51	04							
		e(P)	ZN			10							
		eS	N		52	30							
		e	N			34							
	CB	eS	E	09	52	52							
	KM	eP	X	09	51	41							
		S	X		53	30							
	GP	eP	N	09	51	43							
		e	N		53	35							
		S	N			38							
	AK	S	N	09	51	26							
	Epicentre:			09	49	13	34.7S		180.0		300km	NZ(C)	5.9 NZ
28	WN	e(L)	N	21	01								
	CH	eL	E	21	10								
29	AK	eS	N	05	34	25							
		eSS	N		40	52							
		eL	N		53								
	KP	eS	N	05	34	42							
	WN	eSKS	N	05	34	20			14	20			
		eS	N		35	05			6	11			
		eSS	N		41	.6			24	30			
		eSSS	N	05	45	¼			34	35			
		eL	N		50	½							
		M	N	06	00				46	20			6.9 WN
	CH	SKS	NE	05	34	39n			10	19	7	20	
		eS	NE		35	33			4	20	8	20	
		ePS	ZNE		36	48	8	15	11	20	8	20	
		eSS	NE		42	02			10	24	11	30	
		eLq	NE		50	½			6	20	30	40	
		eLr	Z		56		80	25					
		M	NE	06	02				32	20	58	20	7.0 CH
	SU	iS	N	05	31	19s							
		PS	N		32	09							
		eSS	N		35	58							
		eL	N		43								
	Epicentre:			05	10	28	53½N		167W			USCGS	
29	WN	e	N	07	24	¾							
		eL	N		35								
	CH	eL	E	07	23								
29	CH	eL	Z	23	43								
	Epicentre:			22	49	51	53N		169W			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 3	WN	e	N	07	18	3/4							
	CH	e	N	07	16	42							
5	ON	eP?	E	03	02	36							
	WN	eL	N	03	35	ca							
	CH	e	E	03	30	.8							
		eL	E		34	.0							
	Epicentre:			02	49	39	52N		172½W			USCGS	6½ PAS
5	SU	iP!	N	07	32	44S							
		S?	N		34	24							
	ON	P	E	07	33	14							
			E			25							
		eS	E		35	(46)							
	AK	eP	N	07	33	25							
		i	N			45							
		(S)	N		35	40							
	KP	eP	N	07	33	34							
		e	N			47							
	TU	eP	N	07	33	30							
		e	N			39							
		S	N		35	43							
	TO	eP?	Z	07	33	36							
		e(S)	Z		36	14							
	WN	eP	NZ	07	34	11							
		iS	NZ		36	51							
		iScS	N		46	06							
		isScS	N			48							
	CB	eP	X	07	34	15							
		S	X		37	05							
	KM	eP	X	07	34	34½							
		S	X		37	43½							
	GP	P	N	07	34	39							
		iS	N		37	54							
	CH	eL	NE	07	30	ca							
	Epicentre:			07	30	22	26½N		177W		100km	USCGS	6¾ PAS
							Felt Raoul I. MM 4						
6	SU	eP?	N	13	45	53							
		i	N		46	26							
		i(S)	N		47	00							
		i	N			56							
	ON	P	E	13	48	44½							
	TO	eP	Z	13	49	21							
	WN	eP	N	13	49	45							
		e	N		59	3/4							
7	ON	eP	E	10	23	01							
	KP	e(P)	N	10	23	14							
	TU	e	N	10	23	34½							
	TO	eP	Z	10	23	19							
	WN	iP	NZ	10	23	23u							
		eS	N		30	45							
		eSS	N		34	30							
		eLr	Z		39	ca							
	CB	eP	X	10	23	23							
	KM	eP	X	10	23	27							
	CH	eS	NE	10	30	58							
		eL	NE		37½								
	GP	eP	N	10	23	28							
	Epicentre:			10	14	08	1S		137½E			USCGS	6-6¼ PAS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 9	ON	eP	E	00	35	36							
	KP	eP	N	00	35	46							
		eS	N		45	00¾							
	TU	eS	N	00	45	05							
	TO	eP	Z	00	35	51							
		e	Z		37	33							
		eS	Z		45	07							
	WN	i	Z	00	37	37u							
		iS	N		45	13							
	CB	eP	X	00	35	55							
		e	X		37	42							
		e	X			53							
		eS	X		45	08							
	KM	eP	X	00	36	07							
		e	X		38	06							
		eS	X		45	17							
	CH	eS	EZ	00	45	28							
		e	E		48	23							
	GP	eP	N	00	36	05							
	Epicentre:			00	24	39	30½N		138½E		450km		USCGS 6¾ PAS
10	SU	eS	N	11	51	43							
		PS	N		52	30							
		eL	N	12	02								
		L max	N		14								
	AK	eSKS	N	11	54	04							
		eS	N			52							
		ePS	N		56	13							
		eSS	N	12	01	20							
		eL	N		10½								
	WN	eSKS	NZ	11	54	20							
		S	Z		55	17½							
		e	N			33½							
		ePS	N		56	46							
		SS	N	12	01.9								
		eLr	Z		15.9								
	CH	eSKS	E	11	54	35							
		eS	E		55	49							
	Epicentre:			11	29	58	56N		154W				USCGS 7 PAS
10	SU	P	N	13	46	06							
		eS	N		47	45							
		L max	N		50½								
	ON	eP	E	13	48	56							
	AK	eL	N	13	54½								
	KP	eP	N	13	49	11							
	TO	eP	Z	13	49	22½							
	WN	eLr	Z	13	57½								
	CB	eP	X	13	49	45							
	KM	eP	X	13	49	53							
	GP	eP	N	13	50	02½							
	Epicentre:			13	43	43	15S		173W				USCGS
11	ON	eP	E	06	49	12							
	AK	e	N	06	56	05							
		eL	N		58	10							
	WN	eL	N	06	59.0								
	KM	eP	X	06	50	43							
	CH	eL	E	06	58½								
	Epicentre:			06	44	33	Samoa						USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 14	ON	iP	E	19	23	09							
		i	E			44							
		e(S)	E		27	25							
		e	E		28	57							
		eL	E		29½								
	AK	P	N	19	23	05							
		i(S)	N		27	13							
		eS	N		27	52							
		eL	N		29½								
		eLM	N		31								
	TU	eP	N	19	23	23½							
		eS	N		27	41							
		L	N		31.0								
	TO	iP	Z	19	23	31							
		e	Z		26	09							
		eL	Z		31								
	WN	iP	ZNn	19	23	49us							
		i(pP)	n			59							
		e(PP)	n		24	34							
		e	z		27	39							
		e	N			58							
		e(S)	N		28	43							
		i(PcS)	Nn		30	48							
		eL	Nn		32	08							
		eScS	n		34	29							
		e	n			38							
	CB	eP	X	19	23	54							
		e(PPP)	X		24	55							
		e	X		28	55							
		eL	X		30½								
	KM	iP	X	19	24	10							
		e	X		25	05							
		e	X			26							
		e	X		27	15							
		L	X		33.2								
		eScS	X		33	44							
	Epicentre:			19	17	57	15½S		173W	(BCIS			8 PAS
										(USCGS			7½-¾ BER
14	WN	e	n	22	00	10							
		eL	Zn		08.2								
16	KM	eP		04	14	11							
		e			15	03							
		epP			16	10							
		iS			22	22							
	ON	iP		04	14	17							
		e			15	09							
		epP			16	15							
		e				54							
		eS			22	33							
	GP	eP		04	14	17							
		epP			16	16							
		eS			22	35							
	CH	iP	Z	04	14	19							
		epP	ZE		16	17	14	8			4½	9	
		eP'P'	Z		42	18	11	6			22	9	
	KP	eP		04	14	25							
		epP			16	25							
		eS			22	50							
		e(SP)			23	29							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 16	TU	eP		04	14	31½							
		e				38							
		epP			16	31½							
		eS			22	55							
	TO	eP		04	14	24							
		e			15	09							
		i				14							
		epP			16	24							
		e(S)			22	54							
		P'P'			42	16							
	SU	eP		04	14	25							
	Epicentre:			04	04	04	4½S		107½E		600km		7½ PAS
17	SU	P?	N	08	09	31n							
		i	N			33n							
		S	N		10	26							
	ON	P	E	08	11	57							
		S	E		15	15							
	AK	S-P			2	47	No time signal						
	KP	P	N	08	12	13							
		eS	N		15	36							
	TU	eP	N	08	12	19							
		eS	N		15	36½							
	TO	eP	Z	08	12	22½							
		eS	Z		16	03							
	WN	eP	n	08	12	46½							
		iS	Nn		16	37							
	KM	eP?	X	08	13	08							
		P	X			09							
		eS	X		17	22							
	GP	eP	N	08	13	15							
		eS?	N		17	31							
		e	N			40½							
	Epicentre:			08	07	58	20S		176W		200km		USCGS
19	SU	eP	N	22	30	42							
		iS	N		40	12							
		SKS	N			41							
		PPS	N		41	05							
		eSS	N		44	12							
		eL	N		51								
	ON	P	E		32	26							
	KP	P	N		32	34½							
		ePP	N		36	04							
		e(S)	N		43	33½							
		e(PS)	N		44	43½							
	WN	P	Z		32	49							
		ipP	Z		33	09							
		eSKS	N		43	15							
		iS	N		44	06							
		(SP)	N		45	13							
		SS	N	22	50.5								
		SSS	N		54.3								
		iP'P'	Z		58	01							
		eLq	N		59.2								
		eLr	ZN	23	04.0								
	CB	eP	Z	22	32	54							
	CH	eP	Z		33	57							
		e(S)	E		45	48							
		e(PS)	E		46	32							
		eSS	E		50	50							
		eSSS	E		54	30							
		eP'P'	Z		57	57							
		eLq	E	23	00.0								
		eLr	Z		09								
	Epicentre:			22	19	26	52N		166½W				USCGS 7-7½ PAS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 20	GP	eP	N	00	16	03							
	WN	eL	ZN	00	53.3								
	Epicentre:			00	09	10	Solomon I					USCGS	
20	WN	1P	Z	06	55	26u							
		1PP	Z		56	47d							
		S	N	07	01	12							
		eLr	N		05.1								
	KP	eP	N		55	39½							
		e	N		57	07½							
	ON	eP	E	06	55	58							
	CH	eS	E		01	24							
		L	E		03	58							
		L	Z		05.2								
	GP	eL	N		07±								
	KM	eL	X		07±								
	SU	e		07	10	35							
		eL			12.5								
	Epicentre:			06	48	04	54½S		148½E			USCGS	
20	SU	eP	N	12	37	44							
		e(PP)	N		40	34							
		eS	N		42	40							
		L	N		44	40							
	CB	eP	Z		38	38							
		eS	Z		44	42							
	KM	eP	X		38	43½							
	GP	P	N		38	46							
	WN	eP	Zn		38	52d?							
		eS	N		45	01							
		e	N			30							
		e(ScS)	N		48	21							
		eLr	ZN		51½								
	CH	eP	Z		39	02							
		PcP	E		41	03½							
		ePP	E			23½							
		ePcS	E		44	56							
		e(S)	ZE	12	45	09							
		eSS	E		48	36							
		eLq	E		49.7								
		eLr	ZE		51.9								
	Epicentre:			12	30	37	6S		147½E			USCGS	
21	ON	P	E	00	17	31½							
		eS	E		19	39							
	KP	P	N		17	47							
		S	N		20	04							
	TU	eP	N		17	50½							
		eS	N		20	04							
	TO	eP	Z		17	(57)							
		eS	Z		20	(20)							
	WN	eP	n		18	19½							
		e?	n		19	02½							
		eS	n		20	55							
	GP	eP	N		18	51½							
		S	N		21	49							
	CB	eS	Z		21	09							
	Epicentre:			00	14	53	25½S		179W		NZ(D)		5¾± NZ

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 21	CH	eP?	E	21	31	31							
		eP	ZE		32	00							
			ZE		37	50							
			ZE		41	35							
		e	E		47	35							
		e	Z		49	03							
			E		52	07							
		eL	ZE	22	06.1								
	WN		Z	22	06.3								
	Epicentre:			21	12	2.6	7N	72W					$6\frac{1}{2}$-$\frac{3}{4}$ PAS
24	ON	eP	E	10	48	$09\frac{1}{2}$							
	TU	eP	N		48	17							
		S	N		50	03							
	WN	eP	n	10	48	$57\frac{1}{2}$							
		S	n		51	10							
	CB	eS	X	10	51	28							
	KM	eP	X	10	44	30							
		eS	X		52	05 ± 1							
	GP	eP	N	10	49	$32\frac{1}{2}$							
		S	N		52	15							
	Epicentre:			10	46	02	29.1S		178.8W		NZ(D)		M5.6± NZ
24	SU	PKP	N	19	30	03							
		(PKP)	N			54							
		e(SKKKS)	N		46	58							
		eSS?			52	07							
		eSS				22							
		eL		20	$12\pm$								
	WN	PKP_1	Zn		30	04							
		e(PKP_2)	Z			22							
		eSKKS	N		40	35							
		PPS	N		46	55							
		PSPS	N		54	54							
		SSS	N		59	45							
		eL	N	20	16.8								
	CH	ePKP	Z		30	04							
		e	E		44	00							
		e	E		53	01							
	CB	ePKP	Z	19	30	05							
	GP	PKP	N		30	06							
	ON	$ePKP_1$	E	19	30	08							
		$ePKP_2$	E			$33\frac{1}{2}$							
	KM	$ePKP_1$	X	19	30	10							
		$ePKP_2$	X			32							
	Epicentre:			19	10	05	36N		$28\frac{1}{2}$E			USCGS	$6\frac{3}{4}$-7 PAS 7-$7\frac{1}{4}$ BER
25	SU	$iPKP_1$	N	02	45	27							
		$ePKP_2$	N			39							
		eL	N	03	$26\frac{1}{2}$								
	ON	$ePKP_1$	E	02	45	$30\frac{1}{2}$							
		$ePKP_2$	E		46	02							
	GP	PKP^2	N	02	45	32							
	KM	ePKP	X		45	32							
	CB	PKP	Z	02	45	34							
	WN	ePKP?	n		45	$35\frac{1}{2}$							
		PKP	n			$42\frac{1}{2}$							
		e?	N		46	57							
		e	N		58	02							
		e	N	03	10.4								
		eL	N		$32\frac{1}{2}$								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 25	CH	ePKP$_1$	ZE	02	45	38							
		iPKP$_2$	Z			47							
		e(SKSP)	ZE	03	04	53							
		eL	Z			46½							
	KP	ePKP	N	02	45	40							
	AK	eL	N	03	33	±							
	Epicentre:			02	25	36	36½N		29E			USCGS	7-7½ PAS 7½ BER
25	SU	P	N	09	56	39							
		eS	N		58	50							
25	SU	P	N	10	23	37							
			N		24	39							
		iS?				56							
	GP	eP	N		25	31							
	ON	eP	E		25	51							
		e?	E		26	02½							
	WN	eL	N		40	.8							
	CH	eL	ZE		43	±5							
	AK	eL	N		44	±							
	Epicentre:			10	16	18	4½S		134E			USCGS	
25	ON	eP	E	11	16	02½							
	CB	eP?	Z		16	12½							
		eP	Z			24							
	TO	eP	Z		16	(17½)							
	KP	eP	N		16	19							
	WN	eP	n		16	24½							
	GP	eP	N	11	16	24½							
	Epicentre:			11	06	02	1½N		126E			USCGS	
26	CH	eL	E	04	31								
	WN	eL	Z		33								
27	SU	iP	N	05	51	59							
		S	N		52	20							
	Epicentre:			05	51	.5	Near Suva						
27	SU	iP	N	11	32	45S							
		i	N		33	00							
		(S)	N			36							
		i	N		34	36							
	ON	P	E		34	15							
	KP	P	N		34	41							
	TO	P	Z		34	55½							
	TU	eP	N		34	56							
		eS	N		38	40½							
	CB	P	Z		35	10½							
	WN	eP	Zn		35	18							
		eS	Zn		39	08							
	KM	P	X		35	27½							
		e?	X			(55)							
		e?	X		36	18							
	GP	P	N		35	36							
	Epicentre:			11	30	33	20s		170E	100km		USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 28	ON	eP?	E	01	34	06							
		e	E			26½							
	SU	e(P)?	N	01	34	18							
		eS	N		40	47							
		e(PS)	N		41	16							
	TO	eP	Z		34	22							
	KP	eP	N		34	23½							
	GP	eP	N		34	26¾							
		e	N			42½							
	KM	eP?	X		34	37½							
		e	X		35	09½							
	CH	eL	ZE			56½							
		eL	Z	02	02	±							
	WN	eLr	Z	01	57	.2							
	Epicentre:			01	23	40	7N	127E				USCGS	5¾-6 PAS
28	ON	eP	E	10	43	34							
	KP	eP	N		43	51							
	TO	eP	Z		43	58½ ± ½							
	TU	eP	N		44	04							
	KM		X		44	15½							
	WN	eP	n		44	16							
	GP	P	N	10	44	20s							
	SU	eL	N	10	49	±							
	CH	eS	E		50	46							
		e(ScS)	E		54	02							
		eL	ZE		56	.0							
	Epicentre:			10	36	41	6S	155E	60km			USCGS	
29	AK	eL	N	21	35	±							
	WN	eLq	N			24.9							
		eLr	ZN			32.8							
		i	Z		44	10							
		e	N			45.7							
		e	N			48.2							
	Epicentre:			20	55	57	9S	107E				USCGS	
MAY 2	ON	eP	E	01	57	.1							
		eS	E	02	01	49							
	TO	eP	Z	01	57	44½							
	WN	eS	N	02	04	04							
	GP	eP	N	01	58	08							
	Epicentre:			01	50	04	4½S	153E				USCGS	
2	TO	ePKP?	Z	04	14	52							
	WN	ePKP	Z	04	14	56							
	Epicentre:			03	55	34	72N	67½W				USCGS	
2	GP	eP	N	10	42	13							
	WN	iP	Z	10	42	11							
		e	N			18							
		eS	N		48	33							
		SS	N		51	35							
		e	Z		52	56							
		eL	ZN		53	.8							
	TO	eP	Z	10	42	19							
	KP	e(P)	N	10	42	.4							
	CB	e	E	10	42	30							
	ON	eP	E	10	42	49							
	SU	eL	N	10	58								
	Epicentre:			10	34	14	56½S	123W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 2	ON	eP	E	21	45	20							
	KP	eP	N	21	45	30							
	TU	e	N	21	45	40							
	TO	P	Z	21	45	31							
		PcP	Z		46	13							
	WN	iP	ZN	21	45	31½d							
		PcP	Z		46	08d							
		eS	ZN		52	51							
		e(SP)	N		56	.9							
	CB	P	E	21	45	23							
		eS	X		52	37							
	KM	eP	X	21	45	21							
	GP	P	N	21	45	27½n							
	SU	eP	N	21	45	25							
	Epicentre:			21	36	25	7½S		120E		600km		USCGS
3	WN	e	N	07	22	.6	Traces						
3	WN	e	N	12	54	.4	Traces						
4	SU	eL	N	09	39	.5	Coda for ten minutes						
4	TO	eP	Z	10	14	41							
	WN	eP	Z	10	14	47							
		eS	N		22	14							
		e	N		26½								
		eLr	Z		31	.3							
	GP	eP	N	10	14	53							
	SU	eL	N	10	24								
	Epicentre:			10	05	45	3½S		137E				USCGS
6	TO	eP	Z	11	42	17							
	WN	eS	N	11	46	49							
	CB	eP	E	11	42	39							
	GP	eP	N	11	43	06							
		eS	N		47	33							
	SU	eP	N	11	38	58							
		S	N		40	18							
	Epicentre:			11	37	33	17½S		176W		250km		USCGS
8	ON	eP	E	20	14	00							
	KP	eP	N	20	14	18							
		e	N			39							
		e	N		15	19							
	TO	eP	Z	20	14	33							
	WN	eP?	N	20	14	53							
		eLr	Z		22	.0							
	SU	P	N	20	09	55							
	Epicentre:			20	09	55	15½S		179E		400km		USCGS
10	ON	P	E	16	26	08							
	TU	eS	N	16	27	52							
	WN	eP	N	16	26	54							
		S	N		27	52							
	CB	S	E	16	29	04							
	KM	eS	X	16	29	43							
	GP	eP	N	16	27	26							
		S	N		29	50							
	SU	e(S)	N	16	27	13							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 12	ON	eP	E	05	00	14							
	KP	eP	N	04	59	59							
	WN	iP	ZN	04	59	43d							
		eL	N	05	29½								
	CB	eP	E	04	59	48							
	GP	eP	N	04	59	30							
	RX	eL	E	05	18								
	Epicentre:			04	47	44	Sandwich I. region						USCGS
12	WN	e?	N	11	46	16							
		eS	N		49	02							
		eSS	N		53.8								
		eL	N		56.8								
		eLr	N	12	01								
	GP	eP	N	11	39	53							
	RX	eS	N	11	48	22							
		eSS	N		52.3								
		eLq	N		55	10							
	SU	eL	N	11	58								
	Epicentre:			11	29	07	8½S 107½E						USCGS
15	CB	P*	E	16	10	07							
		S*	E			23							
	WN	iP*	N	16	10	03							
		S*	N			17							
	KM	e(P)	X	16	10	30¾							
		eP*	X			35							
		Sn	X		11	02							
	GP	ePn	N	16	10	35							
		eP*	N			46							
		iSn	N		11	08½							
	TO	Pn	Z	16	10	14							
	TU	e	N	16	10	36							
		e(Sn)			11	03							
	KP	Pn	N	16	10	29							
		eP*	N			38							
		Sn	N		11	01							
		S*				17							
	ON	ePn	E	16	10	58							
		Sn	E		11	46							
		e	E		12	03							
	Epicentre:			16	09	45	40.5S 174.0E S NZ(B) Felt about Cook Strait, Tasman and Golden Bays. Maximum MM5 at Collingwood.						5.0 NZ
17	KP	eP	N	02	46	45							
	SU	P	N	02	42	47s							
		iS	N		43	52							
	Epicentre:			02	42	02	18S 176½W 60km						USCGS
19	ON	P	E	20	33	37							
	TU	eP	N	20	33	28½							
		S	N			52							
	WN	eP	N	20	33	54½							
		S	N		34	41							
	KM	eP?	X	20	34	27							
		S	X		35	32							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 19	GP	eP	N	20	34	28							
		eS	N		35	42							
		i	N			44½							
	Epicentre:			20	32	53	37.75S		176.3E		210km		NZ(B) 5.1 NZ
21	ON	eP	E	01	22	38							
		e	E		23	39							
		eScS	E		32	18							
	KP	eP	N	01	22	41							
		e(sP)	N		23	18							
		ScS	N		32	35s							
	WN	iP	ZN	01	22	56u							
		i	Z		23	42u							
		eS	N	01	31	46							
		eScS	N		32	37							
	CB	eP	E	01	22	55							
		e	E		23	46							
		ScS	E		32	40							
	KM	eP	X	01	22	58							
	GP	eP	N	01	23	04							
	RX	eS	NE	01	32	10							
		ePS	N			56							
		eSS	NE		37.	0							
	SU	eP	N	01	21	04							
		1S	N		28	19s							
		e	N			42							
	Epicentre:			01	11	58	21½N		144E		100km		USCGS
22	KP	e(P)	N	13	42	40							
	WN	e	N	13	55								
		eL	N	14	15								
	CB	e(P)	E	13	42.	9							
	RX	e	E	13	56								
		eL	EN	14	14								
	SU	eS	N	13	49	50							
		ePS	N		50	12							
		eL	N	14	01								
	Epicentre:			13	29	44	50N		177W				USCGS
24	RX	eL	E	03	29								
	Epicentre:			02	37	37	3N		76½W				USCGS
24	WN	eL	N	13	06								
	RX	eL	N	13	09								
	SU	eP	N	12	51	06							
		eL	N		53.	6							
	Epicentre:			12	49	16	15S		173½W				USCGS
25	WN	e	N	05	56		Traces						
26	AK	e	N	07	25								
	KP	ePKP	N	06	53½								
	WN	ePKP$_1$	Z	06	53	24							
		e(pPKP$_1$)	ZN			36							
		eL	N	07	36								
		eLr	ZN		48								
	CB	e(pPKP)	E	06	53	31							
	KM	ePKP	X	06	53½								
	RX	ePKP	Z	06	53	26							
		eSKKS	E	07	03	53							
		e	E		11	10							
		eLq	NE		36								
		eLr	Z		46								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 26	SU	ePKP	N	07	53	15							
		SS	N	08	15	46							
		SSS	N		20	44							
		eL	N		33								
	Epicentre:			06	33	31	41N	31E				USCGS	
28	WN	e(L)	N	00	34½								
	SU	eL	N	00	23½								
	Epicentre:			00	19	10	Samoa					USCGS	
28	WN	eS	N	05	59	28							
	Epicentre:			05	52	32	26S	176W					NZ
28	KP	P	N	23	24	22							
	WN	eP	N	23	24	48							
		eS?	N		28	55							
	KM	eP	X	23	25	01							
	SU	eP	N	23	22	00							
		iS	N		23	56							
	Epicentre:			23	19	39	15S	168E	300km			USCGS	
30	ON	eL	E	00	30								
	AK	eL	N	00	28.0								
	KP	eL	N	00	28.3								
	WN	eP	N	00	23	57							
		e	N		28	55							
		eL	N		30.3								
	KM	eP	X	00	24	26							
	SU	P	N	00	20	58n							
	Epicentre:			00	18	52	20S	175W				USCGS	
30	RX	eL	E	19	54								
		eL	N		56								
		eL	Z		57								
	SU	S	N	19	43	01							
		i	N			40							
		eL	N		44	50							
30	AK	eL	N	23	08½								
	WN	eL	N	23	10								
	RX	eL	E	23	10								
		eL	N		12								
		eL	Z		14								
	SU	S	N	22	59	19							
		eL	N	23	00.9								
30	KP	P	N	21	01	46							
		S	N		04	39							
	WN	eP	N	21	02	14							
		eS	N		05	20							
	CB	P	E	21	02	18							
		eS	E		05	25							
	KM	eP	X	21	02	34							
		eS	X		05	52							
	GP	eP	N	21	02	39							
		S	N		06	05							
	SU	P	N	20	59	46							
		i	N	21	00	50							
		i	N		01	02							
	Epicentre:			20	58	15	22S	179W	600km			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 31	RX	eSKS	E	02	38.4								
	Epicentre:			02	16	27	27½S	63W	600km			USCGS	
31	RX	eL	E	20	20								
		eL	N		22								
		eL	Z		23								
	SU	e?	N	20	05	00							
		e	N			27							
		S	N		06	32							
		eL	N		08.7								
JUN 2	SU	P	N	09	54	35n							
		S	N		55	51s							
		e	N		56.6								
	RL	iP	Z	09	54	35							
		eS	Z		55	38							
		e?	Z			50							
	ON	P	E	09	56	02w							
	KP	P	N	09	56	(17)s?							
		eS	N		59	05							
	WN	eP	ZN	09	56	50½							
		i	N			52							
		S	N	10	00	00							
	CB	P	E	09	56	55							
		eS	E	10	00	06½							
	KM	P	X	09	57	10½							
		eS	X	10	00	30							
	GP	eP	N	09	57	17							
		i	N			21½							
		eS	N	10	00	43½							
4	SU	(S)	N	11	18	23							
		iS	N			36							
		e	N			59							
		e	N		21	20							
	ON	eP	E	11	20	30							
	KM	eP?	X	11	21	06							
	CB	eP	E	11	21	14							
	WN	eP	ZN	11	21	16							
	GP	eiP	N	11	21	31s							
	RX	eS?	N	11	28	34							
		eL?	E		31.1								
		eL	N		32.0								
		eL	E		35.0								
	Epicentre:			11	14	50	10½S	166½E				USCGS	
4	SU	iP	N	17	06	31n							
		iS!	N		07	35							
	RL	P	Z	17	07	44							
		sP	Z		09	34							
		S	Z			51							
		ePcP	Z		12	36							
	ON	P	E	17	08	59½w							
		i	E		09	03w							
		iS	E		12	13½w							
	AK	eP	N	17	09	(15)							
		e(S)	N		11	(49)							
		S	N		12	(18)							
		i	N			(34)							
	WN	P	N	17	09	42							
		e	N		12	40							
		eS	N		13	15							
		i	N		19	34							
		i	N		24	46							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 4	CB	eP	E	17	09	45							
		e	E		11	26							
		S	E		13	20½							
	KM	eP	X	17	10	00							
		e	X		11	36							
		eS	X		13	47½							
	GP	eP	N	17	10	(06)							
		e	N		11	41½							
		S	N		13	59½							
	RX	e	ZN	17	12	03							
		e	N		13	14							
		e	N		14	27							
		i	E			36½							
		e	Z		15	56							
		e	E		17	34							
		e	N			45							
		(L)	Z		19	56							
		i	E		20	04							
	Epicentre:			17	05	02	17½S		178W		500km		USCGS
4	SU	eL	N	22	38	ca							
	ON	eP	E	22	39	46							
		eS	E		44	36½							
	KP	eP	N	22	39	(48)							
	GP	eP?	N	22	40	42							
		eP	N			48½							
	WN	e	N	22	42	32							
		eL	N		48	ca							
	RX	eL	E	22	49	.6							
		eL	N		52	.0							
		E	Z		52	13							
6	ON	eP?	E	19	59	57½							
	KM	eP	X	20	00	13							
	WN	eP?	N	20	00	14½							
	GP	P	N	20	00	16	n						
	RX	e	N	20	08	26							
		e	NE		15	36							
		e	E		20	.1							
		eL	E		23	.1							
		eL?	Z		27	.7							
	Epicentre:			19	49	47	3N		126½E				USCGS
8	WN	eL	N	03	50								
	RX	eL	N	03	42								
	Epicentre:			03	23	33	3S		147½E				USCGS
8	GP	eP	N	06	16	17½							
	RX	e	NE	06	23	00							
		eL	NE		30	.0							
		eL	Z		31	.3							
	WN	eL	N	06	31	ca							
	Epicentre:			06	07	47	2½S		150E				USCGS
8	SU	i	N	17	14	13	s						
		i	N			21	s						
		e	N			30							
	ON	iP	E	17	17	02½	e						
	WN	eP	N	17	17	49							
	CB	eP	E	17	17	53							
	KM	eP	X	17	18	12							
	GP	eP	N	17	18	19½							
	Epicentre:			17	12	03	16½S		173½W				USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 10	KM	eP	X	01	09	54½							
	CB	P	E	01	09	55							
		S	E		17	46							
	AK	eP?	N	01	09	55		ADDENDUM:					
		iS	N		17	55		Jun 8d. 22h. 29m.					
		iScS	N		19	40		See page 111					
		eL	N		35ca								
	ON	iP?	E	01	09	57e							
		eP	E		10	03							
	GP	P	N	01	09	59½							
		ePcP	N		11	45							
	WN	iP	ZN	01	10	04u							
		ePcP	N			59							
		iS	N		17	56							
		iScS	N		19	39							
		eSSS	N		24	29							
		e	N		31	20							
	SU	iP	N	01	10	08s							
		ePP	N		11	59							
		iS	N		18	03s							
		(PPS)	N			51							
		ScS	N		19	19							
	RX	iS	NE	01	17	32s							
		eScS	NE		19	27							
		i(SSS)	N		24	04s							
		eLq	E			40							
		eLr	E		27.0								
		eL	NE		29ca								
	Epicentre:			00	59	54	9S		117E			USCGS	
10	TU	eP	N	02	36	36							
		e(S)	N			59							
	WN	eP?	N	02	37	10½							
		iS	N		38	05							
	GP	eP	N	02	37	48½							
		S	N		39	09½							
	CB	S	E	02	38	23½							
	KM	eS	X	02	39	04							
	Epicentre:			02	36	00	37.4S		178.0E		220km	NZ(D)	4.6 NZ
10	WN	eP	N	03	23	18							
	GP	P	N	03	23	24							
		e(PcP)	N		24	00							
		e				29							
	Epicentre:			03	13	11	13½N		143½E			USCGS	
11	RL	P	Z	14	50	06							
	ON	eP?	E	14	51	45½							
		P	E			48½							
		eL	E		54	00							
	TU	eP	N	14	51	54½							
		S	N		53	32½							
	AK	iP	N	14	51	56							
		i	N		52	05							
		iS	N		53	34							
	WN	eP	ZN	14	52	29							
		e	N			33							
		i	N			44½							
		iS	ZN		54	41							
		ScS	N	15	05	26							
	SU	iP?	N	14	52	38s							
		P	N			45							
		iS	N		56	06							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 11	CB	eP	E	14	52	48½							
		e	E			58½							
		iS	E		54	57							
	KM	eP	X	14	53	06							
		e	X			12							
		iS	X		55	37							
	GP	P	N	14	53	09							
		i	N			19½							
		e	N		55	41½							
		iS	N			44							
		e(ScS)	N	15	04	52							
		eScS	N		05	31½							
	RX	eP	NE	14	53	42							
		eP	Z			52							
		e?	Z		57	06							
		i	N			35							
		L	E		57.	8							
		L	Z		58.	9							
	Epicentre:			14	49	47	30S		178W		100km		USCGS
							Felt Raoul Is. MM4						
11	RX	eP	Z	19	01	24							
		iS	NE		11	10nw							
		e(SS)	E		15	59							
		e(SS)	NE		16	56							
		eL	NE		21.	6							
	KM	eP	X	19	01	27½							
	GP	P	N	19	01	27½							
	WN	eP?	N	19	01	50							
		eS	N		11	10							
		i(PS)	N			38							
		eLq	N		22.	9							
		eLr	N		27½								
	SU	eS	N	19	09	25							
		i(Lq)	N		18	45							
		e	N		26.	0							
	Epicentre:			18	49	24	18N		120½E				USCGS
12	WN	e	N	00	41	06							
		eL	N		43¾								
	RX	i	N	00	18	13							
		e	N			52							
		e?	N		25.	3							
		eL	ZNE		38.	4							
12	GP	eP?	N	00	41	17½							
		e	N			31½							
	RX	e	N	08	53.	5							
		e	N		58.	4							
		eL	N	09	10ca								
	Epicentre:			08	28	34	41½N		142½E				USCGS
13	TU	e(P)	N	07	28	14½							
		iS	N			21							
	WN	iP	N	07	28	20½							
		iS	N			54½							
		e	N		29	19½							
	ON	e?	E	07	28	34							
		e(P)	E			59							
	KM	eP	X	07	28	54							
		iS	X		29	47							
	GP	P	N	07	28	54½							
		S	N		29	56							
	CB	S	E	07	29	09½							
	Epicentre:			07	27	36	38.7S		175.9E		160 km NZ		4.6 NZ

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 13	ON	eP	E	10	53	41							
	SU	e(S)	N	11	00	53							
		e(PS)	N		01	26							
		eL	N		12	.8							
	AK	SKS	N	11	04	02							
		ePS	N		05	25							
		eSS	N		09	55							
		PcPPKP?	N		15	43							
		eLq	N		18	.8							
		eLr	N		21	.5							
	WN	iSKS	N	11	04	20							
		iS	N			45							
		ePS	N		05	55							
		SS	N		10	.6							
		eL	ZN		23	.2							
	RX	iSKS	ZNE	11	04	51							
		S	ZNE		05	41							
		PS	ZN		07	03							
		eSS	NE		12	.0							
		e	E		14	58							
		SSS	N		16	.0							
		eSKKS	E		18	.0							
		eLq	E		21	.0							
		eLq	N		22	.8							
		eLr	ZN		26	.4							
		eLr	E		27	.4							
		eL_2	N	12	48	ca							
	Epicentre;			10	40	38	51½N		175W			USCGS	
14	ON	P	E	16	17	45							
	WN	eP	N	16	18	31½							
		eS	N		20	43½							
	KM	eP	X	16	19	02½							
		eS	X		21	31							
	GP	eP	N	16	19	03½							
		eS	N		21	43							
	TU	eS	N	16	19	42½							
	CB	eS	E	16	20	58½							
	Epicentre:			16	15	40	29½S		179W		N?	NZ(D)	5.9 NZ
15	RX	eS	N	01	06	20							
		ePS	E		07	44							
		eSS	N		12	07							
		eLq	NE		18	.2							
		eLr	NE		21	.4							
	WN	S	N	01	07	45							
		Lq	N		21	.5							
		Lr	N		24	.4							
	Epicentre:			00	44	15	34S		56E			USCGS	
16	TO	iP	Z	11	47	39½u							
		(S)	Z			58½							
	TU	eP?	N	11	47	48½							
		eS	N		48	17							
	WN	P	N	11	47	50							
		S	N		48	19							
	CB	iP	E	11	47	52½							
		S	E		48	25							
	KM	eP	X	11	48	11½							
		eS	X		49	00							
	GP	P	N	11	48	18½							
		iS	N		49	11½							
	Epicentre:			11	47	11	39.1S		174.6E		200km	NZ(C)	4.3 NZ

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 17	SU	iP	N	06	19	00s							
		e	N			31							
		eS	N		20	33							
	ON	P	E	06	21	56							
		e?	E		22	10½							
		e	E			17½							
	AK	iP	N	06	22	04							
	TO	P	Z	06	22	18							
	WN	eP	N	06	22	38							
		eS	N		26	37							
	KM	P	X	06	23	02½							
	GP	P	N	06	23	05½							
	RX	eL	NE	06	32.6								
	Epicentre:			06	44	15	15S		173½W				USCGS
18	RX	e(SS)	E	02	42.2								
		e(SSS)	E		46.1								
		e(Lq)	N		52.5								
		e(Lq)	E		53.8								
		eLr	NE		58.0								
	Epicentre:			02	12	12	14½N		96E				USCGS
18	RX	e(SKS)	NE	15	12.0								
		e(PS)	E		13.3								
		eSS	E		18.1								
		eSSS	NE		21.9								
		e(SKKS)	N		25.2								
		e(Lq)	NE		28.5								
		e(Lr)	NE		34.7								
	WN	e(L)	N	15	28.9								
	Epicentre:			14	48	17	14N		96E				USCGS
18	SU	iP	N	17	58	45s							
		(S)	N	18	00	14							
		L	N		00.6								
	ON	iP	E	17	58	46½w							
		i	E		59	24							
		eL	E	18	01.0								
	AK	iP	N	17	59(00)s								
		e	N	18	01(10)								
		iL	N		03(26)								
	TO	eP	Z	17	59	31½u							
		eL	Z	18	03	27							
	TU	eP	N	17	59	36s							
		e	N	18	00	24							
		eL	N		04	10							
	WN	iP	ZN	17	59	56us							
		e(S)	ZN	18	03	01							
		e(S)	N		02	57½							
		iL	ZN		04	23							
	KM	eP	X	18	00	07							
		e	X			33							
		e(S)	X		04	49							
		eL	X		05.7								
	GP	eP	N	18	00	20							
		e?	N		04	10							
		e(S)	N		05	45							
		eL	N		06.9								
	RX	iP	ZN	18	00	39us							
		iS	NE		04	18							
		eLq	N		05.3								
		eLr	Z		06.0								
	Epicentre:			17	56	03	25S		170E				USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 18	SU	L	N	20	45.9								
	AK	eL	N	20	55								
	WN	eL	N	20	57.4								
	RX	eL	NE	20	59.7								
19	SU	iP	N	01	31	52							
		S	N		33	41							
	ON	eP	E	01	33	26							
	AK	eS	N	01	36(35)								
		eL	N		37.3								
	TU	eP	N	01	33	42							
		eS	N		36	20							
	TO	eP	Z	01	33	49							
		eS	Z		37	07½							
	WN	eP	N	01	34	13							
		iS	N		37	26							
		eL	N		38.6								
	KM	P	X	01	34	38½							
		eS	X		38	17							
	GP	eP	N		34	39½							
		S	N		38	27							
	CB	eP	E	01	34	59							
		eS	E		37	41							
	RX	eP	N	01	35.1								
		eS	NE		39.5								
		eL	NE		40.3								
		eL	Z		43								
	Epicentre:			01	29	48	24S		175W				USCGS
19	SU	e	N	02	56	25							
	ON	P	E	02	58	55							
	KM	eP	X	02	59	53½							
	GP	eP	N	03	00	00½							
	Epicentre:			02	55	03	Fiji						USCGS
19	SU	iP!	N	08	02	02							
	ON	P	E	08	06	03½							
		(S)	E		09	42							
	AK	eP	N	08	06	27							
		eS	N		10	30							
		eL	N		12								
	TO	eP	Z	08	06	34							
		i	Z			38							
	TU	eP	N	08	06	39							
		e(S)	N		10	45							
	WN	iP	ZN	08	06	52d							
		ePP	N		07	47							
		ePPP	N	08	08	04							
		eS	N		11	52							
		eS	N		12	00							
		e(PcS)	N			52							
		SS	N		13	35							
		Lr	ZN		15.8								
	CB	P	E	08	06	55							
		e(S)	E		10	35							
		e(L)	E		11	31							
	KM	eP	X	08	07	14							
		eS?	X		12	02							
	GP	eP	N	08	07	16½							
		eL	N		13.7								
	RX	eP	ZN	08	07	47							
		iS	NE		12	31se							
		e(PcS)	NE		14.1								
		eL	NE		14.4								
	Epicentre:			08	01	30	16½S		176½E				USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 22	SU	eP	N	23	58	53							
		i	N		59	14							
		i	N	24	00	00							
		i(PPP)	N		01	18							
		iS	N		05	21							
		iSS	N		08	19	coda for 2 hrs						
	ON	eP	E	23	59	(20)							
		e	E	24	01	(10)							
		eL	E		11	(20)							
	AK	eP	N	23	59	20							
		iPPP	N	24	02	03							
		eS	N		06	30							
		iLq	N		13	00							
	CB	eP	E	23	59	25							
		eL	E	24	13	22							
	TO	eP	Z	23	59	31							
		eL	Z	24	15	47							
	WN	eP	ZN	23	59	35							
		e(S)	N	24	06	(36)							
		iScS	N		09	35							
		eSS	N		10	40							
		i	N		11	23							
		iLq	N		15	20							
		iL	N		19	19							
		eL	N		24	30							
	GP	eP	N	23	59	38							
		eL	N	24	15	27							
	RX	eP	ZNE	23	59	41							
		eS	E	24	07	06							
		iS	N			13							
		eS	Z			56							
		iScS	E		09	42							
		eSS	N		10	45							
		eSS	E		11	18							
		e	Z		12	06							
		eLq	N		13	.2							
		eLq	E		13	44							
		eLq	Z		15	.3							
		i	NE		20	.1							
	TU	eL	N	24	(12)	?							
	NP	eL	E	24	15	37							
	Epicentre:			23	50	23	1½S 137E					USCGS	
23	SU	eP	N	03	39	22							
		e(L)	N		41	04							
	RX	eL	E	03	52	.9							
		eL	N		54	.0							
	WN	eP	N	03	53	18							
	Epicentre:			03	38	25	14S 173½W					USCGS	
27	SU	P	N	00	22	39							
		e?	N		23	52							
		iS	N		33	12							
		iSS	N		39	23							
		eSSS	N		43	12							
		eLq	N		51	.7							
		eLr	N		58	.4							
	TO	ePKP	Z	00	17	59							
	ON	ePKP?	E	00	28	04							
		e?	E			34							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 27	RX	ePKP	Z	00	28	34							
		ePKP	NE			42							
		eSKS	NE		34	48							
		eSKKS	NE		35	48							
		e	E		36	35							
		i(PKKP)ZNE			38	19							
		i(PS)	ZNE		39	34							
		e(PPS)NE			40	41							
		iSS	NE		44	48							
		eSSS	NE		48	38							
		eLq	E		56.7								
		eLq	N		57.3								
		eLr	N	01	01.6								
		eLr	Z		02.6								
	WN	iPKP	Z	00	28	35							
		iPPP	Z		31	11							
		SKS	N		34	20							
		(PS)	N		37	46							
		e(PKKS)N			43	09							
		eSS	N		44	28							
		eSSS	N		48	00							
		eLr	ZN	01	00.7								
	Epicentre:			00	09	28	56½N	116E				USCGS	
27	SU	P	N	12	52	10							
		S	N		54	20							
	ON	eP	E	12	53	38							
	TO	eP	Z	12	54	13							
	RX	eL	N	12	59.4								
		eL	E		59.6								
		eL	ZN	13	02.6								
	WN	eL	N	13	00¾								
	Epicentre:			12	59	51	22S	171E				USCGS	
28	SU	P	N	00	36	27							
		S	N		38	20							
	WN	eP	N	00	38	49							
		eS	ZN		42	33							
		Lr	ZN		45.2								
	RX	eS	NE	00	43	46							
		eL	N		46.6								
		eL	Z		47.1								
28	TU	eP	N	08	31	05							
		eS	N			37							
	TO	P	Z	08	31	10½							
	WN	eP	N	08	31	31½							
		S	N		32	25½							
	GP	eP	N	08	32	04½							
		S	N		33	24							
	KM	eS	X	08	33	11							
	Epicentre:			08	30	22	37.2S	176.4E	285km			NZ(D)	4½ NZ
28	ON	eP?	E	18	52	30							
		e(P)	E		56	31½							
	SU	P	N	18	55	05							
		eS	N		56	55							
		e	N		59	14							
	TO	eP	Z	18	57	01							
		e	Z			24							
	WN	P	ZN	18	57	21							
		eS	ZN	19	01	16½							
		Lr	ZN		03.3								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 28	GP	eP	N	18	57	44½							
	AK	eS	N	19	01	39							
	RX	eS	NE	19	02	23							
		e(Lq)	N		04.	7							
		eLr	ZN		05.	6							
JUL 1	TU	eS	N	02	29	27							
	WN	eS	N	02	30	24							
	KM	eS	X	02	31	17							
	GP	eP	N	02	27	29							
		eS	N		31	20							
		e	N			24							
	SU	eP	N	02	24	11							
		(S)	N		26	02							
	Epicentre:			02	22	24			Tonga				USCGS
2	WN	iPKP	NZ	01	01	45d							
		ePKS	NZ		05	16½			6	10			
		eL	N		41½								
		Lr	Z		52								
	GP	ePKP	N	01	01	43							
	RX	iPKS	NE	01	05	08e			3	8	10	10	
		eSS	NE		22.	0			4	30	10	35	
	SU	eL	N	01	45								
	Epicentre:			00	42	23			36N	53E			USCGS
3	TU	eP	N	06	05	49							
		eS	N		08	22							
	WN	eP	N	06	06	16½							
		eS	N		09	12							
	CB	eS	E	06	09	17							
	KM	eS	X	06	09	46							
	SU	iS	N	06	05	40							
	Epicentre:			06	02	37			24S	180	550km		USCGS
4	TU	eP	N	09	48	11							
		S	N		49	22							
	WN	eP?	N	09	48	58							
		eS	N		50	31							
		e	N			34							
	CB	eS	E	09	50	48							
	KM	eP	X	09	49	02							
		eS	X		51	30							
	GP	eP	N	09	49	10							
		S	N		51	36							
	SU	eL	N	09	53								
5	ON	P	E	12	36	00½							
	AK	iP	N	12	36	41s							
		iS	N		38	25s							
	TU	eP	N	12	36	08							
		eS	N		37	41							
	WN	e	N	12	36	51							
		e	N		38	49							
		iS	N			53							
	CB	eS	E	12	39	02							
		e	E			08							
	KM	eS	X	12	39	48							
	GP	eP	N	12	37	26							
		S	N		39	54							
	RX	eLq	NE	12	42				5½	20	4	20	
		eLr	Z		44								
	SU	eL		12	40.	0							
	Epicentre:			12	33	56			28½S	179W			USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 6	ON	eP	E	17	11	27							
	TU	eS	N	17	13	11							
	WN	eS	N	17	14	19							
	GP	eP	N	17	12	53							
		eS	N		15	23							
7	ON	eP	E	16	18	10							
		ePcP	E		20	41							
	AK	eL	N	16	29								
	TU	eP	N	16	18	32							
	WN	eP	N	16	18	41							
		e	N		24	01			3	5			
		iS	N			30s			5½	5			
		eL	N		27.4								
	KM	eP	X	16	18	40							
	GP	eP	N	16	18	50							
	RX	eS	NE	16	24	53			4	22	3	22	
		eLq	NE		28	16			16	25	8	25	
		eLr	Z		30½		17	25					
		M	EN		34				25	20	20	20	
	SU	eP	N	16	16	47							
		S	N		20	47							
	Epicentre:			16	11	15	6½S	156E				USCGS	
9	ON	eP	E	10	09	37							
	WN	eL	N	10	35½								
	GP	eP	N	10	09	35							
	RX	eS	N	10	18	01			3	5			
		e	E			46					3	24	
		eLq	N		26.0				2	20			
		eL	Z		33								
		M	NE		35				2	20	4	20	
	Epicentre:			09	58	09	6S	104E		60km		USCGS	
10	ON	P	E	04	40	38							
	TU	eS	N	04	42	26							
	WN	eS	N	04	43	33							
	CB	eS	E	04	43	52							
	KM	eS	X	04	44	29							
	GP	eP?	N	04	42	00							
		S	N		44	38							
	Epicentre:			04	38.5		Kermadec Is region					NZ	
10	RX	ePS	E	09	32	22					2	20	
		eSS	EN		38	22			2	20	4½	22	
		eL	ENZ		53								
		M	NE	10	00				2	19	5	19	
	Epicentre:			09	04	08	8N	82½W				USCGS	
10	ON	P	E	16	12	03							
	TU	P	N	16	11	58							
		S	N		12	46½							
	WN	eP?	N	16	12	37							
		S	N		13	55							
	CB	eS	E	16	14	15							
	KM	eS	X	16	14	54							
	GP	eS	N	16	14	58							
	Epicentre:			16	10	55	35.6S	179.7E(D)		250km			5.4NZ
12	WN	eL	N	21	19								
	RX	eL	NE	21	20								
	SU	e	N	21	05	10							
	Epicentre:			20	56	18	3S	148½E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 12	WN	eL	N	21	19								
	Epicentre:			21	58	45	3S		148½E			USCGS	
13	ON	eP	E	09	37	4							
	AK	eL	N	09	46								
	WN	eP	N	09	37	57							
		eL	N		47	3		9	20				
	KM	eP	X	09	38	4							
	GP	eP	N	09	38	25							
	RX	eLq	NE	09	47						3	25	
		eLr	Z		52		3½	15					
	SU	eP	N	09	34	20							
		S	N			57							
		L	N		35	22							
	Epicentre:			09	32	05	15S		173W			USCGS	
13	WN	eP	N	14	04	44							
		eL	N		13	8							
	SU	eS	N	14	02	30							
		eL	N		03	15							
	Epicentre:			13	58	45	14½S		173½W				
14	ON	P	E	06	26	35e							
		iS	E		28	39e							
	AK	iP	N	06	26	42s							
		iS	N		28	50n							
		ScS	N		39	05							
	TU	eP	N	06	26	52							
		S	N		28	59							
	WN	eP	N	06	27	21							
		iS	N		30	03n							
		iScS	N		39	12s			33	6			
	CB	eP	E	06	27	36							
		e	E		28	09							
		S	E		30	18							
	KM	eP	X	06	27	54							
		S	X		30	53							
	GP	eP	N	06	27	54							
		S	N		31	04							
	RX	eP	NE	06	28	21			2	12			
		e	Z		29	00	4	10					
		iL	NE		33	10			43	35	92	35	
		M	NE		35				25	20	109	20	
	SU	iP	N	06	26	14s							
	Epicentre:			06	23	50	27½S		177W		200km	USCGS	
14	ON	P	E	08	13	11							
	AK	iP	N	08	13	33s							
		S	N		15	05							
	TU	eP	N	08	13	17							
		eS	N		15	03							
	WN	eP	N	08	13	53½							
		eS	N		16	10½							
	CB	e(P)	E	08	14	15							
		e	E		16	27							
	KM	eP	X	08	14	31							
		eS	X		17	09							
	GP	eP	N	08	14	30							
		i	N			41s							
		S	N		17	16							
	RX	e(P)	NE	08	15	16			11	25	4	20	
		eLq	NE		19	5			38	35	80	45	
		eLr	Z		20	4	33	30					
		M	NE		22				44	22	36	20	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 14	SU	iP	N	08	13	37n							
	Epicentre:			08	10	45	30S		177W			USCGS	
14	ON	eP	E	09	46	.7							
	AK	P	N	09	46	54n							
		S	N		50	29							
	TU	eS	N	09	50	.7							
	WN	eP	N	09	47	34							
		eS	N		51	33							
	CB	eP	E	09	47	41							
		eS	E		51	49							
	KM	eP	X	09	47	55							
		eS	X		52	17							
	GP	eP	N	09	47	58							
		eS	N		52	29							
	RX	eS	E	09	53	16					3	7	
		eLq	E		55	00					21	30	
		eLr	Z		56	.3	14	25					
		M	NE		57				3½	20	14	20	
	SU	iP	N	09	44	22n							
	Epicentre:			09	42	27	20S		174½W			USCGS	
16	TU	eP?	N	04	23	59							
		eS	N		25	20							
	WN	eS	N	04	26	27							
	KM	eS?	X	04	27	31							
	GP	eS	N	04	27	33							
16	ON	P	E	15	04	26							
	TU	eP	N	15	04	32							
		S	N		05	17							
	WN	eP	N	15	05	05							
		S	N		06	22							
	KM	eS	X	15	07	20							
	GP	eP	N	15	05	40							
		S	N		07	25							
	Epicentre:			15	03	25	35.3S		179.0E		250km	NZ(C)	5.2 NZ
17	ON	P	E	11	15	43							
		eS	E		19	59							
	AK	P	N	11	15	48							
		iS	N		20	18s							
	KP	P	N	11	16	00s							
		eS	N		20	46							
	TU	eP	N	11	16	(12)							
		S	N		20	(52)							
	WN	iP	NZ	11	16	24½u		10	6				
		i(PP)	Z			47							
		i	Z			57							
		iPP	Z		17	45		9	7-10				
		iS	N		21	14s		11	10				
	CB	eP	E	11	16	24							
		eS	E		21	13							
	KM	P	X	11	16	32sw							
		S	X		21	19							
	GP	iP	N	11	16	43s							
		eS	N		21	49							
	RX	iP!	ZN	11	16	56u	5	5	15	5			
		ePP	ZN		18	20			1	10			
		iS	ZN		22	10	11	15	18	22			
		eL	E		25						20	30	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 17		M	NE		29				20	12	19	19	
	SU	PP	N	11	13	31n							
		S	N		16	09	11S	167E				USCGS	
	Epicentre:			11	10	10	11S	167E				USCGS	
17	WN	eL	N	12	55								
	GP	eP	N	12	35	21							
	RX	eL	NE	12	52								
	Epicentre:			12	26	05	2S	137E				USCGS	
20	KP	eP	N	11	17	23							
	WN	eP	N	11	17	49							
		eS	N		21	01							
	KM	eP	X	11	18	12							
20	KP	eP	N	15	43	28							
	TO	eP	Z	15	43	37							
	WN	eP	ZN	15	43	59							
		eS	N		48	04							
	CB	eP	E	15	44	08							
	KM	eP	X	15	44	23							
	GP	eP	N	15	44	26							
		eS	N		49	04							
	RX	eL	NE	15	52				6	21	6	22	
	SU	iP	N	15	40	43s							
		iS	N		42	26n							
	Epicentre:			15	38	47	19½S	174W				USCGS	
20	SU	e(S)	N	20	53	23							
21	SU	e(S)	N	05	21	38							
		eL	N		23	00							
21	AK	eL	N	06	13								
	WN	iP	Z	06	04	31							
		e	N		09	11			2	10			
		e	N			34			4	8			
		Lr	Z		10.9								
	RX	eP	ZN	06	03	33	7½	6	4	10			
		eLq	E		07.1						5½	20	
		eLr	ZN		08.2		26	20	20	24			
	SU	eL	N	06	22½								
	Epicentre:			05	59	13	62½S	154E				USCGS	
21	KM	eP	X	06	42	28							
	RX	eL	E	06	54						3	20	
	SU	eL	N	06	42.0								
	Epicentre:			06	36	58	18S	169½E				USCGS	
21	ON	eP	E	07	07	23							
		ePP	E		08	08							
	KP	eP	N	07	07	41							
	WN	eP	N	07	07	59							
	CB	eP	E	07	07	52							
	KM	eP	X	07	08	09							
	Epicentre:			07	00	10	4½S	153E				USCGS	
21	ON	eP	E	13	20	24							
	WN	eP	N	13	21	09							
		eS	N		24	10							
	CB	eP	E	13	21	13							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 21	KM	eP	X	13	21	28							
		eS	X		24	42							
	GP	eP	N	13	21	34							
		eS	N		24	47							
21	ON	eP	E	19	40	02							
	AK	eS	N	19	43	.2							
	WN	eP	N	19	40	43							
		eS	N		43	28							
	CB	eS	E	19	43	46							
	KM	eS	X	19	44	26							
		e	X			34							
	GP	eP	N	19	41	24							
		eS	N		44	32							
		e	N			37							
21	RX	eL	E	19	47½						3	25	
		eL	N		50								
	SU	eP?	N	19	39	43							
		e	N			57							
		eL	N		42	42							
	Epicentre:			19	37	10	28S	175W	150 km			USCGS	
22	ON	P	E	06	18	37.8w							
		i	E			48							
		eS	E		20	15							
	AK	P	N	06	18	39s							
		i	N			48s							
		S	N		19	58							
	KP	eP	N	06	18	40							
		e	N			52							
		e	N		19	55							
	TO	eP	Z	06	18	51							
	WN	eP	N	06	19	15							
		e	N			36							
		S	N		20	57							
		eScS	N		32	37							
	CB	eP	E	06	19	26							
		e	E			32							
		S	E		21	18							
	KM	eP	X	06	19	53							
		S	X		21	58							
	GP	eP	N	06	19	52							
		S	N		22	01							
	RX	eP	NE	06	20	34							
		eLq	NE		24	20							
		eLr	Z		25								
		M	NE		27								
	SU	iP	N	06	20	35s							
		eL			24½								
	Epicentre:			06	16	52	33½S	178W				USCGS	
22	ON	P	E	06	23	35.2							
		e	E			43							
		eS	E		25	13							
	AK	S	N	06	24	53							
	KP	eP	N	06	23	38							
		S	N		24	50							
	WN	eP	N	06	24	12							
		e	N			33							
		eS	N		25	53							
		eScS	N		37	51							
	CB	S	E	06	26	14							
	KM	eP	X	06	24	54							
		S	X		26	52							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 22	GP	eP	N	06	24	51½							
		iS	N		26	58							
	Epicentre:			06	21	50	34S	177½W				USCGS	
22	AK	e	N	18	43								
	WN	eLr	NZ	18	42½				8	20			
	RX	eL	E	18	44						2	14	
		eL	NZ		45				1	16			
	SU	e(S)	N	18	33	57							
		eL	N		36	35							
23	KP	eP	N	00	58.1								
	WN	SKS	N	01	08	51			2	7			
		ePS	N		10	34			4	25			
		eL	Z		31								
		M	N		35				10	20			
	RX	SKS	N	01	09	19			3	16			
		S	NE		10	06			2	15	3	21	
		eLq	E		25						2½	25	
		eLr	Z	32			4	20					
		M	NE		40				11	19	5½	19	
	SU	S	N	01	05	20							
		ePS	N			55							
		eL	N		17								
	Epicentre:			00	45	12	52N	177W				USCGS	
23	ON	eP	E	06	24	34							
	AK	eP	N	06	24	43							
		e	N		25	49							
	KP	eP	N	06	24	51							
	TU	eP	N	06	25	12							
	TO	eP	Z	06	25	12							
	WN	iP	ZNZ	06	25	32			2	4			
		iPP	Z			56							
	CB	eP	X	06	25	26							
	KM	eP	X	06	25	40							
	GP	eP	N	06	25	53							
	RX	eL	NE	06	30.5				2	20	7½	22	
		M	NE		33								
	SU	eP	N	06	22	53							
		L	N		25.0								
	Epicentre:			06	20	43	20½S	170E				USCGS	
23	ON	eP	E	07	55	09							
	AK	e(L)	N	07	57.2								
	KP	eP	N	07	55	19							
	TU	eP	N	07	55	08							
		eS	N		56	24							
		eL	N		57	07							
	WN	eS	N	07	57	32							
		eLr	Z	08	00								
	CB	eS	E	07	57	53							
	KM	eS	X	07	58	32							
	GP	eS	N	07	58	35							
	RX	eL	NE	08	01½								
	SU	eL	N	08	04								
							South of Kermadec Is.						
23	ON	eP	E	08	30	32							
	TU	e	N	08	30	23							
		eS	N		31	33							
	WN	eP	N	08	30	13							
		eS	N		32	41							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 23	ON	eP	E	13	32	57							
		iS	E		35	10w							
	AK	eS	N	13	35	57							
	KP	eP?	N	13	33	12							
		eS	N		33	40							
	TU	eS	N	13	35	42							
	TO	eS	Z	13	36	00							
	WN	eP	N	13	33	47							
		eS	N		36	36							
	KM	eP	X	13	34	07							
		eS	X		37	09							
	GP	eP	N	13	34	11							
		eS	N		37	19							
	SU	P	N	13	32	04							
		iS	N		33	33							
	Epicentre:			13	30	17	25S	180		600km		USCGS	
24	TO	eP	Z	02	10	23							
	WN	iP	Z	02	10	20d							
	CB	eP	E	02	10	25							
	RX	eS	E	02	20	58				2½	16		
		eL	ZN		37		4	22	1½	22	3	22	
		M	NE		40				2	20	4½	20	
	Epicentre:			01	57	25	30S	70½W				USCGS	
24	ON	eP	E	06	06	48							
	KP	eP	N	06	06	44							
		eS	N		07	39							
	TU	eP	N	06	06	37							
		eS	N		07	26							
	TO	eP	Z	06	06	52							
	WN	eP	N	06	07	27							
		iS	N		08	37							
	CB	e	E	06	08	00							
		eS	E		09	00							
	KM	e	X	06	08	12							
		eS	X		09	39							
	GP	e	N	06	07	58							
		S	N		09	42							
	RX	eL	NE	06	12½								
	SU	eL	N	06	15								
	Epicentre:			06	05	34½	35.9S	179.4W		S		NZ(C)	5.2 NZ
24	AK	eL	N	10	09								
	KP	eP	N	10	01	38							
	TO	eP	Z	10	01	58							
	WN	eL	ZN	10	09.3								
	KM	eP	X	10	02	30							
	GP	eP	N	10	02	31							
	RX	eLq	N	10	08.4				2½	14			
		eL	E		09.0						8	30	
		M	NE		12				7	20	16	20	
	SU	eP	N	09	59	01							
		e	N			14							
		i(S)	N	10	00	55							
		eL			02								
	Epicentre:			09	56	58	18S	169½E				USCGS	
24	ON	eP	E	11	06	50							
		eS	E		10	37							
	AK	eP	N	11	07.0								
	KP	eP	N	11	07	12							
	TU	eP	N	11	07	35							
	TO	eP	Z	11	07	27							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 24	WN	iP	Z	11	07	46u							
		i	N		08	55							
		M	N		16				26	20			
	CB	eP	E	11	07	.8							
	KM	eP	X	11	07	59							
	GP	eP?	N	11	08	01							
		e	N			10							
	RX	eS	NE	11	12	56			4	16	4	16	
		eL	E		14						37	35	
		eL	Z		16		19	20					
		M	NE		17				53	20	97	20	
	SU	eP	N	11	04	34							
		e	N			48							
		S	N		06	18							
	Epicentre:			11	02	30	20S	169E				USCGS	
24	TU	eP	N	13	10	56							
		S	N		11	53							
	KP	eP	N	13	11	03							
		e	N			17							
		e(S)	N		12	08							
	ON	eP	E	13	11	07							
		i	E			11							
	TO	e(P)	Z	13	11	23							
		e	Z		12	53							
	WN	eS	N	13	13	02							
	CB	eS	E	13	13	22							
	KM	eS	X	13	14	04							
	GP	S	N	13	14	09							
	Epicentre:			13	09	41	35½S	178½W			S	NZ(D)	5.2 NZ
24	TU	eP	N	14	57	05							
		eS	N		58	50							
	ON	eP	E	14	57	06							
		e	E			20							
	TO	eP	Z	14	57	37							
	WN	S	N	14	59	30							
	CB	eS	E	14	59	49							
	KM	eS	X	15	00	28							
	GP	eS	N	15	00	34							
	RX	eL	NE	15	06								
		eL	Z		09								
	KP	eS	N	14	57	.3							
	WN	eL	N	15	08								
	RX	eL	NE	15	04				3	30	5	32	
	SU	eL	N	15	07								
	Epicentre:			14	40	45	3S	134½E				USCGS	
24	TU	eP	N	18	22	55							
		eS	N		24	10							
	KP	e(S)	N	18	24	11							
	ON	eP	E	18	22	57							
		e	E		23	18							
	TO	e(P)	Z	18	23	27							
	WN	S	N	18	25	19							
	CB	eS	E	18	25	39							
	KM	eS	X	18	26	21							
	GP	eS	N	18	26	24							
	Epicentre:			18	21	18	34S	177¾W			N	NZ(D)	5¼ NZ
25	RX	eL	NE	08	30				2	20	1	20	
	SU	eS	N	08	02	34							
		ePS	N		03	12							
		eL	N		18								
	Epicentre:			07	42	25	51N	177W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 25	ON	P	E	08	05	50							
	TU	eS	N	08	08	29							
	WN	eP	N	08	06	40							
		eS	N		09	25½							
	CB	eP	E	08	06	43							
	GP	eP	N	08	07	05							
		eS	N		10	12							
25	TU	eP	N	18	27	58							
		eS	N		29	01							
	WN	eS	N	18	30	09							
	GP	eS	N	18	31	14							
26	ON	iP	E	06	50	59½							
		e	E		52	07							
		e	E			22							
	KP	eP	N	06	50	54							
		e	N		51	21							
		eS	N			49							
	TU	P	N	06	50	47½							
		iS	N		51	38							
		L	N		52	08							
	TO	eP	Z	06	51	04							
		e	Z			17							
		e	Z		52	37							
	WN	eP	N	06	51	35							
		S	N		52	46							
		eL	N		53	30							
	CB	eP	E	06	52.0								
		S	E		53	09							
	KM	eS	X	06	53	(49)							
	GP	eP	N	06	52	14							
		eS	N		53	51							
	RX	Lq	NE	06	56.9								
		Lr	Z		59								
	SU	e	N	05	54.0								
		eL	N		59								
	Epicentre:			06	49	42	35.8S	179.1W		S		NZ(C)	5.4NZ
27	ON	eP	E	14	12	12							
		e	E		13	10							
	KP	eP	N	14	12	05							
		e	N		13	09							
	TU	eP	N	14	11	59							
		eS	N		12	47							
	TO	eP	Z	14	12	14							
	WN	e	N	14	12	53							
		S	N		13	57							
	CB	eS	E	14	14	23							
	KM	eS	X	14	15	01							
	GP	eS	N	14	15	03							
	Epicentre:			14	10	56	35.8S	179.4W		S		NZ(C)	5.1NZ
27	RX	eL	NE	14	59			4	20	5½	20		
	SU	e	N	14	47	29							
		S	N		48	18							
		eL	N		49	25							
	Epicentre:			14	45	28	20S	174½W				USCGS	
28	KP	eP	N	01	36	06							
	TO	eP	Z	01	36	18							
	SU	eS	N	01	35	29							
	Epicentre:			01	30	52	15S	167½E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 28	AK	ePP	N	08	58	10							
		eSKS	N	09	04	25							
		eS	N		05	10							
		eLq			20								
	WN	SKS	N	09	04	28			9	12			
		eL	N		26				17	20			
		M	N		31				47	20			
	RX	ePP	ZNE	08	58	27			4½	22	7½	22	
		iSKS	NE	09	05	03			55	22	98	24	
		iPS	NE		07	32			34	8	34	25	
		eSS	E		13	44					26	48	
		eLq	NE		23	53			150	40	90	40	
		eLr	Z		28								
		M	NE		32				34	20	135	20	
	SU	eP	N	08	52	55							
		iS	N	09	03	25							
		i	NN			58							
		iPS	N		04	30							
		Lq	N		16.2								
	Epicentre:			08	40	04	17N	99W				USCGS	
29	ON	eP	E	09	16	09							
	TO	eP	Z	09	16	35							
	KM	eP	X	09	17.3								
	SU	eP	N	09	12	30							
		(S)			13	12							
	Epicentre:			09	11	49	Fiji region					USCGS	
29	ON	eP	E	09	58	55							
	AK	e	N	10	01								
	KP	e	N	09	59	13							
		e	N	10	00	09							
		e	N			44							
	TU	eP	N	09	58	49							
		eS	N	10	00	03							
	TO	eP	Z	09	59	24							
	WN	eS	N	10	01	10							
	CB	eS	E	10	01	32							
	KM	eS	X	10	02	13							
	RX	eL	E	10	05								
		eL	ZN		07								
		M	NE		08								
	Epicentre:			09	57	13	34S	178W		S		NZ(D)	5.4NZ
29	SU	eP	N	13	30	53							
		(S)	N		31	40							
29	TO	eP	Z	17	28	30							
	WN	eL	N	17	57½			8	20				
	RX	iSKS	NE	17	39	02e		3	20	6½	20		
		ePS	ZN		40	40	3	14	2	20	4	14	
		Lq	NE		54				13	30	8	30	
		eLr	Z		58		15	20					
		M	NE	18	01				5	20	12	20	
	SU	eL	N	18	01								
	Epicentre:			17	15	14	23½S	71½W				USCGS	
31	KP	e?	N	20	13	00							
	TU	S	N	20	13	24							
	WN	eP?	N	20	12	23							
		S	N		14	29							
	CB	eS	E	20	14	45							
	KM	eS	X	20	15	22							
	GP	eP	N	20	13	01							
		S	N		15	31							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 1	ON	eP	E	16	59	49½							
	KP	eP	N	17	00	25½							
		e(S)	N		02	07							
	TU	eP?	N	17	00	01							
		eP	N			06							
		eS?	N		01	32							
		S	N			37							
	TO	eP	Z	17	00	22							
		eS	Z		02	03							
	WN	eP	N	17	00	33							
		e	N			51							
		S	N		02	42½							
	CB	eS	E	17	03	02½							
	KM	eP	X	17	01	14½							
		eS	X		03	39½							
	GP	eP	N	17	01	56							
		S	N		03	48							
	Epicentre:			16	57	30	30S 177½W					USCGS	
1	SU	eP	N	17	45	15							
		iS	N			40							
		L	N		46	00							
2	TU	P	N	02	09	53½							
		S	N		10	07							
	KP	eP	N	02	10	08							
		e	N			16							
		e(S)	N			24							
	TO	ePN	Z	02	10	12							
		P	Z			15							
		(S)	Z			48							
	WN	eP	N	02	10	48							
		e(Sn)	N		11	24							
		eS	N			44							
	CB	eP	E	02	10	58							
		e(Sn)	N		12	01							
	KM	ePn?	X	02	11	14							
		eSn?	X		12	23							
	AK	eS	N	02	11	(20)							
	GP	eS	N	02	12	31½							
	Epicentre:			02	09	35	38.3S 177.9E Felt Opotiki MM3				S	NZ(C)	4.4 NZ
2	TU	eP	N	02	12	45							
		iP	N			46							
		S	N			57							
	KP	Pn	N	02	13	01							
		P	N			08½							
		S	N			26							
	TO	ePn	Z	02	13	04½							
		P	Z			08½							
		e(S)	Z			40½							
	AK	P	N	02	13	(33)							
		Sn	N			(55)							
	WN	ePn	N	02	13	34							
		P	N			45							
		eSn?	N		14	14							
		(Sn)	N			17½							
		S	N			36							
	ON	P	E	02	13	42½							
		(S)	E		14	20½							
	CB	ePn	E	02	13	47							
		eSn	E		14	45							
	KM	ePn	X	02	13	55½							
		Sn	X		15	17½							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 2	GP	ePn	N	02	14	15							
		Sn	N		15	20½							
	RX	eS	NE	02	16.1		1½	13	4½	20	10½	20	
		eL	ZN		17.8								
	SU	eL	N	02	22.6								
	Epicentre:			02	12	28	38.3S 177.9E				NZ(C)		5.2 NZ
							Felt north-eastern parts North Island, maximum MM6 at Toatoa.						
2	TU	P	N	13	01	16							
		S	N			26½							
	KP	eP	N	13	01	29							
		S	N			52							
	TO	eP	Z	13	01	34½							
		e(S)?	Z		02	05							
	WN	ePn	N	13	01	58½							
		eP	N		02	10½							
		Sn	N		02	45½							
		S	N		03	09							
	ON	ePn?	E	13	02	00							
		(P)	E			14½							
		S	E		03	02							
	CB	eP	E	13	02	19							
		eSn	E		03	14½							
	AK	eS	N	13	02	(30)							
	GP	ePn?	N	13	02	36							
		eSn	N		03	47½							
	KM	ePn	X	13	02	40							
		eSn	X		03	48							
	Epicentre:			13	00	58	38.3S 177.9E		S		NZ(C)		4¾ NZ
							Felt north-eastern parts North Island, maximum MM4-5 at Opotiki						
3	TO	P	Z	02	58	21½u							
		eS	Z			42½							
	TU	eP	N	02	58	24							
		iS	N			41½s							
	WN	P	N	02	58	42½s							
		iS	N		59	18s							
	KP	iP	N	02	58	20s							
		iS	N			37½s							
	ON	P?	E	02	58	47							
	CB	eP?	E	02	58	50½							
		S	E		59	32½							
	KM	e(P)	X	02	59	13							
		S	X	03	00	09½							
	GP	eP	N	02	59	16½							
		S	N	03	00	18½							
	Epicentre:			02	57	56½	38.4S 176.1E				160km	NZ(D)	4.7 NZ
3	SU	S	N	08	18	30							
		L	N		21.2								
	ON	P	E	08	18	31½							
	TU	eP	N	08	18	31½							
		eP	N			46							
		eS	N		20	34							
	KP	eP	N	08	18	46½							
		e(S)	N		21	04							
	TO	eP	Z	08	19	04							
		e(S)	Z		21	10							
	WN	ePn?	N	08	19	04½							
		P	N			21½							
		S	N		21	43½							
	GP	eP	N	08	19	50							
		S	N		22	48							
	CB	eP?	E	08	19	51							
		eS	E		22	02?							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 3	KM	eP	X	08	19	46							
		eS	X		22	39½							
	RX	eL	NE	08	25.5				2	15	3½	20	
		eL	Z		29.5		1½	13					
	Epicentre:			08	15	45	28S	176W				USCGS	
3	TU	iP	N	09	59	(28½)s							
		S	N			(40)							
	KP	eP?	N	09	59	42½							
		P	N			44							
		(S)	N	10	00	11							
	TO	eP?	Z	09	59	48							
		P	Z			49							
	WN	ePn	N	10	00	13							
		P	N			29							
		Sn	N			57							
	ON	eP?	E	10	00	35							
	CB	eP	E	10	00	39							
		e(Sn)	E		01	24½							
	KM	ePn	X	10	00	44							
		eSn	X		02	00							
	GP	ePn?	N	10	00	45							
		e(P)	N		01	12½							
		S	N		02	02½							
	Epicentre:			09	59	10	38.4S	178.3E	S			NZ(C)	4.6 NZ
	Felt north-eastern parts North Island, maximum MM4-5 at Motu												
3	TU	iP	N	12	54	23n							
		S	N			34							
	KP	eP	N	12	54	37							
		eS	N		55	03½							
	TO	P	Z	12	54	40½							
		eS?	Z		55	14½							
	WN	ePn	N	12	55	01							
		P	N			18							
		(Sn)	N			50							
		Sn	N			52							
		S	N		56	11½							
	ON	eP?	E	12	55	07½							
		e	E			26							
	CB	e(P)	E	12	55	25½							
		S	E		56	29							
	KM	eP	X	12	55	50							
		Sn	X		56	54							
	GP	eP	N	12	55	52½							
		S	N		56	57							
	RX	eL	NE	12	59.5						1¼	20	
		e	NE	13	02.0						1¼	15	
	Epicentre:			12	54	03	38.4S	178.3E	S			NZ(C)	5.0 NZ
	Felt north-eastern parts North Island, maximum MM4-5 at Motu												
4	SU	e	N	00	52	01							
		e	N		54	32							
	TO	eP	Z	00	47	33							
	WN	iS	N	00	54	30s			1	8			
		e	N		55	03			1	7			
		eL	N	01	06.8				1	15			
	RX	eS	NE	00	54	12			1	12	1	7	
		eL	NE		58.4				2	19	1½	20	
	Epicentre:			00	39	12	3½S	147E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 4	TU	iP!	N	05	52	56s							
		iS!	N		53	07s							
	KP	eP	N	05	53	09							
		eS?	N			26							
		(S)	N			27½							
	TO	eP	Z	05	53	14							
		i	Z			16½							
	WN	eP?	N	05	53	38½							
		eP*	N			54							
		S	N		54	24½							
	ON	eP	E	05	53	39½							
		e	E		54	02							
		S	E			22							
	AK	(P)	N	05	53	55							
		S	N		54	19							
	CB	eP	E	05	53	57½							
		eS	E		54	47							
		eS*	E			59							
	KM	eP	X	05	54	20							
		eS	X		55	28							
	GP	eP	N	05	54	19							
		eS	N		55	28							
	Epicentre:			05	52	41	38.1S 177.7E		S		NZ(C)		4.6 NZ
							Felt north-eastern parts North Island, maximum MM4-5 at Motu						
5	SU	e(P)	N	04	31	46							
		eS	N		33	00							
		eL	N		33.9								
	WN	e(P)	N	04	37	16							
		iL	N		40.6				¾	12			
		eL	Z		41		traces						
	GP	eP	N	04	38	16							
	RX	eL	NE		40.5				1	20	4	20	
		eL	Z		44.3		1½	16					
5	KP	e?	N	21	31	22½							
		e(P)	N		32	23½							
		e(Sn)	N		33	16½							
		e(S)	N		34	15½							
	TU	ePn	N	21	31	58½							
		Sn	N		33	08½							
		e	N		34	12½							
	TO	eP?	Z	21	32	16							
		e	Z			33½							
		(S)	Z		33	50							
	WN	S	N	21	34	18							
		eL	N		35.7								
	ON	e(Sn)	E	21	33	03							
		e	E		35	09							
	CB	eS	E	21	34	41							
	GP	eP	N	21	33	37½							
		S	N		35	23							
	KM	S	X	21	35	19							
	SU	i(P)	N	21	35	25							
		e(S)	N		38	33							
		e(L)	N		39.6								
	RX	eL	NE	21	38.2				1½	16	1½	20	
		eL	Z		40.1		1	17					
	Epicentre:			21	30	39	Kermadec Is.					USCGS	
				21	30	30	32½S 179½W		N			NZ(D)	5.4 NZ
7	SU	eP	N	04	33	48							
		eS	N		39	55							
		eL	N		40	45							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 7	KP	P	N	19	44	43							
	TO	eP	N	19	44	45½							
	TO	eP	Z	19	44	53							
	WN	P	N	19	45	11							
		e(S)	N		48	48	Possibly local						
	CB	eP	E	19	45	15½							
	KM	eP	X	19	45	29½							
		e(S)	X		48	49½	Possibly local						
		eS	X		50	14½							
	GP	eP	N	19	45	37½							
		e(S)	N		48	43½	Possibly local						
	Epicentre:			19	40	52	17½S	179W				USCGS	
9	TO	P	Z	02	38	28							
	KP	eP	N	02	38	23							
	CB	eP	E	02	38	23							
	WN	eP	ZN	02	38	32½	1½	3					
		S	N		45	52			½	10			
		eSSS?	N		53	23			¾	8			
		eL	N		55	8			1¼	15			
	TU	eP	N	02	38	34½							
	KM	eP	X	02	38	36							
	GP	P	N	02	38	40½							
	RX	eS	NE	02	46	02			¾	20	¾	20	
		eLq	NE		51	2			2	35	2	35	
		eL	Z		57	5	1½	16					
	AK	eL	N	02	54	9							
	SU	P	N	02	38	40							
		iS	N		44	06n							
		eSS	N		47	32							
		eL	N		49	52							
	Epicentre:			02	29	20	2S	137E				USCGS	
9	ON	eP	E	19	45	44							
	TU	P	N	19	47	02							
	TO	eP	Z	19	47	25							
	WN	P	N	19	48	10							
	KM	eP	X	19	49	13							
	GP	eP	N	19	49	17½							
10	SU	iP	N	02	20	09							
		(S)	N		21	20							
	ON	eP	E	02	21	54							
		e(S)	E		24	28							
	KP	eP	N	02	22	03							
		eS	N		24	54							
	TO	eP	Z	02	22	16½							
		eS	Z		25	13½							
	WN	eP	N	02	22	30							
		eS	N		25	40							
	KM	eP	X	02	22	53½							
		S	X		26	15							
	TU	eS	N	02	24	54							
	CB	eS	E	02	25	46½							
	GP	eS?	N	02	26	26							
	Epicentre:			02	18	38	21½S	179½W				USCGS	
10	SU	eP	N	03	57	58							
		S	N	04	00	07							
		L	N		01	0							
	ON	eP	E	04	00	45							
	KP	e?	N	04	00	53½							
		eP	Z	04	01	11							
		e(S)	N	04	11	20							
		e	N		12	5							
	KM	eP	X	04	01	55							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 10	RX	e(S)	E	04	10	22					¾	20	
		e	N			11.0							
		eL	E			12.0					1	18	
		e?	Z	04	13	3							
		eL	ZNE			14.7	1¼	14	1¼	16	1¼	16	
	Epicentre:			03	55	46	17S	172W				USCGS	
11	TO	1P!!	Z	05	13	08							
	NP	1P	E	05	13	20							
		S	E			(39½)							
	TU	1P!	N	05	13	12s							
	KP	1P	N	05	13	15n							
		1S	N			30½n							
	AK	1P	N	05	13	30n							
		S	N			56							
	WN	1P	NZ	05	13	30½n							
		1S	N			59½							
	CB	1Pn	E	05	13	40½							
		eP	E			53½							
		S	E		14	19½							
	ON	1P	E	05	13	47							
		1S	E		14	47							
	KM	P	X	05	14	04							
		S	X			58							
	GP	P	N	05	14	06½							
		S	N		15	03							
	RX	eP?	N	05	15	07½							
		eP	ZNE			16							
		1S	ZNE		16	10½ase	s,u,e.						
		e?	NE			20							
		i	NE			33½							
		eL	Z			51	1½	4					
		M	ZNE		17	30	3	6	3	6	5	6	
	Epicentre:			05	12	40	38½S	177E				USCGS	5.7PAS
				05	12	54	39.0S	176E				NZ(B)	5.8NZ
							Felt extensively from Bay of Plenty to Christchurch, maximum MM4.						
11	ON	eP?	E	13	42	24							
		e(P)	E			33							
		e(S)	E		43	46							
	KP	eP	N	13	42	54							
		eS?	N		43	55½							
	TO	eP	Z	13	42	52							
		eS	Z		44	20							
	TU	eP?	N	13	42	56							
		S	N		43	57							
	AK	eP	N	13	43	.0							
		eL	N		45	.0							
	KM	eP	X	13	43	50½							
		S	X		46	07½							
	SU	P	N	13	43	47							
		e	N		44	25							
		eL	N		47	.4							
	WN	e(S)	N	13	45	05			1	5			
		e(Lr)	ZN		47	.6							
	CB	eS	E	13	45	29							
	GP	eS	N	13	46	12½							
	RX	e(S)	E	13	47	.8							
		eL	NE		49	ca			1½	20	2	20	
		eL	Z		51	ca	1	15					
	Epicentre:			13	40	18	31½S	177½W				USCGS	6¾PAS
11	SU	1P	N	21	40	23s							
		(PP)	N			47							
		S	N		41	55							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 11	ON	P	E	21	42	31							
		eS	E		45	57							
		eL	E		48								
	KP	P	N	21	42	47½							
		e?	N		47.8								
		eL	N		51.5								
	TO	eP	Z	21	42	59							
	WN	iP	ZN	21	43	23u							
		i	Z			44d							
		eS	N		46	37			¼	4			
		eL	Z		50½		18	13					
	CB	eP	E	21	43	23							
		e	E		48	ca							
		eL	E		51	ca							
	KM	P	X	21	43	33½							
	RX	eS	NE	21	48	05			3	16	2½	20	
		eL	ZNEZ		49.7		3	20	11	20	23	20	
	Epicentre:			21	38	05	17½S	169E				USCGS	6¾PAS
12	ON	eP	E	14	07	17							
	KP	eP	N	14	07	30½							
		eS	N		09	03							
	TO	eP	Z	14	07	48							
		eS	Z		09	17							
	WN	P	N	14	08	03							
		S	N		09	58							
	CB	S	E	14	10	15							
	KM	eS	X	14	10	49½							
	Epicentre:			14	05	34	30S	179E		N		NZ(D)	5¼NZ
14	WN	iPn	N	02	02	31s							
		Sn	N			46							
	TO	iP	Z	02	02	35u							
	NP	P	E	02	02	(40)							
		S	E		03	(08)							
	TU	e(P)	N	02	02	48							
		eSn	N		03	04							
		e(S)	N			12							
	CB	iPn	E	02	02	44							
		i	E			56½							
		eSn?	E		03	21							
		S	E			30							
	KP	(Pn)	N	02	02	54½							
		i(Sn)			03	31½							
	KM	ePn	X	02	03	08							
		eS?	X		04	04							
	ON	e(P)	E	02	03	46½							
		eS?	E		04	35							
	Epicentre:			02	02	09	40.7S	176.5E		S		NZ(C)	4.9NZ
							Felt southern part of North Is. Maximum MM4 at Pongaroa and Castlepoint.						
14	SU	P	N	18	28	21							
		e	N			29							
		S	N		29	31							
	ON	P?	E	18	30	40							
		eP	E			42							
	KP	eP	N	18	30	56½							
		eS	N		34	12½							
	TO	eP	Z	18	31	06½							
		eS	Z		34	30½							
	WN	eP	N	18	31	31							
		eS	N		35	07							
		eScS?	N		42	28							
	CB	eP	E	18	31	34½							
		eS	E		35	18							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 14	KM	eP	X	18	31	51½							
		eS	X		35	50							
	GP	P	N	18	31	57½							
		eS	N	18	34	17							
	Epicentre:			18	26	52	21S	176½W				USCGS	
16	TO	e?	Z	23	44	35							
	SU	SKS	N	23	54	41							
		Lq	N	24	05	55							
		M	N		13.7								
	WN	i(S)	N	23	56	08w			1	3			
		eL	N	24	08.4				1½	20			
		eLr	Z		13.0								
	RX	SKS	E	23	56	06					1	20	
		eS	NE			47			½	26	1½	20	
		ePs	NE		57	57			½	18	3	19	
		e(PPS)	E		59	19					1	20	
		e	NE			40							
		e?	N	24	00	42			½	23			
		e(PKKP)	E		01	40					½	20	
		e(PKKP)	N		02	24			½	26			
		e	E			40							
		iSS	E		03	32w					4	15	
		e?	N		04	49							
		ePcPPKP	E		06	50					1½	19	
		eSKKS	E		09	40					½	20	
		Lq	N		10	06			3	24			
		eLq	E		11	50					1½	25	
		eLr	E		14	22					5	30	
		eLr	Z		15.0		1	27					
		eLr	N		15.8				5½	20			
	Epicentre:			23	31	55	10½N	104W				USCGS	6½-6¾PAS
17	GP	eP?	N	18	31	05							
		(S)	N		33	55½							
	ON	(P)	E	18	31	16							
	TU	S	N	18	31	45½							
	TO	eS	Z	18	31	50							
	WN	S	N	18	32	49½							
	CB	eS	E	18	33	09½							
	KM	eS	X	18	33	43½							
	SU	L	N	18	35	25							
	RX	e	E	18	47	ca							
18	RX	e	E	06	45	52							
		eL	NE		47.5								
		eL	ZE		49.0								
	WN	eL	N	06	48	ca							
	AK	eL	N	06	51.0								
	SU	e	N	06	56.5								
18	SU	e	N	08	47	31							
		eL	N		55	41							
		(L)	N		57	36							
	KP	e	N	08	48	15½							
		e	N			48							
	TO	e	Z	08	48	12½							
	CB	e	E	08	48	19½							
	GP	e	N	08	48	24							
	WN	e(S)	N	08	57	34							
		eL	N	09	06½								
	RX	S	NE	08	57	30							
		e(L)	N	09	03.0								
		eL	NE		04.2								
	Epicentre:			08	30	57	12N	124E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 18	KP	eP	N	21	55	27½							
	SU	S	N	22	03	03							
		eL	N		14.6								
	WN	e SKS	N	22	06	40			1	9			
		eL	N		25				1	20			
	RX	eSKS	N	22	07	20			1½	8			
		e	NE		14	00							
		eLq	E		21.7						1	40	
		eLr	NZ		28.7		1	25	1½	25			
	Epicentre:			21	42	30	50N	157E				USCGS	6½PAS
19	SU	eP	N	11	39	03							
		i(PP)	N			22							
		i	N		40	44							
		S	N		42	35							
		eL	N		46	24							
	ON	eP	E	11	40	34½							
	KP	eP	N	11	40	53½							
	TO	eP	Z	11	41	04							
	WN	e?	N	11	47	10							
		eL	N		50.6				2	5			
	RX	e	NE	11	47	21							
		eL	NE		50.1				2	20	2	20	
		eL	Z		56.3		2	15					
	AK	eL	N	11	50	36							
		eScS?	N		51	40							
		e(L)	N		55.6								
	Epicentre:			11	34	36	10S	161E				USCGS	6½PAS
20	SU	P	N	06	31	30							
		eS	N		35	03							
		e(SS)	N			27							
	ON	eP	E	06	33	06							
	RX	e(P)	N	06	35	45							
		eS	NE		39	49							
		eL	NEZ		42.5		4	14	4	20	5	20	
	AK	eS?	N	06	38	35							
		L	N		41	44							
	WN	eS	N	06	41	38			1	8			
		eL	H		43½				1½	20			
	Epicentre:			06	27	10	10S	161E				USCGS	6-6½PAS
20	SU	P	N	12	06	15							
		iS	N		09	55							
		M	N		14								
	ON	eP	E	12	07	51½							
	KP	eP	N	12	08	14							
	TO	P	Z	12	08	21							
	WN	eP	Z	12	08	32	3	7					
		eL	N		15.9				2	20			
	AK	eP?	N	12	08	50							
		eS	N		12	51							
	GP	eP	N	12	08	50							
	RX	S	NE	12	14	32			2	20	2½	20	
		L	NEZ		17.3		3	14	5½	20	5½	19	
	Epicentre:			12	01	54	10S	161E				USCGS	6½PAS
21	WN	iP	N	05	48	19½s							
		S	N			29½							
	TO	iP	Z	05	48	30u							
	TU	Pn	N	05	48	38							
		P	N			47							
		Sn	N		49	06½							
		S	N			21							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 21	NP	iPn	E	05	48	39e							
		P	E			46							
		Sn	E		49	07							
	CB	iPn	E	05	48	39							
		P	E			45							
		Sn	E		49	08							
	KP	Pn	N	05	48	48½							
		P	N			55							
		eSn?	N		49	17							
		S	N			31							
	GP	ePn	N	05	48	55½							
		P	N		49	09							
		Sn	N			34							
	KM	Pn?	X	05	48	56½							
		Pn	X			58½							
		P	X		49	10							
		Sn	X			38½							
		S	X		50	03							
	AK	Pn?	N	05	49	08							
		e(Pn)	N			13							
		P	N			21							
		(Sn)	N		50	16							
	ON	ePn	E	05	49	20							
		P	E			29½							
		e?	E		50	01							
		eS	E			30							
	RX	eP	N	05	50	02							
		eP	NEZ			06							
		e?	E			29½							
		eS?	N		51	26			½	3			
		S	EZ			29					½	2½	
		(L)	E			55	2	11			3	14	
	Epicentre:			05	48	03	40.9S	176.0E			S	NZ(B)	5.6NZ
							Felt extensively in North Island, from Te Kuiti to Wellington. Maximum MM4.						
22	SU	eP	N	16	46	32							
		P	N			39							
		S	N		48	28							
	KP	P	N	16	48	50½							
		S	N		53	06½							
	TU	eP	N	16	49	02							
		eS	N		53	10½							
	TO	iP	Z	16	49	02u							
		eS	Z		53	14							
	WN	eP	N	16	49	17		½	½				
		eS	N		53	29		½	1				
	CB	eP	E	16	49	17							
	KM	eP	X	16	49	24							
	GP	P	N	16	49	34½							
	RX	eL	NE	16	54	7		½	20	1	25		
	Epicentre:			16	43	45	18S	168E				USCGS	
22	SU	e?	N	18	36	30							
		eL	N		38	47							
	WN	i(S)	N	18	47	01							
	RX	eL	NE	18	47	ca							
23	SU	e(P)?	N	02	05	52							
		e(PP)	N		07	00							
		e(S)	N		10	3							
		L	N		12	2							
	ON	eP	E	02	07	07½							
		eS?	E		13	18½							
	AK	eP?	N	02	07	20							
		(P)	N			53							
		eS	N		12	50							
		i	N		13	34							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 23	KP	eP	N	02	07	24½							
		eS	N		13	10½							
	TO	P	Z	02	07	34							
	CB	P	E	02	07	37½							
		eS	E		13	26½							
	TU	eP	N	02	07	39							
		eS	N		14	04½							
	WN	1P	NZ	02	07	47d	2½	8					
		e(PcP)	N		09	47			1	5			
		S	NZ		14	11			2	10			
		SS	N		16	52			1	20			
		eLr	NZ		19.2				1	20			
	KM	eP	X	02	07	47							
		eS?	X		13	19							
	GP	P	N	02	07	53							
	RX	eP	Z	02	08	02	½	12					
		P	NE			04½			1	15	½	20	
		ePP	NEZ		10	20	1	12	1	13	½	13	
		eS?	N		13	51							
		S	NE		14	10			1	20	1½	16	
		(SS)	NEZ			40	2	12	3½	20	2	22	
		eLq	NE		17.5					35	7	34	
		eLr	NEZ		20ca		2½	26	7	26	8	22	
	Epicentre:			02	00	05	68	154½E				USCGS	6½PAS
23	ON	eP	E	20	13	34							
	TO	eP?	Z	20	13	47							
		e?	Z		14	23½							
		e	Z			47½							
		eS	Z		15	52							
	TU	eP?	N	20	14	05½							
		e	N			52							
		eS	N		15	08							
	KP	eP?	N	20	14	14							
		eS	N		15	14½							
	SU	P	N	20	14	58							
		eS	N		17	11							
		L	N		18.4								
	RL	1P	Z	20	11	44½							
		S	Z		12	02							
	AK	e?	N	20	15	02							
		iS	N			30							
		L	N		16.6								
	WN	e	N	20	16	02							
		eS?	N			17½							
		eL	NZ		18.9								
	CB	eS	E	20	16	38							
	GP	e	N	20	17	06							
		(S)	N			23							
	RX	eL	NE	20	20.4				1	20	1½	20	
		eL	NZ		22.5				1½	17	1	16	
	Epicentre:			20	11	22	30.58	176.9W				NZ(D)	5.4NZ
24	SU	e(P)?	N	01	03	16							
		i(S)	N			54							
		iS	N		04	26							
		(L)	N		05ca								
	ON	P	E	01	06	38							
	KP	eP	N	01	06	52							
	WN	eL	N	01	15ca				1	20			
	RX	eL	E	01	15.2						1	20	
		eL	N		17.7				1	20			
25	RX	eL	NE	15	28.8								
	WN	eL	N	15	31								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 26	RX	ePSS	E	11	55.8								
		eSSS	N	12	05.4						½	30	
		e	E		09	18							
		G	NE		11½								
		R	NEZ		18				2	35	1	30	
	WN	e	H	12	19								
		eL	Z		21								
	SU	eL	N	12	22								
	Epicentre:			11	28	50	19S	63W				USCGS	6¼-6½PAS
27	SU	e	N	20	58	30							
		e	N		59	01							
		e	N	21	00	00							
		e	N			57							
	ON	P	E	20	58	57w							
		S	E	21	01	00							
	KP	P	N	20	59	14							
		S	N	21	01	31							
	TO	eP	Z	20	59	24							
		eS	Z	21	01	53							
	WN	P	Z	20	59	44							
		e	N			46							
		e	N			25							
	CB	P	E	20	59	47							
		S	E	21	02	27							
	KM	eP	X	21	00	04							
		e(S)	X		03	05							
	GP	eP	N	21	00	09							
		eS	N		03	09							
	TU	eS	N	21	01	32							
	Epicentre:			20	56	29	25½S	178E				USCGS	
28	ON	e	E	08	22	01							
		e(S)	E		23	16							
		eL	E		26½								
	SU	e	N	08	22	20							
		e	N		23	09							
		eL	N		25½								
	KM	e?	X	08	22	48							
		e	X		26	16							
		e(S)	X			22							
	AK	e	N	08	22	55							
		e	N		26	59							
		L	N		27½								
	WN	eP	NZ	08	22	55							
		S	NZ		25	22							
		L	NZ		29								
	GP	e	N	08	23	40							
		eS	N		26	25							
	TU	e	N	08	24	13							
	TO	e	Z	08	24	49							
	RX	eL	NE	08	28								
	Epicentre:			08	19	10	28½S	175W				USCGS	
29	ON	e(P)	E	06	57	36							
	KP	e(P)	N	06	58	07							
	TU	e	N	06	58	07							
		e	N		59	22							
	TO	e	Z	06	58	19							
	AK	e(L)	N	06	59.7								
	RX	eL	E	07	05								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 29	ON	e(P)	E	07	23	49							
		e	E		29	19							
	TU	eP	E	07	23	54							
		e	E		25	05							
	KP	e(P)	N	07	23	57							
	TO	e	Z	07	24	08							
	AK	e	N	07	25	25							
		e	N		26	45							
	WN	e	N	07	28								
	RX	eL	NE	07	30								
	SU	e	N	07	30								
29	SU	e(P)	N	14	04	21							
		iS!	N		05	36							
		e	N			54							
	ON	P	E	14	05	42							
		S	E		08	06							
	WN	e	N	14	05	55							
		P	N		06	27							
		eS	N		09	24							
	KP	P	N	14	05	58							
		S	N		08	34							
	TU	eP	N	14	06	00							
		e	N		08	37							
		e(S)	N			42							
	TO	P	Z	14	06	07							
		e	Z		08	56							
	KM	eP	X	14	06	46							
		eS	X		10	00							
	GP	P	N	14	06	51							
		e	N		10	09							
		e	N			20							
	AK	eS	N	14	08	20							
		e	N		09	10							
30	TU	e(P)	N	03	55	31							
	WN	eP	N	03	56	37							
		e	N			39							
	CB	e	E	03	56	55							
	GP	e	N	03	57	43							
	RX	eL		04	01								
	Epicentre:			03	50	36	Kermadec Is.					USCGS	
31	WN	e	N	10	56	49							
		e	N		57	24							
	TU	e	N	10	56	52							

Date		Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP	2	WN	eL	N	05	49				9	20			
		RX	eL	E	05	49								
			eL	NE	05	52				5	18	11	16	
		SU	(S)	N	05	39	45							
			eL	N		40	40							
	2	ON	eP	E	09	51	54							
		KP	eP	N	09	52.0								
		WN	eL	N	10	01½								
		RX	eLq	E	10	01.5						10	25	
			eL	ZN		05		11	20	7½	19			
		SU	iP	N	09	48	39							
			i	N		49	50							
			S	N		50	20							
			L	N		51	15							
		Epicentre:			09	46	30	15S	173½W				USCGS	
	3	SU	e(PP)	N	06	10	09							
			eS	N		12	06							
			eL	N		13.5								
		Epicentre:			06	06	42	12S	167E				USCGS	
	3	TU	eS	N	14	46	40							
		WN	P	N	14	44	21							
			S	N		47	31							
		SU	P	N	14	41	56							
			S	N		43	10							
		Epicentre:			14	39	34	Fiji	600km				USCGS	
	4	SU	eL	N	01	37.0								
		Epicentre:			01	31	23	12S	167½E				USCGS	
	4	WN	eL	N	05	05								
		RX	eL	NE	04	58				7	35	5	35	
		Epicentre:			04	33	51	Indian Ocean					USCGS	
	4	WN	eL	N	22	26½				12	10			
		RX	e	NE	22	24.5				1.8	12	1.5	12	
			eLq	NE		26.1				9	30	5	25	
			eLr	Z		27½		8	30					
		SU	eL	N	22	35								
	5	WN	eL?	N	03	22								
		RX	eL	NE	03	24								
		SU	(P)	N	03	13	29							
			eL	N		15	26							
	7	KP	eP	N	10	19	41							
		TO	eP	Z	10	19	46							
		WN	eL	N	10	51								
		CB	eP	E	10	19	56							
		RX	eSKS	N	10	30	50			1.6	9			
			S	N		31	41			1.5	8			6.6RX
			eL	E	10	49								
			eL	N		52		2	30					
			eL	Z		54								
		SU	eS	N	10	27	22							
		Epicentre:			10	06	47	51½N	178½W				USCGS	
	8	TO	eP	Z	08	50	09							
		Epicentre:			08	41	26	2S	141E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 8	TO	eP	Z	13	26	29							
	WN	eP	N	13	26	40							
	CB	eP		13	26	34							
	Epicentre:			13	18	55	5S	152E		60km		USCGS	
9	WN	eS	N	00	30	00			3	12			6.0WN
		eL	N	00	35	45			28	35			
		M	N		38				8	20			6.0WN
	RX	S	NE	00	28	49			3	18	8	18	6.2RX
		SS	NE		32	23			11	20	11	20	
		Lq	NE		33	08			4½	35	4	35	
		eLr	Z		36½								
		M	NE		37				5½	20	4	20	5.9RX
	SU	eL	N	00	46½								
	Epicentre:			00	13	30	48S	100E				USCGS	
9	KP	eP	N	09	05	48							
		eS	N		10	11							
	WN	P	ZN	09	06	20			2	5			
		ePP	Z		07	00							
		e	N		07	05							
		e	N		10	24							
		e	N		11	29							
		eL	Z		12.4								
		M	N		16				15	20			5.9WN
	RX	Lq	NE	09	14	41			6½	30	17	30	
		eLr	Z		16	52	7	16					
		M	NE		17				5½	20	29	20	6.1RX
	SU	P	N	09	01	55N							
		i(L)	N		03	57							
	Epicentre:			09	00	33	15S	176½W				USCGS	
11	ON	P	E	13	45	32							
	KP	P	N	13	45	45							
	TO	eP	Z	13	45	53							
	WN	iP	ZN	13	46	13½u							
	CB	eP	E	13	46	17							
	KM	eP	X	13	46	40							
	SU	e	N	13	43	10							
		S	N			56							
		i	N		44	12							
	Epicentre:			13	41	44	19S	178W		500km		USCGS	
11	WN	eL	N	14	49								
	RX	eL	NE	14	47								
	Epicentre:			14	26	45	New Ireland region					USCGS	
11	ON	P	E	23	27	21							
		eS	E		31	36							
	KP	eP	N	23	27	35							
		S	N		32	04							
	TU	eP	N	23	27.6								
	TO	eP	Z	23	27	39							
		eS	Z		32	30							
	WN	eP	N	23	27	58							
		eS	N		32	51			1¼	7			5.6WN
		eL	N		36.6				9	20			
	CB	eP	E	23	28	15							
		eS	E		33	08							
	KM	eP	X	23	28	27							
	RX	eL	NE	23	38	33							
	SU	eP	N	23	24	30							
	Epicentre:			23	22	09	16S	172W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 14	AK	eL	N	12	52								
	WN	e(P)	ZN	12	42	43u			3	5			
		e(S	N		46	45			2	8			
		eL	ZN		48.3								
		M	N		52				16	10			
	RX	e	N	12	41	46							
		eL	E		45	12							
		eL	ZNE		46		15	20	9	20	10	20	
	SU	eL	N	13	00								
15	KP	e	N	18	49	52							
	TO	eP	Z	18	49	38							
		e	Z		50	00							
	CB	P	E	18	49	43							
	GP	P	N	18	49	59							
	RX	eL	NE	19	00				3	30	6	30	
	Epicentre:			18	42	20	6S	153½E		150km		USCGS	
19	ON	eP	E	17	06	18							
	KP	e	N	17	06	.6							
	GP	eP	N	17	07	31							
		eS	N		11	48							
	SU	eS	N	17	04	31							
	Epicentre:			17	02	02	19S	176W		200km		USCGS	
20	AK	eL	N	18	56								
	WN	eL	N	18	58								
	RX	eL	E	18	59½								
		eL	N	19	01								
	SU	e(P)	N	18	48	32							
		e(S)	N		49	17							
		eL	N		50	02							
21	ON	eP	E	15	50	11							
	KP	eS	N	15	51	05							
	TU	eS	N	15	50	55							
	WN	S	N	15	52	05							
	CB	eS	E	15	52	27							
	GP	eS	N	15	53	09							
23	SU	eL	N	18	48½								
	Epicentre:			18	44	10	16S	173W				USCGS	
24	AK	eL	N	08	45								
	KP	eP	N	08	31	.7							
	TU	eP	N	08	31	.8							
	TO	eP	Z	08	31	.7							
	WN	eP	ZN	08	31	44							
		eS	N		40	07					53	25	7.1WN
		SS	N		43	.9					60	25	
		Lr	Z		51	.9							
		M	N		53						90	25	
		iP'P'	ZN	09	00	53							
	KM	eP	N	08	31	.8							
	GP	eP	N	08	31	49							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 24	RX	eP	NE	08	31	51			4	20	7	20	
		S	N		40	10n			36	37			
		1S	ZE			19e	35	25			72	30	
		SS	E		44	40							
		SSS	NE		47	03			12	24	5½	20	
		Lq	NE		47	45			50	26	47	26	
		M	NE		57				21	22	52	23	
	SU	1	N	08	31	58							
		eS	N		38	47							
		eL	N		44.9								
	Epicentre:			08	21	05	5½N	127E				USCGS	
25	WN	eL	N		10	02½							
	SU	eL	N		09	54							
25	WN	eL	N		17	12			12	20			
	RX	eL	E		17	09					6	30	
	SU	eL	N		17	05							
	Epicentre:			16	36	37	Mindanao					USCGS	
26	ON	1P	E	12	04	10.2							
		1S	E		05	00							
	TU	P	N	12	03	50							
		S	N		04	24½							
	TO	1P	Z	12	03	34¾							
	WN	1P	N	12	03	32.5							
		S	N			50½							
	CB	P	E	12	03	30¼							
		S	E			48½							
	KM	1P	X	12	03	51½							
		(S)	X		04	23½							
	GP	1P	N	12	03	58.0							
		1S	N		04	38							
	RX	(S)	ZNE	12	05	36							
	SU	eP	N	12	07	55							
	Epicentre:			12	03	06	40.1S	173.8E		110km		NZ(B)	6.0NZ
				12	03	03	39½S	174½E		150km		USCGS	
	Felt in Wellington, Taranaki, Nelson, and Marlborough. Maximum MM5 at Otaki, Blenheim, and New Plymouth.												
26	ON	eP	E	20	22	41							
	AK	e(L)	N	20	24½								
	TU	eP	N	20	22	41							
		eS	N		23	50							
	TO	e	Z	20	23	14							
	WN	S	N	20	25	00							
	CB	eS	E	20	25	21							
	KM	eS	X	20	26	00							
	GP	eS	N	20	26	05							
	Epicentre:			20	21	12	34S	178½W				NZ(D)	5.5NZ
27	AK	eS	N	04	25	50							
		eL	N		39								
	TO	eP	Z	04	18	24							
	WN	eP	ZN	04	18	26							
		S	Z		26½								
		eL	N		34½				12	20			6.2WN
	CB	e(P)	E	04	18	35							
	KM	e(P)	X	04	18	41							
	GP	eP	N	04	18	25							
	RX	eS	N	04	26	22			7	30			6.3RX
		eS	E			26					10	25	
		eSSS	N		32	32			6	22			
		eL	ZNE		33						14	25	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 27	SU	eP	N	04	17	40							
		eL	N		31								
	Epicentre:			04	08	23	1S	127E				USCGS	
27	WN	eL	N	06	27				7	20			6.1WN
	RX	eS	NE	06	14	50					2	24	5.6RX
		eL	E		25				1½	20	5	20	6.0RX
		eLr	Z		30.6		4	16					
	Epicentre:			05	56	50	1S	127E				USCGS	
27	KP	P	N	07	59	58							
		iS	N	08	00	20½							
	TU	eP	N	07	59	56							
		iS	N	08	00	18½							
	TO	P	Z	08	00	07							
		e(S)	Z			36							
	WN	eP	N	08	00	31							
		S	N		01	21½							
	CB	P	E	08	00	41							
		eS	E		01	40							
	KM	eP	X	08	01	07							
		eS	X		02	22							
27	GP	eP	N	08	01	08							
		S	N		02	24							
	Epicentre:			07	59	27	37.45S		177.4E		150km	NZ(B)	5.0NZ
28	KP	eP	N	00	38	38							
		eS	N		47	54							
	TU	eP?	N	00	38	49							
		eS	N		48	02							
	TO	eP	Z	00	38	43							
	WN	eP	N	00	38	50							
		iS	ZN		48	10			5½	5			6.6WN
	CB	eP	E	00	38	53							
		eS	E		48	04							
	RX	eS	E	00	48	30					3½	8	6.3RX
		e	E		51	24					4½	10	
		e	N			32			3½	6			
	Epicentre:			00	27	31	30½N		137½E		500km	USCGS	
28	TO	eP	Z	04	20	17							
	WN	eL	N	04	38								
	RX	eL	NE	04	32								
	Epicentre:			04	11	23	3S	135½E				USCGS	
28	ON	eiP	E	14	23	28w							
		esP?	E		25	38							
		S	E		26	00e							
		i	E			17e							
		i	E			24w							
		eL	E		29	10							
		eScS	E		34	03							
	AK	iP	N	14	23	35s							
		esP	N		25	51							
		iScS	N		34	10							
	KP	eP	N	14	23	42							
		esP	N		26	03							
		i(S)	N			42							
		PcP	N		27	27							
		eS	N		26	38							
		eScS	N		34	05							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 28	TO	eP	Z	14	23	53							
		esP	Z		26	16							
		eS	Z			54							
		i	Z		27	21							
		eScP	Z		30	24							
		eScS	Z		34	08							
	WN	iP	NZ	14	24	11u			7	10			
		i	Z		26	12d							
		isP	NZ			35u			120	20			
		iS	N		27	26½			45	10			6.4
		ScP	N		30	36							
		eL	N			56			33	10			
		iScS	N		34	15			140	12			
	CB	eP	E	14	24	13							
		esP	E		26	44							
		eS	E		27	33							
		eScS	E		34	15							
	KM	eP	X	14	24	32							
		eS	X		27	58							
		eScS	X		34	17							
	GP	eP	N	14	24	35							
		eS	N		28	12							
		e(PPcP)	N		30	16							
		ScP	N			40							
		ScS	N		34	24							
	RX	eP	N	14	24	59							
		e	NE		26	31			15	20	11	20	
		sP	NEZ		27	36sw	11	14	65	15	38	16	
		iS	E		28	51e					180	22	6.2
		iScP	E		30	33w					75	18	
		PcS	NE		31	50n			130	20	220	20	
		iScS	NE		34	33w			140	17	150	22	
		esScS	NE		38	53			45	14	110	22	
	SU	iP	N	14	21	32							
	Epicentre:			14	20	00	20½S		178W		650km		USCGS
28	ON	iP	E	14	47	33							
		eS	E		50	24							
	KP	eP	N	14	47	47½							
		e	N		50	46							
	TU	eP	N	14	47	48							
		eS	N		50	44							
	TO	eP	Z	14	47	55							
		e(S)	Z		51	28							
	WN	iP	N	14	48	15							
		eS	N		51	33							
	CB	eP	E	14	48	20							
		eS	E		51	41							
	KM	eP	X	14	48	34							
		eS	X		52	09							
	GP	eP	N	14	48	38½							
		S	N		52	16							
	Epicentre:			14	44	02	20½S		178½W		600km		USCGS
28	WN	eLr	ZN	23	43				12	20			
	RX	eL	NE	23	41				4½	30			
		eL	Z		43								
	SU	eL	N	23	53								
29	TO	eP	Z	02	14	27							
	WN	iP	ZN	02	14	11		4	5				6.4WN
		eS	N		18	35		5	8				6.0WN
		Lr	ZN		20	4							
		M	N		22	½		29	20				6.0WN
		i(ScS)	N		25	35							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 29	RX	Lq	NE	02	18	0			9	18	15	20	5.8RX
		eLr	Z		19	3	14	20					
	SU	S	N	02	24	10							
		eL	N		31								
	Epicentre:			02	08	55	64½S	172½W				USCGS	
29	ON	eP	E	07	09	45							
		eS	E		12	43							
	TU	eS	N	07	12	59							
	WN	eP	N	07	10	27							
		eS	N		13	46							
	CB	eP	E	07	10	33							
		eS	E		13	56							
	KM	eP	X	07	10	46							
		eS	X		14	19							
	GP	eP	N	07	10	51							
		eS	N		14	30							
	SU	iS	N	07	08	48							
	Epicentre:			07	06	11	20S	178W		650km		USCGS	
29	ON	P	E	08	15	59w							
		S	E		18	03							
		ScS	E		27	12							
	KP	P	N	08	16	15½							
		S	N		18	36							
		eScS	N		27	12							
	TU	eP	N	08	16	19							
		eS	N		18	39							
		eScS	N		27	15							
	TO	eP	Z	08	16	28							
	WN	iP	ZN	08	16	44							
		i	N		17	00							
		iS	ZN		19	23			30	4			6.2WN
		eScP	ZN		23	45							
		iScS	Z		27	20							
29	CB	P	E	08	16	54							
		S	E		19	37							
		eScS	E		27	22							
	KM	P	X	08	17	05							
		S	X		20	01							
	GP	eP	N	08	17	11½							
		S	N		20	12							
	RX	e	NE	08	20	2		5	20	11	20		
		e(S)	N		21	10		11	22				5.4RX
		e	N		23	18		21	22				
	SU	iP !	N	08	15	15n							
		eS	N		16	48							
	Epicentre:			08	12	22	25S	178½E		600km		USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 2	RX	eL	E	13	29								
	WN	eL	N	13	30								
	Epicentre:			12	27	55	11N	63W				USCGS	6½-6¾PAS
2	RX	e(PP)	E	21	15	.4							
		e	E		19	.4							
		e	N		20	.3							
		e(SS)	ZE		28								
	WN	eSS	N	21	28								
		e	Z		32								
	Epicentre:			20	58	39	6½S	69½E				USCGS	
3	TO	eP	Z	06	07	22							
	RX	eL	NE	06	21								
	WN	eL	Z	06	27								
	Epicentre:			05	58	12	4S	134E				USCGS	
3	SU	e?	N	13	46	25							
		e(P)	N			30							
		e(L)	N		48	35							
	RX	eL	NE	13	57								
4	SU	e(P)	N	01	02	26							
		iS	N		03	34							
	KP	P	N	01	04	41							
	TU	e(P)	N	01	04	52							
		eS?	N		07	42							
		e	N			48							
	WN	eP	H	01	05	10							
		e	H		08	33							
	GP	P	N	01	05	36							
		e(S)	N		09	11							
	Epicentre:			01	01	03							
4	RX	e	E	05	54	36							
		e(PS)			57	43							
		e(SS)	06	03	28								
		e	E		07	42							
		e	NE		08	18							
		eLq?	N		18								
		eLr	ZE		23								
	WN	e(PS)	ZN	05	57	.2							
		e(SS)	H	06	03	.2							
		eLq	H		19								
		eLr	ZN		26								
	SU	e?	N	06	01								
		eL	N		25								
	Epicentre:			05	26	09	11N	63W				USCGS	6¾-7PAS
4	WN	eP	N	08	20	41							
		eS	N		23	32							
	GP	e(P)	N	08	21	05							
		e(S)	N		24	13							
	Epicentre:			08	17	04							
4	KP	P	N	16	47	53							
		e(S)	N		50	03							
	TU	e(P)	N	16	47	53							
		S	N		49	55							
	TO	eP	Z	16	48	04							
		eS	Z		50	17							
	WN	eP	N	16	48	26							
		S	N		50	58							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 4	KM	e(S)	X	16	(51	42)							
	GP	eS	N	16	51	54							
	Epicentre:			16	45	12							
5	TU	e(P)	N	14	47	04							
		S	N			57							
	ON	eP?	E	14	47	07							
		e(P)	E			10							
	KP	e?	N	14	47	13							
		e	N			20							
		eS	N		48	05							
	TO	e(P)	Z	14	47	42							
		e(S)	Z		48	29							
	WN	eP?	N	14	47	43							
		e(P)	N			57							
		S	N		49	07							
	KM	S	X	14	50	09							
	GP	S	N	14	50	12							
	Epicentre:			14	46.0		38S	180				NZ(D)	5.0NZ
7	SU	e	N	03	55	50							
		e	N		57	15							
		eL	N		58								
	AK	e	N	04	05								
	WN	eL	N	04	06								
	RX	eL	N	04	07								
		eL	Z		10								
	Epicentre:			03	53	53	21S	174½W				USCGS	
7	WN	eL	N	14	07								
		eL	Z		09								
	RX	eL	N	14	14								
7	SU	iP	N	16	50	20n							
		i(S)	N		51	29							
	ON	eP	E	16	52	18							
		eS	E		55	04							
	KP	eP	N	16	52	31							
		e	N			43							
		eS	N		55	36							
	TO	e(P)	Z	16	52	44							
		e	Z			57							
		e(S)	Z		55	44							
	TU	e(P)	N	16	52	44							
		e	N			56							
		eS	N		55	30							
	WN	eP	N	16	52	59							
		e(S)	N		56	13							
		e	N			21							
		eScS	N	17	02	53							
	CB	eP	E	16	53	(00)							
		eS	E		56	(20)							
	KM	eP	X	16	53	19							
		e	X		56	46							
		eS	X			49							
	GP	eP	N	16	53	24							
		eS	N		57	00							
	Epicentre:			16	48	47	20S	179W		650km	±	USCGS	
10	SU	iP	N	03	48	36							
		iS	N		49	53							
	GP	eP	N	03	51	08							
	KM	e(S)	X	03	54	13							
	Epicentre:			03	46	59	22S	178½E		700km	±	USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 10	RX	eL	ZN	14	47±								
	WN	eL	ZN	14	48±								
10	SU	i(P)	N	18	46	01							
		iS	N		47	16							
	ON	eP	E	18	47	39							
		eS	E		50	14							
	KP	P	N	18	47	55							
		eS	N		50	44							
	TU	e(P)	N	18	48	02							
		e	N		50	27							
		e(S)	N			48							
	TO	eP?	Z	18	48	04							
		e	Z			09							
		e	Z		50	49							
		e(S)	Z		51	04							
10	WN	P	N	18	48	32							
		eS	N		51	45							
	CB	eP	E	18	48	(40)							
		eS	E		51	(58)							
	GP	eP	N	18	48	58							
		e	N		52	27							
		e(S)	N			33							
	AK	i	N	18	50	25							
		i	N			37							
	Epicentre:			18	44	30	23S	179W	400km		USCGS		
10	SU	eL	N		19	28							
	RX	eLq	E		19	35							
		eLr	N			40							
	Epicentre:			18	53	59	54N	166W				USCGS	5¾BER
12	TO	e	Z	19	07	54							
		e	Z		08	06							
	CB	e(P)	E	19	07	54							
	GP	eP	N	19	07	56							
	WN	e(P)	N	19	08	03							
		eL	Z		32ca								
	RX	e	NE	19	15	51							
		e	E		20.4								
		e	N		23.1								
		eR	ZNE		27								
	Epicentre:			18	57	02	8S	111E				USCGS	
13	RX	e	E	04	45.7								
		eL	E	05	05ca								
	WN	eL	N	05	07								
13	RX	i(P)	ZE	20	37	22w							
		e(L)	E		40	40							
	CB	e?	E	20	38	25							
		eL	E		44								
	SU	eP	N	20	42	40							
		eS	N		48	21							
		eL	N		54.8								
	WN	e	N	20	43	00							
		eL	N		45								
	KP	eL	N	20	47								
	AK	eL	N	20	48								
	Epicentre:			20	33	01	60S	151E				USCGS	
15	TO	e?	Z	05	(57)	14							
		e	Z		(58)	37							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 15	WN	e(P)	N	05	58	21							
		S	N	06	00	21							
	GP	eP?	N	05	58	51							
		eS	N	06	01	25							
	TU	e(S)	N	06	49	14							
	CB	S	E	06	00	37							
	KM	S	X	06	01	15							
	Epicentre:			05	55	21	30S	179W		150km±		USCGS	
18	SU	P	N	19	10	59							
		i	N		11	14							
		iS	N		13	05							
		e	N		15	20							
	ON	eP	E	19	12	15							
		e	E			58							
	KP	eP	N	19	12	44							
	TO	eP	Z	19	(13)	01							
	CB	eP	E	19	13	22							
	WN	eP	H	19	13	23							
		eL	ZN		18½								
	GP	eP	N	19	13	42							
		e	N		14	50							
		e?	N		18	23							
	RX	eL	N	19	20								
	Epicentre:			19	08	53	22S	172E				USCGS	
19	TU	e?	N	00	18	37							
		e	N			47							
	WN	e(S)	N	00	19	45							
	GP	e(S)	N	00	20	49							
19	WN	e(S)	N	08	36	32							
	GP	e(S)	N	08	37	38							
19	SU	eP	N	18	40	12							
		e	N		41	06							
		S	N		49	08							
		e	N			25							
		SS	N		53.9								
		Lq	N		58½								
		Lr	N	19	02								
	TO	P	Z	18	41	06							
	WN	eP?	N	18	41	09							
		e(P)	Z			24							
		eS	N		51	20							
		e(SS)	N		57	10							
19	WN	eLq	H	19	03								
		eLr	Z		05								
	RX	e(P)	Z	18	41.3								
		e(PP)	Z		44	30							
		eS	NE		51	17							
		e	NE		53								
		eSS	NE		56	44							
		e	N		59.8								
		eL	NE	19	03								
	Epicentre:			18	28	50	23½N	122E				USCGS	6½-6¾PAS
20	RX	eSS	NE	12	45								
		e	E		50								
		eLq	NE	13	01								
		eLr	Z		10								
	WN	M	H	13	18								
	Epicentre:			12	04	22	11½N	42W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 21	KP	e?	N	00	22	38							
		e	N			53							
	GP	eP	N	00	23	54							
	WN	eL	H	00	30								
		eL	ZN		35								
	RX	eL	N	00	30								
		eL	NE		32								
	Epicentre:			00	17	25	11S	167E				USCGS	
21	SU	e?	N	07	07	21							
	KP	e	N	07	08	05							
	TU	e	N	07	10	54							
	WN	e(S)	N	07	11	46							
	GP	eS	N	07	12	38							
	Epicentre:			07	04	39	22S	179½W		600km		USCGS	
22	GP	e	N	06	10	25							
		e(S)	N		11	37							
		e	N		(12)	22							
	RX	eL	NE	06	11								
	WN	eL	ZN	06	15								
22	TU	e(S)	N	22	09	06							
	TO	e(P)	Z	22	08	34							
	KP	e	N	22	09	16							
	WN	e(S)	N	22	10	16							
		e	N			20							
		eL	ZN		13								
	GP	e(S)	N	22	11	23							
	RX	eL	E		14½								
		eL	N		16								
23	WN	e(SKS)	N	06	20.7				1	10			
		eS	N		21				2	8			
		eL	ZN		41.0								
		M	N		45				7	20			
	RX	e(SKS)	N	06	21.1								
		e(S)	E		22.2						½	20	
		eSS	N		29.1								
		eSSS	N		33								
		eL	N		43								
		eL	E		46								
		M	NE		47				3	22	2	22	
	SU	eL	N	06	30								
	Epicentre:			05	56	52	52½N	169½W				USCGS	6¼PAS
23	ON	e	E	11	15	07							
	TU	eS	N	11	16	08							
	WN	eS	H	11	17	16							
		e(L)	N		21								
	GP	e	N	11	18	23							
23	ON	e	E	12	15	36							
		e	E			59							
	TU	e(P)	N	12	15	37							
		eS	N		16	58							
	KP	e	N	12	16	04							
		e	N		17	04							
	TO	e(P)	Z	12	16	16							
		e	Z		17	29							
	GP	e?	N	12	17	04							
		e	N		19	10							
		e(S)	N			13							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 23	WN	eS	N	12	18	05							
		eL	N		20								
		eL	Z		22								
	KM	eS	X	12	19	08							
	RX	eL	NE	12	22								
	Epicentre:			12	13	36	Kermadec Is.						USCGS
23	ON	e	E	13	47	38							
	TU	eS	N	13	48	45							
	WN	eS	N	13	49	53							
		eL	N		52								
	KM	e(S)	X	13	50	55							
	GP	eS	N	13	51	02							
24	SU	P	N	00	20	18							
		i	N		21	02							
		iS	N		22	09							
	ON	eP	E	00	22	34							
		e	E		26.7								
		e(L)	E		29								
	KP	eP	N	00	22	58							
		eS	N		27	23							
	TO	eP	Z	00	23	09							
24	WN	P	ZN	00	23	27d							
		e	ZN			55							
		e	N		28	00							
		e	N			48							
		eL	N		32								
		M	N		35				22	15			
	KM	eP	X	00	23	36							
	GP	eP?	N	00	23	43							
		e	N			50							
	RX	eP	ZN	00	23	54u	3	6					
		e	ZN		24	54							
		eS	NE		29.1				5	20	2	20	
		eLq	NE		31								
		eL	Z		33								
		M	E		35						20	17	
	AK	e(S)	N	00	(25)	57							
	Epicentre:			00	17	57	14½S	167½E				USCGS	6½PAS
24	SU	iP	N	09	08	58n?							
		e	N		09	31							
		i(S)	N		10	05							
	ON	P	E	09	11	01w							
		e	E		12	27							
		e	E		13	14							
		eS	E			54							
	KP	P	N	09	11	16s							
		e	N		13	30							
		e	N		14	13							
		e(S)	N			24							
	TU	e(P)	N	09	11	18							
		eS	N		14	14							
	TO	eP	Z	09	11	24							
		e	Z		13	48							
		e	Z		14	45							
		e(S)	Z			50							
	WN	P	N	09	11	45s?							
		e	ZN		14	06							
		e(S)	N		15	03							
		e	N			13							
		eScS	N		21	56							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 24	CB	eP	E	09	11	48							
		e	E		15	08							
		e(S)	E			11							
		e	E		16	08							
	KM	eP	X	09	12	03							
		e	X			13							
		e	X		13	55							
		e	X		14	10							
		e	X		15	37							
		e(S)	X			42							
		e	X		22	10							
		e	X			19							
	GP	e(P)	N	09	12	14							
		e	N		15	47							
		e(S)	N		16	04							
	RX	e	N	09	15	03							
		e(S)	NE		16	27							
		e	N		19	10							
		e	ZN		21	.6							
		e	E		22	21							
	Epicentre:			09	07	30	20½S		179W		550km	USCGS	
24	SU	e	N	22	23								
	RX	eL	NE	22	27								
		eL	NE		32								
	WN	eL	H	22	29								
	Epicentre:			21	44	28	25N		109½W			USCGS	6PAS
25	KP	eP	N	10	16	46							
	TO	eP	Z	10	16	50							
	SU	ePP	N	10	17	47							
		iS	N		24	08							
		eL	N		35½								
	RX	e?	N	10	17	.3							
		eSKS	NE		27	33			2	20			
		eS	NE		28	19			3	12	3	16	
		eSS	NE		34	50							
		eSSS	NE		38	.2							
		eLq	E		43								
		eLr	ZN		49								
		M	N		51				7	25			
	WN	i?	Z	10	19	14							
		e(SKS)	N		27	10							
		i(S)	N			42			3	8			
		eSS	N		33	.9							
		eSSS	N		37	.3							
		eLr	ZN		46½								
		M	N		49				20	25			
	Epicentre:			10	03	32	50½N		156½E			USCGS	6½-6¾
25	RX	eL	NE	20	56								
	WN	eL	H	20	58								
		eL	Z	21	00								
26	SU	iP	N	08	27	46							
		eS	N		28	54							
	ON	eP	E	08	29	42w							
		i	E			44e							
		e	E		32	19							
		e(S)	E			29							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 26	KP	P	N	08	29	55s							
		e	N		32	22							
		eS	N		33	02							
		e	N			18							
		e	N			38							
	TU	e	N	08	29	58							
		e	N		32	51							
	TO	eP	Z	08	30	04							
		e	Z			12							
		e(S)	Z		33	16							
	WN	eP	ZN	08	30	25dn							
		e	H		31	16							
		e	H		33	10							
		e(S)	H			39							
		e	H		40	28							
	CB	eP	E	08	30	27							
		e(S)	E		33	46							
	KM	eP	X	08	30	43							
		e	X		31	03							
		eS	X		34	15							
	GP	eP	N	08	30	48							
		e(S)	N		34	26							
		e	N			48							
	RX	e	N	08	33	54							
	Epicentre:			08	26	12	20½S	178W		600km		USCGS	6-6¼
26	CB	eP	E	14	27	37							
	ON	eP	E	14	27	40							
	KP	e(P)	N	14	27	45							
	TO	eP	Z	14	27	46							
	WN	eP	N	14	27	46							
		i	Z			52							
		eS	H		36	27							
		e(L)	H		49								
		e(L)	Z		56								
		M	ZN	15	00								
	GP	eP	N	14	27	43							
	KM	e(P)	X	14	27	46							
	RX	e(S)	E	14	36.1								
		e	E		40.4								
		eL	NE		43								
		eL	NE		49								
	Epicentre:			14	16	57	2S	116E				USCGS	
27	RX	eL	E	23	42								
		eL	E		46								
	Epicentre:			22	32	25	56N	161E				USCGS	6½PAS
29	GP	eP?	N	02	32	13							
	TO	eP	Z	02	32	22							
	KP	eP	N	02	32	24							
	KM	eP	X	02	32	28							
	RX	eL	N	02	54								
	Epicentre:			02	21	30	2S	116E				USCGS	
31	SU	i	N	10	30	59							
		e	N		34	10							
	RX	e	E	10	36.1						3	20	
		e	E		36.9						3	25	
		e	E		42.2						5	25	
		eL	E		58½								
		M	E	11	01						5	20	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 31	WN	e?	N	10	47	30			1	4			
		e(SKKS)	N		48.	8			2	12			
		M	N	11	01				5	20			
	Epicentre:			10	07	54	6½N	83W				USCGS	6½-6¾PAS
31	RX	e	E	15	33	16							
		eL	NE		36½								
	KM	e	X	15	34	14							
	CB	e	E	15	34	22							
	WN	(P)	Z	15	34½								
		e(L)	N		38	34							
		e	N			43							
	SU	e(L)	N	15	57								
	Epicentre:			15	29	10	55S	148E				USCGS	
31	RX	eL	NE	17	12								
	WN	eL	ZN	17	14								
NOV 1	WN	eL	Z	13	01								
2	ON	eP?	E	18	35	39							
		e(P)	E			52							
		e	E		36	19							
		eS	E		39	54							
	KP	eP?	N	18	36	00							
		e	N			13							
	TU	eS	N	18	40	43							
	TO	eP?	Z	18	36	20							
		e(P)	Z			46							
	WN	eP	Z	18	35		5	6	Time marks missing				6.5WN
		e	NZ		36								
		eS	N		40								
		eL	NZ		41				26	20			6.0WN
	CB	eP?	E	18	36	27							
		e(P)	E			40							
		eS	E		41	03							
	KM	e(P)	X	18	36	44							
		eS	X		41	26							
	GP	P	N	18	36	40							
		eS	N		41	36							
		e	N		43	22							
	RX	eP	ZN	18	36	52	2	6	1.6	20			6.2RX
		e	N		38	01							
		S	NE		41	58			4½	21	4	10	6.0RX
		Lq	NE		44	36			4	20	21	30	
		eLr	Z		46.	0	22	28					
		M	NE		47½				12	21	21	21	6.1RX
	SU	P	N	18	33	31							
	Epicentre:			18	30	24	13S	166½E				USCGS	
3	TO	eP	Z	10	32	43							
		e				53							
	WN	iS	N	10	39	20			3	5			6.3WN
	RX	eL	NE	10	48						2	22	
	Epicentre:			10	24	51	6S	147E				USCGS	
5	KP	eP	N	09	59	16							
	TO	P	Z	09	59	26							
	WN	eP	N	09	59	40							
		iS	N	10	03	46			6	3			6.0WN

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 5	SU	e	N	09	57	12							
		eS	N		58	57							
	Epicentre:			09	54	29	13S	169E		650km		USCGS	
7	ON	eL	N	06	38								
	KP	eL	N	06	37								
	WN	e	Z	06	29	05							
		ePP	ZN			19	2	6	2½	10			6.3WN
		eS	N		33	15			3½	11			6.0WN
		eL	N		35				20	20			6.0WN
	KM	eL	X	06	37								
		eL	N	06	36								
	RX	ePP	ZNE	06	29	.3	2½	10	1½	8	2	7	6.1RX
		S	NE		33	30			1.8	17	5	17	5.9RX
		Lq	NE		35	07			26	30	15	26	
		eLr	Z		36	.4	15	25					
		M	NE		36½				19	16	19	16	
	SU	eL	N	06	42								
	Epicentre:			06	21	56	57½S	143½W				USCGS	
8	CB	eP	E	02	53	53							
	GP	eP	N	02	54	09							
	Epicentre:			02	46	22	5½S	155E				USCGS	
NOV 10	AK	eL	N	02	52								
	KP	e	N	02	43	27							
		ePP	N		44	47							
	TO	eP	Z	02	43	35							
	WN	eP	Z	02	43	45	3	6					6.2WN
		e	Z		44	56							
		e(Lr)	Z		52½								
	CB	eP	E	02	43	38							
	GP	eP	N	02	43	57							
	RX	ePP	Z	02	45	26	6	10					6.4RX
		ePP	NE			40			4½	15	3½	15	6.2RX
		S	NE		50	06			7½	20	14	20	6.6RX
		iSS	E		53	09e					36	15	
		Lq	NE		54	.0			19	30	38	35	
		eLr	Z		56	.2	23	20					
		M	NE		57½				22	19	28	20	6.3RX
	SU	eP	N	02	41	50							
		iS	N		46	17s							
	Epicentre:			02	36	21	7S	155½E				USCGS	
10	SU	e(P)	N	03	49	38							
	Epicentre:			03	43	49	7½S	155½E					
10	ON	eP	E	05	31	51							
		e	E		32	11							
	AK	eL	N	05	36								
	WN	eS	N	05	35	40							
		e(Lr)	Z		39								
	RX	eLq	NE	05	39	.5			3	30	6¼	30	
		M	NE		41				2.3	20	10	20	5.8RX
		eLr	Z		42	.2	8½	16					
	SU	eP	N	05	30	16							
		S	N		32	02							
		iL	N			43							
	Epicentre:			05	28	10	24½S	175½W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 10	AK	eL	N	06	13								
	TO	eP	Z	05	56	51							
	RX	ePP	N	05	59	16			2½	11			6.1RX
		eS	NE	06	03	.3					2½	19	5.7RX
		eLq	NE		07	½			5	25	9½	35	
		M	E		12						7	20	5.9RX
	SU	S	N	06	01	00							
	Epicentre:			05	48	57	6½S	147E				USCGS	
10	SU	eP	N	23	46	00							
		S	N			26							
11	ON	eP	E	06	26	12							
	TU	eP?	N	06	26	25							
		eS	N		27	57							
	WN	eS	N	06	29	07							
	CB	eS	E	06	29	23							
	KM	eS	X	06	30	01							
	GP	eP?	N	06	27	40							
		eS	N		30	09							
	Epicentre:			06	24	00	30½S	177½W				USCGS	
12	TU	eS	N	00	26	24							
	TO	eS	Z	00	26	49							
	WN	eS	N	00	27	29							
	CB	eS	E	00	27	44							
	KM	eS	X	00	28	24							
	RX	eL	NE	00	50								
	SU	e	N	00	22	13							
	Epicentre:			00	20	03	24S	177W				USCGS	
12	WN	eL	N	01	54	.2			6	20			5.9WN
	Epicentre:			01	31	40	6S	149½E				USCGS	
12	ON	P	E	18	22	15							
	KP	eP	N	18	22	17							
		eS	N		23	33							
	TU	eP	N	18	22	10							
		eS	N		23	27							
	TO	eP	Z	18	22	26							
		eS	Z		23	56							
	WN	eP	N	18	22	51							
		S	N		24	36							
	CB	eS	E	18	24	57							
	KM	eP	X	18	23	29							
		eS	X		25	38							
	Epicentre:			18	20	30	34S	177½W		NZ(D)			5.5NZ
13	ON	P	E	17	24	24							
	KP	eP	N	17	24	30							
	TU	eP	N	17	24	27							
		S	N		25	43							
	TO	eP	Z	17	24	40							
	WN	eP	ZN	17	25	05							
		eS	N		26	51							
		eScS	N		38	20							
		eScS	N			43							
	CB	eP	E	17	25	15							
		S	E		17	11							
	KM	e(P)	X	17	25	45							
		eS	X		27	51							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 13	GP	eP	N	17	25	41							
		S	N		27	57							
	RX	eP	NE	17	26	18							
		Lq	NE		30	00							
		Lr	Z			50							
	SU	iP	N	17	26	15							
	Epicentre:			17	22	41	33S	179W				USCGS	
15	WN	eL	N	08	29								
		eL	N		34								
	GP	eP	N	08	03	29							
	RX	e	E	08	13								
		eL	NE		20								
	Epicentre:			07	52	25	8½N	124E				USCGS	
15	WN	eL	N	17	14				6	20			6.2WN
	RX	eL	NE	17	17				2	22			6.0RX
	Epicentre:			16	30	29	51½N	158E				USCGS	
18	ON	P	E	14	59	46							
	TU	eS	N	15	02	42							
	WN	eP	N	15	00	35½							
		eS	N		03	29							
	GP	eP	N	15	01	01							
		eS	N		04	18							
19	RX	eL	NE	02	43				5	20	4	20	5.5RX
	WN	eL	ZN	02	47.6				7	10			
	Epicentre:			02	34	15	Antarctic Ocean					USCGS	
20	WN	eSKS	N	13	04	25			3½	10			
		eS	N		05	14			3	10			6.7WN
		SS	N		11.9								
		eL	N		19.0				18	20			
		eLr	Z		26.3								
	RX	eSKS	N	13	04(47)				3	15			
		eS	NE		05	50			3	18	1.8	18	6.7RX
		ePS	N		07	18							
		eSS	NE		12.8				6½	24	2½	22	
		eL	E		22						6½	40	
		eLr	Z		28		9	25					
		M	NE		33				10	20	3.7	20	6.4RX
20	SU	e(PS)	N	13	02	07							
		eSS	N		06	06							
		eL	N		14								
	Epicentre:			12	40	23	54N	165W				USCGS	
21	ON	P	E	14	35	43							
		S	E		36	40							
	KP	P	N	14	33	52							
		S	N		36	52							
	TU	eP	N	14	35	48							
		S	N		36	49							
	TO	eP	Z	14	36	00							
		i	Z			02							
	WN	eP	N	14	36	26							
		i	N			27							
		S	N		37	53							
	KM	eS	X	14	38	52							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 21	GP	eP	N	14	37	02							
		S	N		38	58½							
	SU	e(P)	N	14	38	15							
	Epicentre:			14	34	29	34S	180		100km		NZ(D)	5.6NZ
22	KP	e	N	07	49.2								
	KM	e	X	07	50	17							
	GP	e	N	07	50	21							
	SU	e(P)	N	07	47	23							
		e(L)	N		49	05							
22	TO	eP	N	16	06	07							
	GP	P	N	16	04	57							
		S	N		06	26							
	WN	eL	N	16	08.4				9	20			
	Epicentre:			16	03	02	Southwest of South Island						NZ
22	KP	eP	N	16	09	20							
	TO	eP	Z	16	09	37							
	WN	eP	ZN	16	10	01	5	5	12	7			6.0WN
		eS	ZN		13	36		6	7	10			5.7WN
		eL	N		15				11	15			
	GP	eP	N	16	10	28							
	SU	eP	N	16	07	15							
		eL	N		09	15							
	Epicentre:			16	05	35	22½S	172E				USCGS	
23	TO	eP	Z	22	08	06							
	WN	eLr	ZN	22	13.1				5	20			
	GP	eP	N	22	08	53							
	RX	e(S)	NE	22	13	31			2½	6	4	5	6.2RX
		eL	E		16.0						2½	18	
	SU	e(P)	N	22	06	10							
		eL	N		08.0								
	Epicentre:			22	04	13	23S	173E				USCGS	
24	SU	e(S)	N	00	04	01							
		eL	N		05	36							
25	SU	eL	N	21	02	04							
25	AK	eL	N	23	09								
	KP	eP	N	22	45	49							
	TU	eP	N	22	45	57							
	TO	eP	Z	22	45	49							
	WN	eP	ZN	22	45	51	2	6					6.5WN
		eL	N	23	09				3½	10			
		eL	Z		14		9	20					
	CB	eP	E	22	45	43							
	GP	eP	N	22	45	46							
	RX	eS	NE	22	54	09			2	10	2	10	6.2RX
		eSS	NE		58	43					2.2	20	
		eLq	NE	23	00.9				5	25			
		eL	Z	23	10								
		M	NE		08				4	20	4	20	6.0RX
	Epicentre:			22	35	00	1½S	116E				USCGS	
26	AK	eL	N	05	47								
	KP	eP	N	05	20	49							
		e	N		21	31							
	TU	e(P)	N	05	20	59							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 26	TO	eP	Z	05	20	50							
	WN	eL	N	05	39				4	15			
		eL	Z		49		7	20					
	CB	eP	E	05	20	41							
	GP	eP	N	05	20	47							
	RX	eLq	N	05	36								
		M	NE		44				3	20			5.9RX
		eLq	Z		47								
	SU	eL	N	05	36								
	Epicentre:			05	10	00	28	116E				USCGS	
26	WN	eL	N	12	24								
	RX	eL	N	12	23								
		eL	Z		27								
	SU	e(S)	N	11	56	20							
	Epicentre:			11	35	44	51½N	176W				USCGS	
28	ON	P	E	20	55	08							
		eS	E		59	15							
	KP	eP	N	20	55	29							
	TU	eP	N	20	55	40							
	TO	eP	Z	20	55	39							
	WN	eP	Z	20	55	52	3½	10					6.0WN
		(P)	N		57								
		eS?	Z	21	00	24							
		eLr	Z		04.8		12	16					
	Epicentre:			20	50	10	158	168½E				USCGS	
29	ON	eP	E	22	33	12							
		epP	E			51							
		e	E		37	10							
		eSKS	E		43	19							
	AK	e	N	22	37	00							
		is	N		44	25							
		e	N		45	58							
	KP	eP	N	22	32	58							
		esP	N		34	08							
		e	N		37	03							
		eSKS	N		43	19							
		eS	N		44	00							
		esS	N		45	19							
	TO	P	Z	22	32	56							
		i	Z		33	02							
		e	Z			58							
		e	Z		36	58							
		eSKS	Z		43	15							
	WN	iP	ZN	22	32	52d	7½	6	4	15			7.2WN
		eP	N			55							
		ipP	Z		33	52m	9½	7					
		i	NZ		36	47m	10	6	5	15			
		e	N		43	02							
		iSKS	NZ			11	5	6	6½	10			
		eS	N			51			13	15			7.4WN
		e	N		44	50			14	25			
		esS	ZN		45	30	10	9	28	20			
		eSS	N		51	57			14	25			
		iPPP	Z		58	56	8	6					
	CB	eP	E	22	32	57							
		e	E		34	04							
		e	E		36	55							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 29	KM	eP	X	22	33	05							
		eSKS	X		43	07							
		e	X		45	18							
	Epicentre:			22	19	38	21S	66W		200km		USCGS	
DEC 4	RX	e(P)	Z	03	52	00							
		e(P)	E			14							
		e(P)	N			32							
		i	Z		56	28d							
		i	NE		57	03ne							
		e(SKS)	E	04	02	44							
		e(SKS)	N		03	06			25	16			
		e	Z		05	29							
		i	N		06	02n							
		e	E			14							
		e	N		11	04							
		e	E			32							
		e	Z			40							
	WN	eP	Z	03	52	32							
		PKP	Z		55	46	3.5	4					
		ePP	Z		56	51	16	7					
		PP	N			55							
		e	N		57	40							
		iPPP	Z		59	18							
		eSKS	N	04	03	06			28	14			
		PS	ZN		06	32							
		PPS	N		07	29							
		i	N			46							
		SS	N		12	17							
		eL	N		24								
	AK	e(P)	N	03	55	32							
		i	N	04	11	42n							
		e(L)	N		26								
		M	N		36				200	20			
	KP	e	N	03	55	49							
		e	N		56	43							
		e	N	04	06	11							
		e	N		12	17							
		e	N		15	53							
		eL	N		26								
	CB	e	E	03	56	48							
		eL	E	04	26								
	ON	e?	E	03	57	04							
		e	E			56							
		e	E	04	06	43							
		eL	E		27								
		M	E		38						3.5	20	
	KM	e	X	04	18	16							
		e	X		24½								
		eL	X		27½								
		M	X		43								
	TO	e	Z	04	35	11							
		eL	Z		38								
	Epicentre:			03	37	45	45½N	99½E				USCGS	7¼-8PAS
10	ON	eP	E	14	42	50							
		e	E		43	02							
		e	E		48	14					0.3	1	
		e	E		50	53							
		eL	E		51								
	KP	eP	N	14	43	06			1	2½			
		e	N			35							
		eS	N		48	53			10	5			
		eL	N		53½								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 10	TO	eP	Z	14	43	15							
	CB	eP	E	14	43	23							
		e	E			32							
		e	E		49	08							
	WN	iP	ZN	14	43	25us							
		i	Z			29	5	8					
		i	ZN		44	02							
		eS	ZN		49	23			8	8			
		eSS	ZN		52½								
		eL	ZN		55								
	GP	eP	N	14	43	38			1½	1			
		e	N			58							
		e(SS)	N		53	13							
	RX	eP	ZNE	14	43	40s	3	14	2	18			
		ePP	NZ		45	36	5	15	4	16			
		e	NE		49	20							
		i(S)	NE			50							
		i(SS)	NE		53	04							
		eL	ZN		55								
		Mr			58		100	20	80	20			
	Epicentre:			14	35	57	68	154½E				USCGS	6½-6¾PAS
10	KP	P	N	16	57	53							
		S	N		58	26							
	ON	eP	E	16	58	01							
		e	E			37							
		e	E			44							
	TO	iP	Z	16	58	01							
		(S)	Z			47							
	WN	P	N	16	58	24							
		eS	N		59	22							
	CB	eP	E	16	58	31							
		(S)	E		59	33							
		e	E			37							
	GP	P	N	16	58	53							
		i	N		59	03							
		eS	N	17	00	21						NZ(B)	
	Epicentre:			16	57	11	37.1S	177.0E			300km		5.0NZ
12	ON	P	E	09	52	10					¼	1	
	KP	eP	N	09	52	29			½	½			
	TO	eP	Z	09	52	40							
	GP	e	N	09	53	15			½	1			
	RX	eL	NE	10	02	ca							
	Epicentre:			09	47	02	14½S	167½E				USCGS	
12	ON	e?	E	18	43	37							
		e	E			42							
	AK	e	N	18	43	51							
		e(S)	N		48	09			3	4			
	KP	e	N	18	43	54							
		e	N		44	07							
	TO	e?	Z	18	44	00							
		e	Z			14							
	GP	eP	N	18	44	34							
		e	N			45							
	WN	e	H	18	45	30							
		e	H		50.0								
		eL	H		54								
	RX	eL	ZNE	18	54	ca							
	Epicentre:			18	38	19	32½S	167E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 12	ON	P	E	19	16	02							
	KP	e(P)	N	19	16	21							
	TO	e(P)	Z	19	16	31							
	GP	eP?	N	19	17	04							
13	RX	ePP	ZE	02	07	30	8	8					
		e	E		13	48							
		eSS	NE		24								
		eL	N		40								
		eL	E		52								
	WN	i(PP)	Z	02	08	00	6	7					
		e	Z		17	24	1	4					
	Epicentre:			01	44	59	34½N	48E				USCGS	
13	RX	eL	N	21	29								
17	SU	e	N	05	29	42							
		e	N		36	50							
		eL	N		43								
		M	N		51½				55	23			
	RX	e	N	05	33	56							
		e	E		35	28							
		e	Z		37	24							
		eL	N		57½								
		eL	E	06	01								
		eL	Z		03½								
		M	N		06½				20	20			
		M	Z		07		30	20					
		M	E		13						15	18	
	WN	e	N	05	34	47							
		eL	N		55½								
	AK	eL	N	05	58¾				20	20			
	Epicentre:			05	10	11	43½N	162E				USCGS	
17	SU	iP	N	13	51	25n							
	ON	eP	E	13	55	31½							
		i(S)	E		59	47e					100	8	
		eL	E	14	07								
	AK	iP	N	13	55	40s							
		i(S)	N	14	01	05n							
	KP	eP	N	13	55	50							
		e	N		56	29							
		e(S)	N	14	00	18			60	8			
		e	N		01	21							
		e(L)	N		06½								
	WN	e(P)	N	13	56	14							
		iP	ZN			15us	70	8	50	8			
		i(PP)	N		57	14							
		i(PPP)	N			36s							
		iS	ZN	14	01	01½n							
		eScS	N		06	44							
		M	N		09½								
	KM	iP	X	13	56	27sw							
		i	X		57	11ne							
		e(S)	X	14	01	15							
		e(L)	X		02								
	GP	eP	N	13	56	32			20	2			
		e	N		58	22							
		eS	N	14	01	33			20	3½			
		eL	N		03½								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC	RX	iP	ZN	13	56	46s	150	4	100	4			
		eP	E			48					60	4	
		(S)	E	14	01	22					20	11	
		eS	N			26			20	11			
	Epicentre:			13	50	05	12S	167E				USCGS	
19	TU	eP	N	07	24	27½							
		eS	N			44							
	KP	eP	N	07	24	29							
		iS	N			46s							
	TO	eP	Z	07	24	33							
		S	Z			56							
	WN	eP	N	07	24	56							
		eS	N		25	36½							
	ON	e	E	07	24	58½							
	CB	eP	E	07	25	06							
		S	E			52½							
	KM	eP	X	07	25	29½							
		S	X		26	31							
	GP	eP	N	07	25	32							
		eS	N		26	38½							
	Epicentre:			07	24	05	38.2S	176.7E	150km			NZ(C)	5.0NZ
19	TU	eP	N	16	42	46							
		eS	N		43	09½							
	KP	e	N	16	42	47½							
		S	N		43	11							
	TO	P	Z	16	42	56							
		e(S)	Z		43	34							
	ON	e	E	16	43	00							
	WN	eP	N	16	43	20							
		eS	N		44	12							
	GP	e	N	16	44	00							
		eS	N		45	15							
	KM	e(P)	X	16	44	13							
		e(S)	X		45	07							
	CB	e	E	16	44	27½							
		e(S)	E			29½							
	Epicentre:			16	42	14	37.3S	177.5W	150km			NZ(C)	4.9NZ
24	TU	e	N	09	58	23							
		eS	N			52							
	KP	e?	N	09	58	24½							
		e	N			52½							
	TO	e	Z	09	58	33							
	WN	eP	N	09	58	57							
		eS	N		59	51½							
	GP	e(P)	N	09	59	27							
		eS	N	10	00	55							
	CB	e	E	10	00	07							
	KM	e(S)	X	10	00	44½							
	Epicentre:			09	57	40	37S	177.5E	250km			NZ(D)	5.0NZ
24	GP	e?	N	23	53	04							
	KP	e	N	23	53	33½							
	TO	P	Z	23	53	34½							
		S	Z			58½							
	WN	P	N	23	53	40							
		eS	N		54	08							
	Epicentre:			23	53	03	40S	175E				NZ(D)	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 25	WN	e(S)	N	12	45	48½			¼	½			
	CB	e	E	12	45	51							
	TO	e	Z	12	46	06							
	KM	e	X	12	46	39							
	GP	e	N	12	46	48			0.3	½			
25	RX	e(L)	E	17	23½								
		eL	Z		33								
	WN	eL	Z	17	33								
26	ON	iP	E	12	10	54				4	1		
	KP	e(P)	N	12	11	00							
		e	N			11							
		e	N		12	20							
		e(S)	N			23			1½	1½			
	TO	eP	Z	12	11	09							
		e	Z			21							
		e	Z		12	39							
		e	Z		13	07							
	WN	eP?	N	12	11	40							
		eS	N		13	20			2	½			
		e	N		14	02							
		iScS	N		24	52n			2	2			
	CB	e(P)	E	12	11	46							
		eS	E		13	41							
	GP	e(P)	N	12	12	13							
		eS	N		14	28			1	⅝			
	RX	eL	E	12	16½								
	Epicentre:			12	09	11	32½S	178W				USCGS	
26	TO	iP	Z	13	30	22							
		e	Z			32							
	KP	iP	N	13	30	31½							
		eS	N			48							
	WN	iP	N	13	30	44							
		e(S)	N		31	09							
		e	N			20							
	CB	eP	E	13	30	54							
		e(S)	E		31	29							
		e	E			31							
	ON	e	E	13	31	03½							
		e	E			52							
		e(S)	E			57							
	KM	eP?	X	13	31	19							
		eS	X		32	05							
	GP	P	N	13	31	19							
		e	N		32	11							
		(S)	N			13							
	Epicentre:			13	30	09	39.2S	175.5E		100±km		NZ(D)	5.0NZ
28	TO	P	Z	08	12	45							
		e	Z		13	07							
		e	Z			11							
	WN	eP?	Z	08	12	49							
		e(P)	ZN			56							
		(S)	ZN		13	15							
	KP	eP	N	08	12	59							
		e	N		13	05							
		e(S)	N			38							
		e	N			48							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 28	CB	eP	E	08	13	06							
		e	E			16							
		e(S)	E			43							
		e	E			56							
	AK	e(S)	N	08	13	20							
	GP	eP?	N	08	13	21							
		e(P)	N			25							
		eS	N		14	13							
	KM	eP	X	08	13	25							
		e	X			48							
		e(S)	X		14	16							
		e	X			50							
	RX	eL	NE	08	16								
	Epicentre:			08	12	10	40.6S 177.7E					NZ(D)	4.9NZ
							Felt S.Hawkes Bay and Manawatu Maximum MM4 at Porangahau and Dannevirke.						
28	SU	e(P)	N	19	04	41							
		e	N			53							
		e	N		05	35							
		e(L)	N		07	20							
	KP	eP	N	19	06	51							
		eS	N		11	12			2	4			
	TO	eP	Z	19	07	01							
		e(S)	Z		11	39							
	CB	eP	E	19	07	24							
		eS	E		12	30							
	KM	eP	X	19	07	48							
	GP	e(P)	N	19	07	50							
		e(S)	N		13	22							
	AK	eS	N	19	11	03							
	RX	eL	E	19	15								
	Epicentre:			19	01	22	16S 172W					USCGS	
31	KP	e(P)	N	04	39	03							
		eS	N			31							
	TO	iP	Z	04	39	12							
		e(S)	Z			47							
	ON	eP?	E	04	39	14							
	WN	eP	N	04	39	34							
		e	N		40	25							
		(S)	N			28							
	CB	eP	E	04	39	42							
		eS	E		40	39							
	KM	eP	X	04	40	04							
		(S)	X		41	17							
	GP	eP	N	04	40	08							
		e	N		41	26							
		(S)	N			29							
	Epicentre:			04	38	26	37S 177½E			250±km		NZ(D)	5.0NZ
31	RX	iP!	ZNE	14	28	59dw							
		e(S)	ZE		29	29							
	KM	P	X	14	29	28							
		e	X			55							
		iS	X		30	18							
	GP	P	N	14	29	31							
		i	N			35							
		i	N			39							
		e	N			51							
		e	N			58							
		e	N		30	16							
		e	N			22							
		i(S)	N			25							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 31	CB	eP	E	14	29	51							
		e	E			55							
		e	E		30	59							
		eS	E		31	01							
	WN	eP	N	14	30	05							
		e	N			11							
		e(S)	N		31	25							
		e	Z			46							
		e	N		32	41							
	TO	eP	Z	14	30	31							
		e	Z		32	11							
		e(S)	Z			15							
	KP	eP	N	14	30	42s							
		e	N		31	17							
		e	N		32	30							
		e(S)	N			33							
		e	N		33	20							
	AK	e(P)	N	14	30	50							
		e	N		31	23							
		e(S)	N		33	16							
	ON	eP	E	14	31	00							
		e	E			10							
		e	E		32	59							
		eS	E		33	02							
	SU	eP	N	14	34	14			4	5			
		e(S)	N		39	12			4	6			
		eL	N		42								
	Epicentre:			14	28	15	45S 165½E					USCGS	
				14	28	18	44.5S 166.0E				S	NZ(D)	6.6NZ
							Felt Otago and Southland.						
							Maximum MM5 in Stewart Island.						

ADDENDUM:

JUN 8	RX	eP?	Z	22	29	38							
		e?	E		(26.	9)							
		eLq	E		37.	4							
		eLr	Z		40.	2							
	WN	eP?	N	22	29	48							
		eS	N		35	14							
		eL	ZN		38.	2							
	Epicentre:			22	26	17	19½S 168E					USCGS	

APIA.

Date	Phase	h	m	s	A	T
JAN 2	e	02	28	41		
	e			46	0.4	2
	e(ScS)		38	39		
	eSSS		44	27		
	eL		56			
2	e	03	24	15	0.2	2
2	e(P)	03	59	42	0.4	2
	e	04	00			
	eSSS		16			
3	e(S)	02	20	15	0.2	2
3	e(S)	12	59	28	0.6	1½
3	e(S)	13	07	16	0.5	½
5	P	14	50	12	1½	
	S			48	9	
6	(S)	04	49	50	0.6	
	e(T)		52	49	0.7	
6	P	21	17	26	1.3	
	S			57	7	
10	eP	06	03	37	0.7	
	eS		04	26	1.2	
	eT		07	07		
10	eP	08	12	04	0.8	
	eS			51	0.8	
	eT		15	52	1.2	
14	P	09	51	04	1.8	
	eS		52	38	1.0	
14	eP	14	22	46	0.5	
	S		24	40	0.8	
16	eP	20	38	29	0.5	
	eS		40	11	0.7	
17	P	12	45	49	0.9	
	eS		46	42	1.1	
18	eP	12	16	24	0.5	
	e		18	40		
	eS			45	0.4	
19	iP	05	18	57ne	2.2	
	iS		20	45	5.3	
21	e(P)	15	52	25		
	eS		53	56	0.4	
22	eP	02	37	07	0.3	2
22	eP	05	37	52		
	eS		39	15	0.7	
22	eP	12	36	46	0.5	2½
23	eP	17	42	27	½	
24	eP	19	27	16	0.4	
	eS		28	46	0.7	
25	eP	08	58	36		
	e			48		
	eS		59	02	5+	
28	iP	08	16	52 sw		
	Felt Apia MM3					
28	P	10	59	27	1.4	
	eS	11	00	03	1.7	
28	P	11	18	32	0.7	
	S		20	10	1.1	
29	eP	15	47	40	0.6	
	eS		48	29	0.8	
	eT		51	35		
30	P	09	46	37	2½	
	eS			54		
30	eP	15	30	41	0.1	
	eS		31	49	1.7	
	eT		35	40		

Date	Phase	h	m	s	A	T
JAN 30	P	16	55	07		
	e			15		
	eS			27	12±	
FEB 2	i(P)	11	50	11	0.4	2
	e			28	0.4	2
3	P	09	36	57		
	e		38	22		
	S			25	1.2	
5	P	04	03	31	1½	
	e		04	34		
	S			37	5±	
	e(T)		09	21		
5	eP	16	02	23		
	e			39	0.7	2
6	eP	05	34	37	0.5	
6	eS		35	04	1.6	
	e		36	58		
6	P	08	51	10	2	
	S			43	5±	
9	eP	13	33	59	0.3	½
	iS		37	36	0.8	½
	e			44	0.5	1
	e(ScS)		44	53	0.3	2
	e		45	12	0.5	2
9	P	17	57	28		
	S		58	24	2.2	
	eT	18	02	28		
17	eP	21	12	03		
	eS			29	3½	
18	P	07	21	05	5±	
	S			22	?	
	Felt Pago Pago MM1-2					
22	eP	12	12	19		
	S			48	3±	
23	(P)	20	37	57		
	i		38	00	1.1	1
	eL	21	00			35
24	P	06	40	57		
	S		41	41	3±	
MAR 2	e(P)	08	17	39	0.1	2
	e		18	09	0.4	1½
	e			29	0.4	1
2	P	20	12	48	1.6	
	eS		14	11	1.7	
5	P	12	23	08	2.6	
	S		24	07	1.2	
7	P	10	49	28	0.8	
	S		51	01	4.5	
7	eP	17	45	19	0.4	
	i			31	2	
	e			49		
	e(S)			53	25±	
7	P	19	12	19	2.9	
	S			38	1.5	
8	ePKP$_2$	12	41	11	0.4	
8	P	16	37	56 n		
	S		40	08		
8	eP	18	21	12	0.5	
	eS		22	46	0.5	
8	eP	22	26	42	0.8	
	eS		28	13	0.6	½
9	e	14	33	28	0.5	2
	e			38	1.0	2

Date	Phase	h	m	s		A	T
MAR 9	e			55		1.0	2
	e		41	32		1.2	2
	e?		42	15			
	e			32		2.4	8
	e		44	18		0.6	2
	e		47	17		1.0	2
	e?		48	.0			15
	i		48	22			15
	eL		52				30
	eL		56½				18
9	e	15	02	50		1.1	2
9	e	15	52	34		2.0	1
	e			50		0.8	1
9	e	20	50	14		0.3	1
	e		59	00		0.8	16±
	eL	21	09				30
10	e	03	16	58		0.4	2
	e		17	15		0.4	1
	eL		42				20
11	e	03	23	25		0.6	2
	e		32	27		0.3	18±
	eL		42				30
11	e	10	09	52			
	e		10	06		0.7	1
	eS		18	20		0.6	8
	eL		29				30
11	e	15	06	15		0.7	½
	e		07	14		0.8	2
	e		14	38			
	eS			45		0.6	9
	eL		25				30
12	e	07	39	35		0.3	2
12	e	07	50	08		0.4	2
12	i	11	55	38		0.5	2
	eS	12	04	14		0.5	6
	e		05	05		0.5	6
	eL		11½				20
	eL		15				14
12	e	12	24	30		0.3	2
	e		32	24		½	11
12	e	16	36	52		0.5	1
	e		37	48		0.8	1½
12	P	17	24	08		0.9	0.4
	S		25	56		0.9	½
12	P	18	30	49		2.0	0.4
	S		32	18		1.0	0.4
12	iP	19	12	40	sw	½	5
	eS		13	44			
	iS			46	sw	2	
13	P	04	59	52		1.4	
	S	05	00	49		6½	
13	P	09	16	48	n?	0.5	1
	e		18	30		0.5	2
13	iP	15	52	50	ne	0.5	2
14	eP	14	58	23	n		
	e			38		0.9	1½
	e(S)	15	07	07		0.2	6
	i			15		0.7	4
	eL		15				15
14	e	15	15	56			
	e		16	16		0.3	1-2
14	e	15	27	16		0.3	2
15	eP?	03	03	02			
	e			06		0.3	2

Date	Phase	h	m	s		A	T
MAR 16	e	02	45	08		0.5	2
	eS		53	41		0.4	20±
	e		54	05		0.5	20±
	eL	03	03				35±
16	P	17	45	19		0.5	
	eS		47	02		0.9	
18	P	19	32	16		1.5	
	iS		33	46		3.5	
19	e	13	01	38		0.2	1
7	e		02	34		0.5	1
20	iP	18	36	06		2.1	
	S		37	10		1.2	
21	eP	13	42	22		1.4	
	eS		43	53		0.6	
22	eP	01	14	06		0.6	
	eS		15	24		0.8	
22	e	14	32	11		0.2	2
	e			30		0.6	2
	e		34	12		0.4	2
	eL		48				25
	eL		51				30
23	iP	05	22	15		1.4	1.8
	e		26	43			4
24	iP	05	28	22		7	
	iS			32		25	
24	e	11	17	14		0.3	2
27	eP	07	34	12			
	i			16		0.9	
	e		35	51			
	eS			55		9	
	e		40	13		0.5	
28	iP	03	55	10	ne	15	
	S			43		28	
28	eP	09	28	18		1.3	
	eS		29	15		1.2	
29	P	05	02	56		2½	
	eS		03	15		18	
29	e	05	21	36		0.3	2
	eL		41				28
29	e?	05	48	42			
	e			46		0.3	2
APR 1	e(P)	18	27	16		0.3	
	eS		28	47		0.4	
2	eP	17	36	13		0.6	
	eS		38	13		0.8	
5	P	07	33	30		4.8	½
	S		35	48		11	½
	e		38	32		0.5	8
6	eP	15	32	40			
	eS		34	08		0.4	
7	e	10	23	25		0.1	2
9	eP	00	34	42		0.1	¾
10	e	11	41	24		0.6	2
	eS		50	35		0.3	14
	eL		59				20
	eL	12	03				25
10	P	13	44	11		1.5	
	i			14		13	
	S			32		41	
10	eP	14	28	16			
	i			20		7	
	S			36		27	
11	P	01	10	44			
	i			50			

Date	Phase	h	m	s	A	T
APR 11	S		11	03	29	
11	iP	06	44	54 sw		
	S		45	13	27	
11	P	06	53	23		
	e			30		
	S			43	11	
11	iP	10	14	50 sw		
	S		15	09	18	
14	P	07	22	27	0.6	
	S		23	15	3.1	
	e		26	30	0.6	¾
	e		27	26	1.2	¾
14	iP	19	18	32 ne	Large	
	Felt: MM6-7					
	On board M.V.'Matua'					
	(14 28'S 173 37'W)					
	MM5 Pago Pago.					
	MM4-6 Throughout Upolu					
	and Savai'i.					
	Pendulum clocks stopped,					
	but no damage in Samoa.					
	Aftershocks are reported only when their magnitude exceeds 4.6 .					
14	P	19	50	26		
	eS			48	16	
14	eP	20	09	01	0.7	
	eS			17	4	
14	P	20	09	23	12	
	i(S)			41		
	e			44	45	
16	P	01	07	19	0.8	
	e		08	01		
	S			03	2.6	
16	iPcP	04	15	21	1.3	2
	epP		17	22	1.0	3
	e		19	27	0.7	3
	e(PPP)		20	24	0.8	2½
	e(S)		24	40	0.8	7
16	iP	10	19	06 ws		
	S			25	18	
16	iP	22	57	06 ne		
	i			07		
	S			27		
17	iP	08	09	43	1.8	
	i		10	55		
	eT		15	26	2½	
18	eP	01	44	22		
	S			42	26	
19	e(P)	15	55	35	0.6	1
	e			43	0.4	2
19	eP?	22	30	15		
	i(P)			16	1.5	2
	e			32	1.8	2
	e(S)		39	06	0.8	4
	eL		46.2			20
20	e	06	57	17	0.8	1½
	eL	07	09			20
20	eP	12	38	16	0.2	1
	e			23	0.4	1½
	e			30	0.8	1
20	iP	21	40	53 n	0.6	
	S		41	58	1.8	

Date	Phase	h	m	s	A	T
APR 24	ePKP$_2$	19	30	06 ne?	0.5	2
	e			10		½
25	ePKP$_2$	02	45	33	0.4	2
	e			42	0.7	2
	e		46	26	1.2	1
25	eP	10	25	17	0.3	2
	e			32	0.3	2
	e			42	0.5	1½
27	eP?	11	34	51	0.3	2
	i(P)			52 nw	0.3	2
	e?		44	22	0.5	1½
28	P	14	38	57	2.2	
	e		39	32	1.7	
	S			58	10	
28	P	15	03	14		
	S			34	17	
MAY 2	e?	10	54	27		2
	e(L)			59		10
2	e	11	49	53	0.7	2
2	i(P)	21	46	27 w	0.8	2
4	e	10	15	05	0.4	2
6	iP	11	38	54	2½	
	S		39	53	15	
8	eP	20	11	19	0.4	2
	S?		12	11	0.8	3
	e(L)		12.0			15
12	eP	01	18	52	1.4	
	S		19	58	5½	
12	iP	05	04	15 sw	5½	
	S			42	17	
12	iP	11	30	19 s	2½	
				38	14	
12	eP?	11	41	14		1½
	e			30	0.6	2
12	iP	17	48	05 s	2½	
	S			24	18	
12	iP	23	30	01 sw	5	
	S			19	19	
15	iP	10	29	11 ne	5	
	S			34	10	
15	iP	23	34	45 ne		
	S			35 07		
	Felt:MM3					
21	P	01	21	32	06.2	
	pP		22	02		2
	S		29	11	0.8	6
	e		31	19		2
	e(L)		36			18
22	e	13	40	28	0.3	1½
23	Wiechert instruments dismantled and Wood-Andersons moved to temporary site,on account of building operations.					
24	P	12	49	47		
	S		50	07	43	
26	ePKP2?	06	53	15		1
	e			24	0.4	2
	e		55	02	0.4	2
28	iP	00	19	36 sw	14	
	S			56	59	
28	e?	06	07	56		
	e		08	14	0.5	1
28	eP	23	23	46 sw	0.6	2
29	P	02	31	55 sw		

Date	Phase	h	m	s	A	T
MAY 29	S		32	15	18	
30	P	00	20	41	0.6	
	S		21	55	1.5	
	eT		27	55		
	e		29.0			
30	P	19	42	43	0.5	
	S		43	58	0.7	
	eT		49	54		
30	eP	21	00	36	0.4	
	S		02	36	1.2	
30	eP	22	59	05	0.2	
	e			15	0.4	
	eS	23	00	21	0.6	
	eT		06	30		
31	eP	20	06	00	0.4	
	e		07	09	0.5	
	i(S)			14	0.9	
JUN 2	P	02	19	50	0.5	
	eS		20	45	1.4	
2	P	23	52	37	1.3	
	S		53	11	13	
4	P	11	19(48)	ne	1.0	2
	Time marks failed. Bracketed readings may be 2-3 secs in error.					
4	iP	17	07(03)	ne	3.7	
	e		08(32)		5.7	
	eS		(34)			
4	eP	20	00(44)			
	S		01(49)		1.5	
4	eP	22	35(06)			
7	P	20	55	47	0.4	
	S		57	43	0.3	
8	eP	03	33	40		
	S		34	16	6	
8	iP	17	13	01	ne 15	
	eS			35		53
10	eP	00	45	03	0.3	½
	e			11	0.8	1
10	eP	01	11	06	1.1	2
11	eP	14	53	43	0.2	½
	e			53	0.7	2
	e		56	48	0.9	½
	e(S)			53	1.3	1
	eL		58			30
	e(T)	15	07	10	0.3	¼
11	e	19	01	07	0.5	¾
13	e	10	51	28	0.5	2
	e(S)	11	00.2			16
16	eP	12	04	23		
	S		05	09	7	
	(T)		08	59		
17	iP	06	17	21	nw 24	
	S			40	55	
	Felt: Apia MM-3					
17	e(P)	16	36	00	0.2	½
	i(S)		37	36	0.6	1
18	eP?	18	00	41	0.1	
	e			46	2.2	2
	eL		06	08	0.2	26
21	P	21	40	11	1.2	
	eS		41	07	2.0	

Date	Phase	h	m	s	A	T
JUN 22	eP	23	59	32		2-4
	e			46	0.4	3
	e(S)	24	07	09		20
	eL		13			25
	e?		35	39		4
23	P	03	34	35	1.2	¾
	e(S)		36	14	0.7	¾
23	iP	03	38	51	sw 9	
	S		39	11	42	
	Felt: Apia					
24	iP	01	38	46	6	
	iS		39	18	12	
24	e(P)	09	20	10	0.5	1-2
26	iP	15	23	22	10	
	S			45	25	
27	eL	00	50			20
27	e	12	54	23		½
	e			31	0.3	1½
30	e(P)	12	59	13	0.3	½
JUL 1	eP	02	24	44	0.5	
	e			26	20	
	e(S)				24	2.0
3	P	06	05	23	1.4	½
	i		07	31	0.4	1
	e(S)				35	0.5	½
	e				37	1.0	1
	e		12	01		
3	e(P)	08	26	53	0.2	
			28	31	0.3	
5	P	06	26	19	5	
S	S			39	26	
5	eP	10	37	41		
	eS		39	23	0.5	
5	e	12	38	01	0.3	
	e		39	23	0.3	1
7	e	16	17	56	0.5	2
9	iP	14	18	31	3	
	S		19	24	4	
13	iP	09	32	36	sw 10±	
	(S)			56	57±	
13	iP	13	59	13	sw 2	
	e			20	5	
	S			34	30	
13	P	14	24	52	2	
	e			57	5	
	S		25	02	30	
14	P	06	27	09	3.0	½
	e			26	4.5	1½
	e		29	32	2	
	iS			34	5	
	i			37	13	½
	eT		37	18		
14	eP	08	14	40	0.8	2
	i		17	30		
	i(S)			33	2.5	¾
	eT		25	18		
14	eP	09	44	09	0.9	
	i			34	0.5	
	e		45	16	0.8	
	e(S)			32	1.3	½
	eT		50	52		
17	i(P)	11	15	04	ne 2	
	e(S)		19	05	6	

Date	Phase	h	m	s	A	T
JUL 17	e			32	10	
	e			40	8	
20	P	15	40	25	3½	
	e		41	22		
	S			28	10	
21	eP	19	40	23		
	e		42	29		
	e			36	0.5	½
	e		53	35		
22	eP	06	21	34	0.7	2
	e(S)		25	03	0.7	1½
22	eP	06	26	33	0.5	½
	e(S)		30	00	0.4	½
23	eP	06	25	07	0.6	2
23	e(P)	13	33	07		
	e(S)		35	28	0.5	½
24	eP	10	01	21	0.3	2
24	eP	11	06	51		
	i			56	0.8	2
	e		13.	0	0.1	9
	e		14	14	0.1	9
24	eP	19	57	51		
	S		58	33	8	
25	P	10	41	00		
	S			52	0.6	
25	P	11	08	48		
	eS		10	19	0.5	
26	eP	06	54	44	0.2	2
27	P	12	17	55	1.2	
	i		18	27	1.0	
	i(S)			29	2.5	
	i			32	5	
27	e(P)	13	41	54	0.3	½
	e		42	22	0.4	½
	e		44	18	0.3	½
27	eP	14	47	12	0.5	½
	eS		48	25	0.8	½
	e		51	25	0.2	½
	e		54	12	0.6	½
27	P	20	09	12	4.2	
	eS			40	13	
28	e	08	52	15	0.2	2
	e			48	0.4	2
	e		54	14	0.4	2½
	eL	09	16	26		25
28	P	13	15	37	0.6	
	e		17	23	0.4	
	S			25	0.7	
28	e	19	46	36	0.2	½
	e		49	47	0.1	½
AUG 3	e(P)	08	19	13	0.2	1½
	e(S)		21	48	0.2	1
4	iP	23	55	46	17	
	S		56	04	45+	
5	P	07	49	48	5	
	S		50	09	27	
5	iP	12	58	05	12	
	S			25	35	
5	e(P)	21	35	43	0.2	1
	e(S)		38	57	0.1	½
7	eP	19	42	47	2.0	½
	e		44	18		
	eS			20	3.5	1
8	e(P)	14	54	45	0.3	
	eS		55	46	0.4	

Date	Phase	h	m	s	A	T
AUG 10	eP	02	21	08	0.3	½
	eS		23	01	0.7	1½
10	eP?	03	56	39		
	e(P)			41	0.8	½
	e			59	1.1	½
	S		57	19	6	
	e		59	59		
	eT	04	00	04		
10	iP	09	44	07	19	
	S			28	20	
11	P	05	33	20	0.9	
	S		34	13	3.8	
11	eP?	13	44	34		
	e?		47	37		
11	e	21	43	10	0.5	1½
	e		48.5		0.2	10
	Beginning lost during record changing.					
11	eP	22	04	52	0.4	
	eS		06	15	0.6	
12	iP	10	25	59	11	
	S		26	41	18	
13	eP	07	03	02		
	eS			43	0.7	
13	eP	08	00	58	0.4	
	eS		01	36	1.0	
	e		04	29	0.5	
13	P	10	02	25	0.7	
	S		03	07	2.0	
14	e(P)	18	28(46)		1.1	½
	S		30(08)		7½	½
	eT		34(33)			
	Time marks failed. Bracketed times correct to within 2 secs.					
14	eP	19	55(33)		0.6	½
	e		57(13)			
	eS			(18)	1.1	½
14	P	23	09	17	2½	
	S			50	28	
16	eP	14	53	27	0.2	½
	eS		55	45	0.3	½
17	e(L)	00	07			
17	P	18	34	30	0.5	1
19	eP	07	49	03		
	eS			40	0.5	1/6
	eT		52	35	0.4	1
	Weak coda.					
19	P	10	47	45	0.3	½
	eS		48	24	1.2	1/6
	eT		51	17	0.9	1
	e			33	1.3	4
20	eL	12	41.	1	0.3	20
20	eP	22	58	27	0.4	
	eS		59	07	1.6	
	eT	23	02	02	0.6	
21	P	17	39	13	8	
	S			36	50	
22	e	16	48	19	0.3	1
23	P	18	50	50	1.0	
	eS		51	32	16	
24	e	01	03	26	0.2	½
	e(L)		05.6			10
26	e(P)	02	10	18	0.3	
	e(S)		11	33	0.3	

Date	Phase	h	m	s		A	T
AUG 27	eP	20	59	37		0.2	0.4
	i			40		0.8	0.4
	eS	21	02	09		0.4	½
28	eP	08	22	42		0.2	½
	e		25	08		0.6	½
	eL		26½				
29	e(P)	14	05	20		0.1	
	e		29	1.4		0.4	
	e		07	39		0.3	1
	S			41		0.5	½
SEP 2	eP	05	42	01		0.4	1½
	e		44	44		0.3	2
2	P	09	46	58	ne	15	
	eS		47	18		52	
	Felt: Apia MM-2						
2	eS	09	51	52		2.0	
2	eP	09	53	19		7½	
	eS			39		27	
3	P	14	42	54		0.3	0.4
	S		44	45		0.3	½
6	eP	00	26	10		0.6	
	eS		27	17		0.6	
9	eP	09	01	43	ne		2½
	e			44		0.6	0.4
	e		02	15		0.7	2
	e(S)		03.0			0.8	9
	e(T)		05	38			
9	P	13	06	12		2½	
	S			33		11	
11	P	13	43	40	w	1.6	0.4
	e		45	08		0.8	
	1(S)			12		1.8	0.4
11	1P	23	22	46	n	22	
	S		23	08		55+	
	Felt: Apia.						
19	1P	00	54	58	ne	15	
	S		55	18		40	
19	P	17	03	32	n	0.8	0.4
	S		04	36		14	0.4
20	1P	06	33	14	n	3½	
	1S			52		27	
20	P	18	48	12		0.3	0.4
	eS		49	27		0.8	1
23	P	18	44	49			
	S		45	14		20	
24	eP	01	45	14			
	S			39		12	
24	e(PcP)	08	32	02		0.4	2
	e		36.3				3
	e(S)		40.4			0.1	12
	e		41.2			0.1	15
	Lr		51				22
	M		58			0.3	18
26	eP	11	30	06		0.2	1½
28	eP	00	37	32		0.3	⅔
28	1P	14	22	12	ne	23	1½
	e		23	56		9	
	1S			59	sw	40	1
	e		34	46		0.5	1
28	P	14	46	15		0.6	½
	e		47	55			
	S			58		3.2	½
29	P	07	08	20		1.3	⅔
	eS		10	02		0.5	½

Date	Phase	h	m	s		A	T
SEP 29	eP	08	16	26	ne	1.7	0.4
	i			33		4½	0.4
	eS		18	53		1.7	0.5
	eScS		27	22		0.4	2
29	eP	13	40	28		0.3	½
	e		42	16			
	eS			19		0.5	½
OCT 3	P	13	46	33		0.2	
	eS		48	08		0.4	
4	P	01	03	17		0.5	
	S		05	00		3	
	eT		09	30		0.5	
4	P	16	47	24		0.9	
	S		48	00		3.4	
	T		51	18		0.5	
4	1P	20	47	46	n	12	
	S		48	06		20	
7	P	03	55	43			
	S		56	59		0.7	⅓
7	eP	16	51	04		0.6	⅓
	e(S)		52	50		0.6	⅔
	e			56		0.7	2
10	1P	03	07	06	ne	5	
	eS			44		2.5	
10	P	03	51	52		0.3	1
10	1P	18	47	00		1.3	⅓
	e		48	53			
	S			56		3.0	⅓
14	P	14	13	47		1.0	½
	e		15	54			
	eS		16	00		1.2	½
15	eP	04	20	46		0.2	1
	e		22	27		0.9	⅔
21	eP	00	22	05		0.3	2
	e			20		0.4	2
24	eP	00	22	15		0.4	2
	e(PP)			44		0.3	1½
	e(S)		26	30		0.2	8
24	eP	09	09	39	n	1.1	2
	1S		11	18		5	1
26	P				w	2.5	1
	1S				e	10.5	½
	Power failure and clock stoppage. 1S-P=1min 44sec.						
NOV 2	1P	18	34	13	n	2.2	2
	ePP			37		2.5	2
	ePPP			44		1.2	2
	S		39	10		0.7	3
	ePcS		43	09		0.3	6
5	1P	09	58	18	sw	0.6	1
7	P	14	35	12		0.8	⅓
	S		36	02		4.5	½
7	e(P)	16	01	03		0.5	1
8	eP	10	02	32		0.2	⅓
	eS		03	58		0.2	⅓
10	eP	02	42	56		0.3	2
	ePP		43	30		0.4	2
	eL		51			0.2	18
10	P	05	30	49		0.4	0.4
	eS		32	43		0.5	1
	e(T)		42			0.3	1
12	P	00	22	57		1.4	½
	S		24	54		1.4	1

Date	Phase	h	m	s	A	T
NOV 12	P	17	04	27	0.5	½
	S		06	13	0.5	½
12	eP	18	25	(17)	0.5	½
	e		27	(55)	0.3	½
	i		28	15	0.3	½
13	P	17	27	15	0.4	2
	ePP			32	2.0	2
	e		28	24	1.0	2
	eS		30	56	0.7	½
	e(PcP)		30	59	0.8	½
	e		31	04	1.0	½
	i(ScS)		39	16 nw	0.8	2
	(T)		48		0.5	1
14	iP	16	35	27 n	4½	½
	S		36	05	20	½
18	eP	14	59	39	0.3	½
	eS	15	01	(42)	0.5	½
21	e(PP)	14	40	(08)	0.4	½
24	P	03	22	41	0.5	½
	e(S)		24	12	0.3	½
25	eP	22	46	36	0.4	1.0
	No records 26d-29d during re-installation of seismographs.					
29	P	21	44	36	2.0	½
	iS		45	26 sw	14	
30	eP	17	38	31	2.3	½
	S		38	50	13	
DEC 3	eP	17	59	15	0.5	½
	S	18	00	20	3.0	½
4	eP	03	52	05	0.5	2
	ePPP		55	48	0.5	1½
	eS	04	02	16	0.6	12
	eSS		09	08	0.5	12
	eLq		19.1		1.2	40
	eLr		22		1.5	
	M		30	1.2	22	
4	eP	07	20	(14)	0.5	½
	eS		22	06	0.6	½
5	eP	10	36	28	1.0	½
	iS		38	12 w	0.8	½
6	eP	21	16	39	1.0	½
	iS!		18	21 s	2.0	½
10	eP	14	42	(52)	0.7	1½
	ePP		44	12	0.7	2
	iPPP		44	44	0.8	2
	eLq		51.3		0.6	20
12	eiP	02	07	57 n	2.5	½
	iS		08	00	15.5	½
12	iP	02	13	14 n	3.5	½
	iS			34 s	19.0	½
	iPP			33	0.9	2
	iPPP			46	0.8	2
13	iP	17	30	55 ne	24.0	½
	eS		31	16	38.5	½
17	iP	13	54	57	20.5	2½
	iPP		55	18	11.0	2
	iPPP			30	12.0	3
	iPcP		58	50	3.5	5
	iS		59	11	7.5	12
	eL	14	00	.2	2.2	16
23	eP	23	38	54	3.5	½
	eS		39	10	12.5	½
26	eP	12	13	42	0.5	½

Date	Phase	h	m	s	A	T
DEC 28	iP	19	02	04	14.0	½
	P			14	35±	½
	eiS			35	44±	½
31	eP	14	35	24	0.7	2

RAOUL ISLAND.

Recordings at Raoul Island are made on 35mm. cine film, and are read by projection in a viewer magnifying eight times. Amplitudes are given in millimetres, as read directly from the screen of the viewer. The recording speed of the drum is 15 mm/min.

Date	Phase	h	m	s	A	T
MAY 1	P	07	05	51	2	
1	iP	21	35	02	15	
2	P	17	44	52	6	
4	P	22	07	46	3	
	S			57	4	
4	e(P)	22	08	34	3	
	(S)			38	10	
5	iP	16	57	16	7	
	S			28	12	
6	eS	11	42	15	3	
6	P	11	03	34		
	S		04	19		
6	iP	13	17	35	5	
7	eP	08	18	23	2	
8	eP	20	12	35	3	
10	P	16	25	22	6	
	eS			48	14	
10	eP	19	07	41	2	
11	eP	03	01	47	4	
11	eP	16	00	35	4	
12	eP	01	21	12	3	
12	P	02	30	57	2	
12	iP	20	57	31	5	
	S			40	5	
12	iP	20	58	47	28	
13	P	03	21	09	2	
	S			54	5	
	eT		25	50	3	
14	P	01	59	23	5	
	eS	02	00	39	5	
14	P	17	56	27	2	
	eS			45	5	
14	eP	19	20	09	1	
	eS			19	3	
16	P	03	35	53	4	
	eS		36	35	8	
16	iP	11	23	41	8	
	S			57	16	
17	iS	02	46	49	12	
17	e(P)	10	00	13	5	
17	P	11	53	59	5	
17	iP	23	45	03	5	
18	iP	12	59	31	5	
	S			46	18	
20	eP	21	08	25	2	
	S			32	5	
20	eP	23	12	30	2	
	S			32	5	
21	iP	01	22	20	2	
21	P	08	24	31	3	
	S		25	07	5	
21	eP	09	42	44	1.5	
21	P	11	32	09	3	
21	i(P)	12	25	03	1.5	
21	eP	17	58	11		
	eS			25	3	
MAY 21	eP	18	47	02		
	S			13	3	
23	iP	04	49	03	2	
23	iP	20	38	58	8	
	S		39	59	4	
24	P	16	04	07	4	
	S			23	8	
	e?			38	12	
26	eP	04	02	41	5	
26	iP	22	33	41	7	
				51	10	
28	iP	00	06	12	7	
	S			40	10	
28	P	05	53	32	4	
	S		54	18	15	
	T		57	51	8	
28	iP	23	23	36	10	
29 29	P	08	39	28		
	S			42	6	
29	P	12	01	58	3	
	S		02	12	5	
30	P	00	21	07	3	
	S		22	46	7	
	?			53		
30	e(P)	11	35	42		
30	eP	19	43	11		
	S		44	50	8	
30	P	21	00	13	7	
	S		01	39	6	
	e			45	14	
30	e(P)	22	59	34		
	e(S)	23	01	12	¾	
31	e(P)	00	34	29	5	
31	e?	20	13	33		
31	e(P)	20	28	34		
JUN 1	eP	05	28	49	4	
1	P	11	47	44	6	
	S		48	06	12	
1	P	20	31	18	4	
	S			38	8	
2	eP	07	30	44	2	
2	iP	09	38	42	20	
	S			56	20+	
2	iP	09	54	35	2	
	eS		55	38	10	
	e			50		
2	P	19	20	07		
	S			20		
3	eP	02	38	23	2	
	S			32	5	
3	iP	09	15	42	13	
	eS		16	11	6	
4	P	15	35	29	2	
	S			50	2	
4	P	17	07	44	13	
	eP		09	34	5	

Date		Phase	h	m	s	A	T
JUN	4	S			51	16	
		ePcP		12	36		
	4	eS	20	03	37		
	5	P	07	39	51	2	
		S		40	01	5	
	5	e?	09	54	11	2	
	5	iP	17	40	58	5	
		S		41	15	6	
	5	P	18	59	15	2	
		eS			51		
	6	P	05	37	51	3	
				38	07	21	
	11	iP	14	50	05		
JUL	1	eP	02	21	09	1½	¾
		i			19½	6	¾
		i			23	8	¾
		i			27½	5	¾
		i			44		1
		i(S)		22	27	10?	
		i			44	12?	1
		e		26±			
	1	eP	03	46	00		
		i			04		
		i			09		
		e			17		
		e(S)			39		
	4	iP	09	45	55	8	¼
		i(S)		46	07	Large	
	5	iP	12	34	17	4	¼
		i(S)			21	Large	
	6	iP	17	09	51		
	6	e	20	31	58		
		i		32	01		
	7	iP	02	14	43		
		i			47		
		i(S)			56		
		i(S)			59		
		i		15	02		
	7	e(L)	16	17	59	10	1
	7	e(L)	17	16	13		
	8	e	15	00	43		
	8	iP	16	57	08		
		i			10		
		iS			24		
	9	e	04	35	35		
	10	iP	04	38	45ca		
	10	iP	14	09	32		
		iS			46		
	10	e	14	28	33		
	10	e	14	45	44		
	10	e	15	39	05		
	10	e	23	05			
	12	e	14	41			
	12	e	14	52			
	14	iP	06	24	41		
			Felt: MM3				
	14	iP	08	11	06		
			Felt: MM5				
	14	iP	09	39	05		
		iS			14		
	14	eP	09	44	46	1	½
		i		45	03	2½	1
		i			10	3	1
		i(S)			50	5	1

Date		Phase	h	m	s	A	T
JUL	14	i			39	10	1½
		i			50	5	1
	15		11	33			
	16	eP	04	22	17	2	1?
		i			20	3	
		i			23	3	
		i(S)			37	Large	
	16	e(P)	11	52	29		
		iS			41		
	17	iP	00	15	40		
		iS			48		
	17	i	05	58	07		
	17	eP	11	15	21	2	1
		e			43	2	2
		i			46	4	1½
		i			57	4	1
	17	e	13	17			
	17	P?	15	01	46		
		S			57		
	17		20	37			
	17	iP	21	33	57		
		i(S)		34	12		
	18	eP	04	01	04		
		iS			20		
	18	eP?	06	09	23		
		S			38		
	18	iP	10	00	26		
		i(S)			40		
			Felt: MM1				
	18	eP	21	17	12		
		iS			28		
	19		00	52+			
	19	iP	07	09	19		
		iS			37		
		i			41		
	19	eP	10	13	44		
		i			56		
		iS		14	12		
		i			20		
	19	iP	14	39	21		
		iS			37		
	19	eP	14	48	44		
		iS			54		
	19	eP	15	06	18		
		i(S)			36		
		i			38		
	19	iP	15	12	42		
		i		13	00		
	19	iP	15	29	00		
			In minute mark.				
		iS			14		
		i			29		
		i			40		
	19	iP	15	35	55		
		iS		36	10		
		i			17		
	19	P	15	38	25		
		S			40		
		i			46		
	19	eP?	16	18	20		
		e(S)			32		
		e(L)			43		
	19	e(S)	17	28	13		

Date	Phase	h	m	s	A	T
JUL 19	i			18		
19	P	18	59	42		
	i			47		
	i(S)			54		
	i(S)	19	00	01		
20		04	03			
20		07	23			
20	iP	07	25	29		
	iS			46		
	i			53		
20		08	16	ca		
20	e(S)	11	12	32		
20	eP?	15	41	18		
20		22	49			
20		23	50			
21	iP	11	21	12		
	iS			28		
	i			34		
21	P	11	24	26		
	(S)			41		
21	eP	11	34	57		
	iS		35	13		
	i			19		
21		17	51±			
21		18	25±			
21	iP	19	37	50	2	
	i			54		
	iS		38	25	Large	
22		03	13±			
22	iP	06	17	57	Large	
22	iP	06	22	55		
23	iP	03	23	21		
	iS			37		
23	i(S)	06	58	56		
23	eP	07	54	24	1	1
	iS		55	06	4	1
23	eiP	13	31	43	Large	
	eS		32	47	3	1
23	eP?	13	40	11		
	S?			39		
	i			45		
23	e	23	09	17		
24	iP	04	56	51		
	iS		57	12		
24	e	06	07	12	1½	1
24	eL	10	00	54	4	1½
24	eL	11	06	19	8	2
24	i	14	56	27	3	1
25	eP	08	04	39		
	e			34		
	e(S)			50		
25	e	19	30			
26	e	06	08			
26	e(P)	06	51	26	2	1
	e(S)		52	15	2½	1
	i			37	2	½
	e(L)			58	3	2
26	e(P)	22	33	07		
	i(S)			10		
27	iP	11	51	05		
	iS			14	Large	
27		13	19	ca		
27		14	14	ca		

Date	Phase	h	m	s	A	T
JUL 27	eP	14	47	41	1	½
	iS		49	21	2	1
	e			39	1½	1
27		15	00+			
	iS			50		
	i		30	00		
28	e	13	16	55		
	i		17	01		
29	eP	02	40	05		
	iS			18		
29	eiP	08	12	59		
	i(S)		13	16	Large	
29	e(P)	09	58	27	1½	1
	i			38	4	1
	i			40	4	1
	i(S)		59	17	2	1
	i			21	5	1
30		07	27+			
30	e	07	59	50		
30	iP	08	03	02		
	(S)			14		
30	e(P)	13	08	32		
	e		10	14		
	e			54		
	e		12	26		
30	e	17	02	40		
	i			55		
30	e?	21	39	21		
	i			34		
	i			40		
	i		40	07		
	i			28		
	i		41	44		
31	iP	14	27	15		
	i			22		
	iS			28		
31	iP	18	15	56		
	i(S)		16	09		
31	iP	20	10	22		
	iS			49		
AUG 1	eiP	16	57	55		
	i			58		
3	iP	08	16	15	21	½
	i			19		
	S?			36		
3	eP	08	58	00		
	e(S)			18		
	i			21		
3	eP?	15	48	20		
	iS			36		
3	e(P)	17	17	58	4	1
	i		18	06	6	½
	iS			22	9	½
4	e(P)	01	26	10	2	1
		In minute mark.				
	i			23	5	½
	i(S)			28	12	
5	P?	10	54	14		
	i			22		
	iS			30		
5	i(P)	21	31	25	5	1
	e			36	5	1

Date	Phase	h	m	s	A	T
AUG 5	i			48	5	1
	iS		32	11	15	1
6	eP	08	49	11	2	< ½
	i			22	4	½
	(S)			44	12	½
6	iP	08	53	11	3	½
	i			14	4	< ½
	i			23	4	1
	i			35	10	1
	i(S)			42	4?	1
	i			45	8	1
6	eP?	23	20	07		
	e(S)			48		
	i			51		
	i			54		
6	e	23	24			
7	e	03	33	02		
7	eP	05	46	25		
	i			3		
	(S)			52		
	i(S)			57		
7	eP	10	27	58		
	i		28	07		
	iS			23		
	i			53		
7	eP?	18	53	16	½	2
	iP?			17	½	6
	In minute mark.					
	i			26	½	6
	i(S)			42	½	15
7	ei	19	42	06		
	e			24		
	eS			59		
8	P	00	29	17		
	In minute mark.					
	i			22	4	½
8	i			39	5	1
	i(S)			47	10	1
	i(S)			53	20	1
8	eP	03	38	35	2	< ½
	i			38	5	< ½
	i(S)			45	10	< ½
	i			47	10?	½
8	(P)	09	38	53±		
9		02	01			
10		09	00			
10	iP	09	34	09		
	(S)			17		
11	P	03	43	56		
	S		44	12		
11	P?	05	16	54		
	S		17	18		
11	P	12	42	20		
	S?			55		
11	eP	13	40	53	3	
	i			56	6	
	S		41	23	30?	
11	eP	14	01	23±		
	(S)			53		
11		14	08			
11	iP	21	41	57	2	
	i			59	4	
	iS		42	05	16	
11	e	22	07	45		

Date	Phase	h	m	s	A	T
AUG 12	iP	00	26	59	7	½
	i		27	03	10+	½
	i(S)			09		
12		00	30			
12	iP	11	56	30	3	½
	i			32	3	½
	i(S)		57	04	3	½
	i			12	6	½
	i			16	14	½
12	e(P)	17	23	49	1	½
	iS		24	02	4	½
	i			07	15	½
12	e	19	33	13		
	i			18		
	i			23		
13	eP	09	24	08		
	i			19		
	(S)			24		
	In minute marke.					
14	iP	13	27	53	5	½
	iS		28	06	20+	½
14	eP	18	28	51		
	e		29	51		
	iS		30	24		
	i			28		
14		18	34			
14	iP	19	50	31		
	iS		51	17		
	e		55	01		
15	eP	21	59	23		
	i			27		
	i(S)			34		
	i			41		
16	eP	00	13	32		
	i			34		
	i			41		
	i(S)			47		
16	eP	04	31	55		
	i		32	02		
	i(S)			19		
	i			26		
	i			33		
16	i	08	19	03		
	i			12		
16	i	11	24	51		
16	i(P)	14	52	00		
17	e	12	59	23		
	e	13	00	24		
	e			49		
17	eP?	14	39	05		
	i			17		
	iS			39		
	i			55		
18	eP?	06	13	43		
	i			53		
	iS		14	24		
	i			46		
18	e?	11	13	22		
	e(S)		14	07		
18	e(P)?	11	56	42		
	e		57	33		
	(S)		58	03		
18		14	19			
19		09	21			

Date	Phase	h	m	s	A	T
AUG 19		10	24			
19	eP?	17	50	38		
	iS		51	04		
20	eP	10	02	26		
	i			47		
	iS			53		
	i		04	29		
20	e?	11	16	54		
	e		17	26		
	i			42		
20		11	26			
20	e	12	08	45		
20		14	03			
20		19	57			
21		01	50			
21		14	20			
21	e	17	44	15		
	i(S)			41		
22	e	13	10			
22	iP	16	38	27		
	i			34		
	iS			43		
22	e	16	48	10±		
22		18	34±			
22		23	17±			
23		02	12±			
23		07	18±			
23	e(P)?	12	27	43		
	iS			52		
23	iP	20	11	47	2	½
	i			59	7	½½
	iS		12	04	?	½½
23	eP	21	33	02	1	½½
	i			12	5	½
	iS			17		
24		20	35±			
25	iP	04	40	26		
	i			34		
	i(S)			45		
	i(S)			48		
25	i	07	15	50		
25	iP	07	21	36		
	i			41		
	iS			49		
25	eP	09	52	04		
	S			23		
25	eP?	23	40	58		
	(S)		41	10		
	i			19		
26		16	47±			
27	e	06	25	53		
27	P	18	24	11		
	S			24		
27	iP	20	58	02	Large	
	iS		59	20	11	½
28	eP	00	44	39		
	i			59		
	i(S)		45	04		
	i(S)			07		
	e			16		
28	iP	08	19	50	Large	
28		10	09±			
29	e	06	56	22		
29	i?	07	23	10		
29		09	38			

Date	Phase	h	m	s	A	T
AUG 29	iP	14	04	34	6	½
	i			38	5	½½
	(S)		06	02	5	½
	i			10		
29	i	22	26	12		
		22	58			
29	eP	23	39	55		
	S		40	15		
30	iP	03	51	10	Large	
		In minute mark.				
31	iP	08	22	22		
	iS			44		
31		12	33±			
31	P	16	55	56	Large	
31	i	18	29	17		
SEP 1	P?	09	17	04		
	S			44		
		In minute mark.				
2	P?	04	45	03		
	S			28	10	½
2	eP?	09	02	39		
	iS			52		
	i			58		
3	eiP	14	42	21	11	½½
	i			26	5	½
	e		43	50	3	1
	i(S)			54	6	½
	i		44	03	6	1
	i			13	8	½
3		16	00±			
5		05	50±			
5		20	00±			
7	eP	04	56	25		
	S			33		
7	(L)	06	34±		6	1
8	iP	11	21	38	3	1
	i			47	4	½
	iS			52	8	½½
	i			55	10	<½
9		15	07±			
9	iP	18	20	21		
10	eP	08	06	09	2	½
	i			26	4	½½
	i(S)			42	6	½½
	i			46	3	½½
	e			54		?
		In minute mark.				
10 eP		17	58	58		
	eS		59	36		
10	eP?	19	08	54		
	i(S)			59		
11	eP?	13	44	07		
	i			13		
	e(S)		46	03		
	i			09		
	i			15		
11	eP	23	25	34	2	<½
	iS		28	03	3	½½
	i			11	13	½½
	i			14	8	½½
12	iP	15	05	03	3	<½½
	i			10	8	<½
	iS			15	15±	
12	P?	15	08	00		
	S			10		

Date	Phase	h	m	s	A	T
SEP 12	eP	15	09	46	1	< ½
	(S)		10	00	15	?
12	P?	15	15	37		
	S			48		
13	iP	02	26	21	5	½
	i(S)			40	10	½?
13	eP	03	01	32		
	S?		02	00		
	In minute mark.					
14			10	48		
14	e	11	16	18		
No records 15d to 18d.						
19		02	29ca			
19		03	15ca			
19	iP	05	48	50	10	< ½
	iS		49	01	Large	
	In minute mark.					
	Felt: MM1					
19	iP	14	01	23		
	e(S)		02	42		
19	e(S)	17	06	23		
	e(S)			27		
20		17	24			
22	iP	10	51	21		
	e			27		
	i(S)			31		
22	eP	22	49	17		
	e(S)			32		
22		23	33			
23		14	54			
24	e?	08	32	07±		
	e			15		
24	eP	13	03	24		
	iS			48		
	i			52		
25		21	46			
25	P?	23	01	03±		
	eS			57		
	i		02	18		
26		03	03			
26	eP	12	08	07		
	e(S)			17		
26	iP	15	31	15	2	< ½
	i			19	13	1
	i(S)			31	5?	1
	i(S)			33	Large	
26	eP	20	22	09		
	i			22		
	i(S)			43		
	i			56		
26	eP?	21	41	38		
	eS		42	03		
26	i	23	15	25		
	i			27		
27	(P)	11	33	25		
	i			28		
28	i	00	38	16		
	e			21		
28	P?	07	33	16		
	S			21		
28	eP	14	22	08	5	½
	iP			09	Large	
	i(S)		23	46	Large	
28	e	14	34	44		

Date	Phase	h	m	s	A	T
SEP 28		14	38			
28		14	40			
28	iP	14	46	13		
	iS		47	54		
	i		48	04		
28	P?	15	11	15		
	S		12	58		
28	P?	15	32	01		
	S?			42		
28	e(S)	16	08	44		
28	P?	20	58	01		
	S			30		
28	P?	21	25	37		
	iS			57		
29	iP	07	08	28		
	(S)		10	19		
29	eiP	08	14	57	12	
	(S)		16	15	Large	
29	eP	13	40	16		
	(S)		42	05		
30		13	32	01		
	(S)			12		
OCT 1	iP	04	19	27	12±	< ½
	i(S)			35	Large	< ½
1	P	11	23	58	1	< ½
	i		24	05	2	< ½
	i			34	4	½
	i			40	5	½
	i			47	10±	½
1	P?	13	30	56±		
	e		31	13		
	i			35		
	(S)			47		
	i			55		
	i		32	07		
2	P	03	13	20		
	In minute mark.					
	S			35		
2		21	08ca			
3	P?	13	46	06		
	e(S)			26		
	i			36		
4	P?	01	03	54±		
	e(S)		04	09		
	i(S)			12		
4	iS			41		
4	i	10	52	58		
4	iP	10	56	01	Large	
4	iP	11	05	20	10	< ½
	i			34	8ca	< ½
	iS			56		
4	eiP	16	46	11	3,11	½
	i			22	8?	½
4	iP	22	07	37		
	S			55		
4	iP	23	39	36		
	i(S)			56		
5		07	43			
5	iP	13	43	06		
	i(S)			14		
5	i			03		
5	P	15	56	58		
5	iS		57	09		
7	P	02	23	40	1	½

Date	Phase	h	m	s	A	T
OCT 7	i			44	4	½
	iS			52	10±	½
7	iP	16	51	02		
	i			07		
	iS		52	51		
	i			55		
9		14	59ca			
10	iP	03	48	59		
	i		49	04		
	i(S)		50	36		
	i			40		
11	eP	02	41	48	1	½
	i			54	2	½
	(S)		42	30	5	½
	i			35	10	½
	i			37	10	1
12	P?	00	12	33ca		
	i(S)			43		
	i(S)			44		
12	iP	19	29	00		
	(S)			16		

Date	Phase	h	m	s	A	T
OCT 13	eP	10	59	50	4	<½
	iS			59	Large	
13		16	35ca			
13	P	19	10	57	2	½
	iS		11	09	4	½
	i			12	10±	
13	P	22	44	32		
		In minute mark.				
	S			56		
14	iP	00	23	00	3	<½
	iS			09	10+	<½
14	iP	14	10	57	5	<½
	i		11	16	5?	½
	i(S)			45	Large	½

No further records available this year owing to breakdown of recorder drive.

SCOTT BASE.

Recordings at Scott Base are made on 35mm cine film, and are read by projection in a viewer magnifying eight times. Amptitudes are given in millimetres, as read directly from the screen of the viewer. The recording speed of the drum is 15mm/min.

Date	Phase		h	m	s	A	T
MAR 4	e	z	12	22	40		
4	e	z	18	36	37		
5	i	z	13	18	05		
5	iP	z	19	13	58½	d	
	i	z		14	08½		
8	iP	z	16	43	54		
9	iPKP	z	14	42	01	d	
	i	z		42	10		
	e	z		43	23½		
	i	z		45	11½		
	i	z		45	47½		
	eL	z	15	31	45		
9	e	z	15	29	21		
9	ePKP	z	16	01	04½		
11	iPKP	z	15	54	08	d	
12	iPKP	z	12	04	08½	u	
	e	z		16	54		
12	ePKP	z	13	05	27		
12	eSKP	z		08	47½		
12	P	z	16	42	35½	u	
	e	z		43	18		
	e	z			34		
12	eP	z	17	30	42		
12	P	z	19	21	06½		
13	P	z	09	18	36		
13	ePKP	z	16	01	19		
14	ePKP	z	15	06	56		
	e	z	02	53	23		

Date	Phase		h	m	s	A	T
MAR 15	e	z	03	14	45		
16	ePKP	z	02	53	23		
17	eSKP	z		56	50½		
17	e	z	14	51	13½		
171	ePKP	z	23	03	59½		
	eSKP	z		07	21½		
18	ePKP	z	02	44	39		
	eSKP	z		47	51½		
18	iP	z	19	39	36	u	
	PcP	z	21	25	44	u	
19	iPKP	z	03	58	47½	d	
	iSKP	z	04	02	05½	u	
19	ePKP	z	08	31	48		
19	ePKP	z	11	47	48		
	eSKP	z		51	20		
19	e	z	12	10	03		
19	ePKP	z	13	10	03		
	eSKP	z		13	23		
	e	z		22	43		
19	ePKP	z	17	23	38		
19	ePKP	z	20	33	56		
	eSKP	z		47	16		
19	e	z	22	33	39		
	e	z	23	21	45		
20	ePKP	z	00	41	34		
	eSKP	z		44	55		
20	iP	z	03	01	41		
20	ePKP	z	03	44	10		

Date	Phase		h	m	s	A	T
MAR 20	ePKP	z	11	21	06		
	eSKP	z		24	15		
20	iP	z	13	03	38	u	
20	iP	z	16	08	10	u	
20	iP	z	17	19	47	d	
20	iP	z	18	44	29		
21	eP?	z	02	52	27		
	eP	z	09	50	54		
22	e	z	14	20	19		
	e	z		23	19		
22	e	z	14	38	31		
22	ePKP	z	14	40	22		
	eSKP	z		43	47		
22	ePKP	z	14	52	29		
	eSKP	z		55	47		
23	iP	z	05	01	29		
23	iP	z	05	24	09	d	
	ipP	z		24	50½	d	
	ipPP	z		27	02	u	
	e	z		28	31		
	e	z		28	48½		
	eS	z		33	46		
	e	z		34	33		
24	e1P	z	06	41	22		
	iP	z			23	d	
	e	z		42	48		
	eL	z		46	.0		
24	ePKP	z	11	25	30		
24	ePKP	z	11	56	02		
	eSKP	z		59	20		
	e	z			29		
24	eP	z	15	41	06		
24	eP	z	19	16	02		
24	e	z	20	30	08		
	i	z			44		
24	iP	z	23	50	44		
25	ePKP	z	01	23	09		
	iSKP	z	01	26	26		
27	eP	z	02	32	33		
27	iP	z	07	41	24	u	
	ePcP	z		42	20		
	e	z		52			
27	eP	z	13	11	56		
28	eP	z	07	26	35		
28	eP	z	09	04	23		
29	e	z	05	19	04		
29	ePKP	Z	05	29	44		
	eSKP	z		33	05		
29	eP	z	05	50	48		
	eL	z	06	11	.5		
29	iP	z	18	40	09	n	
30	iPKP	z	09	36	12	d	
	e1SKP	z			30½	u	
30	e	z	09	55	00		
	e	z	00	45	22	d	
31	iP	z	02	34	15		
31	e	z	20	02	44		
APR 1	eP?	z	08	06	51	u	
2	eP	z	02	52	00		
	i	z			07		
2	ePKP	z	08	50	45		
2	iP	z	17	42	42		
2	eP	z	20	00	08		
4	ePKP	z	00	32	12		
	eSKP	z		35	42		

Date	Phase		h	m	s	A	T
APR 4	eP	z	11	10	57		
4	e	z	11	40	01		
4	e	z	11	57	05		
	e(SKP)	z			25		
	e	z	12	21			
5	ePKP	z	03	08	52		
	eSKP	z		12	12		
5	i	z	04	02	58		
5	iP	z	07	39	30	u	
	i	z			40	u	
	i	z		40	02	u	
	e	z		41	09		
	e	z			50		
	e	z		45	14		
	S	ZN		46	52		
5	eP	z	11	54	47		
7	iP	z	06	41	20½		
	iS	z			45		
7	e	z	09	07	27		
7	iP	z	10	26	12	u	
7	i	z			29		
7	e	z	16	30	48		
7	e	z	17	33	55		
	i	z		34	46		
9	ePKP	z	00	42	21		
	e	z			57		
	eSKP	z		24	48		
9	e	z	16	08	46		
10	ePKP	z	03	44	33		
	iSKP	z		47	55	u	
10	ePKP	z	09	28	26		
10	ePKP	z	11	49	22		
	eSKP	z		52	52		
	eL	Z	12	33	.5		
10	ePKP	z	13	39	25		
	eSKP	z		42	43		
10	eP	z	13	54	18		
10	e	z	14	38	22		
13	e	z	02	35	10		
13	eP	z	06	42	58		
13	eP	ez	10	23	34		
14	iP	zZN	19	28	35	us	
	e(PP)	z		31	15	u	
	e	z		31	15	u	
	e	z		33	30		
	eS	z		37	12		
	eL	ZN		47	.0		
16	iP	zZ	04	15	15	d	
	ipP	Z		17	19		
	e	Z		18	00		
	iS	Ze		24	31		
	e	N		25	24		
	e	n			31		
16	e	z	04	33	03		
	e	z		40	50		
	e	z		43	18		
16	e	z	08	51	34		
16	eP	Z	10	29	12		
16	iP	z	15	20	35	d	
16	eP	z	18	29	08		
16	iP	z	19	56	47	u	
17	eL	Z	05	22			
17	eP	z	08	17	40		
17	ePKP	z	13	43	33		
	e	z		16	15		

Date		Phase		h	m	s	A	T
APR	18	e	z	05	31			
	18	ePKP	z	07	19	16		
		eSKP	z		22	32		
		e	z		22	58		
	19	e	z	06	18	37		
	19	e	z	08	39	27		
	19	eP	z	08	51	01		
	19	ePKP	z	16	04	03		
		eSKP	z		07	23		
	20	eP	z	00	20	10		
	20	e	z	06	33	27		
	20	eP	z	06	54	33		
		eL	N	07	02.5			
	20	eP	z	12	42	08		
	20	e	z	18	44	03		
		iP	z	21	49	10	u	
	21	eP	z	21	26	30		
		e			30	28		
		eL	Z	22	05			
	21	ePKP	z	23	37	06		
		eSKP	z		40	23		
		e	z			52		
	22	e	z	01	54	24		
	23	eP	z	22	10	36		
	24	e	z	10	54	52		
	24	eP	z	18	43	48		
	24	ePKP	z	19	29	26		
		eSKP	z		32	04		
		eL	Z	20	23			
	25	e?	z	02	44	46		
		e	z			54		
		iPKP	z			58	d	
		i	z		45	58	d	
		e(SKP)	z		48	12		
		e?	z		56	52		
		eL	z	03	37			
	25	ePKP	z	07	34	29		
		eSKP	z		37	45		
	25	eP	z	10	28	06		
		i	z		31	09	d	
	25	iP	z	11	18	29	u	
	25	e	z	13	30	22		
	25	ePKP	z	14	27	01		
	25	e	z	14	44	14		
	26	ePKP	z	02	30	33		
	26	e	z	04	26	06		
	26	ePKP	z	06	53	04		
	26	ePKP	z	15	27	17		
	26	e	z	22	42	17		
	27	iP	z	11	40	16	u	
		i	z			32	d	
	27	e	z	12	24	54		
		e	z	22	07	26		
	28	eP	z	01	36	32		
	28	eP	z	10	48	03		
	28	iP	z	14	47	16		
	29	e	z	10	23	15		
	29	eP	z	21	07	41		
	30	e	z	1	10	17		
	30	e	z	16	05	32		
		eP	z	18	35	35		
MAY	2	eP	z	02	01	44		
	2	e	ze	03	10	36		
	2	$ePKP_1$	z	04	15	34		
		$ePKP_2$	z		16	36		

Date		Phase		h	m	s	A	T
MAY	2	eP	z	10	40	50		
		e	N		49	30		
		e(ScS)	N		51	16		
		e			53	20		
	2	ePKP	z	11	48	26		
		eSKP	z		51	46		
	2	ePKP	z	11	58	07		
		eSKP	z	12	01	34		
	2	iP	ze	21	47	09	d	
		i	z			16	u	
		eS	e		56	00		
	2	e	z	22	14	27		
		e	z		17	06		
	3	ePKP	z	07	29	10		
		eP	z	12	26	22		
	3	eP	z	15	58	02		
	4	e?	z	10	17	00		
		eP	z			33		
	4	e	z	22	16	17		
	4	e	z	22	16	17		
	5	iP	z	10	21	43		
	5	eP	z	13	59	45		
	6	eP	z	02	50	40		
	6	iP	z	11	44	22	u	
	6	eP	z	21	54	41		
	7	ePKP	z	05	55	41		
	7	e	z	12	01	50		
	8	e	z	10	12	00		
	8	iP	z	20	19	42	u	
	10	iP	z	00	33	49	u	
	10	iP	z	04	20	01	u	
	10	iP	z	10	35	30	u	
	10	eP	z	16	32	25		
	11	eP	z	18	10	45		
	11	eP	z	22	21	34		
	12	eP	z	01	27	08		
	12	e	z	04	55	38	d	
		ePP	z		57	18		
	12	eP	z	11	40	25		
		e	z			50		
		e	z		42	20		
	12	iP	z	13	02	40		
	12	e	z	22	07	18		
	12	iP	z	22	40	06		
	14	e	z	06	43	31		
	14	e	z	10	10	04		
	16	e	z	03	44	06		
	16	i	z	11	52	29	u	
	17	iP	z	05	42	59		
	18	ePKP	z		43	12		
		eSKP	z		46	20		
	19	eP	z	05	31	52		
	19	eP	z	07	30	15		
	19	iP	z	10	50	51		
	19	eP	z	21	03	51		
	21	e	z	01	24	20		
		e	z		25	03		
		e	z			39		
		i	z		29	47	u	
		e	z		31	51		
		e	N	15	04	54		
		e	z		10	41		
	22	eP	z	10	35	43		
		ePKP	z	13	48	50		
		eSKP	z		53	14		

SBA

Date	Phase		h	m	s	A	T
MAY 22	e	z	14	01	06		
22	e	z	15	39	25		
23	eP	z	09	29	35		
23	e	z	16	00	12		
24	eP	z	02	51	26		
	ePP	z		55	48		
24	ePKP	z	03	55	49		
	eSKP	z		59	07		
24	eP	z	10	20	57		
24	e	z	10	47	40		
24	eP	z	12	59	48		
25	eP	z	14	35	11		
25	eP	z	18	59	13		
	ePP	z	19	01	26		
26	ePKP	z	06	52	58		
	e	z		55	53		
	eL	Z	07	41			
26	e	z	09	44	26		
26	ePKP	z	09	56	04		
26	iP	z	11	05	22		
	i	z			26		
28	eP	z	00	29	37		
28	iP	z	06	01	49d		
28	iP	ze	23	29	33		
29	e(P)	z	07	38	07		
29	eP	z	07	50	45		
29	eP	z	08	02	15		
29	e	z	09	40	57		
30	eP	Z	00	28	51		
30	iP	z	09	11	24u		
30	e	z	14	44	23		
30	iP	z	19	50	54d		
30	iP	z	21	07	10u		
	i	z			21		
	epP	z		09	05		
30	eP	z	23	07	14		
31	eP	z	02	26	50		
	ipP	z		28	47		
31	e	z	02	54	20		
31	e	z	04	23	56		
31	ePKP	z	22	36	18		
31	e	z	20	14	21		
JUN 2	eP			44	59		
2	iP	z	10	01	55u		
2	e	z	13	17	13		
2	e	z	20	31	27		
3	eP	zne	08	41	13		
4	e	z	08	20	37		
4	e	z	08	26	46		
4	iP	z	11	25	47u		
4	eP	z	13	23	25		
4	iP	z	17	14	29d		
	iPcP	z		15	06u		
	ipP	z		16	23u		
	eS	z		22	01		
4	iP	z	20	08	57d		
4	eP	z	20	30	24		
4	iP	z	22	44	46		
5	iP	z	02	36	25u?		
5	eP	z	02	51	34½		
	e	z		53	20		
5	e	z	06	26	33		
5	ePKP	z	07	36	09		
	i	z	18u		18u		

Date	Phase		h	m	s	A	T
JUN 5	e	z	10	35	58		
5	ePKP	z	14	16	50		
5	iP	z	22	24	01½u		
	e	z			23		
5	eP	z	22	33	21		
6	e	z	01	39	09		
6	eP	z	02	58	11		
6	ePKP	z	03	49	32		
	eSKP	z		52	49		
6	ePKP	z	05	57	39		
	eSKP	z	06	00	58		
6	iP	z	20	02	24u		
7	e	z	12	56	44		
7	iP	z	21	02	05u		
8	eP	z	06	19	35		
8	eP	z	17	22	28		
8	eP	z	22	24	14		
8	eP	z	22	36	13		
9	eP	z	11	53	18		
10	iP	z	06	14	13d		
10	e	z	08	39	38		
11	eP	Z	14	58	22		
	i(S)	N	15	05	22u		
	e	E		08	20		
	eL	Z		12	.2		
12	ePKP	e	00	13	06		
	eSKP	e		16	26		
12	eP	z	06	14	30		
	iPKP	z	08	47	23		
12	eP	z	10	15	08		
13	ePKP	z	10	59	48		
	eSKP	z	11	03	08		
	e	z	11	03	08		
	e	z		12	35		
	L	Z		46			
13	iP	z	20	33	45		
14	eP	z	05	53	34		
14	ePKP	z	06	43	29		
	eSKP	z		46	47		
15	eP	z	00	54	35		
	ePKP	z	18	37	32		
	eSKP	z		40	50		
16	e	z	02	08	19		
17	iP	z	06	27	19u		
18	eP	z	18	05	21		
	L	E		19			
19	eP	z	01	39	22		
19	eP	z	03	04	21		
	eP	z	08	11	48		
	i	z			52d		
	L	Z	08	31			
20	e	z	13	49	30		
21	e	z	02	26	59		
22	ePKP	z	06	37	08		
	e	z		39	12		
23	iP	z	00	02	23u		
	e	z		04	33		
	ePP	z		05	18		
	eS	NE		12	16		
	e	E		13	57		
23	eP	z	03	42	07		
	ePKP	z		46	30		
23	eP	z	03	48	56		
24	eP	z	02	28	01		

Date	Phase		h	m	s		A	T
JUN 24	eP	z	11	08	18			
	eP	z	11	32	46			
25	eP	z	01	10	58			
	eP	z	16	16	13			
26	eP	z	02	59	57			
26	eP	z	13	07	15			
27	ePKP	Z	00	28	52			
	ePP	Z		31	41			
	eSKP	e		32	31			
	ePPP	Z		34	29			
	e	z		41	20			
27	eP	z	04	15	42			
27	iP	z	12	59	36	u		
	ipP	z			48	d		
	e	z	13	03	55			
28	eP	z	00	43	49			
28	e	z	18	00	45			
	eP	z	19	02	29			
	e	z	22	30	03			
29	ePKP	z	08	07	28			
	iSKP	z		10	48	d		
29	e	z	15	41	59			
29	e	z	22	15	01			
29	e	z	22	47	28			
29	ePKP	z	22	53	17			
JUL 1	eP	z	02	32	03			
	e	z		33	14			
1	iP	z	06	36	23			
1	e	z	13	18	10			
	Very weak.							
1	e	z	13	31	14			
1	eP	z	19	44	52			
	ePKP	z		48	59			
	Could be PP							
	e	z	20	00	01			
2	ePKP	z	00	04	55			
2	iPKP	z	01	01	32	u	2½	1.6
	iPP	z		03	46	d	+1¼	2
	eL	Z		53.0				
2	eP	z	07	55	06			
2	eX	z	14	56	54			
2	eP	z	15	08	11			
2	eP	z	22	03	52			
3	iP	z	06	11	19	d	+1½	0.8
	iPcP	z		12	14	d	+1	0.5
	epP	z		13	05			
	iScP	z		15	21	d	+½	0.6
3	ePKP	z	12	43	45			
3	e	z	12	56	25			
	Very weak arrival							
4	iP	z	08	41	07			
4	eP	z	09	54	17			
4	eP	z	14	23	09			
	Very weak and emergent.							
4	e	z	16	05	20			
	Very weak.							
4	eP	z	23	12	00			
5	eP	z	06	35	27			
	e	z		36	19			
5	iP	z	12	42	32	u	1	1
5	e	z	16	59	30			
5	e	z	20	19	53			
6	iP	z	00	31	53			
	Weak.							

Date	Phase		h	m	s		A	T
JUL 7	e	z	09	58	11			
	Local.							
7	eP	z	15	46	49			
7	iP	z	16	22	38	u	2	1
	eS	E		31	58			
	e	N		32	21		1	5
	eScS	N		42	43		1¼	5
	e	z		33	30			
	eL	Z		46.0				
	Surface waves not well developed.							
9	eP	z	10	10	07			
	e	N		19.0				
	eL	Z		38.0				
11	e	z	18	50	54			
11	e	ze	00	02	02			
11	iP	e	04	16	29			
	Local.							
11	e	z	21	08	09			
11	e	z	22	16	49			
	Very emergent.							
13	iP	z	01	50	38			
13	eP	z	09	42	39			
	i	z			40			
13	eP	z	14	09	13			
13	eP	z	14	34	53			
13	eP	z	16	11	22			
14	ePKP	z	02	45	50			
14	iP	z	06	32	49	u	11	0.8
	iP	N		32	49	s	4	2
	ipP	z		33	32	d	6	2
	e	z		34	01		4	1½
	e	Z		35	26			
	iScP	z		37	36	u	2	2½
	iS	N		39	59	u	7	6½
	e	z		40	05		½	3
	iScS	N		42	20	s	4	6½
14	eP	z	07	02	52			
14	iP	z	08	19	38	u	4	1
	iP	N		19	39	s	3	5
	e	z		23	35			
	iS	N		26	44	s	9	6
	e	N		27	48			
	e	N		30	04			
	e	N		30	54			
	eL	Z		34.0			1½	30
14	iP	z	09	52	26		+1	1
15	eP	z	12	48	02			
16	eP	z	04	30	19			
	Weak.							
16	eP	z	17	09	19			
	Weak.							
17	e	z	03	22	35			
17	eP	z	05	24	39			
17	iP	z	11	21	00	u	9	1
	iP	N			00	s	4	5
	iP	e			00	s	1	0.8
	i	z		21	54	d	1½	1
	e	N		27	37			
	iS	N		29	46	s	4	4
	eScS	E		30	35			
	e	E		32	14			
	eL	Z	46.0					
	Not well developed.							

Date	Phase		h	m	s		A	T
JUL 17	e	z	11	49	34			
17	eP	z	12	38	06			
17	e	z	12	50	40			
18	e	z	00	41	52			
18	e	z	09	07	10			
	Weak.							
18	e	z	10	09	01			
	Weak.							
18	iP	z	13	32	48	u	1	1
18	iP	z	19	07	46			
18	iP	z	19	47	31			
	eS	N		50	25			
18	e	z	20	01	15			
18	e	z	21	52	14			
19	ePKP	z	13	20	29			
19	e	z	14	46	18			
19	eP	z	20	37	53			
	Weak.							
19	eP	z	21	48	33			
20	eP	z	10	07	36			
	iP	z			37	u	¾	1
	eS	N		17	33		¾	5½
20	iP	z	11	22	45			
20	e	z	13	07	47			
20	eP	z	15	48	53			
	i(PcP)	z		49	09			
20	e	z	19	03	40			
	Very weak.							
20	e	z	21	00	48			
20	e	z	21	20	26			
21	eP	z	00	34	29			
21	e	z	06	02	54			
	Very emergent.							
	e	z		03	06			
	e	z		03	24			
	eL	Z		07.4				
21	e	z	06	15	20			
21	eP	z	06	47	07			
21	iP	z	07	11	47			
21	eP	z	13	26	10			
21	iP	z	19	46	08	d	¾	1
	eS	N		32	02			
	eP	z	06	30	17			
	ipP	z		30	25	d	1½	¾
	iPcP	z		31	53	u	1	½
22	eP	z	10	45	35			
23	ePKP	z	01	04	19			
	eSKP	z		07	40			
	eL	Z		53.1				
	Not well developed.							
23	eP	z	06	30	34			
	e	z		31	38			
23	e	z	13	38	52			
23	e	z	22	37	33			
24	eP	z	02	08	28			
24	eP	z	02	36	42			
24	eP	z	06	13	38			
24	e	z	06	22	42			
24	iP	z	10	07	06	u	¾	1
24	iP	z	10	58	48	d	½	¾
24	eP	z	11	12	38			
	i	z			47	u	1½	0.8
	eS	N		20	54		1	4
	eS	e			56			
	e	N		21	48		1	5

Date	Phase		h	m	s		A	T
JUL 24	eL	Z			32.0			
24	e	z	14	52	38			
25	eP	N	01	06	25			
	Local.							
25	iP	z	11	16	06	u	¾	½
25	e	z	22	50	25			
26	eP	z	06	57	45			
27	e	z	06	48	50			
27	eP	z	14	19	07			
27	iP	z	14	55	25			
27	iP	z	18	54	27	d	¾	1
28	e	z	01	41	17			
28	e	z	02	58	29			
28	e	z	05	44	47			
28	eP	z	08	54	39			
	Very emergent.							
	iPP	Z		59	05	d	3	5
	iPP	z		59	07	u	2	2.6
	i	z		59	20	d	2½	4½
	e	Z	09	00	00			
	eSKS	N		05	14			
	e	z		09	49			
	Different shock?							
	eL	Z		14.5			12½	25
28	e	z	13	22	22			
29	e	z	00	43	24			
29	e	z	09	21	56			
29	e	z	10	05	42			
29	e	z	15	59	07			
29	iP	z	17	26	53	u	1	1
	First movement in the timemark.							
	eS	n		36	27			
	eS	e		36	27			
	eL	Z		50.8				
	eP'P'	z		54	18			
30	e	z	02	23	13			
30	e	z	02	38	08			
30	e	z	05	57	13			
30	e	z	07	50	20			
	e	z		51	09			
30	e	z	08	11	39			
30	e	z	17	05	51			
30	e	z	20	56	50			
31	eP	z	07	44	30			
31	e	z	10	54	00			
	Near or local.							
31	iP	z	20	18	07	u	1½	½
AUG 1	eP	z	02	32	03			
	e	z		33	14			
1	iP	z	06	36	23			
1	e	z	13	18	10			
	Very weak.							
1	e	z	13	31	14			
	Weak.							
1	eP	z	19	44	52			
	ePKP	z		48	59			
	Could be PP.							
	e	z	20	00	01			
2	ePKP	z	00	04	55			
2	iPKP	z	01	01	32	u	2½	1.6
	iPP	z		03	46	d	1¼	2
	eL	Z		53.0				
2	eP	z	07	55	06			
2	e	z	14	56	54			

Date		Phase		h	m	s		A	T
AUG	2	eP	z	15	08	11			
	2	eP	z	22	03	52			
	3	iP	z	06	11	19	d	1½	0.8
		iPcP	z		12	14	d	1	0.5
		epP	z		13	05			
		iScP	z		15	21	u	½	0.6
	3	ePKP	z	12	43	45			
	3	e	z	12	56	25			
		Very weak.							
	4	iP	z	08	41	07			
	4	eP	z	09	54	17			
	4	eP	z	14	23	09			
		Very weak and emergent.							
	4	e	z	16	05	20			
		Very weak.							
	4	eP	z	23	12	00			
	5	eP	z	06	35	27			
		e	z		36	19			
	5	iP	z	12	42	32	u	1	1
		ePcP	z		44	00			
		eS	N		49	33			
	5	e	z	16	59	30			
	5	e	z	20	19	53			
	6	iP	z	00	31	53			
		Weak.							
	7	e	z	09	58	11			
		Local.							
	7	eP	z	15	46	49			
	7	iP	z	16	22	38	u	2	1
		eS	E		31	58			
		e	N		32	21		1	5
		eScS	N		32	43		1¼	5
		eX	z		33	30			
		eL	Z		46.0				
		L-waves not well developed.							
	9	eP	z	10	10	07			
		e	N		19.0				
		eL	Z		38.0				
	11	e	z	18	50	54			
	11	e	z	00	02	02			
	11	iP	e	04	16	29			
		Local.							
	11	e	z	21	08	09			
	11	e	z	22	10	35			
		Very emergent.							
	11	e	z	22	16	49			
		Very emergent.							
	13	eP	z	09	42	39			
		i	z			40			
	13	eP	z	14	09	13			
	13	eP	z	14	34	53			
	13	eP	z	16	11	22			
	14	ePKP	z	02	45	50			
	14	iP	z	06	32	49	u	11	0.8
		iP	N		32	49		4	2
		ipP	z		33	32	d	6	2
		e	z		34	01		4	1½
		e	Z		35	26			
		iScP	z		37	36	u	2	2½
		iS	N		39	59	n	7	6½
		e	z		40	05		½	3
		iScS	N		42	20	s	4	6½
		eL	Z		53.0			1½	15

Date		Phase		h	m	s		A	T
AUG	14	eP	z	07	02	52			
	14	iP	z	08	19	38	u	4	1
		e	z		23	35			
		iS	N		26	44	s		
		e	N		27	48			
		e	N		30	04			
		e	N		30	54			
		eL	Z		34.0			1½	30
	14	iP	z	09	52	26	u	1	1
	15	eP	z	12	48	02		1	
	16	eP	z	04	30	19			
		eP	z	17	09	19			
	17	e	z	03	22	35			
		eP	z	05	24	39			
		iP	z	11	21	00	u	9	1
		iP	N			00	s	4	5
		iP	e			00	e	1	0.8
		i	z		21	54	d	1½	1
		e	N		27	37			
		iS	N		29	46	s	4	4
		eScS	E		30	35			
		e	E		32	14			
		eL	Z		46.0				
		Not well developed.							
		e	z	11	49	34			
		eP	z	12	38	06			
		e	z	12	50	40			
	18	e	z	00	41	52			
	18	e	z	09	07	10			
	18	e	z	10	09	01			
	18	e	z	11	22	40			
	18	iP	z	13	32	48	u	1	1
	18	iP	z	19	07	46			
	18	iP	z	19	47	31			
		eS	N		50	25			
	18	e	z	20	01	15			
	18	e	z	21	52	14			
	19	ePKP	z	13	20	29			
	19	e	z	14	46	18			
	19	eP	z	20	37	53			
	19	eP	z	21	48	33			
	20	eP	z	10	07	36			
		iP	z			37	u	¾	1
		eS	N		17	33		¾	5½
	20	iP	z	11	22	45			
	20	e	z	13	07	47			
	20	eP	z	15	48	53			
		iPcP?	z		49	09	u		
	20	e	z	19	03	40			
		Very weak.							
	20	e	z	21	00	48			
	20	e	z	21	20	26			
	21	eP	z	00	34	29			
	21	eP	z	00	34	29			
	21	eP	z	06	02	54			
		Very emergent.							
		e	z		03	06			
		e	z		03	24			
		eL	Z		07.4				
	21	e	z	06	15	20			
	21	eP	z	06	47	07			
	21	iP	z	07	11	47	d		
	21	eP	z	13	26	10			
	21	iP	z	19	46	08	d	¾	1
	22	iP	z	06	25	20	u	1	1

Date	Phase		h	m	s		A	T
AUG 22	1pP	z		25	28	d	4	¾
	1PcP	z		26	58	u	3½	¾
	eS	N		32	02			
22	eP	z	06	30	17			
	1pP	z		30	25	d	1½	¾
	1pP	z		31	53	u	1	½
22	eP	z	10	45	35			
23	ePKP	z	01	04	19			
	eSKP	z		07	40			
	eL	Z		53.1				
	Not well developed.							
23	eP	z	06	30	34			
	e	z		31	38			
23	e	z	13	38	52			
23	e	z	22	37	33			
24	eP	z	02	08	28			
24	eP	z	02	36	42			
24	eP	z	06	13	38			
24	e	z	06	22	42			
24	1P	z	10	07	06	u	¾	1
24	1P	z	10	58	48	d	½	¾
24	eP	z	11	12	38			
	i	z			47	u	1½	0.8
	eS	N		20	54		1	4
	eS	e			56			
	e	N		21	48		1	5
	eL	Z		32.0				
24	e	z	14	52	38			
25	eP	N	01	06	25			
	Local.							
25	1P	z	11	16	06	u	¾	½
25	e	z	22	50	25			
26	eP	z	06	48	50			
27	eP	z	14	19	07			
27	1P	z	14	55	25			
27	1P	z	18	54	27	d	¾	1
28	e	z	01	41	17			
28	e	z	02	58	29			
28	e	z	05	44	47			
28	eP	z	08	54	39			
	Very emergent.							
	1PP	Z		59	05	d	3	5
	1PP	z		59	07	u	2	2.6
	i	z		59	20	d	2½	4½
	e	Z	09	00	00			
	eSKS	N		05	14			
	e	z		09	49			
	Separate shock?							
	eL	Z		14.5			12½	25
28	e	z	13	22	22			
29	e	z	00	43	24			
29	e	z	09	21	56			
29	e	z	10	05	42			
29	e	z	15	59	07			
29	1P	z	17	26	53	u	1	1
	First movement in time mark.							
	eS	n		36	27			
	eS	e		36	27			
	eL	Z		50.8				
	eP'P'	z		54	18			
30	e	z	02	23	13			
30	e	z	02	38	08			
30	e	z	05	57	13			

Date	Phase		h	m	s		A	T
AUG 30	e	z	07	50	20			
	e	z		51	09			
30	e	z	08	11	39			
30	e	z	17	05	51			
30	e	z	20	56	50			
31	eP	z	07	44	30			
31	e	z	10	54	00			
	Near or local.							
31	1P	z	20	18	07	u	1½	½
SEP 1	e	z	11	07	25			
2	eP	z	00	13	27			
2	eP	z	05	48	08			
	eP	e			10			
	eP	N			18			
2	eP	z	09	57	05			
	eP	N			09			
	eS	N	10	05	44			
2	ePKP	z	14	39	23			
	eSKP	z		42	44			
2	eP	z	20	29	50			
2	e	z	21	46	13			
3	eP	z	06	17	32			
	eP	e			36			
3	1P	z	14	49	17	u		
	eP	e			17			
3	eP	e	21	57	45			
	eP	z			48			
	eP	n			52			
4	eP	z	01	42	12			
4	eP	z	04	42	22			
4	e	z	11	38	27			
	Weak.							
4	eP	z	12	38	28			
4	eP	z	22	47	56			
	Weak.							
5	eP	z	01	34	29			
	Weak.							
5	eP	z	03	20	55			
5	e	z	07	13	18			
5	e	ze	07	27	25			
5	1P	z	07	29	15	u		
5	eP	z	07	34	10			
5	eX	ze	07	46	30			
5	ePKP	z	11	55	06			
	Weak.							
5	eP	z	14	02	23			
5	eP	z	19	10	27			
6	eP	z	00	29	42			
	ePKP	z	05	13	44			
7	ePKP	z	07	07	40			
7	ePKP	10		25	54			
	e	z		26	06			
	eSKP	z		29	14			
7	e	z	11	03	34			
8	e	z	03	26	31			
8	eP	z	08	53	17			
8	e	z	09	40	16			
8	eP	z	13	30	25			
9	1P	z	00	20	58	u	1	1
	eP	e			58			
	eP	N		21	03			
	eS	e		27	05			
	Very emergent.							
	eL	Z		29.0				

Date	Phase		h	m	s		A	T
SEP 9	1P	z	05	03	42	u		
9	1P	z	09	11	06	u	¾	1¼
	eP	e			07			
9	eP	ze	12	21	38			
10	eP	ze	07	03	39			
			Near?					
10	eX	z	17	40	46			
			Weak.					
11	eP	z	13	25	00			
11	1P	z	13	51	03	u	1¼	¾
	1P	e			03	w	1	¾
	epP	z		52	52			
11	1P	z	23	32	40	u	1	1
	1P	e			40	w	1	1
	1P	N			40	s		
	1pP	z			50	u		
13	eP	e	09	12	13			
13	eP	e	12	55	08			
13	eP	z	16	33	20			
	1pP	z		34	30	u		
14	eP	zne	12	41	09			
	e	N			37			
	eL	Z		45.7				
15	1P	z	04	34	01	u		
	1P	e			01	e		
	1S	E		43	32	e		
	eScS	E			51			
15	eP	ze	18	53	41			
	eS	e	19	02	12			
17	eP	e	13	46	11			
17	eP	e	14	34	18			
17	e	e	20	36	48			
			Near.					
19	1P	z	01	04	55	u		
20	eP	z	10	09	36			
			Weak.					
20	1P	z	11	36	57			
20	eP	ze	16	14	22			
20	e	z	17	06	40			
20	eP	z	18	56	23			
23	1P		18	54	40	u		
	1P	z	18	54	40	u		
24	eP	z	01	55	05			
24	1P	Z	08	33	48	u	2	3
	eP	ne			52			
	1pP	z		34	02	d	3	1¼
	1	Z			13	d	2¼	2½
	1PP	z		37	04	u	2½	1½
	1	N			26	n	4	2
	1	N		43	57	s	1½	3
	1	Z		44	20	u	1	5½
	1S	N		44	31	n	5	5½
	ePKKP	z		51	29			
	eP'P'	z	09	00	01			
	eL	Z		08.5				
24	e	z	09	20	13			
			Weak.					
	e	z			32			
24	eP	z	09	23	15			
24	e	z	17	28	01			
			Near					
25	eP	z	16	49	25			
	eS	N		59	51			

Date	Phase		h	m	s		A	T
SEP 26	eP	z	10	20	35			
26	1P	z	12	10	11	d	4	1
	1Pn	N			11			
	eP	e			12			
26	1P	z	18	59	27			
	eP	n			30			
	eS	N	19	10	27			
27	eX	Zne	02	52	42			
			Near?					
27	eP	z	04	20	32			
	eP	ne			37			
	eS	N		30	39			
27	eP	z	04	30	55			
	eP	ne			58			
27	ePKP	z	05	18	18			
27	eP	z	06	09	00			
27	ePn	e			02			
27	eP	z	11	40	29			
27	eP	zne	14	50	10			
			Near?					
27	1P	ze	22	48	31			
	eP	n			31			
28	ePKP	ze	00	45	09			
28	eP	z	04	23	14			
28	1P	z	14	29	02	d	13	½
	1P	e			02	e	14	½
	1P	n			02	n	4	½
	1pP	Z		20	54	u	4	7
	1pP	N			54	s	7	7
	1pP	z			58	d	3	1
	1	z		31	02	d	7	1
	1	N		32	23	s	4½	2
	1PPP	z			48	d	3	3
	eS	z		36	20			
	1S	E			21	e	7	10
	1S	N			22	n	26	4½
	1S	e			22	e		
	1ScS	E		37	52	e	5	9
	1ScS	N			53	s	15	8
	1ScS	e			55	w		
	1sS	N		39	47	n	12	11
	1sS	E			47	w	4	
	1SS	N		40	35	s	6	5
	eP'P'	z		58	24			
	e	z			45			
28	1P	z	14	40	56	u		
	eP	ne			56			
28	1P	z	14	53	06	u		
28	eP	zne	23	35	22			
	1P	z			24	u		
29	eP	z	02	12	38			
	1P	z			39	u		
	eP	Nne			39			
	e	n		13	29			
	eL	E		16.7				
29	e	z	06	48	45			
			Near?					
29	1P	z	06	49	32	u		
29	1P	z	07	15	15	u		
29	1P	z	08	21	50	u	6	1
	eP	n			50			
	1P	N			51	s		1½
	1P	Z			51	u		1½
	1S	e		28	41	e	5	2½

Date	Phase		h	m	s	A	T
SEP 29	eS	n			41	2	2½
	1S	E			42 e	1½	4
	1S	N			44 s	8	3
	eScS	e		30	42		
29	e	z	10	23	28		
			Near?				
30	eP	z	03	11	39		
30	eP	z	12	18	50		
30	eP	z	13	55	44		
OCT 1	1P	z	07	23	50		
1	e	zne	09	35	48		
			Near.				
1	eX	zne	22	23	57		
			Near.				
2	eP	z	11	37	48		
			Very emergent.				
2	ePKP	z	12	46	54		
			Very weak and				
			emergent.				
2	eP	z	20	51	32		
	eP	Nne			36		
	eS	N		58	31		
	eL	E	21	09.5			
2	eP	z	21	11	21		
3	eP	zne	06	09	59		
3	eP	z	13	54	03		
3	eP	z	14	09	08		
4	1P	z	01	10	10		
	ePcP	z		11	05		
4	ePKP	z	05	44	48		
			Very emergent.				
	eL	Z	06	16.0			
4	eP	z	07	05	48		
			Coda of 8 minutes.				
4	eP	z	08	25	41		
4	e	zne	09	48	45		
			Near?				
4	eP	z	20	57	45		
4	eP	z	20	57	45		
4	e	zne	23	09	50		
			Near?				
5	ePKP	z	00	14	54		
	eSKP	z		18	02		
5	ePKP	z	11	56	15		
			Weak.				
5	e	zne	14	32	10		
			Near?				
5	eP	z	16	17	15		
			Very emergent.				
5	1P	z	21	17	08 u		
	1P	e			08 w		
	eP	n			09		
6	eP	zne	12	58	13		
			Near.				
7	eP	ze	04	03	49		
7	e	z	13	28	35		
7	1P	z	16	57	49 u		
	eP	Nne			49		
8	Recording interrupted						
	by blizzard.						
10	1P	z	03	55	40 u	2	1
	eP	ne			40		
10	1P	z	18	53	32 u		
	1P	e			32 w		

Date	Phase		h	m	s	A	T
OCT 10	eP	n			32		
	1PcP	z		54	26 u		
	1PcP	e			26 w		
11	eP	z	20	38	52		
			Very weak.				
12	eP	z	16	54	36		
	eP	e			39		
12	1P	z	10	08	47 u		
	1P	e			47 e		
	eP	N			49		
	1S	N		18	21 s		
	e	N		20	07		
14	eP	z	03	21	44		
14	1P	z	14	19	58 u		
15	1P	z	06	03	53 d		
	1P	e			54 d		
	eP	n			54		
	ePcP	z		05	15		
15	eP	zne	09	51	54		
17	ePKP	z	14	57	21		
	ePKP	e			24		
17	e	e	18	03	13		
18	eP	z	13	53	30		
			Near?				
18	1P	z	19	18	32 d		
	eP	n			32		
18	eP	zn	19	51	30		
			Near?				
19	eP	ze	13	01	43		
			Near?				
19	ePKP	z	18	47	15		
			Very emergent.				
	ePKP	ne			30		
20	eP	z	06	50	17		
			Near?				
20	e	z	12	33	35		
			Very weak and				
			emergent.				
20	1P	z	16	05	39		
	eP	n			39		
	eP	e			40		
	e	N		09	29		
20	eP	z	21	40	08		
	eP	e			12		
21	eP	N	00	28	14		
	eS	N		37	07		
	Short period instruments						
	not recording.						
21	eP	z	07	13	31		
21	eP	z	15	14	35		
24	1P	z	00	02	28		
	eP	n			28		
24	eP	z	00	28	08		
	eP	n			09		
	eP	e			12		
24	1P	z	09	16	37 u	2	0.4
	eP	n			38		
	eP	e			38		
	e	z			50		
	1PcP	z		17	15	2	0.3
	1PcP	e			15 e	3	0.3
	1PcP	n			15		
	epP	z		18	27		
	e	z		20	30		

Date	Phase	h	m	s		A	T
OCT 24	1S N		24	00	n	2½	5
	eScS N		25	34		1	4
	eSS E		27	15			
24	eP e			23			
	eP n			23			
25	1P z	04	42	35	d	7	½
	1P e			35	w	2	½
	1P n			35	s	4	½
	1S e		43	09	e		
	1S n			09	n		
	eS z			09			
25	ePKP z	10	22	37			
	ePKP e			51			
25	eP z	20	51	14			
	eP n			15			
26	1P z	08	35	16	u		
	eP ne			16			
	epP z		37	12			
	1S N		42	37	n	2	6
	eScS N		44	06			
26	eP zne	17	47	02			
27	1P z	05	51	15			
	1P e			15			
27	ePKP z	22	51	30			
	e z			40			
	e z		52	17			
	eSKP z		54	56			
27	1P z	23	07	47	u		
	1P e			47	w		
28	eP zne	08	29	20			
	eS e			55			
29	eP z	02	33	48			
30	eP zne	15	15	43			
	Near.						
30	1P e	19	48	14			
31	eP zne	02	13	44			
31	eP ze	04	35	20			
31	eP z	10	37	56			
	eP e			57			
31	eP zN	15	34	32			
	eP ne			34			
	e N		37	37			
	eL N		42.1				
NOV 1	eP zne	20	00	30			
	Near.						
2	eP z	16	29	38			
	Weak.						
2	1P z	18	41	03	u	2½	1
	eP n			03			
	eS E		49	43			
	1S N			44	n	2	4
	eScS N		51	20			
3	1P e	09	58	16			
	eP zn			16			
	1S e			19			
3	eP ze	10	36	19			
	eS E		45	52			
3	eP e	11	26	03			
4	eP ne	18	02	42			
	Near.						
5	eP zne	00	47	54			
5	eP z	04	03	31			

Date	Phase	h	m	s		A	T
NOV 5	eP ze	10	04	13			
	1P zne			14	uw		
6	eP z	00	53	09			
	Weak.						
6	eP ze	05	10	15			
	Very emergent.						
	eS N		20	14			
6	eP ze	06	16	19			
7	eP ze	03	09	40			
7	eP ze	04	37	40			
7	eP ze	06	27	39			
	eL NE		33.9				
8	1P z	02	57	51	u		
	eP ne			51			
8	1P z	06	29	52	u		
	eP ne			52			
8	eP z	10	10	13			
9	1P z	19	21	56	u		
9	eP zne	23	50	57			
	1S e		51	01			
10	eP z	02	47	42			
	eP ne			43			
	1X N		52	19			
	1S E		57	03	e	1½	10
	1S e			04	w	1½	6
	eS N			07			
	1ScS N			49	n	2½	5
	1ScS e			51	w	1	2½
	1ScS E			52			
	eSS E	03	00	19			
	eL Z		09.9				
10	1P z	03	44	58			
	eP ne			58			
	1S e		45	07			
10	eP z	03	55	07			
	eP e			14			
	eS e	04	04	30			
	eS N			36			
	1ScS N		05	16			
10	1P z	05	37	41	u	1	1
	eP ne			41			
10	eP z	06	00	26			
	eP ne			30			
	1PPP N		04	48	n		
	1S E		09	55	e		
	1S N			57	s		
	eL Z		23.5				
	L-waves weak.						
10	eP zne	12	45	12			
	1S e			17			
10	eP ze	18	13	48			
11	1P z	06	32	44	u		
	1P e			46	w		
	1pP z			48			
	ePcP z		34	09			
11	e ze	11	56	55			
12	eP ze	00	29	34			
12	eP z	01	43	10			
	eP e			13			
12	eP zne	09	45	22			
12	1P z	17	11	12	d		
	eP e			13			

Date	Phase	h	m	s	A	T
NOV 12	iPcP z			59 u		
12	eP zne	21	42	.2		
	Near.					
13	iP zne	17	31	08 unw	3	¾
	iP N			08 s	3½	4
	i z			52		
	iPcP z		32	44		
	iS N		37	55 s	6	10
	eSS n		41	23		
	iSS E			29		
	eL E		42	.9		
14	iP z	16	44	42 u		
	eP e			43		
	ePcP z		45	21		
15	ePKP ze	16	49	36		
	eP zne	21	12	21		
	iS e			25		
16	ePKP z	02	07	57		
	Weak.					
17	ePKP z	06	16	08		
18	eP zne	12	47	.5		
	Near.					
	iP zne	19	29	59		
	iS e		30	02		
19	iP zne	02	38	14 ue		
	eL		42	.9		
19	eP ze	16	29	53		
	Diffracted?					
19	eP z	19	37	56		
20	ePKP z	12	59	43		
	Very weak and emergent.					
21	eP ze	18	09	20		
22	eP z	16	08	56		
22	iP z	16	15	16		
	i zne			20		
	i z			23		
23	iP zne	22	13	48 u	1	2
24	eP ze	04	56	22		
24	eP z	08	01	19		
24	iP zne	16	12	54		
	i e		13	21		
	i e			27		
25	ePKP z	04	30	24		
	Weak.					
25	eP ze	22	47	18		
	Strong microseisms.					
	i ne			29		
	eS N		57	28		
	eL Z	23	20	.0		
	Not well developed.					
26	iP z	05	22	18 u	1½	2
	eP e			18		
26	eP zne	12	33	40		
	Near.					
26	iP zno	15	31	18		
	iS n			38		
26	iP z	15	35	53 u		
	iP e			53 w		
	eP n			53		
26	eP ze	23	08	25		
	e n			32		
	Near.					
27	eP ze	03	33	45		

Date	Phase	h	m	s	A	T
NOV 27	eP ze	03	33	45		
	epP z		34	13		
27	eP zne	04	10	20		
	Near.					
27	iP z	08	45	20		
	eP e			20		
27	eP z	14	08	30		
28	eP ze	01	41	12		
	e e			54		
28	iP ze	03	19	41		
28	eP z	05	22	45		
28	iP z	11	11	10		
28	eP z	11	54	50		
28	iP zne	21	00	40	2	2
	iP N			41 s	1½	4
	i ze			43		
	eS Z		02	59		
	eS N		09	17		
	eL N		09	17		
	eL E			22.9		
	Not well developed.					
29	eP ze	06	47	04		
29	eP zne	11	00	14		
29	eP ze	17	50	14		
29	iP z	21	53	24		
	eP e			24		
29	eiP z	22	31	13 d	1½	1½
	iP z			16 d	12	1
	iP e			16 u		
	iP E			16 e	2	6
	iP nN			17 s		
	iP Z			17 d	8	3
	iPcP N			23 n	6	3
	iPcP n			23 n	2	1½
	iPcP z			24 d	30	1
	iPcP Z			24 d	22	3
	iPP Z		34	02 u	6	3
	iS N		40	45 s	25	7
	iS E			45 w	2½	9
	iScS N		41	11 s	7	5
	iPKKP z		50	28 d	1	1
	iP'P' z		58	19 d	4½	3
	i z		59	20 u	3	3
	iSKPP z	23	01	36 d	2	2
	i e		03	00 w	4	5
30	eP ze	19	41	55		
30	eP zne	21	10	52		
	Very weak.					
30	eP ze	22	20	53		
30	eP e	23	24	35		
	e			49		
	Near?					
DEC 1	eP z	11	09	31		
1	eP ze	12	56	23		
1	iP z	14	04	17 u		
1	eP z	19	33	48		
2	eP z	08	24	16		
2	eP z	14	41	37		
3	eP ze	04	02	24		
4	iP z	00	39	18 d		
4	iP e			18 e		
4	eP zne	01	18	59		
	Near.					
4	eP ze	03	46	00		

Date	Phase	h	m	s		A	T
DEC 4	1PKP z	03	56	59	d	2	1½
	ePKP ne		57	03			
	1PKP z			07	u	8	2
	sPKP N			07			
	e z		58	57			
	1(PP) z		59	32	u	7	2½
	1SKP z	04	00	06	d	5	2½
	eSKP z		00	21		10	12
	1PKS N		00	38	s	8	4
	1SKKP z		11	18	u	10	15
	eSS E		16	56			
	eSSS E		21	50			
	eL z		44.5				
	L-waves continue for 3 hours.						
4	ePKP z	13	39	17			
4	eP z	13	43	56			
	Near.						
6	1P z	09	49	45	u		
	eP ne			46			
	e z		55	03			
6	eP zne	12	27	31			
	Near.						
6	eP zne	16	06	46			
	Near.						
7	eP z	02	45	54			
7	eP zne	03	27	28			
	1P z			29	u		
7	eP ze	16	05	24			
	e n			26			
	Near.						
7	eP zne	17	18	50			
	Near.						
8	eP zne	00	02	00			
	Near.						
8	eP z	01	45	20			
8	eP z	19	28	51			
	eP ne			53			
	Near.						
9	eP z	15	08	46			
9	eP z	15	08	46			
9	1P ze	16	00	07	uw		
	eP n			08			
9	1PKP z	22	27	25	u		
10	e1P z	14	47	21			
	1P z			23	d	2	2
	eP Nne			23			
	1PcP z			30	d		
10	1 z		48	07			
	e z		49	54			
	1S E		56	44	e	3	9
	1S z			48	u	3½	7
	1S N			49	n	3½	7
	1ScS N		57	31	s	6	7
	eSS N	15	00	35			
	e z		04.5				
	eL z		11.4				
10	eP z	16	04	24			
10	1P z	17	04	36			
	eP e			36			
10	eP z	17	45	18			
11	eP zne	08	40	56			
11	1P ze	09	13	21	u		

Date	Phase	h	m	s		A	T
DEC 12	1P zne	09	57	34	un		
	e e	10	00	17			
12	1P zne	18	48	57	u	1½	1
	1pP z		49	21	d	3	1¼
	eS N		57	06			
12	eP zne	18	55	39			
	Near.						
12	1P z	19	21	27	d		
13	Short period instruments not working.						
13	ePKP z	02	04	11			
	1SKP z		07	32	u	3	5
	eSKKS N		13	17			
	e N		15	08			
	e z		16	15			
	eL z		53.0				
14	1P z	12	33	25			
	eP ne			25			
15	eP z	15	50	50			
16	1P z	03	55	51	u		
16	eP z	08	50	34			
16	eP zn	14	10	07			
16	1P z	19	14	03	d		
17	eL z	06	19.0				
17	e1P z	14	00	50			
	e1P e			51			
	e1P nEe			52			
	1P z			55	u	40	1
	1P n			55	s	34	1
	1P z			55	u	70	2½
	1P N			55	s	100	1½
	1pP z		01	19	d	30	4
	1PP z	03	03	22	u	15	9
	1ScP n		05	07	d	6	2
	1S e		09	35	e	32	4
	1S E			35	e	23	8
	1S n			36	n	18	4
	1S N			36	n	80	5
	1S z			37	n	10	4½
	1ScS E		10	23	e	18	7½
	1ScS e			29	e	24	5
	1ScS z			43	u	10	10
	eSS N		14	14		20	15
	eL E		17.2				
	1P'P' Z		29	27	u	15	7
18	1P z	20	52	48			
	1P e			52			
	eP n			52			
	e z			58			
18	e z	22	09	10			
19	eP z	06	00	53			
19	eP z	23	01	20			
20	eP zne	01	24	06			
	Near.						
20	eP		11	29	35		
	eP ne			46			
21	1P z	17	55	04	u		
22	1P e	09	01	54			
	eP n			54			
	eP z			56			
25	eL z	17	22				
26	1P z	12	17	38	u	2	1

Date	Phase		h	m	s		A	T
DEC 26	eP	ne			38			
	ipP	z			43	d	2	1
	ipP	e			44			
	iPcP	z		19	15	d	3	¾
	iPcP	e			15	d	4	
	iX	z			18			
27	iP	z	07	24	17	d		
27	iP	zne	19	09	.6			
			Near.					
27	eP	zne	23	23	36			
			Near.					
28	eP	z	14	48	58			
28	iP	zne	19	11	52	d		
DEC 28	ipP	z		11	02			
29	iP	z	15	23	06	u		
29	eP	z	19	20	13			
31	iP	z	14	34	53	u	2	1½
	eP	n			53			
	eP	e			58			
	epP	z		35	04		4	2½
	ipP	z			05	d	3	3
	iPcP	z		37	37	u	2	1
	iS	N		40	15	s	18	5
	iS	E			16	e	2	5
	eL	Z			43.5			
31	eP	z	21	24	04			

HALLETT STATION.

Amplitudes given in the Hallett section of the bulletin are in millimetres, read directly from the records.

APR 4	iP	Z	11	11	07			
5	ePKP	Z	03	09	46			
5	eP	E	07	38	48			
	iS	E		45	19			
	eScS	E		48	28			
7	iP	Z	05	15	02			
7	.P	zN	10	25	47	0.1	1	
	iP	Z			49	0.3	11	
	iS	N		35	24	0.3	15	
	iS	E			30	0.3	16	
	iS	Z			36	0.2	19	
	iPS	N		36	11	0.2	15	
	iPS	Z			42	0.2	13	
	i	Z		38	35	0.2	12½	
	i	E			48	0.2	16	
	eSS	E		40	06	0.3	14	
	iSS	N			57	0.2	24	
	iSS	Z		41	04	0.2	14	
	eSSS	E		43	52	0.3	18	
	iSSS	Z		44	25	0.2	14	
8	i	N	20	09	10			
	e	Z			14			
	i	E			42			
	i	N			47			
	e	N		11	17			
8	e	E	21	06	08	0.2	20	
	e	Z			27	0.2	20	
	e	N		07	53	0.1	20	
	L	N		12	52	0.2	14	
9	i	z	00	03	03			
9	iPKP?	z	00	41	31			
	iPPP	Z		44	44	0.2	14	
	i	N		48	04	0.3	10	
	ePS	Z		51	30	0.1	10	
	ePPS	Z		52	54	0.2	20	
	e(SS)	N		56	47	0.2	15	
	e(P'P')	E	59	27	0.3	15		
	e	E		04	28	0.1	10	
	ePKS	Z	11	23	49			
	L	Z		58	07			
9	e	Z	21	34				
10	ePKP	z	09	28	21			
	i	z		41	28			
APR 10	ePKP	z	11	49	10			
	ePKP	Z			17	0.2	16	
	ePP	Z		51	25	0.4	19	
	iPKS	Z		52	30	1.6	10	
	PKS	zE			33	0.3	10	
	ePPP	z		54	10			
	ePS	E	12	01	40	0.3	15	
	e	z		02	34			
	iSS	Z		08	53	0.7	14	
	iSS	E			59	1.0	16	
	iSSS	E		13	50	0.6	23	
	L	Z		30	15	3.0	25	
10	ePKP	z	13	39	15			
10	iP	z	14	39	01			
10	eP	z	13	53	40			
	iS	E	14	01	11			
11	i(PPS)	E	02	28	21			
11	eP	z	06	54	23			
	iS	E	07	02	35			
	L	E		11	43			
11	eP	z	14	31	14			
12	ePKP	z	11	10	20			
12	e	z	22	06	40			
13	eP	z	10	23	16			
			No long-period records April 13-14.					
13	eP	z	15	51	41			
14	iP	zE	19	27	56	1.6	12	
	eS	z		36	27			
15	Records disturbed by strong winds.							
16	i(P)	z	09	57	53			
	i(S)	z		58	45			
16	eP	z	10	29	34			
16	iP	z	15	20	18			
16	iP	z	18	29	23			
17	iP	z	08	17	01			
	iS	E		24	21			
	i(SS)	E		28	51			
17	i(S)	E	14	43	26			
	L	N	15	02				
18	PKP	z	07	19	04			
18	e	z	09	23	24			

Date	Phase		h	m	s	A	T
APR 18	e	z	10	27	12		
19	eP	z	08	14	23		
19	eP	z	08	39	41		
19	eP	z	08	50	27		
19	iPKP	z	16	03	53	0.1	1
19	ePKP	z	22	38	28	0.2	2
20	eP	z	00	19	35		
20	iP?	z	02	02	39		
20	P	zE	06	54	19		
	iS	NE		59	20		
20	eP	z	07	07	27		
20	iP	zN	12	41	38	0.1	1
	i(PP)	N		45	26	0.3	12
	iS	E		50	34	1.0	14
	iS	N			44	0.7	16
20	eP	z	15	48	06		
21	iP	z	13	12	14		
21	ePcP	z	21	26	39	1	1
	ePP	z		30	16	1	1
	ePP	E			54	0.3	11
	iSKS	E		37	12	0.6	>12
	iSKS	NE			21	0.8	>20
	iSKKS	N		38	31	0.7	18
	iPS	E		40	18	0.9	25
	iSS	N		45	39	0.7	15
	iSSS	E		49	44	0.8	28
	iSSS	N		50	03	0.8	28
24	ePKP	z	19	29	36		
	ePP	z		32	23		
	ePP	N			34	0.2	7
	iSS	N		50	49	1.2	16
25	ePKP	z	02	45	03	0.1	1
	ePP	zN		48	02	0.1	1
	Recording interrupted April 25-27 for installation of new seismometer cable.						
27	eP	z	11	39	33		
27	eP	z	17	22	09		
27	eP	z	22	06	50		
28	P	zN	01	36	15	0.2	2
	iP	Z			21	0.4	14
	iS	ZN		46	34	0.3	25
28	e	z	05	09.7			
29	e	z	09	45.2			
29	e	z	10	23	32		
	e	z		24	35		
29	eP	z	21	07	36		
	iS	N		17	06		
29	e	z	23	21	58		
30	Records disturbed by strong winds.						
MAY 1	Records disturbed by strong winds.						
2	iP	z	02	01	12		
	iS	N		11	12		
2	eP	z	06	47	26		
2	eP	z	10	40	42	0.2	1
	iS	N		45	41	1.1	25
2	e	z	11	48	29		
2	e	z	11	58	57		
2	eP	N	21	46	49		
	iP	z			52		
	eS	z		55	26		
	i(S)	N			34		

Date	Phase		h	m	s	A	T
MAY 2	eP	z	22	14	07		
	e	z		16	52		
3	e	z	01	52	36		
3	i(S)	N	02	08	21		
	L	N		49.8			
3	eP	z	07	15	53		
3	iP	z	12	26	02		
	eS	N		34	12		
3	iP	z	14	56	03		
3	eP	z	15	57	26		
3	eP	z	19	52	24		
4	iP	z	02	14	21		
4	iS	N	10	26	29	0.3	14
6	eP	z	02	53	45		
6	eP	z	11	45	42		
6	eP	z	21	54	25		
8-9	Records disturbed by blizzard.						
10	eP	z	00	34	30		
10	iP	z	08	07	23		
11	eP	z	22	20	56		
12	eP	z	04	56	19		
12	eP	z	11	38	48		
	i	z		39	41		
12	iP	z	13	03	16		
12	eP	z	23	39	27		
16	iP	z	15	05	53		
17	iP	z	02	51	26		
21	iP	z	01	25	17	0.1	1
	ePP	z		29	07	0.1	2
25	iP	z	14	35	29		
25	eP	z	18	59	57		
29	eP	z	07	37	57		
	eS	N		47	26		
29	eP	z	07	50	25		
29	iP	z	08	01	57		
29	e	z	19	09	17		
30	eP	z	00	28	11		
	iS	NE		35	41		
	iSSS	E		40	59		
30	eP	z	09	10	47		
30	eP	z	14	43	32		
30	eP	z	19	51	14		
30	iP	z	21	06	31		
31	iP	z	02	27	09	0.2	2
	ipP	zNE		29	06	0.1	2
						0.2	8
						0.1	3
	iS	NE		35	56	0.3	8
						0.3	10
	e	N		36	20	0.4	14
31	eP	z	20	14	57		
31	e(P)	z	20	26	51		
JUN 1	i(P)	z	05	36	45		
1	e	z	20	28.2			
4	eP	Z	17	13	48	0.2	2
	iPP	Z		15	39	0.3	12
	ePP	N			42	0.2	12
	i	Z		16	41	0.2	14
	ePcS	Z		18.7		0.3	10
	iS	Z		20	51	0.4	10
	iS	NE			55	0.5	24
						0.3	12
	i	E		22	39	0.3	8

Date	Phase		h	m	s	A	T
JUN 4	eScS	E		24	07	0.2	16
	eScS	N			13	0.7	15
	i	E		28	10		
4	iS	E	22	52	08		
	e	E		58	49		
5	iP	ZE	02	35	43		
	e	ZN		39.15			
	e	E		39.5			
5	iP	ZE	02	50	55		
	e	ZE		54	40		
5	e	NE	10	41.8			
5	e	N	22	53.5			
6	iP	Z	20	02	06	0.2	8
	eP	N		02.2			
	iS	NE		12	10	0.3	10
7	eP	z	07	24	50		
9	eP	z	03	25	41		
	i	z		26	18		
10	iP	Z	01	11	45	0.3	8
	i(P)	NE		11	52	0.2	10
						0.3	15
	eS	Z		20.2			
	iS	N		20	22	0.9	20
	iS	E			25	0.6	16
10	iP	Z	03	26	17	0.2	6
	eS	Z		35	55	0.3	15
	S	NE		36	03	0.3	10
						0.2	10
11	e	z	04	01.7			
11	i	z	07	15	03		
11	e	z	13	32	48	0.1	1
11	iP	zN	14	57	37	0.4	2
	ePP	z		59	41	0.2	2
	iS	zNE	15	04	00	0.2	7
						1.5	10
						2.5	18
11	i	z	17	39	42		
11	iP	z	19	02	55	0.2	1
	iPP	z		06	47	0.1	2
	iSKS	NE		13	30	0.5	20
						0.3	18
12	ePKP	z	00	12	55		
	eSS	N		32	08		
12	iP	z	06	13	12		
	iS	N		15	03		
	iS	Z			09		
	iS	E			13		
12	ePKP	z	08	46	05		
	eSS	N	09	04	33		
12	i	N	10	00	30		
12	eP	z	10	15	28		
13	ePKP	z	10	59.7		0.1	1
13	eP	z	20	33	38		
14	ePKP	z	06	43	28	0.1	1
14	e	z	08	47.2			
	Records disturbed by blizzard.						
15	iP	z	00	55	00	0.1	2
	iP	Z			018	0.2	10
	iS	Z	01	04	48	0.4	17
15	ePKP	z	18	38.0			
15	eP	z	19	37	18		
17	iP	z	06	26	42		
18	eP	z	15	21½			

Date	Phase		h	m	s	A	T
JUN 18	i	Z		25	19		
	i	Z		35	31		
18	iP	z	18	04	40		
	iP	Z			40	0.3	11
	eP	N		04.7		0.2	10
	iPP	N		06	31	0.8	12
	iPP	Z			34	0.5	12
	iS	N		11	36	1.5	15
	i(S)	Z			48	1.2	16
	Records disturbed by blizzard.						
19	iP	z	01	38	41	0.1	1
	iS	N		45	46	0.4	10
19	eP	z	08	11	09	0.1	2
	iS	N		19	23	0.6	21
				High winds.			
22	ePP	z	06	37	47	0.1	4
23	iP	z	00	02	00	0.2	2
	iP	Z			00	0.5	10
	i(P)	NE			05	0.7	8
	i	z		03	12	0.2	3
	i	Z		06	31	1.0	11
	i	Z		07	47	1.0	12
	iS	N		11	30	0.7	12
	iS	E			33	1.0	15
	i(S)	Z		12	03	0.9	13
23	iP	z	00	48	20		
24	iP	z	11	08	07		
	e(S)	E		13	47		
	e(S)	N		13.8			
24	eP	z	11	32	24		
25	eP	z	16	16	08		
26	L	ZNE	03	30ca			
26	e	z	11	25	53		
26	eP	z	13	06	45		
26	e	z	17	17	15		
27	iPKP	Z	00	28	45	0.4	11
	ePKP	z			46		
	ePKP	E			54	0.2	10
	iPKP	N			57	0.2	10
	iPP	Z		31	14	0.7	15
	ePP	z			16	0.1	2
	iPP	NE			28	0.7	12
						0.5	16
	iPKS	ZNE		32	21	0.7	12
						0.6	14
						0.8	14
	iPKS	z			24	0.3	14
	iPPP	E		34	17	0.3	8
	iSKS	Z		35	29	0.6	13
	iSKS	E		36	05	0.3	7
	iSKS	N			13	0.4	13
	iSKS	E		38	24	0.5	15
	iPS	E		41	53	0.8	25
	iPPS	E		43	25	0.6	12
	iPPS	N			29	1.2	25
	iSKKS	N		44	36	0.7	12
	iSS	N		49	13	1.2	10
	iSS	E			36	2.0	25
27	eP	z	12	58	56		
28	eP	z	00	43	11		
	L	ZNE		58.5			
28	eP	z	19	01	02		
28	e	z	22	52	35		

Date	Phase		h	m	s	A	T
JUN 28	e	z	23	31	4		
29	1P	z	04	08	14		
29	1PKP	z	08	06	27		
29	eP	z	22	14	35		
29	1P	z	22	46	54		
29	ePKP	z	22	52	20		
29	e(L)	N	23	18	9		
	e(L)	E		19	9		
	e(L)	Z		20	3		
JUL 1	eP	z	02	31	25	1.0	1
2	eP	z	22	04	10	1.0	1
3	eP	z	06	10	40	0.5	1
	ePP	z	06	12	23	1.0	1
3	e	z	06	36	07	1.0	1
3	e	z	09	58	50	0.5	1
3	1P	z	10	05	1	1.0	1
3	1PKP	z	12	43	37d	1.0	1
3	e	z	17	20	12	0.5	1
	e	z	17	23	32	0.5	1
4	1P	z	08	41	02d	1.0	1
4	e	z	19	38	32	0.5	1
4	1P	z	23	12	42	1.0	1
4	1P	z	12	41	47u	1.0	1
	1P	Z	12	41	47u	2.0	13
	1S	Z	12	48	20d	3.0	15
	1S	N	12	48	10	0.4	16
	eSS	Z	12	51	33	2.0	15
	1(ScS)	Z	12	51	56d	3.0	12
	1(ScS)	N	12	51	44		
5	e	z	17	01	43	0.5	1
	1P	z	00	31	15	1.0	1
7	1P	z	16	22	05u	1.0	1
9	1P	z	07	57	07	1.0	1
	1	N	07	58.2		3.0	18
			Local?				
9	1P	z	10	10	02u	1.0	1
10	eP	z	04	43	45	1.0	2
10	eP	z	08	10	49	0.5	1
	e(S)	z	08	12	05	2.0	2
			Local.				
10	e	z	09	25	51	0.5	1
	ePP	Z	09	22	27	2.0	10
	1S	N	09	30	07n	2.0	22
	1PS	Z	09	31	43d	2.0	18
	e(PSS)	N	09	36	04	2.0	25
	e(PSS)	Z	09	40	53n	2.0	15
	1SSS	N	09	40	53n	2.0	15
	L	Z	09	51.7			
11	1P	z	23	52	14	1.0	1
11	ePKP	z	23	56	40	1.0	1
12	e	Z	07	49.7		2.0	25
	e	N	07	51.2		2.0	21
12	1P	z	21	07	38u	1.0	1
	e(S)	N	21	16	56	1.0	10
	e(L)	N	21	32		2.0	20
12	eP	z	22	10	03	0.5	1
	e	N	22	41.4		2.0	20
13	1P	z	09	42	02d	1.0	1
	1P	N	09	42	02s	2.0	7
	1P	Z	09	42	07u	2.0	8
	eS	Z	09	50	00	2.0	12
	eS	E	09	50	00	3.0	18
	e	Z	09	51	56	2.0	14
	e(L)	N	09	56	2.0	25	

Date	Phase		h	m	s	A	T
JUL 13	e(L)	E	09	56		2.0	25
	e(L)	Z	09	56	32	3.0	25
14	1(S)	N	03	38	10	3.0	15
			Local.				
14	1P	E	06	31	54	1.5	2
	ipP	N	06	32	34s	12.0	12
	ipP	E	06	32	34w	4.0	12
	iPP	E	06	34	24w	3.0	8
	iScP	N	06	37	00s	4.0	16
	ePcS	E	06	37	38	2.0	14
	iS	N	06	38	14n	30.0	12
	iS	E	06	38	30w	3.0	10
	iScS	E	06	39	49w	15.0	12
14	i	N	06	39.8		10.0	17
	i(L)	N	06	42.6		15.0	14
	i(L)	E	06	42.3		25.0	15
14	iP	N	08	18	42s	3.0	7
	iP	E	08	18	42w	3.0	8
	i	N	08	19	45n	3.0	8
	iPP	N	08	20.2		2.0	14
	ePP	N	08	20	40	4.0	15
	iPcS	N	08	24	31n	4.0	16
	ePcS	E	08	24	40	4.0	34
	iS	N	08	25	10n	25.0	15
	iS	E	08	25	20e	8.0	28
	iScS	N	08	28	32n	8.0	8
	iScS	E	08	28	37e	25.0	35
15	e	z	09	36	42	5.0	1
	ePKP	z	09	56	23	5.0	1
	e	z	10	53	35	5.0	1
16	e	z	16	27	57	0.5	1
	iP	z	16	56	04d	0.5	1
16	iP	z	17	09	04	1.0	1
17	eP	z	05	24	40	0.5	1
	i	z	05	24	54s	1.0	1
17	iP	z	11	20	23	6.0	1
	iP	N	11	20	23s	2.5	7
	iS	N	11	28	11s	2.5	32
17	ePKP	z	18	57	25	1.0	1
18	ePKP	z	01	34	04	0.5	1
18	ePKP	z	01	38	46	0.5	1
18	eP	z	02	34	55	0.5	1
	i(S)	N	02	37	58	12.0	16
	i(S)	Z	02	38	04	2.0	17
19	e	z	07	41	27	1.0	1
19	e	z	15	54	54	0.5	1
19	eP	z	21	48	10	0.5	1
20	iP	z	10	08	03u	1.0	1
20	e	z	13	32	46	0.5	1
20	iP	z	15	48	17	1.0	1
	i(pP)	z	15	48	28	1.5	2
21	iP	z	00	34	42	1.0	1
21	i(P)	z	02	08	42	1.5	1
21	eP	z	06	01	50	2.0	2
	i(S)	E	06	04	11w	20.0	17
	i(S)	N	06	04	37s	15.0	16
	e	E	06	07	46	7.0	10
21	eP	z	06	46	27	0.5	1
21	iP	z	07	11	17	1.0	1
21	e		15	10	14	1.0	1
	iP	z	19	45	24d	1.5	1
	ePP	z	19	47	01d	0.5	1
	eS	Z	19	51	55	2.0	7
	eeS	Z	19	53	04	2.0	14

Date	Phase		h	m	s	A	T
JUL 21	1SSS	Z	19	56	41u	3.0	8
	1		20	04	08		
	L		20	08.1			
22	1P	z	06	24	36d	1.0	1
	1(pP)	z	06	24	44u	2.0	1
	ePP	z	06	26	08u	1.0	3
	eP	Z	06	24	34	2.0	2
	e(pP)	Z	06	24	44	3.0	11
	1PP	Z	06	26	09u	5.0	07
	1(pP)	N	06	24	43n	2.0	5
	1PP	N	06	26	09s	3.0	6
	1S	Z	06	30	29u	7.0	15
	1SS	Z	06	33	47d	7.0	12
	1SS	N	06	33	35	3.0	16
22	eP	z	06	29	41	1.5	1
23	e	z	22	38	45	0.5	1
24	1P	z	02	08	45u	1.0	1
	1P	Z	02	08	43d	3.0	10
	1P	N	02	08	49u	1.5	7
	1P	E	02	08	49e	1.0	10
	1(pP)	z	02	09	01u	1.5	8
	eS	Z	02	18	02u	2.0	12
	1S	N	02	17	59n	1.5	15
	1S	E	02	17	58e	2.0	14
	1SS	z	02	22	21n	2.0	17
	1	Z	02	26	29d	2.0	10
	1	Z	02	28	41d	2.0	18
	eL	Z	02	30			
	eL	N	02	30			
	eP'P'	z	02	36	45	1.0	1
24	eP	z	03	58	34	1.0	1
	eP	z	06	12	46	0.5	1
	eS	E	06	18	43	2.0	12
	e(L)	E	06	22.6		3.0	14
	e(L)	N	06	23	26	3.0	14
24	1P	z	10	06	26u	2.0	1
24	1	z	10	59	53u	1.0	1
24	1P	z	11	12	01d	1.0	1
	1P	Z	11	12	01d	2.0	2
	eP	N	11	12	01s	2.0	1
	1pP	z	11	12	08u	2.0	1
	1pP	N	11	12	11	2.0	8
	ePP	N	11	13	14	2.0	14
	1PP	Z	11	13	19	3.0	14
	1X	Z	11	21	09	3.0	20
24	eP	z	13	50	12	0.5	1
24	1P	z	14	52	15		
24	e		14	20	38	1.0	1
24	1(S)	E	13	54	11		
24	1P	z	14	52	15u	0.5	1
24	eP	z	15	02	43	1.0	<1
24	eP	z	21	26	59	0.5	1
25	eP	z	22	51	03	0.5	1
25	e(P)	z	22	52	50	1.0	1
25	1(S)	E	23	01	21	1.0	18
25	e	N	23	05.0		4.0	22
	1	Z	23	06	19u	3.0	19
		N	23	11	23s	4.0	15
	e	E	23	05.0		2.0	13
26	eP	z	06	56	58	1.0	1
	1S	E	07	02	05w	2.0	13
28	eP	z	01	40	38	1.0	1
28	eP	z	02	58	34	0.5	1
28	eP	z	08	54	34	0.5	1

Date	Phase		h	m	s	A	T
JUL 28	1P	Z	08	54	33u	4.0	07
	1PP	z	08	58	57u	1.0	2
	1PP	Z	08	58	56u	15.0	20
	1PPP	Z	09	01	07u	6.0	11
	1(S)	Z	09	05	21u	14.0	28
	1(PS)	Z	10	08	05d		
	1	Z	10	12	39u		
28	e		09	10	01	1.0	1
29	eP		10	04	58	1.0	1
29	1P		17	27	05d	4.0	1
	1P	Z	17	27	06d	4.0	11
	1P	E	17	27	06e	3.0	11
	1S	Z	17	36	46u	4.0	16
	1S	E	17	36	50e	11.0	12
	eSS	Z	17	41	47	4.0	25
	eSS	E	17	41	58	5.0	20
	e(PKKP)	z	17	45	06	2.0	1
	L	Z	17	50.2		12.0	24
29	1P	z	22	09	54d	3.0	1
			Local.				
29	eP	z	22	19	22	1.0	1
30	eP	z	02	22	03	1.0	1
30	e(S)	z	02	24	48	2.0	18
30	e	z	07	27	38	1.0	1
30	1P	z	07	51	37d	2.5	1
30	1P	z	13	53	17d	1.0	1
	1P	z	21	51	44u	7.5	1
			Local.				
31	eP	z	07	43	23	0.8	1
	1P	z	10	52	36d	4.0	1
31	eP	z	20	17	23	0.3	1
AUG 1	eP	z	06	36	05	1.0	1
1	1P	z	17	05	33u	1.0	1.5
2	eP	z	02	19	20	0.5	1
	1S	z	02	24	36u	1.0	1
	e	L	02	28.2			
2	1X	z	09	30	04u	0.8	1
2	eP	z	09	52	08	0.8	0.8
2	ePkP	z	12	40.6		0.3	1
2	eP	z	13	27.9		0.3	1
3	eP	z	06	55	32	0.5	1
3	1P	z	08	24	03d	0.9	1
	1S	N	08	30	43s	1.6	20
	1S	E	08	30	44e	3.5	15
	1(SS)	N	08	35	46n	3.0	10
	1(SS	E	08	35	22e	0.25	7
	1(SS)	z	08	35	31d	0.25	12
4	1P	z	00	50	29d	1	1
	1PP	Z	00	53	08u	2	8
4	eS	Z	00	59	52d	2	14
	1S	N	00	59	46n	3	12
	1S	E	00	59	47w	4	12
	1ScS	Z	01	00	34d	2.5	12
	1SSS	N	01	08	01n	4.0	20
	1SSS	Z	01	08	11d	1.5	9
4	eP	z	02	12	19	0.8	1
4	1P	z	02	30	49d	1.0	1
4	eP	z	09	35	14	0.7	2.5
4	1P	z	21	18	50d	1.0	1.7
	1	z	21	18	55u	2.2	1.2
	1PcP	Z	21	19	58u	2.1	9
	1S	Z	21	27	12d	4.0	20
	1S	N	21	27	13n	11.5	22
	1S	E	21	27	16w	13.0	15

Date		Phase		h	m	s	A	T
AUG	4	iSSS	Z	21	31	25d	4.5	28
		iSS	N	21	31	27n	5.5	22
		iSSS	Z	21	33	39u	4.0	12
		iSSS	N	21	33	21n	5.0	12
		iSSS	E	21	33	22w	5.5	11
	5	eP	z	04	38	29	0.3	1
		i	z	04	38	35d	1.0	1
	5	iP	z	07	59	06d	1.0	1
	5	iP	z	08	23	48u	1.2	1.2
	5	iP	z	13	08	30u	1.0	2
	7	iP	z	19	49	20d	2.0	1.2
		iPcP	z	19	50	17d	0.7	1
		ipP	z	19	51	09d	1	1.2
		eS	z	19	56	14	0.8	1.7
		ePP	Z	19	52	03	1.2	14
		eS	Z	19	56	13	1.7	15
	8	iP	z	03	25	36d	0.7	1
	8	iP	z	10	01	27	0.3	1
	8	eP	z	11	38	24	0.5	1
			Local?					
	8	eX	z	22	35	33	0.5	1
	8	eP	z	22	47	01	0.3	1
	9	iP	z	02	40	55d	4.0	1
		eS	N	02	50	24	2.0	7
	9	eP	z	16	48	58	0.8	1
	9	eP	z	22	02	23	0.3	1
	10	eP	z	00	05	47	0.2	1.3
	10	eP	z	02	07	18	0.3	1
	10	iP	z	02	26	51u	1.8	1.2
	10	eP	z	04	05	30	1.0	1.5
		iS	N	04	13	26s	1.2	12
		iSSS	N	04	19	21n	1.5	16
	10	eP	z	12	11	28	1	1
		iX	z	12	12	23u	1	1
	11	eP	Z	05	19	26	1.3	1.2
	12	eP	z	07	21	08	0.7	1.2
	12	eX	z	13	29	02	0.5	1.2
	12	i(P)	z	20	35	16d	0.5	1
	12	eP	z	22	27	50	0.5	1
	13	eP	z	00	14	57	0.3	1
		e	z	00	15	03	3.0	1
			Local.					
	13	iP	z	03	47	58	3.0	1
			Local.					
	13	eP	z	09	47	08	0.3	1
		i	z	09	47	20u	1.0	1
			Local.					
	13	ePKP	z	12	18	55	0.3	1
		ePKS	z	12	23	05	0.3	1
	13	eP	z	12	29	58	0.5	1.6
		iS	N	12	37	35s	3.0	22
	13	iP	z	14	55	19u	0.5	1
	13	e	z	17	44	01	0.5	1.2
		e	z	17	47	44	0.5	1.1
	13	eP	z	18	00	43	0.3	1
		e	z	18	03	23	0.3	1
	14	iP	z	04	06	29	0.8	1
		e	z	04	12	19	0.3	1
	14	ePKP	z	09	37	19	0.3	1
	14	ePKP	z	09	53	32	0.3	1
	14	iP	z	13	56	09	0.5	1
	14	e	z	14	38	12	0.3	1.2
	14	iP	z	18	35	45u	1.0	1
		ipP	z	18	36	32d	1.0	1
		eS	z	18	42	09	0.3	1
AUG	14	e	z	20	01	7	0.3	1.2
	14	e	z	20	55	06	0.3	1.3
	15	iP	z	12	07	50u	1.0	1
	15	iP	z	20	55	34	2.0	1.2
		iP	Z	20	55	34u	3.5	12
		ipP	z	20	57	20d	1.0	1
		ipP	Z	20	57	21d	2.5	14
		iS	Z	21	03	58d	2.5	12
		iSS	Z	21	08	50d	2.5	15
	16	iP	z	03	37	04u	1.5	1
		ePcP	03		37	25	1.0	1
	16	iP	z	12	08	16u	1.7	1.2
		iP	Z	12	08	21u	2.0	12
		iPcP	z	12	08	40d	1.3	1.6
		iPcP	Z	12	08	44d	2.0	10
		iS	Z	12	17	54d	2.0	15
	16	iP	z	14	59	19u	0.3	1
		iPcP	z	14	59	44	0.8	1.6
	16	iP	z	18	39	00u	1.2	1
		eL	Z	18	54.5		4.0	23
	16	eP	z	23	45.7		0.5	1.8
		iP	Z	23	45	43d	1.2	10
		ePP	z	23	49.8		0.5	3
		iPP	Z	23	49	36u	1.8	10
		i(SkS)	Z	23	55	56d		7
		iS	N	23	57	11s	5.0	10
		iPS	Z	23	58	29u	6.5	8
		iSS	N	24	04	01s	7.0	24
		iSS	Z	24	04	09d	8.5	12
		iSSS	Z	24	07	41u	3.5	21
		eL	Z	24	18½		23	25
	17	iP	z	02	32	28d	1.0	1
		iPcP	z	02	32	51d	1.2	1.6
	17	iP	z	04	37	20d	1.0	1.5
	17	iP	z	12	18	04d	0.8	1.2
	18	iP	z	00	00	37u	0.3	1
	18	e(P)	z	05	13	20	0.3	1
		e(S)	Z	05	16	43	1.0	15
		i(S)	N	05	16	13n	2.2	16
		iX	Z	05	18	17d	1.7	06
	18	iP	z	06	39	38d	1.3	1.2
		iP	Z	06	39	37d	2.8	10
		e(P)	N	06	40	05	0.5	1
		iX	Z	06	44	21d	3.9	11
		iX	N	06	44	05s	6.0	1
		L	Z	06	45.1		10	17
	18	iP	z	06	49	41d	0.5	1
	18	iP	z	08	17	44d	0.5	1.3
	18	iP	z	08	49	58u	2.0	1.6
		eP	Z	08	49	58	1.2	4
		eP	N	08	49	53	0.5	2
		i	z	08	50	25u	2.0	1.6
		e	Z	08	51	09u	2.2	14
		iPPP	Z	08	54	41d	2.3	17
		iPP	z	08	53	34u	1.3	4
		ePPP	N	08	54.8		1.5	19
		eS	Z	09	00	46	2.0	14
		iS	N	09	00	34n	2.2	12
		iSS	N	09	05	42n	4.0	7
		e	Z	09	10	06	4.0	18
		eP'P'	z	09	14	31	0.3	1
		eL	Z	09	20	51	7.0	35
	18	e	z	12	30	19	1.0	1
		e	z	14	34	17	0.5	1.2
	18	iP	z	16	11	14u	1.1	1

Date	Phase		h	m	s	A	T
AUG 18	eP	z	21	41	20	0.2	1
	i	Z	21	45	36d	2.0	23
18	iPKP	z	22	01	26u	1.0	1.6
	ePKP	Z	22	02		1.5	20
	iS	N	22	09	56n	2.2	12
	ePKKP	z	22	11	10	0.3	1
	i	Z	22	12	56	4.0	17
	e	N	22	12	51s	3.0	20
	eX	Z	22	18	58	2.0	10
	eL	Z	22	38.1		7.0	32
19	iP	z	00	22	17u	0.8	1.2
	i	z	00	26	06u	0.8	1
19	iP	z	02	52	11u	1.8	1.2
	e	z	10	56	34	0.5	1.6
19	iP	z	11	45	01	1.0	1.6
	iP	Z	11	45	02d	3.0	11
	iP	N	11	45	02d	1.8	11
	eS	Z	11	53	34	2.0	12.0
	iS	N	11	53	41s	2.5	8
	iS	E	11	53	34e	2.5	8
	eSS	N	11	57	30	10	1.5
19	iPKP	z	21	50	51d	0.7	1
20	iP	z	04	54	14d	0.5	1
20	iP	z	06	37	31u	0.8	1
20	iP	z	07	12	29u	1.5	0.1
			Local.				
20	iP	z	12	12	15u	1.3	1.2
	iP	Z	12	12	17d	4.5	12
	iP	N	12	12	17s	2.1	12
	eS	Z	12	20	23	2.0	14
	e	Z	12	28.1		3.2	39
20	e	z	12	16	07	0.5	1.2
20	e	z	12	24	04	0.3	1
20	eP	z	18	51	11	0.5	1
	iS	Z	18	53	47	3.0	20
20	iP	z	22	36	05d	0.5	1
20	eP	z	22	11	54	0.8	1
20	iP	z	23	07	14d	0.5	1.2
21	iP	z	05	54	27d	1.0	1.6
21	e	z	08	08	24	0.3	1
21	e	z	12	01	39	0.5	1
21	e	z	14	57	46	1.0	1
21	iP	z	17	34	55u	0.8	1.2
21	e	z	18	19	50	0.5	1.6
22	eP	z	06	29	18	0.5	1.2
22	iP	z	08	07	08d	1.2	1.6
	i	z	08	07	47u	3.0	1.2
	eL	Z	08	33.7			
22	iP	z	15	39	19d	0.5	1.2
22	iP	z	16	45	47u	0.3	1.0
22	iP	z	16	53	23u	0.7	1.6
	iP	Z	16	53	24d	1.5	?
	iP	N	16	53	24n	1.0	?
	iS	N	17	01	16n	2.2	15
22	ePKP	z	18	42	07	0.3	1.2
22	iP	z	19	03	33u	1.0	1.2
22	eP	z	23	39	41	0.8	1.2
23	iP	z	02	11	04d	4.2	1.2
	iP	Z	02	11	04d	7.5	6
	ipP	z	02	11	46d	2.0	1.2
	ipP	Z	02	11	41d	8.0	?
	ipP	N	02	11	42s	4.3	?
	ePP	N	02	13	35	22.0	17
	i	Z	02	19	49d	1.2	7
	i	N	02	19	54s	3.8	16

Date	Phase		h	m	s	A	T
AUG 23	iS	Z	02	20	18u	3.5	12
	iS	N	02	20	17s	14.5	21
	iSS	Z	02	24	48d	7.7	14
	iSS	N	02	24	55s	12	?
	i	Z	02	29	23d	0.8	17
	i	N	02	29	07s	6.0	31
	ePKKP	z	02	31	26	0.3	1
23	iP	z	02	43	12d	1.5	1.2
23	iP	z	07	01	23u	0.3	1.2
23	iP	z	11	49	00u	0.5	1
23	eP	z	12	00	36	0.3	1.2
23	iP	z	13	44	42u	2.3	1.2
	ipP	z	13	45	05d	22	1.6
23	e	z	16	26	32	0.5	1.2
	eL	Z	16	52		1	26
23	e	z	17	15	35	0.8	1
23	eP	z	20	19	17	0.5	1
23	iP	z	23	02	40d	1.0	2
	ipP	z	23	03	01d	1.0	2
	eL	Z	23	26.9		3.0	22
24	eP	z	01	11	39	0.8	1.2
24	iP	z	01	38	12d	1.0	1.2
24	iP	z	15	12	45d	0.5	1.3
	eL	Z	15	22	2.5	22	
24	eP	z	17	32	45	0.3	1
25	iP	z	14	00	28	0.5	1
25	iP	z	15	04	43	0.5	1
25	iP	z	15	23	12	0.3	1
	i	z	15	23	14	8.0	1
	iP	Z	15	23	12d	2.8	15
	iP	N	15	23	10s	3.2	18
	iS	Z	15	25	29u	16	14
	iS	N	15	25	29s	14	15
25	iP	z	16	53	47d	0.3	1
25	iP	z	18	42	18d	0.5	0.8
25	eP	z	21	23	09	0.3	1
	i	z	21	23	11d	0.5	1
26	ePKP	z	07	01	58	0.3	1
26	iP	z	11	41	18u	3.8	1
	iP	Z	11	41	18d	8.5	14
	iP	N	11	41	23s	1.8	10
	iPP	Z	11	44	45d	3.0	13
	i	Z	11	51	18d	12.0	1.8
	iS	N	11	51	30n	6.5	15
	i(PS)	Z	11	52	30d	7.8	14
26	e	z	11	59	47	0.3	1
26	eP	z	12	22	13	0.3	1
26	eP	z	14	12	07	0.3	1.2
	eS	N	14	22	36	18.0	1.7
	iSS	N	14	29	42n	6.0	24
26	iP	z	18	34	44d	1.0	0.8
26	iP	z	20	04	25u	0.3	1
	iP	Z	20	04	25d	1.8	7
	iX	z	20	04	27d	2.0	1.2
	ipP	Z	20	05	05d	2.2	10
	iS	Z	20	13	33d	1.8	15
	eS	N	20	13	55	1.5	10
27	eP	z	00	15	23	1.0	1
27	iP	z	07	50	23u	0.8	1.5
					Local.		
27	iP	z	21	04	09u	2.2	1
	iX	z	21	08	26d	0.3	1
28	eP	z	11	37	46	0.3	1
28	eP	z	19	58	16	0.3	1
28	eP	z	23	34	39	1.0	1

Date	Phase		h	m	s	A	T
AUG 28	iP	z	07	29	58u	0.6	1.6
29	iP	z	07	56	38d	0.3	1
29	iP	z	12	57	54d	0.6	1
	i(PcP)	z	12	58	22u	1.5	1
29	iP	z	14	10	49d	0.5	1.2
	i(PcP)	z	14	11	56u	0.3	1
29	eP	z	23	18	57	1	0.8
30	iP	z	14	40	25u	0.5	1
			Local.				
30	iP	z	16	37	07d	0.5	1
	eL	Z	17	23		2.0	24
SEP 1	e	z	12	54		0.5	1
1	e	z	13	09	.1	0.2	1
1	e		19	03	.1	0.3	1
1	e	z	21	43	.1	0.5	1
2	eP	z	05	47	30	0.7	1
	eS	Z	05	55	17	1.4	15
2	eP	z	05	47	27	0.5	1
2	eP	z	09	56	27	0.5	1
	i	Z	09	56	35u	1.0	11
	e	z	10	02	50	0.2	1
	eS	N	10	04	29	1.3	11
	e(S)	Z	10	04	35	2.0	09
2	e	z	12	49	28	0.5	1
2	iPKP	z	14	39	11		1
2	i	z	14	41	02d	0.2	6
	ePKKP	z	14	48	56	0.2	1
	ePKKS	z	14	52	41	0.3	1
2	e	z	19	02	.4	0.5	1.2
2	iP	z	20	29	18u	0.8	1.2
2	iPKP	Z	21	46	17d	0.7	1.2
3	iP	z	04	48	32u	0.3	1.2
3	eP	z	06	16	54	0.3	2
	i	z	06	16	59u	0.8	1.6
	e(L)	Z	06	35	.6	1.3	30
3	e	z	07	31	0.5	1.5	1
3	iP	z	14	48	32u	0.8	1
	i	z	14	50	12u	1.2	0.3
	ipP	z	14	50	23d	1.6	0.5
	e(PKKP)	z	15	13	37		
	e(P)	z	00	33	43	0.3	2
	e(S)	N	00	40	30	2	20
	i	Z	00	41	55u	2.2	15
4	iP	z	01	41	37u	0.7	2
4	e	z	07	56	.3	0.3	1
4	eP	z	08	25	04	0.3	1
4	eP	z	12	37	55	0.5	1.3
4	eP	z	22	17	47	0.3	0.8
	e	z	22	18	10	0.3	1.3
4	iP	z	22	47	26d	0.7	1.0
5	iP	z	01	24	41u	0.7	1.2
5	e	z	03	20	15	0.3	1
5	i	z	03	25	31u	0.5	1.0
5	iP	z					
5	i(P)	z	07	10	10d	0.5	1.2
	e	z	07	12	36	0.5	1.3
	i(S)	Z	07	17	38u	2.3	10
5	e	z	07	26	45	0.8	1.4
	e	z	07	29	40	0.3	1.1
5	ePKP	z	07	44	18d	0.4	1.4
	dSKS		07	50	56	0.3	1.3
5	e	z	09	05	42	0.3	1
5	e	z	09	34	32	0.3	1
5	iP	z	19	10	43d	1.0	1.1

Date	Phase		h	m	s	A	T
SEP 6	iP	z	00	29	55d	1.0	1.3
	epP	z	00	30	24	1.1	1.0
	e	z	00	33	57	0.3	1.0
6	iP	z	01	28	00d	0.3	1.0
6	ePKP	z	05	13	31	0.3	1.3
	ePKKS	z	05	27	30	0.3	1
7	iP	z	06	12	55u	0.4	1.2
7	ePKP	z	07	07	30	0.3	1
	ePcPPKP	Z	07	17	06	1.0	3
	iPcSPKP		07	19	08	1.0	4
	eL	Z	07	46			
7	ePKP	z	10	25	28	0.8	1
	i	Z	10	27	25u	1.4	4
	eL	Z	11	03			
8	iP	z	13	29	55		
9	iP	z	00	21	08		
	i	z	00	22	52		
9	iP	z	04	50	53d		
9	iP	z	05	03	08d	1.9	1.0
9	iP	z	09	10	29d	1.2	1.0
	i(S)	Z	09	19	05d	3.	8
	iS	E	09	18	37d	3.2	7
	i	E	09	25	01w	6.2	20
	eL	Z	09	27	.3	4.5	37
9	iP	z	12	20	22d	2.2	1.2
	iS	E	12	21	47	1.0	14
			Local.				
	i(S)	Z	12	22	13d	4.0	18
9	eF	z	20	14	37	0.3	1.2
10	eP	z	11	52	25	0.3	1
10	eP	z	14	55	05	0.3	1
10	iP	z	15	40	02	0.5	1.2
11	eP	z	12	11	41	0.3	0.8
	i	z	12	11	45u	0.8	0.7
			Local.				
	i	z	12	11	50d	7.0	0.8
11	iP	z	13	24	20u	0.6	1.0
11	iP	z	13	50	24d	1.2	1.0
	e(P'P')	z	13	22	31	0.3	1.0
11	e	z	14	36	25	0.3	1.0
	e	z	14	38	00	0.5	1.2
	e(L)	Z	15	02		1.5	25
	e(L)	N	15	02		1	25
11	eP	z	19	19	41	0.3	1
11	iP	z	23	32	01u	7.2	1.2
	iP	Z	23	32	01d	2.0	4.0
	iP	N	23	32	01s	1.0	5.0
	eP	E	23	32	01	0.3	1
	eS	Z	23	39	58	1	18
	eS	Z	23	39	58	1	18
	eS	N	23	39	58	0.8	10
	iSS	Z	23	46	42u	2.0	?
	eL	Z	23	47		2.0	33
	eL	N	23	48		1.5	20
12	ePKP	z	00	46	35	0.3	1
	eSKS	z	00	53	44	0.3	1
	iPKKP	Z	00	56	34u	1.5	?
	ePKKP	E	00	56	47	1.5	20
	e	Z	01	03	11	2.0	34
	eL	Z	01	20	3.5	30	
12	iP		00	03	58u	0.3	1
12	iP	z	08	26	06u	1.0	1.4
	eL	Z	09	05	3.0	26	
	eL	E	09	05		2	22

Date	Phase		h	m	s	A	T
SEP 12	ePKP	z	17	45	39	0.3	1
13	iP	z	00	03	58u	0.3	1
13	i(P)	z	09	12	10d	0.3	1.0
	iP	z	09	12	54d	0.9	1.2
	i	N	09	19	56n	1.5	16
	e	E	09	23	19	1.5	24
	e	Z	09	30	51	1.0	16
	e(L)	Z	09	34.9		1.3	15
	e(L)	N	09	34.9		2.0	16
13	iP	z	12	55	24d	2.0	1.0
13	iP	z	16	32	38u	0.3	1.0
14	iP	z	00	13	22	0.3	1.2
14	iP	z	06	24	51u	0.5	1.6
14	iP	z	12	40	08d	0.8	1.2
	i	z	12	40	20d	2.0	1.2
	eL	z	12	43.0		0.8	15
14	eP	z	14	07	27	0.3	1
15	iP	z	03	35	22u	0.5	1.4
15	iP	z	04	33	50u	1.0	1.0
	ipP	z	04	34	57u	0.5	1.2
	iS	E	04	43	14	3.5	6
17	i(P)	z	06	31	30u	0.7	1.0
17	i(P)	z	08	55	52d	1.3	1.2
17	iP	z	13	45	52d	0.3	0.8
	e	z	14	34	37	0.5	1
	e	Z	14	43	22	1.2	?
	eL	z	14	54.7		2.0	43
	eL	E	14	53.1		2.5	27
	eL	N	14	53.1		3.0	25
	e	z	21	51		0.3	1
	eL	Z	22	03.5		1.9	17
18	iP	z	03	24	19d	0.3	0.8
	i	z	03	24	37u	0.8	11
18	iP	z	03	58	13u	0.5	1.2
18	eP	z	12	34	33	0.3	0.8
	i	z	12	34	49d	0.8	1.0
18	eP	z	20	07	23	0.3	1
18	iP	z	00	50	27u	0.5	1.2
18	iP	z	01	04	18u	0.5	1.2
19	e(P)	z	23	38	33	0.5	1.2
20	eP	z	18	55	48	0.5	1.2
20	P	z	19	21	33u	0.5	1.6
21	iP	z	09	48	41d	0.5	1.5
22	iP	z	06	04	18u	0.5	1.2
22	iP	z	06	47	49u	1.3	1.0
22	iP	z	08	56	11u	0.5	1.2
22	iP	z	09	33	56u	0.7	1.2
22	e(P)	z	09	42	01	0.5	1.6
22	i	z	09	45	17u	0.3	1.3
22	iP	z	18	54	03d	0.5	1.6
23	eP	z	01	54	28	0.5	1.6
	eL	N	02	16			
24	e(P)	z	08	33	29	0.8	?
	iP	z	08	33	31d	1.8	1.8
	iP	N	08	33	34d	1.2	4
	eP	Z	08	33	35	1.2	4
	ipP	Z	08	33	50d	5	8
	ipP	N	08	33	50n	10	10
	iS	z	08	43	40u	1	5
	iS	N	08	43	41n	5	12
	iS	Z	08	43	45u	14	12

Date	Phase		h	m	s	A	T
SEP 24	isS	Z	08	44	03d	11	20
	isS	N	08	44	07s	50	50
	i(PSP)	z	08	44	37u	1	4
	ePKKP	z	08	52	18	0.5	1.2
	eP'P'	z	09	00	07	0.8	1.2
	iP'PKS	z	09	03	39d	1.0	9
	i	z	09	20	14		
24	iP	z	09	23	02u	0.5	1.1
25	iP	z	02	24	30u	1.1	1.6
25	i(PKP)	z	06	09	39d	1.0	1.5
	e(PKS)	z	06	13	15	1.0	1.5
	eL	Z	06	56.8			
25	eP	z	07	21	58	0.5	1.0
	e	Z	07	24.5		1.5	21
25	e	z	07	27	10	2.0	18
25	iP	z	08	32	03d	0.5	1.2
	eL	Z	10	12		1.4	20
25	iP	z	11	37	38u	0.8	1.6
25	iP	z	14	19	31u	0.6	1.2
	eP'P'	z	14	47	39	0.3	1.2
	e	Z	14	47.7		0.8	1.0
25	e(pP)	z	15	22	19	0.3	1.0
25	iP	Z	16	28	41u	0.8	1.6
25	eP	z	16	42	19	0.3	1.1
25	iP	z	16	49	02d	0.3	1.2
	iP	Z	16	49	03u	1.2	10
	ipP	z	16	49	11d	1.0	1.2
	i	Z	16	49	33u	1.5	14
	eS	E	16	59	07	1.0	7
	iS	N	16	59	10n	1.0	?
	i(SKS)	N	16	39	15s	1.2	7
	i(SKS)	Z	16	59	15d	1.2	6
25	iP	z	16	56	37u	1.0	1.3
25	iP	z	18	09	59d	0.3	1.0
	e	z	18	10	44	0.3	1.0
25	iP	z	21	21	09u	0.5	1.6
25	eP	z	22	29	27	0.3	1.0
25	eP	z	23	45	58	0.3	1.0
26	eP	z	02	44	27	0.3	1.0
26	eP	z	06	13	18	0.3	1.1
26	iP	z	06	43	02u	0.3	1.3
	e	Z	06	48	23	1.6	8
26	eP	z	07	09	24	0.3	1.0
26	eP	z	10	20.1		0.3	1.1
26	eP	z	10	34	04	0.3	1.1
26	iP	z	11	10	13d	0.8	1.6
26	e	z	12	08	08	0.3	1.0
26	eP	z	14	33	26	0.3	1.1
26	iP	z	18	59	10u	1.4	1.1
26	eP	z	20	28	38	0.3	1.2
26	iP	z	21	45	19d	0.3	1.6
26	iP	z	22	18	35u	0.3	1.6
27	ePKP	z	00	43	31	0.3	1.2
27	eP	z	04	19	(18)	1.5	1.2
	eP	Z	04	19	20	?	0.5
	eX	Z	04	19	27	2.2	7.0
	e(PKS)	Z	04	28	23	1.8	5.0
	eX	Z	04	30	00	1.0	8.0
	iX	N	04	30	01s	5.0	1.0
	iS	N	04	30	06s	7.3	7.0
	iS	E	04	30	06w	2.0	1.4

Date	Phase		h	m	s	A	T
SEP 27	iS	Z	04	30	11	3.9	?
27	ePKP	z	05	18	13	0.3	1.2
27	iP	z	06	08	43u	1.2	1.5
	ePPP	Z	06	13	56	1.0	20
	eS	Z	06	18	16	1.2	20
	eL	Z	06	33		2.0	40
27	iP	z	22	47	08d	4.8	1.0
	e(S)	N	22	49	15	1.4	15
	e(S)	E	22	49	15	1.0	15
			Local.				
	e(S)	Z	22	49	20	1.6	20
28	ePKP		00	43	32	0.3	1.3
28	eX	z	00	46	49	0.7	5
	eX	Z	00	46	51	1.3	10
28	eP	z	04	22	51	0.6	1.6
28	iP	z	07	15	01	0.5	1.2
28	iP	z	14	28	23u	7.0	1.6
	iP	Z	14	28	23	11.2	4
	iP	E	14	28	24e	2.0	7
	iP	N	14	28	24s	6.0	10
	ipP	Z	14	30	10d		
	ipP	N	14	30	10s	19.5	14
	ipP	E	14	30	10e	6.0	7.0
	iPPP	N	14	31	15s	12	14
	iS	N	14	35	09s	15	15
	iS	z	14	35	10d	2.9	9
	iScS	N	14	36	06s	31	17
	isS	N	14	38	29s	46	21
	ePKPPKP	z	14	58	19	1.2	1.2
28	iP	z	14	38	38d	10.5	1.2
28	iP	z	14	52	28u	1.6	1
28	iP	z	21	16	09d	0.3	1.2
28	eP	N	23	34	22	1	15
	iP	z	23	34	23u	2.0	1.2
	iP	E	23	34	23e	1.2	21
	iX	z	23	34	28d	2.0	1.2
	iX	Z	23	34	29d	2.0	?
	iS	N	23	36	40u	5.0	14
	iS	E	23	36	40e	5.5	14
28	iS	z	23	36	40u	0.8	7
	iX	Z	23	36	52d	2.0	?
29	iP	z	01	39	39d	0.3	1.2
29	iP	z	02	11	40d	1.6	1.2
	iP	Z	02	11	40u	4.7	9
29	iP	E	02	11	40w	5	11
	iP	N	02	11	40n	4.5	10
	iX	z	02	13	19u	1.1	4
	iX	E	02	13	19w	1.8	5
	iX	Z	02	13	20d	2.2	6
	iS	Z	02	13	46d	3.8	15
	iS	N	02	13	47s	23	18
	iX	E	02	13	56e	22.5	14
	iX	Z	02	14	26	?	?
29	iP	z	06	49	13u	2.2	1.2
29	iP	z	07	14	37u	2.0	1.2
29	iP	z	08	21	08u	7.5	1.2
	iP	Z	08	21	08d	4.1	8
	eX	Z	08	23	07	1.7	2
	iX	N	08	24	13s	1.5	6
	iS	E	08	27	23w	10.6	10
	isS	E	08	29	57w	10.5	12
	isS	z	08	30	02u	1.1	4
	iX	E	08	33	45e	9.5	13
29	i(PP)	z	08	25	27d	2.0	1.2

Date	Phase		h	m	s	A	T
SEP 29	eP	z	17	46	58	0.3	1.1
30	iP	z	12	18	31u	0.3	1.6
30	eP	z	13	54	07	0.3	1
OCT 1	iP	z	07	23	19d	0.9	1.0
1	iP	z	21	47	11d	Local?	
2	iP	z	03	42	07u	Local.	
2	iP	z	11	37	31d	0.7	1.5
	eL	Z	12	10.5		1	25
2	ePKP	z	12	47	13	0.6	1.3
	ePS	Z		56	49	0.9	10
	e	Z	13	01	57	1.2	6
	eSS	N		02	54	1.5	10
	eL	Z		21		1.3	23
2	iP	z	14	04	59u	Local?	
2	eP	z	15	58	11	0.3	1.8
	e	Z	16	04.2		1.0	26
2	iP	Z	20	52	14d	1.3	7
	iP	zN			15d	0.9	1.2
	iS	Z		59	49d	5.0	16
	iS	N			54s	13.5	17
	eL	Z	21	08.0		3.8	50
2	eP	z	21	11	24.	0.5	1.2
2	iP	z	23	54	43u		
3	eP	z	06	09.7		0.5	1.3
			Records disturbed by high wind.				
4	ePKP	z	05	45	20	1.3	>10
	i	z		46	37	3.0	12
			Records disturbed by high wind.				
4	i	z	07	04	13u		
	iP	z			15d		
	eP	Z			17		
			Wind interference.				
5	eP	z	16	16	59	0.5	1.1
5	iP	z	21	16	34u		
6	iP	z	00	48	04u		
7	iP	z	16	57	13u		
8	iP	z	07	05	11d	2.6	1.0
	ipP	z			45d	1.0	1.0
9	iP	z	14	37	16u		
			Local.				
10	iP	z	03	55	02d	3.0	1
10	iPKP	z	07	57	18d	0.5	1
10	eP	z	14	32	35	0.3	1.2
	eL	Z		56.9		2.0	23
10	i(P)	z	18	52	40u		
10	iP	z	18	52	53u	1.2	1.6
10	ePKP	z	19	12.8		0.3	1.0
11	iP	z	00	39	11	0.8	1.4
12	e	z	16	54	54		
12	eP	z	16	55	21	0.5	1.2
	eS	E	17	02	28	1.3	7
	iSS	ZE		05	58w	0.8	14
						3	11
	eL	E		11.6		1.6	18
12	iP	z	19	08	38d	0.6	1
	eP	Z			39	2.0	12
	iS	ZN		17	59ds	3.8	16
						3.6	7
	i(SS)	E		22	44e	3.2	11
	i(SS)	N			58s	3.2	11
	iSSS	Z		25	48d	1.2	15
	iSSS	N			50s	1.0	10

Date	Phase		h	m	s	A	T
OCT 12	e(SSS)	E		26	11	2.5	22
	eL	Z		31.5		2.3	37
12	eP	z	22	14	21	0.3	1.2
	eL	Z		38.9		1.0	28
13	e	z	04	40	33	1.0	5
	eSS	N		57	36	2.1	25
13	iP	z	05	29	15d		
13	eP	z	20	30	22	0.5	1
	iS	Z		33	02u	4	0.8
	eS	E			03	1.2	15
	eS	N			05	1.4	15
13	iP	z	20	36	22u	0.3	1
	iP	ZNE			23dsw	7	8
	i(PcP)Z			37	50u	4.8	5
	iS	ZE		38	54de	4	20
	iS	N			55s	9	25
13	iP	z	03	21	11u	1	1.5
	eS	N		25	24	2	20
	eS	E			29	1.5	20
	eS	Z			30	1.5	
	eL	Z		27			
14	eP	z	12	28	46		
14	eP	z	12	56	03	0.3	1.0
14	eP	z	14	19	16	0.3	1
15	iP	z	06	03	09u	1.1	1.3
15	eP	z	12	49.1			
15	e	N	12	58	15	4	21
	e	Z	13	00	16	2.3	22
15	e	N	13	18	17	6.5	20
	e	Z		20	02	2.3	21
17	eP	z	14	49.0		0.3	1.1
17	eP	z	14	57	20	0.3	1.1
17	eP	z	15	33	17	0.3	1.2
17	eP	z	17	56	21	0.3	1.0
19	eP	z	18	42	42	0.3	1.2
	eP	Z			42	2.5	17
	ePP	z		46	56	0.8	4
	iPP	Z			57d	4.3	15
	iPP	N			59u	2.2	15
	i(PKP)z			47	14u	1.0	1.5
20	ePKP	z	12	23	11	0.3	1
	e	Z		32	12	1.0	8
	e(PPS)N			34	58	1	12
	iSS	NE		40	12es	1	27
	i(SKKS)Z				40u	1.5	14
	eSSS	Z		44	56	1.2	24
	eL	N		52.8		3.5	50
20	iP	z	16	06	17u	1.2	1.3
20	e(P)	z	19	30.2			
21	iP	z	00	27	36d	3	1.2
	P	ZN			36u	1	6
	eL	Z		46.5		2	30
	From 21d to 23d blizzard conditions interfering with recordings.						
23	iP	z	00	02	45d	2.1	1
24	iP	z	00	27	31d	1.2	1
	iP	ZN			31ds	1 3	8
	i	Z		28	05d	2.5	9
	iS	E		35	35w	2	12
	iS	ZN			36dn	2.2	11
	eL	Z		44		3	44
24	iP	z	09	15	59u	1	1.3
	i	z		16	10u	1	1.2

Date	Phase		h	m	s	A	T
OCT 24	iPcP	z			32d	1	1.2
	ipP	z		17	43d	0.5	1.6
	i	N		18	39s	1.2	7
	iS	N		22	46n	3.2	21
	i(PPS)	N		24	51s	1.2	8
	isS	N		25	50s	3.3	1
24	iP	z	20	18	40u	2.3	1.0
	iP	Z			42u	1.1	10
	i(pP)	z			55u	1.3	1.0
	e	Z		42.1		1.0	23
	e	Z		47.1		2.0	21
24	e(PPS)	Z	22	13.4		1.6	9
	i(SSS)	Z		19	49d	1.9	25
	eL	Z		36.6		3.7	24
25	ePKP	z	10	22.7		0.5	1.2
25	iP	z	20	49	55d	1.8	1
	i(P)	z			57u	2.2	1
	iP	ZN			58ds	2.0	16
	i(S)	E		51	43e	1.9	14
	i(S)	N			45s	8.9	20
	i(S)	Z			48u	6.0	20
25	iP	z	22	57	43u	1.3	1.0
26	eP	z	04	43	02	0.5	1.5
26	iP	z	08	34	37u	0.9	1.2
26	iP	z	14	28	55d	1.2	1
	iPP	z		31	55d	1.3	1.6
27	iPKP	z	22	51	29d	1.2	1.2
	i	z		52	06u	0.9	1.2
27	iP	z	23	07	08u	2.2	1.0
	i(pP)	z			20d	1.0	1.2
29	iP	z	02	33	34u	0.7	1.4
	iPP	z		36	27u	0.1	1.2
29	eP	z	12	54	38	0.3	1.2
	i	z		55	22d	0.7	1.0
29	eL	Z	03	00.5		1.5	25
31	e	Z	10	25	25	0.5	8
	iS	E		32	32w	1.3	14
	e(SP)	Z		34	43	1.0	22
	iSP	E		35	10w	3.5	22
	iSS	Z		40	22d	1.9	35
	iSSS	Z		44	23d	3.2	22
	eL	E		52.5		2	28
	eL	Z		54.8		2	30
31	iP	ZE	10	33	45	2.7	11
31	eS	ZE	17	07		3.0	31
NOV 2	iP	z	16	29	21u	0.6	1
	e(PKKP)	z		45	27	0.3	1
2	iP	z	18	40	26u	1.9	1.2
	iP	Z			26d	4.0	8
	eP	E			27	0.7	7
	i(PcP)Z			41	14d	3.2	8
	iPP	Z		42	39d	1.9	12
	e	Z		48	12	1.7	14
	iS	E			29e	2.1	12
	iSS	Z		52	21u	1.7	15
	iSSS	Z		54	26u	2.8	18
	eL	E		55.1		5	17
	eL	Z		58.2		7	31
	e(PKPPKP)z		19	10	02	0.3	1
3	eP	z	10	35	41		
	ipP	z			52u		
	eS	E		44	50		
	eL	N		57			
	ePKPPKP	z	11	04	38		
3	i(pP)	z	11	25	31		

Date	Phase		h	m	s		A	T
NOV 3	i(pP)	z	11	25	31			
	e(PKPPKP)	z		54	10			
3	eP	z	15	38	46			
3	eP	z	22	59	38			
	e(S)	N	22	07	13			
	eL	N		19				
4	eP	z	13	55				
			Very emergent.					
4	eP	z	15	06	07d			
5	iP	z	00	47	27	u		
5	iP	z	10	03	35	d	1.2	1.0
	iPKKP	z		26	15	u	0.7	0.8
5	eP	z	11	23	44			
6	iP	z	05	10	33	d		
7	eL	Z	02	05.5				
7	iP	z	03	09	33	u		
	eL	Z		28.9				
7	iP	zE	06	27	18	u	0.5	1.6
							1.7	10
	iS	E		31	38	e	1.8	15
	eL	E		32	36		21	16
8	iP	z	02	57	19	u		
8	eP	z	06	29	11			
9	iP	z	19	21	26	u		
10	iP	z	02	47	10	d	0.5	0.9
	iP	Z			10	u	2.8	11
	i(P)	N			14	d	1.2	11
	iS	ZNE		55	58unw		4	12
							5.1	15
							8.6	16
	iSS	ZE	03	00	17de		5.8	22
							8	22
	eL	Z		07	08		8	26
	ePKPPKP	z		15	50		0.3	1
10	iP	z	03	54	30	d	0.5	1
10	eP	z	08	53	39			
10	iP	z	12	57	34			
11	i(P)	z	13	11	42	d		
	i	z		12	14	u		
11	iP	z	22	50	48	u		
	i	z		51	21	u		
12	iP	z	00	29	33d			
12	iP	z	01	42	40	d		
	ipP	z			50	u		
	epP	Z			52			
	iS	N		51	35	s		
	eS	Z			40			
12	iP	z	09	45	01	d		
12	iP	z	18	28	05	d		
13	eP	z	00	25	04			
13	iP	z	17	30	22	u	2.6	1
	iP	ZNE			22ds		8.5	7
							6.7	7
	ipP	zN		31	57ds		9	1.6?
							5.5	12
	iS	N		36	11	n	2.2	11
	i(sS)	N			22	n	6.9	16
	i(sS)	Z			25	u	8.3	15
	i(sS)	E			30e		10.8	24
	iSS	ZE		39	28uw		6.9	12
							21	26
14	eP	z	03	14	56			
14	eP	z	10	23	42			
14	ePKP	z	14	36	08			

Date	Phase		h	m	s		A	T
NOV 14	iP	z	16	44	06	u		
14	eP	z	18	07	13			
14	eP	z	21	35	12			
14	iP	z	22	57	20	d		
15	iP	z	08	05	08	u	1.2	1.2
	e	Z			47		0.8	6
	i(PP)	z		08	27		0.6	1.2
	iS	N		15	26	s	3.2	17
	e(S)	E			31		1	17
	i(S)	Z			36	d	1.3	17
	iPS	Z		16	41	d	1.5	12
	e(SS)	Z		21	12		1	25
	e	Z		24	48		1.9	20
	e	N			49		1.9	17
15	iP	z	12	22	08	d	Local.	
	i(P*)	z			10	u		
15	iPKP	z	12	49	25	d		
	ePP	Z		51	12			
	iPS	Z	13	01	06	d		
	e(SS)	N		08	30			
	eL	E		21.9				
	eL	Z		27.8				
16	iPKP	z	02	07	46	u		
17	eP	Z	15	50	57(u)			
	i(S)	ZE		58	31	dw		
	i(S)	N			36	s		
	eL	Z	16	06.0				
17	iP	z	19	08	17	u	Local.	
18	iP	z	15	01	06	u	Local.	
	i(P*)	z			11			
18	iP	z	15	06	45	u		
18	iP	z	15	18	34	u		
19	i	z	00	43	15	u		
	i	z			25	d		
19	eP	z	02	37	16			
	iP	ZN			16	ds		
	ipP	z			25	d		
	i(S)	N		39	37	u		
	i(S)	Z			38	u		
	eL	Z		40.1				
19	iPKP	z	16	29	38	d		
20	ePKP	z	12	59	39		0.5	3
	iPKP	Z			39	d	1.0	5
	e	z	13	01	28		1.3	9
22	eP	z	07	45	58			
22	eP	z	08	31	10			
22	eP	z	16	07	05			
	eL	E		12.5				
22	iP	z	16	14	34	d		
	i(P*)	z			38	u		
22	eP	z	22	02	58			
23	eP	z	01	17	39		0.7	1.3
23	eP	z	16	43	02			
23	iP	z	18	08	50	d		
23	iP	z	22	13	06	u		
	eL	z		27.5				
25	iP	z	00	11	10	u		
25	iP	z	00	38	43	d		
25	iP	z	22	47	04	u	2.3	1.6
	iP	Z			04	d	3.8	5.0
	i(PP)	z		49	55	d	1.2	4
	iPP	Z		50	00	d	2.2	8.0
	iPPP	Z		51	56	u	2.0	10
	eS	Z		56	55		2.0	19

Date	Phase		h	m	s		A	T
NOV 25	eSS	Z	23	02	07		4	20
	eL	Z		08.7			2.9	23
26	iP	z	05	22	05	u	1.8	1.6
	iP	ZE			05	dw	3.2	10
							1	7
	iPP	z		24	58	u	2.3	2
	iPP	Z			59	d	1.8	9
	iS	ZE		32	03	dw	2.2	17
							2.0	17
	eSS	Z		37	04		4.2	30
	eL	Z		43.5				
26	iPKP	z	11	54	45	d	0.5	1.2
	eL	Z	12	36.6			1.1	11
27	eP	z	01	57	07			
27	iP	z	03	33	28	u		
27	eP	z	08	14	52			
27	iP	z	08	44	42	u		
27	iP	z	14	08	45	d		
	i	z		09	23			
27	iP	z	22	48	40	u		
28	eP	z	05	22	15			
28	iP	z	21	00	01	u	1.5	1.6
	iP	NE			02	w	0.5	10
							2.0	11
	iS	E		08	01	w	2.8	14
	iS	N			03		0.7	10
	iSSS	N		14	51	s	4.0	35
	iL	E		17	30	e	4.0	42
28	eP	z	35	08.4		Very emergent.		
29	eP	z	07	34	53			
29	eP	z	10	11	38			
29	iP	z	17	49	56	d		
	eS	E		54	52			
	e	N		55	26			
	eL	N		57.1				
29	iP	z	21	52	45	d		
29	iP	z	22	31	22	d	17	1.2
	iS	z		41	19	u	2.0	7
	eSS	z		45	46		1.8	6
	ePKKP	z		50	04		1	1.2
	ePKPPKP	z		57	52		1	1.2
	i	z		59	22	u	2.8	5
	i	z	23	02	52	u	1.8	5
30	iP	z	02	12	51	d		
DEC 3	iP	z	15	25	20	u		
3	e	Z	21	21	48			
	eL	Z	22	05.3				
4	iP	z	00	38	59	u		
4	iP	z	03	36	34	d		
4	iPKP	z	03	57	55	u	3	1
4	iP	z	07	26	17	d		
4	eP	z	09	01	54			
	e	z		02	24			
4	eP	z	12	05	39			
	e	z		06	22			
4	iPKP	z	13	39	12	u	½	1½
5	iP	z	10	49	14	u		
	e	z			47			
6	iP	z	09	50	26	u		
7	iP	z	03	27	11	u	2	1¼
	eS	Z		35	43		2	10
	eS	N			50		1½	10
7	iP	z	10	53	34	d		
7	i(P)	z	14	23	26	d		
	i(pP)	z			57	d		

Date	Phase		h	m	s		A	T
DEC 7	i(P)	z	15	08	42	d		
	i(pP)	z		09	17	d		
7	i(P)	z	15	38	42	d		
7	eL	Z	23	15.1				
8	iPKP	z	15	47	54	d		
8	iPKP	z	15	47	54	d		
8	eP	z	15	56	46			
8	i(pP)	z	16	14	34	u		
8	i(pP)	z	16	45	54	d		
8	ePKP	z	16	46	00			
9	eP	z	08	47	24			
9	iP	z	15	59	29	u		
9	eP	z	16	21	26			
	i(pP)	z		22	01	d		
9	ePKP	z	22	27	13		0.3	1¼
10	iP	z	14	46	49	u	1	1½
	iP	ZNE			49	ds(W)	5	14
							3	15
							1	16
	ipP	z			58	u	5½	1¼
	iS	ZN		55	36	us	10	10
							8	16
	i(S)	E			54	w	19	20
	i(SS)	N		59	30	s	14	9
	iSS	E			57		5	25
	iSSS	E	15	03	25	e	4½	22
	i(SSS)Z				29	u	10¾	18
	ePKKP	z		06	12		0.3	1½
	eL	Z		07.1				
	iPKPPKP	z		15	22	d	1.2	7
10	iP	z	20	00	03	u		
11	eP	z	09	12	43			
12	iP	ZN	18	48	20		2	6
							1	7
	eS	N		56	24		2	22
	eL	N	19	05.5			1	37
	eL	Z		05.7			2½	36
13	iS	Z	01	56	34	d	1.8	10
13	ePKP	N	02	05	03		1.8	10
	iPP	N		07	46	s	6.7	11
	iSP	Z		16	54	u	6.7	11
	eSPP	Z		18	27		4	12
13	eP	z	20	14	50			
13	eSS	N	21	04	45			
	e	Z		05	07			
	eL	Z		30				
	eL	N		33.0				
16	ePKP	z	17	47	05		0.5	1.2
16	iP	z	19	14	21	d		
	eL	Z		25.1				
17	ePKP	z	05	29	15		0.5	1.6
	ePKP	Z			15		1.0	7
	ePP	Z		30	51		1.2	9
	iSS	N		48	43	n	7.3	24
17	iP	NE	14	00	18	w	31	7
							15.3	7
18	iP	Z	20	53	27	u		
20	iP	Z	11	29	53	u		
	eS	Z		38	52			
	e(SSS)Z			47	06			
	eL	Z		52.6				
25	iP	z	16	13	25			
	eP	Z			26			
25	ePKP	Z	16	45	15		1	3
	e(SKS)Z			54	40		1.3	15

Date	Phase		h	m	s		A	T
DEC 25	eL	Z	17	19	0.0			
26	iP	Z	12	16	52	d	2.0	9
	iPP	Z		18	30		1.1	11
28	eP	z	14	49	06		1.5	1.6
	eP	ZE			06		1.2	12
							1.7	11
	S	ZNE		59	32	se	1.1	12
							2.1	16
							2.0	12
	eL	Z	15	17	5		2.5	30
28	iP	Z	19	11	11	d		
	i(P)	z			15	d		

Date	Phase		h	m	s		A	T
DEC 28	eS	ZE		19	13			
	eL	Z		27				
30	iP	z	23	20	10	u		
31	iP	z	14	34	05	u	0.7	1.2
	iP	ZN			05	ds	2.1	15
							1.8	19
	ipP	z			14	u	1.8	1.6
	iS	ZNE		38	44	usw	4	15
							4	27
							8	12
	eL	z		40.6			10	22

INSTRUMENTALLY DETERMINED EPICENTRES

The following list includes the epicentres of all earthquakes reported felt, and of all instrumentally recorded earthquakes of magnitude 4 and above. An explanation of the notation will be found at the beginning of the section 'Station Readings'. These epicentres have been plotted on the folding maps at the back of this Bulletin.

No	Date	h	m	s	Epicentre	Depth	Mag.	Class
57/ 1	JAN 5	05	40	01	41.2 S 178.1E	N?	4.4	C
2	8	10	54	35	36.4 S 177.4E	250km	5.1	C
3	9	02	44	01	38.2 S 178.0E		3½	D
4	9	21	38	00	38.2 S 175.9E	300km	5.1	C
5	10	02	21		Felt Inveraan (Locality 35)			
6	11	22	25	03	38.2 S 177.9E	S	4.7	C
7	12	00	31	30	45.4 S 168.0E	N	5.1	D
8	13	05	34	32	38.4 S 176.0E	210km	4.6	B
9	19	01	36	56	40.1 S 175.1E	90km	4.4	C
10	21	01	14	45	36 S 175¼ E	N	3	D
11	24	01	20	04	39.0 S 176.25E	90km	4.8	B
12	24	15	16	50	39.9 S 174.5E	170km	4.1	D
13	24	17	18	.3	36 S 175 E	N	3½	D
14	30	06	18	54	38.4 S 176.6E	165km	4.6	B
15	31	14	54	21	39.0 S 176.7E	N	3.9	C
16	FEB 3	18	19	42	41.4 S 174.0E	N	4.4	C
17	3	23	52	49	38.2 S 176.2E	180km	4.4	C
18	6	11	55	28	39.2 S 175.25E	N	3.7	C
19	9	02	10	32	34.3 S 180.0	N	5.2	D
20	9	13	29	20	33.8 S 179.5W	135km	6¾±	D
21	12	14	08	.4	Felt Westport		2.2	
22	15	07	44	01	36.2 S 178.9E	N	4.6	C
23	16	22	42	41	39.9 S 173.1E	N	4.3	C
24	17	01	17	02	45.0 S 168.1E	N	4.2	D
25	19	04	04	33	38.5 S 175.45E	250km	4.3	B
26	22	00	30	11	39.2 S 175.1E	S	5.5	C
27	MAR 1	01	30	44	37.85S 176.4E	210km	4.6	B
28	2	08	40	19	38.65S 176.1E	16.km	4.4	C
29	3	09	45	28	42.8 S 170.7E	S	4.3	C
30	4	12	17	33	45 S 168 E		4±	D
31	MAR 4	18	20	26	39.1 S 174.0E	S	3½	C
32	4	21	20	27	41.2 S 174.8E	S	3.5	C
33	7	05	29	17	38.5 S 178.6E	S	5.0	C
34	11	22	05	39	37.3 S 178.6E	170km	4.5	C
35	13	00	30	29	38.3 S 177.7E	S	3.9	C
36	13	09	11	30	38.7 S 175.6E	270km	6.5±	B
37	18	02	58	21	38.1 S 176.2E	185km	4.7	B
38	23	06	06	40	38 S 176¾ E		3	D
39	23	09	49	34	39.8 S 177.0E	N	4.2	C
40	24	03	49	49	40.5 S 175.9E	S	4.6	B

No	Date	h	m	s	Epicentre	Depth	Mag.	Class
57/41	MAR 24	07	19	47	42.7 S 171.4E	N	4.5	C
42	24	23	21	04	40.5 S 175.4E	N	3.7	C
43	28	09	49	13	34.7 S 180.0	300km	5.9	C
44	29	20	01	22	38.7 S 175.95E	150km	4.6	C
45	29	20	48	31	42.6 S 172.3E	N	2¾	D
46	31	12	51	50	42.75S 171.4E	S	4.0	C
47	APR 6	15	28	06	40.2 S 175.0E	N	4.2	C
48	9	10	16	49	38.9 S 175.2E	100km	4.3	C
49	11	12	14	23	38.5 S 178.7E	N	4.3	C
50	12	09	18	25	39.2 S 175.8E	N	4.0	C
51	13	11	59	13	41.1 S 177.5E	S	4.5	C
52	21	02	43	54	40.5 S 176.7E	S	4.7	C
53	24	16	44	40	40.5 S 173.3E	130km	4.7	C
54	25	10	12	15	38.0 S 178.9E	N	4.5	C
55	25	18	13	44	40.3 S 173.5E	160km	4.4	B
56	27	02	43	18	35.5 S 179.4E	N?	4.8	D
57	28	21	10	36	38.0 S 177.3E	N	4.2	D
58	30	15	30	01	38.3 S 178.2E	N	4.4	C
59	MAY 5	22	08	25	41.2 S 172.6E	180km	4.1	C
60	9	03	20	50	38¼ S 178½ E	N	4¼	D
61	15	16	09	45	40.5 S 174.0E	S	5.0	B
62	16	12	42	37	40.0 S 175.1E	N	4.1	C
63	19	20	32	53	37.75S 176.3E	216km	5.1	B
64	20	06	39	07	38.3 S 176.2E	200km	4.8	B
65	26	03	24	49	37.5 S 177.5E	140km	4.7	B
66	28	09	42	44	44½ S 167 E	S	4½	D
67	JUN 2	12	08	32	35¾ S 175 E	S	3¾	D
68	3	12	12	14	35¾S S 175 E	S	3¾	D
69	4	05	35	05	Felt Mokohinau Is.		2¾	D
70	4	22	24	45	Felt Mokohinau Is.		2¾	D
71	7	10	37	25	Near Whakatane.		3¼	D
72	8	22	12	04	Felt Mokohinau Is.		3	D
73	9	04	31	24	Felt Mokohinau Is.		3¾	D
74	JUN 10	02	36	00	37.4 S 178.0E	220km	4.6	D
75	13	07	27	36	38.7 S 175.9E	160km	4.6	C
76	16	11	47	11	39.1 S 174.6E	200km	4.3	C
77	28	08	30	22	27.6 S 176.8E	324km	4.5	D
78	JUL 3	06	10	14	40.0 S 175.0E	80 km	4.1	C
79	5	12	40	33	42.3 S 173.4E	N	4.1	B
80	9	21	33	17	41.35S 173.3E	100km	4.4	B
81	10	16	10	55	35.6 S 179.7E	250km	5.4	D
82	13	10	01	04	39.6 S 174.3E	200km	4.0	D
83	16	15	03	25	35.3 S 179.0E	150km	5.2	C
84	17	13	54	34	41.7 S 173.5E	S	3.9	C
85	20	14	00	33	39.5 S 175.6E	60±km	4.1	D
86	22	06	16	52	33.5 S 178.0W	N	6.6	C
87	22	06	21	50	34.0 S 177.3W	N	6.3	D
88	24	06	05	34	35.9 S 179.4W	S	5.2	C
89	24	13	09	41	35½ S 178¼ W	S	5.2	D
90	24	18	21	18	34 S 177¾ W	N	5¼	D D
91	26	06	49	42	35.8 S 179.1W	S	5.4	C
92	27	14	10	56	45.8 S 179.4W	S	5.1	C
93	29	09	57	13	34 S 178 W	S	5.4	D
94	AUG 2	02	09	35	38.3 S 177.9E	S	4.4	C
95	2	02	12	28	38.3 S 177.9E	S	5.2	C
96	2	03	03	13	Felt Motu.		3¾	D
97	2	07	05	23	38.3 S 177.9E	N	4.2	C
98	2	13	00	58	38.3 S 177.9E	S	4.8	C
99	2	18	52	18	Felt Motu.		3¾	D
100	3	02	57	56	38.4 S 176.1E	160km	4.7	B
101	3	08	56	16	38 S 177¾ E	N	4.0	D
102	3	09	59	10	38.4 S 178.3E	S	4.6	C
103	3	12	54	03	38.4 S 178.3E	S	5.0	C
104	3	22	44	49	40.4 S 176.8E	S	4.1	C

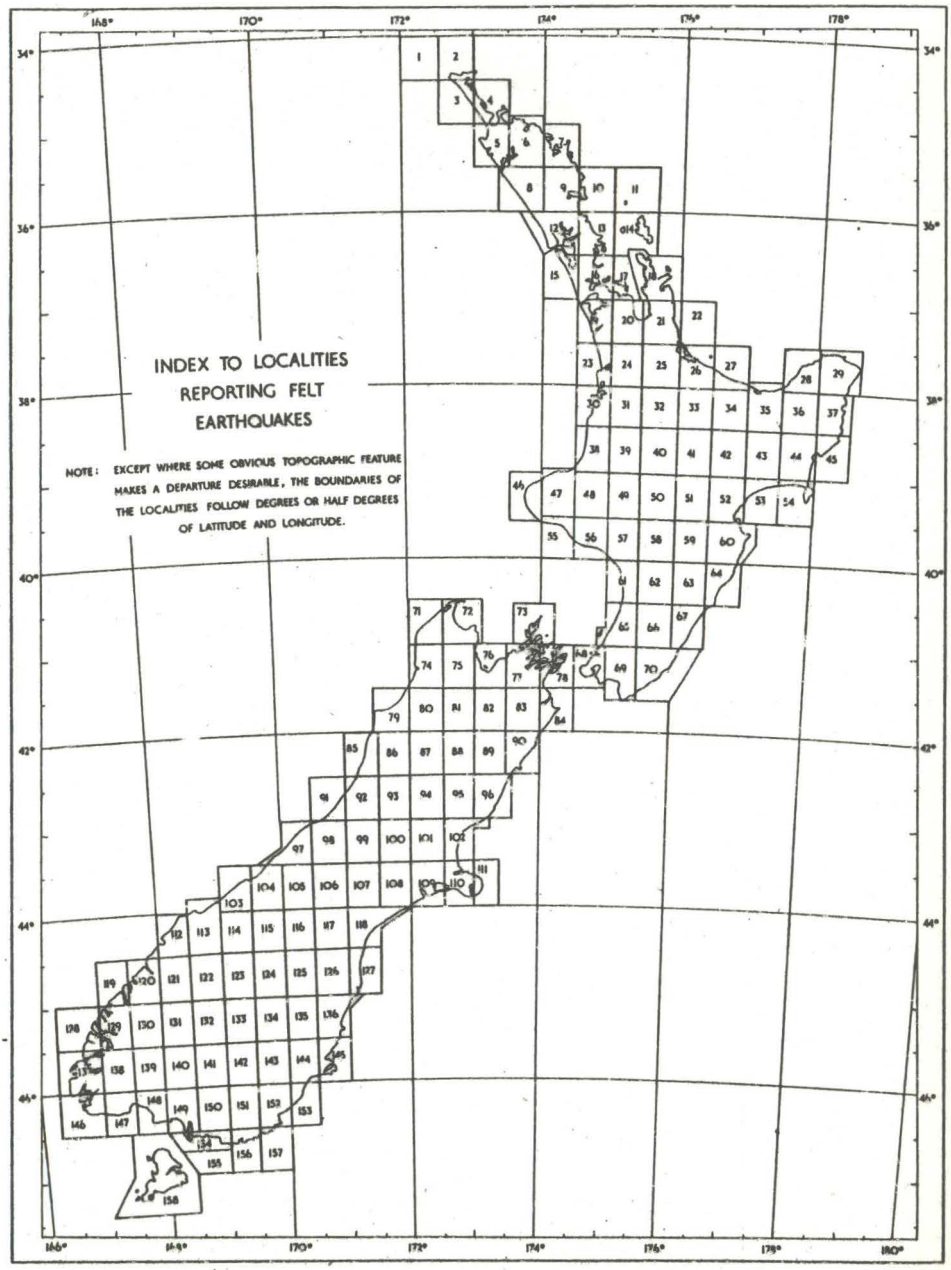
No	Date	h	m	s	Epicentre	Depth	Mag.	Class
57/105	AUG 4	05	52	41	38.1 S 177.7E	S	4.6	C
106	4	23	35	53	Felt Matawai.		3.8	D
107	5	21	30	30	32½ S 179½W	N	5.4	D
108	7	04	28	03	40.2 S 178.5E	N	4.1	D
109	9	08	45	45	43.5 S 170.8E	N	4.1	C
110	11	05	12	54	39.0 S 176.0E	N	5.8	B
111	11	11	01	16	37.8 S 177.2E	N	3.1	D
112	14	02	02	09	40.7 S 176.5E	S	4.9	C
113	14	13	40	22	38.1 S 176.8E	N	3.8	D
114	19	21	35	12	37.9 S 176.8E	N	3.3	C
115	21	05	48	03	40.9 S 176.0E	S	5.6	B
116	25	00	11	58	37.7 S 176.3E	200km	4.2	D
117	26	08	28	26	35½ S 180	200km	4.7	D
118	27	15	01	01	42.0 S 174.2E	S	3.9	C
119	28	17	41	47	42.2 S 174.2E	N	3.5	D
120	SEP 1	07	50	06	39.3 S 174.9E	210km	4.8	C
121	1	13	36	58	40.8 S 176.7E	S	4.8	B
122	13	00	11	23	41.4 S 174.5E	60 km	3¼	C
123	13	19	56	12	41.0 S 175.3E	N	4.0	C
124	13	22	22	31	40.9 S 175.2E	S	4.8	B
125	14	16	55	46	44.8 S 167.7E	N	4.3	C
126	19	21	25	38	40.8 S 175.4E	S	3.7	C
127	22	08	50	59	41.5 S 172.5E	S	4.6	B
128	26	12	03	06	40.1 S 173.8E	110km	5.0	B
129	26	20	21	12	34 S 178½ W	>N?	5.5	D
130	27	07	59	27	37.45S 177.4E	150km	5.0	B
131	28	08	07	03	40.1 S 173.8E	S	4.3	C
132	30	04	02	29	41.5 S 172.2E	S	3.7	C
133	OCT 3	15	50	33	40.5 S 176.0E	N	3.8	D
134	5	14	46.0		35 S 180		5.0	D
135	7	00	42	29	38.1 S 176.1E	150km	4.7	D
136	8	17	57.2		42.2 S 174 E	>N?	3.9	D
137	14	03	29	05	Felt Rotorua.		2.0	D
138	15	19	48	13	39.1 S 174.8E	N	4.1	B
139	17	18	10	56	39.1 S 174.8E	N	3.3	D
140	21	01	37	43	39 S 175.3E	100km	4.7	D
141	22	15	48	52	40.1 S 173.7E	100km	4.0	C
142	23	22	47	22	38.4 S 176.2E	160km	4.0	D
143	29	18	41	41	40.2 S 174.0E	N	4.0	D
144	NOV 2	18	33	42	Near Wellington.		2.9	D
145	3	11	50	58	38.3 S 177.2E	N	4.2	C
146	3	18	00	48	39.2 S 174.6E	N	4.0	C
147	6	00	27	32	36.9 S 177.3E	220km	4.7	C
148	7	21	30	46	38.9 S 175.2E	220km	4.6	B
149	8	23	00	26	39 0 S 175.7E	100km	4.6	B
150	12	16	51	59	38.0 S 176.8E	N	3¼	D
151	12	18	20	30	34 S 177½ W	>N?	5.5	D
152	13	22	26	16	40.8 S 175.3E	N	4.1	C
153	21	14	34	29	34 S 180	100km	5.6	D
154	21	21	56	32	38.5 S 176.1E	80 km	3½	C
155	22	10	31	13	39.55S 174.5E	130km	4.8	B
156	25	13	13	35	40.2 S 176.7E	S	3½	D
157	26	09	17	58	46½ S 167 E	S	4.8	D
158	27	04	19	32	39.6 S 175.0E	100km	4.7	B
159	28	09	34	43	40.2 S 173.0E	S	3.5	D
160	DEC 2	04	39	07	46½ S 169½ E	S	4.7	D
161	4	03	47	14	40.1 S 174.7E	N	3.9	D
162	10	16	57	11	37.1 S 177.0E	300km	5.0	B
163	11	10	28.4		41 S 174 E	N	3.8	D
164	18	19	28	23	39.4 S 174.3E	200km	4.6	D
165	19	07	24	05	38.2 S 176.7E	150km	5.0	C
166	19	16	42	14	37.3 S 177.5E	150km	4.9	C
167	23	09	57	40	37 177.5E	250km	5.0	D

No	Date	h	m	s	Epicentre	Depth	Mag.	Class
57/168	DEC 26	13	30	09	39.2 S 175.5E	100km	5.0	D
169	28	08	12	10	40.6 S 177.7E	N	4.9	D
170	31	04	38	26	37 S 177½ E	250km	5.0	D
171	31	14	28	18	44.5 S 166.0E	S	6.6	D

INDEX OF FELT EARTHQUAKES.

A number of difficulties arise in estimating the distribution of felt intensities in a given earthquake. Observers are not evenly distributed over the country, and personal circumstance may prevent them from noticing the earthquake. There are also difficulties in listing the earthquakes felt at any given place. It may reasonably be assumed that a strong earthquake reported from one township will be felt in another a few miles distant, even though the Observatory has received no report. However, an index of this kind must summarize the data, and not the deductions. The following scheme is therefore used :

The whole area of New Zealand has been divided into numbered rectangles, with sides measuring half a degree, as shown in the accompanying map. Each rectangle is given a name, usually that of the largest centre of population within it. These areas are termed 'localities', and the names adopted are as follows :


INDEX TO LOCALITIES
REPORTING FELT
EARTHQUAKES
NOTE: EXCEPT WHERE SOME OBVIOUS TOPOGRAPHIC FEATURE MAKES A DEPARTURE DESIRABLE, THE BOUNDARIES OF THE LOCALITIES FOLLOW DEGREES OR HALF DEGREES OF LATITUDE AND LONGITUDE.
168°
170°
172°
174°
176°
178°
180°
34°
36°
38°
40°
42°
44°
46°

1 Three Kings
2 Te Reinga
3 Ninety Mile Beach
4 Doubtless Bay
5 Kaitaia
6 Kaikohe
7 Bay of Islands
8 Dargaville
9 Whangarei
10 Bream Head
11 Moko Hinau
12 Kaipara
13 Warkworth
14 Whakapunaki
15 Helensville
16 Auckland
17 Waiheke
18 Coromandel
19 Pukekohe
20 Mercer
21 Thames
22 Mayor Is.
23 Raglan
24 Hamilton
25 Matamata
26 Tauranga
27 Whakatane
28 Te Kaha
29 East Cape
30 Kawhia
31 Te Kuiti
32 Tokoroa
33 Rotorua
34 Murapara
35 Opotiki
36 Motu
37 Tolaga Bay
38 Mokau
39 Taumarunui
40 Tokaanu
41 Taupo
42 Te Whaiti
43 Tuai
44 Whakpunaki
45 Gisborne
46 Cape Egmont
47 New Plymouth
48 Whangamomona
49 Ohakune
50 Chateau
51 Kaweka
52 Napier
53 Wairoa
54 Mahia
55 Hawera
56 Waverley
57 Wanganui
58 Taihape
59 Rushine
60 Hastings
61 Bulls
62 Palmerston North
63 Dannevirke
64 Porangahau
65 Otaki
66 Masterton
67 Castlepoint
68 Wellington
69 Featherston
70 Martinborough
71 Mt. Stevens
72 Takaka
73 D'Urville
74 Karamea
75 Motueka
76 Nelson
77 Blenheim
78 Picton
79 Westport
80 Murchison
81 Glenhope
82 Wairau
83 Awatere
84 CapeCampbell
85 Greymouth
86 Reefton
87 Maruia
88 Hanmer
89 Clarence
90 Kaikoura
91 Hokitika
92 Kumara
93 Arthur's Pass
94 Lake Sumner
95 Culverden
96 Cheviot
97 Franz Joseph
98 Hari Hari
99 Whitcombe Pass
100 Lake Coleridge
101 Oxford
102 Rangiora
103 Haast
104 Bruce Bay
105 Mt. Cook
106 Tekapo
107 Mount Somers
108 Ashburton
109 Rakaia
110 Christchurch
111 Akaroa
112 Big Bay
113 Jackson's Bay
114 Makarora
115 Lake Ohau
116 Pukaki
117 Fairlie
118 Timaru
119 George Sound
120 Milford
121 Glenorchy
122 Arrowtown
123 Wanaka
124 St. Bathan's
125 Kurow
126 Duntroon
127 Waimate
128 Secretary Is.
129 Doubtful Sound
130 Te Anau
131 Livingstone Mts.
132 Kingston
133 Alexandra
134 Poolburn
135 Ranfurly
136 Oamaru
137 Resolution Is.
138 Pillan's Pass
139 Monowai
140 Mossburn
141 Waikaia
142 Roxburgh
143 Lawrence
144 Outram
145 Dunedin
146 Puysegur Pt.
147 Poteretere
148 Tuatapere
149 Invercargill
150 Gore
151 Clinton
152 Balclutha
153 Waihola
154 Bluff
155 Ruapuke
156 Tahakopa
157 Owaka
158 Stewart Is.

The first section of the index gives the names of places from which each earthquake has been reported felt, classified according to the intensity on the modified Mercalli scale. A ? indicates that no information is available beyond the fact that the whole shock was felt, or that the description was too imprecise to allow an intensity to be assigned. When the place name is not that of a 'locality' it is followed by the number of the locality in brackets. In the second list localities reporting shocks during the year are given in alphabetical order, followed by the number of the shock in the list of epicentres and the reported intensity. By comparing the reports from a given locality with those of the neighbouring ones, it is possible to form a truer estimate of the incidence of felt earthquakes than would be possible from a simple list of the places reporting each shock.

Earthquakes felt in Samoa and Raoul Island are reported with the instrumental readings for Apia and Raoul respectively.

PLACES REPORTING FELT EARTHQUAKES.

57/3	JAN 9d	02h 40m	
		?	Inveraan (35)
57/5	JAN 10d	02h 21m	
		?	Inveraan (35)
57/6	JAN 11d	22h 25m	
		MM3	New Plymouth
		?	Inveraan (35)
57/7	JAN 12d	00h 31m	
		MM1	Gore
57/10	JAN 21d	01h 14m	
		?	Moko Hinau
57/13	JAN 24d	17h 18m	
		?	Moko Hinau
57/15	JAN 31d	14h 54m	
		?	Waipawa (60)
57/16	FEB 3d	18h 19m	
		MM4	Woodburn (77)
		MM3	Blenheim
		MM2	Wellington
57/18	FEB 6d	11h 55m	
		MM4	Ohakune, Taumarunui
57/20	FEB 9d	13h 29m	(See Isoseismal Map)
		MM5	Whakatane
		MM4	Wellington, Beacon Hill (18), Nelson, Gisborne, Napier, Foxton (61), Tuai
		MM3	Waikanae (65), Castlepoint, Dannevirke, Palmerston North, Masterton, Blenheim, Waipawa (60), Cheviot, Greymouth.
		MM2-3	Havelock North (60)
57/21	FEB 12d	14h 08m	
		MM3	Westport
57/23	FEB 16d	22h 42m	
		?	Farewell Spit (72)
57/24	FEB 17d	01h 17m	
		MM2	Queenstown (132)
57/26	FEB 22d	00h 30m	(See Isoseismal Map)
		MM6	Ohakune
		MM5	Wanganui, Hawera

57/26		MM4-5	Taumarunui
		MM4	Awakino (38), Tongariro (50), New Plymouth, Tokaanu, Te Kuiti
		MM3	Wellington, Hunterville (58), Stratford (47), Bunnythorpe (62), Whangamomona, Taihape, Otaki
		MM2	Foxton (61)
		MM1	Levin (65)
		?	Karapiro (25)
57/29	MAR 3d	09h 45m	
		MM2	Greymouth
57/32	MAR 4d	21h 20m	
		MM2	Lower Hutt (68)
57/36	MAR 13d	09h 11m	(See Isoseismal Map)
		MM5	Taihape
		MM4	Wellington, Titahi Bay (68), Bunnythorpe (62), Dannevirke, Foxton (61), Levin (65), Gisborne, Hunterville (58), Wanganui, Opotiki
		MM3-4	Paraparaumu (65), Greymouth, Castlepoint, Tuai
		MM3	Nelson, Palmerston North, Blenheim, Hawera, Christchurch, Levin (65), French Pass (73), Tadmor (75)
		MM2-3	Tolaga Bay
		MM2	Ohakune, Whangamomona, Napier, Havelock North (60)
57/38	MAR 23d	06h 06m	
		MM1	Te Teko (34)
57/39	MAR 23d	09h 49m	
		MM2	Havelock North (60)
57/40	MAR 24d	03h 49m	
		MM3	Dannevirke, Palmerston North
		MM2	Bunnythorpe (62)
		MM1	Taihape, Ohakune, Karori (68)
57/41	MAR 24d	07h 19m	
		MM3	Otira (93), Hokitika
		Not Felt	Greymouth
57/42	MAR 24d	23h 21m	
		MM3	Foxton (61)
57/45	MAR 29d	20h 48m	
		MM3	Hokitika
57/46	MAR 31d	12h 51m	
		MM4	Greymouth
57/47	APR 6d	15h 28m	
		?	Wanganui, Marton (61), Taihape
57/48	APR 9d	10h 16m	
		MM3	Te Kuiti, Awakino (38), Taumarunui, Okahune
		MM2	Whangamomona
		?	Waiouru (50), Owhango (49)
57/49	APR 11d	12h 14m	
		MM2	Gisborne
57/52	APR 21d	02h 43m	
		MM4	Dannevirke
		MM2	Bunnythorpe (62), Palmerston North

57/53	APR 24d	16h 44m	
		MM4	Karori (68)
		MM3	Nelson
57/58	APR 30d	15h 30m	
		MM1	Gisborne
57/60	MAY 9d	03h 20m	
		?	Mangatuna (37)
57/61	MAY 15d	16h 09m	
		MM5	Collingwood (72)
		MM4	Nelson, Wellington
		MM3-4	Stevens Is. (73)
57/65	MAY 26d	03h 24m	
		MM3	Whakatane
57/67,68,69,70,72,73	JUN 2d-9d		
		Earthquake Swarm experienced at Moko Hinau. See the section 'Principal Earthquakes in 1957' for fuller discussion.	
57/71	JUN 7d	10h 37m	
		MM3	Whakatane
57/78	JUL 3d	06h 10m	
		MM3	Ohakune
		?	Wanganui
57/79	JUL 5d	12h 40m	
		MM4	Molesworth (89)
55/84	JUL 17d	13h 54m	
		MM1	Lyall Bay (68)
55/94	AUG 2d	02h 09m	
		MM3	Opotiki
57/95	AUG 2d	02h 12m	
		MM6	Toatoa (36)
		MM5	Matawai (36)
		MM4-5	Motu
		MM4	Gisborne, Opotiki
		MM3	Te Teko (34)
		MM2	Tolaga Bay
57/96	AUG 2d	03h 03m	
		MM4-5	Motu
57/96	AUG 2d	03h 03m	
		MM4-5	Motu
57/98	AUG 2d	13h 00m	
		MM4-5	Motu
		MM4	Opotiki
		MM3	Whakatane
		?	Matawai (36)
57/99	AUG 2d	18h 52m	
		MM4-5	Motu
57/101	AUG 3d	08h 56m	
		MM4-5	Motu
		MM4	Opotiki, Matawai (36)
57/102	AUG 3d	09h 09m	
		MM4	Matawai (36), Whakatane , Opotiki
		?	Motu
55/103	AUG 3d	12h 54m	
		MM4-5	Motu
		MM4	Matawai (36), Whakatane, Opotiki

57/105	AUG 4d	05h 52m	
		MM4-5	Motu
		MM4	Matawai (36), Opotiki
		MM3	Gisborne
57/106	AUG 4d	23h 35m	
		MM2	Matawai
57/109	AUG 9d	08h 45m	
		MM1	Lake Coleridge
57/110	AUG 11d	05h 12m	
		MM4	Mangaweka (58), Shannon (65), Ohakune, Whakatane, Paraparaumu (65)
		MM3	Napier, Hunterville (58), Opotiki, Taihape, Motu, Dannevirke, Taumarunui, Gisborne, Bunnythorpe (62), Blenheim, Christchurch.
		MM2	Kelburn (68), Karori (68), Nelson, Paraparaumu (65)
		MM1	Greymouth.
57/112	AUG 11d	11h 01m	
		MM3	Whakatane
57/112	AUG 14d	02h 02m	
		MM4	Pongaroa (67), Napier, Castlepoint
		MM3	Eketahuna (66)
		MM2	Palmerston North, Bunnythorpe (62), Dannevirke
		MM1	Foxton (61)
57/113	AUG 14d	13h 40m	
		MM4	Napier
57/114	AUG 19d	21h 35m	
		MM4	Kawerau (34)
		MM3	Te Teko (34)
57/115	AUG 21d	05h 48m	
		MM4	Taihape , Hawera, Palmerston North, Castlepoint, Paraparaumu (65), Masterton, Karori (68), Eketahuna (66) Dannevirke, Pongaroa (67)
		MM3	Wanganui, Porangahau, Te Kuiti, Kelburn (68), Ohakea (61), Levin (65), Foxton (61)
		MM2	Ohakune, Taumarunui, Titahi Bay (68)
		?	Patea (55), Hukanui (66), Masterton, Makakaho (56), Mangaweka (58), Shannon (65), Rangiwahia (58)
57/119	AUG 28d	17h 41m	
		?	Seddon (84)
57/121	SEP 1d	13h 36m	
		MM4	Dannevirke, Pongaroa (67)
57/122	SEP 13d	00h 11m	
		MM1	Wellington
57/123		MM1-2	Wellington
		MM1	Paraparaumu (65)
57/124	SEP 13d	22h 22m	
		MM4	Kelburn (68), Paraparaumu (65)
		MM3	Foxton (61)
		MM1	Palmerston North, Dannevirke
		?	Otaki, Omoana (48), Titahi Bay (68)
57/125	SEP 14d	16h 55m	
		MM3-4	Queenstown (132)

57/127	SEP 22d	08h 50m	
		MM4-5	Karamea
		MM3	Collingwood (72), Tadmor (75), Westport, Farewell Spit (72)
		?	Paturau (71), Baton (74)
57/128	SEP 26d	12h 03m	(See Isoseismal Map)
		MM5	Blenheim
		MM4-5	Otaki
		MM4	New Plymouth, Stratford (47), Hawera, Paraparaumu (65), Wellington, Nelson, Coolongton (72), Greymouth, Martinborough, Dannevirke, Whangamomona,
		MM3-4	Karamea
		MM3	Taumarunui, Wanganui, Foxton (61), Farewell Spit (72)
		MM2-3	Te Kuiti
		MM2	Hunterville (58), Bunnythorpe (62), Akaroa
		MM1	Palmerston North
		?	Patea (55), Titahi Bay (68), Omoana (48) Waverley, Moutoa (61), Otaki, Baton (74) Otunui (39), Waitara (47), Urenui (47) Paturau (71), New Plymouth, Owhango (49) Opunaki (46), Wakefield (76), Gravetown (77), Seddon (84), Akaroa
57/131	SEP 28d	08h 07m	
		MM3	Farewell Spit
57/132	SEP 30d	04h 02m	
		MM4	Karamea
57/133	OCT 3d	15h 50m	
		MM3	Dannevirke
57/137	OCT 14d	03h 29m	
		MM4	Rotorua
57/138	OCT 15d	19h 48m	
		MM3	Whangamomona
57/144	NOV 2d	18h 33m	
		MM2	Wellington
57/145	NOV 3d	11h 50m	
		MM4	Whakatane
		MM3	Opotiki
57/146	NOV 3d	18h 00m	
		MM3	Whangamomona
57/150	NOV 12d	16h 51m	
		MM2	Whakatane
57/152	NOV 13d	22h 26m	
		MM2	Farewell Spit (72), Wellington
57/154	NOV 21d	21h 56m	
		MM3	Wairakei (41)
57/155	NOV 22d	10h 31m	
		MM3	Dannevirke
		MM1	Wellington
57/156	NOV 25d	13h 13m	
		MM2	Dannevirke
57/159	NOV 28d	09h 34m	
		MM2-3	Farewell Spit (72)
57/160	DEC 2d	04h 39m	
		MM3-4	Dunedin -

57/163	DEC 11d	10h	28m	
		MM4		Wainuiomata (68)
		MM3		Wellington
57/168	DEC 26d	13h	30m	
		MM3		Dannevirke
57/169	DEC 28d	08h	12m	
		MM4		Dannevirke, Porangahau
		MM2		Bunnythorpe (62)
57/171	DEC 31d	14h	28m	(See Isoseismal Map)
		MM5		Halfmoon Bay (158)
		MM4		Invercargill, Gore, Cromwell (133)
				Tuatapere, Lumsden,(140), Centrels. (148)
				Awarua (154)
		MM3-4		Dunedin
		MM3		Nightcaps (140)
		MM2		Invercargill
		?		Monowai, Roxburgh.

EARTHQUAKES FELT NEAR STATED LOCALITIES.

The first figure after the locality name is the number of the epicentre, followed by the maximum MM-intensity (in brackets) reported from the district covered by the locality name. The instrumental magnitude may be found from the epicentre list, and the places actually reporting the shock from the table of 'Places reporting felt earthquakes'.

111	Akaroa	128(2)				
133	Alexandra	171(4)				
93	Arthur's Pass	41(3)				
77	Blenheim	16(4)	20(3)	36(3)	110(3)	128(5)
154	Bluff	171(4)				
61	Bulls	20(4)	26(2)	36(4)	42(3)	47(?)
		112(1)	115(3)	124(3)	128(3)	
84	Cape Campbell	119(?)	128(?)			
46	Cape Egmont	128(?)				
67	Castlepoint	20(3)	36(3-4)	111(4)	114(4)	121(4)
50	Chateau	26(4)	48(?)			
96	Cheviot	20(3)				
110	Christchurch	36(3)	110(3)			
89	Clarence	79(4)				
63	Dannevirke	20(3)	36(4)	40(3)	52(4)	110(3)
		112(2)	114(4)	121(4)	124(1)	128(4)
		133(3)	155(3)	156(2)	168(3)	169(4)
145	Dunedin	160(3-4)	171(3-4)			
73	D'Urville Is.	36(3)	61(3-4)			
45	Gisborne	20(4)	36(4)	49(2)	58(1)	105(3)
		110(3)				
150	Gore	7(1)	171(4)			
85	Greymouth	20(3)	29(2)	36(3-4)	46(4)	110(1)
		128(4)				
60	Hastings	15(?)	20(3)	36(2)	39(2)	
55	Hawera	26(5)	36(3)	114(4)	115(2)	128(4)
91	Hokitika	41(3)				
149	Invercargill	171(4)				
74	Karamea	127(4-5)	128(3-4)	132(4)		
132	Kingston	24(2)	125(3-4)			
100	Lake Coleridge	109(1)				
70	Martinborough	128(4)				
66	Masterton	20(3)	112(3)	114(4)	115(2)	
25	Matamata	26(?)				
38	Mokau	26(4)	48(3)			
11	Moko Hinau	10(?)	13(?)	67,68,69,70,72,73.		
139	Monowai	171(?)				
140	Mossburn	171(4)				
36	Motu	95(6)	96(4-5)	98(4-5)	99(4-5)	101(4-5)
		102(4)	103(4-5)	105(4-5)	106(2)	110(3)
75	Motueka	36(3)	127(3)			
71	Mount Stevens	127(?)	128(?)			
34	Murupara	38(1)	95(3)	114(4)		
52	Napier	20(4)	36(2)	110(3)	112(4)	113(4)
76	Nelson	20(4)	36(3)	53(3)	61(4)	110(2)
47	New Plymouth	6(3)	26(4)	128(4)		
49	Ohakune	18(4)	26(6)	36(2)	40(1)	48(3)
		78(4)	110(4)	115(2)	128(?)	
35	Opotiki	3(?)	5(?)	6(?)	36(4)	94(3)
		95(4)	98(4)	101(4)	102(4)	103(4)
		105(4)	110(3)	145(3)		
65	Otaki	20(3)	26(3)	36(4)	110(4)	114(4)
		115(3)	123(1)	124(4)	128(4-5)	

62	Palmerston North	20(3)	26(3)	36(4)	40(3)	52(2)
		110(3)	112(2)	114(4)	124(1)	128(2)
		169(2)				
64	Porangahau	115(3)	169(4)			
33	Rotorua	137(4)				
142	Roxburgh	171(?)				
158	Stewart Island	171(5)				
58	Taihape	26(3)	36(5)	40(1)	47(?)	110(4)
		114(4)	115(2)	128(2)		
72	Takaka	23(?)	61(5)	127(3)	128(4)	131(3)
		152(2)	159(2-3)			
39	Taumarunui	18(4)	26(4-5)	48(3)	110(3)	115(2)
		128(3)				
41	Taupo	154(3)				
31	Te Kuiti	26(4)	48(3)	115(3)	128(2-3)	
40	Tokaanu	26(4)				
37	Tolaga Bay	36(2-3)	60(?)	95(2)		
42	Tuai	20(4)	36(3-4)			
148	Tuatapere	171(4)				
57	Wanganui	26(5)	36(4)	47(?)	78(?)	114(3)
		128(3)				
56	Waverley	115(2)	128(?)			
68	Wellington	16(2)	20(4)	26(3)	32(2)	36(4)
		40(1)	53(4)	61(4)	84(1)	110(2)
		114(4)	115(3)	122(1)	123(1-2)	124(4)
		128(4)	144(2)	152(2)	155(1)	163(4)
79	Westport	21(3)	127(3)			
27	Whakatane	20(5)	65(3)	71(3)	98(3)	102(4)
		103(4)	110(4)	111(3)	145(4)	150(2)
48	Whangamomona	26(3)	36(2)	48(2)	124(?)	128(4)
		138(3)	139(1)	146(3)		

PUBLICATIONS

During 1957, the following contributions were published by members of the Observatory staff.

G.A.EIBY : "Earthquakes" 168 pp., illustrated.
F.Muller,London;Harper and Brothers,New York.

MAPS

This Report contains the following maps.

1. Epicentres of Normal Focus Earthquakes in 1957
2. Epicentres of Deep Focus Earthquakes in 1957
3. Isoseismals for the earthquake of 1957 Feb. 9
4. Isoseismals for the earthquakes of 1957 Feb. 22 and Dec. 31
5. Isoseismals for the earthquake of 1957 Mar. 13
6. Isoseismals for the earthquake of 1957 Sep. 26

NORMAL EARTHQUAKES

1957

This map shows the instrumentally determined epicentres of all earthquakes whose focal depths are classified as 'shallow' or 'normal'. Open circles indicate an uncertainty of 15 miles (24 km) or more in position. The size of the circle is an indication of instrumental magnitude. Where several shocks have the same epicentre, the magnitude of the largest is shown.

REFERENCE

Magnitude 6·0 — 6·9
5·0 — 5·9
4·0 — 4·9
< 4·0

Onerahi
Auckland
Karapiro
Tuai
New Plymouth
Tongariro
Bunnythorpe
Cobb
Wellington
Kaiteata
Gebbies Pass
Roxburgh
Monowai

SCALE

20 0 20 40 60 80 100 Statute Miles
20 0 20 40 60 80 100 Kilometres

SEISMOLOGICAL OBSERVATORY BULLETIN E-138, MAP I

DEEP FOCUS EARTHQUAKES

1957

This map shows the instrumentally determined epicentres of all earthquakes whose focal depths are greater than 'normal'. Open circles indicate an uncertainty of 15 miles (24 km) or more in position. The size of the circle is an indication of instrumental magnitude. Where several shocks have the same epicentre, the magnitude of the largest is shown.

REFERENCE

Magnitude 6·0 — 6·9
5·0 — 5·9
4·0 — 4·9
< 4·0

Onerahi
Auckland
Karapiro
Tuai
New Plymouth
Tongariro
Bunnythorpe
Cobb
Wellington
Kaimata
Gebbies Pass
Roxburgh
Monowai

SCALE

20 0 20 40 60 80 100 Statute Miles
20 0 20 40 60 80 100 Kilometres

ISOSEISMALS

(Modified Mercalli Scale)

Epicentre 57/20 1957 Feb. 9d

33·8° S 179·5 W

Focal Depth 135 km

Magnitude $6\frac{3}{4}$ ±

EPICENTRE

Onerahi
Auckland
Karapiro
Tuai
New Plymouth
Tongariro
Bunnythorpe
Cobb
Wellington
Kaimata
Gebbies Pass
Roxburgh
Monowai

SCALE

20 0 20 40 60 80 100 Statute Miles

20 0 20 40 60 80 100 Kilometres

BULLETIN E-138

MAP 3

ISOSEISMALS

(Modified Mercalli Scale)

Epicentre 57/26 1957 Feb. 22 d

39·2° S 175·1° E

Magnitude 5·5

Epicentre 57/171 1957 Dec. 31 d

44·5° S 166·0° E

Magnitude 6·6

EPICENTRE

Onerahi
Auckland
Karapiro
Tuai
New Plymouth
Tongariro
Bunnythorpe
Wellington
Cobb
Kaimata
Gebbies Pass
Roxburgh
Monowai

SCALE

20 0 20 40 60 80 100 Statute Miles

20 0 20 40 60 80 100 Kilometres

BULLETIN E-138

MAP 4

ISOSEISMALS

(Modified Mercalli Scale)

Epicentre 57/36 1957 Mar. 13 d

38·7 S 175·6 E

Focal Depth 270 km

Magnitude 6½ +

EPICENTRE

Onerahi
Auckland
Karapiro
Tuai
New Plymouth
Tongariro
Bunnythorpe
Wellington
Cobb
Kaimata
Gebbies Pass
Roxburgh
Monowai

SCALE

20 0 20 40 60 80 100 Statute Miles

20 0 20 40 60 80 100 Kilometres

BULLETIN E-138

MAP 5

ISOSEISMALS

(Modified Mercalli Scale)

Epicentre 57/128 1957 Sep. 26 d

40.1 S 173·8 E

Focal Depth 110 Km

Magnitude 6·0

EPICENTRE

Onerahi
Auckland
Karapiro
Tuai
New Plymouth
Tongariro
Bunnythorpe
Wellington
Cobb
Kaimata
Gebbies Pass
Roxburgh
Monowai

SCALE

20 0 20 40 60 80 100 Statute Miles

20 0 20 40 60 80 100 Kilometres

BULLETIN E-138

MAP 6

R. E. OWEN, GOVERNMENT PRINTER
WELLINGTON, NEW ZEALAND—1961