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NEW ZEALAND

SEISMOLOGICAL REPORT

1958

SEISMOLOGICAL OBSERVATORY BULLETIN
E – 139

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:

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Wellington, New Zealand.

NEW ZEALAND SEISMOLOGICAL REPORT 1958

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INTRODUCTION

The New Zealand Seismological Report for 1958 follows the plan of its predecessors. It is intended to summarize all standard earthquake measurements and computations carried out at the Seismological Observatory, Wellington, and its associated outstations. Much of this has necessarily to be presented in the form of tabulated figures, but the sections on the principal New Zealand Earthquakes of the year and the associated maps should make the Report of some interest to people other than professional seismologists.

Explanations of the material will be found at the head of each separate section. It should be particularly noted that all times are given in U.T. (See section 'Station Readings'). Dates of shocks occurring in the N.Z. forenoon are therefore dated one day earlier than the N.Z. civil date.

New Zealand Data for 1959, 1960, and part of 1961 are now available at the observatory, and standard readings have been forwarded to international data centres. It is confidently expected that arrears of publication will soon be overtaken. Reprints of research papers by members of the staff and material that is not regularly included in this Report are issued as a series of S-bulletins. The Observatory is prepared to consider additional agreements to exchange material of this kind with other Observatories.

PRINCIPAL NEW ZEALAND EARTHQUAKES IN 1958

Seismic activity in 1958 was low, the number of epicentres determined being substantially fewer than in any year since 1950. Differences in Observatory procedure do not allow comparison over a longer period. The decline in the number of felt reports received was not so marked. In all 76 earthquakes were reported felt, 55 in the North Island, only 15 in the South Island, and only 6 in some parts of both islands.

The most noteworthy characteristic of the year is the renewal of activity off Cape Egmont. This area has often been active in the past, but has been quiescent since 1953. None of the earthquakes was large, but those on April 14 and 15 (Epicentres 58/43, 44, 45) with magnitudes $4\frac{1}{2}$ - $4\frac{3}{4}$ were felt at New Plymouth, Hawera, and Stratford, and in the northern part of the South Island. An earlier shock of comparable magnitude on February 27 (Epicentre 58/25) did not produce any felt reports.

The small shock of December 21 (Epicentre 58/133), with an origin in South Canterbury, lies in a part of the country where a few shocks have been instrumentally located. Most known epicentres lie further westward, towards the Alps; but at least one is known to have been in the Canterbury Bight, South and East of the present shock, which had a magnitude of 3.8, and was felt sharply in the Ashburton district.

The shallow shock of January 31 (Epicentre 58/11) had a magnitude of 5.9, and was centred to the east of the Ruahine Range, near Ashley Clinton, some 25 miles north of Dannevirke. Although in no sense a major earthquake, it resulted in a troublesome amount of minor damage. Officers of the Seismological Observatory and the Geological Survey visited the area , but no evidence of geological movements was found. Between Dannevirke and Raumati, some four or five miles to the east , there is an area of typical 'slump' or 'landslide' topography which did not appear to have been affected.

At the time of the visit, no instrumental epicentre was available, and the party did not travel as far north as Ashley Clinton, where it was later found that a large proportion of the chimneys was damaged, and that plaster had cracked or fallen. When the number of chimneys affected is related to the size of the settlement, and the nature of the other damage considered, it seems clear that the intensity in Ashley Clinton was a little above that in Dannevirke, and should probably be described as MM7.

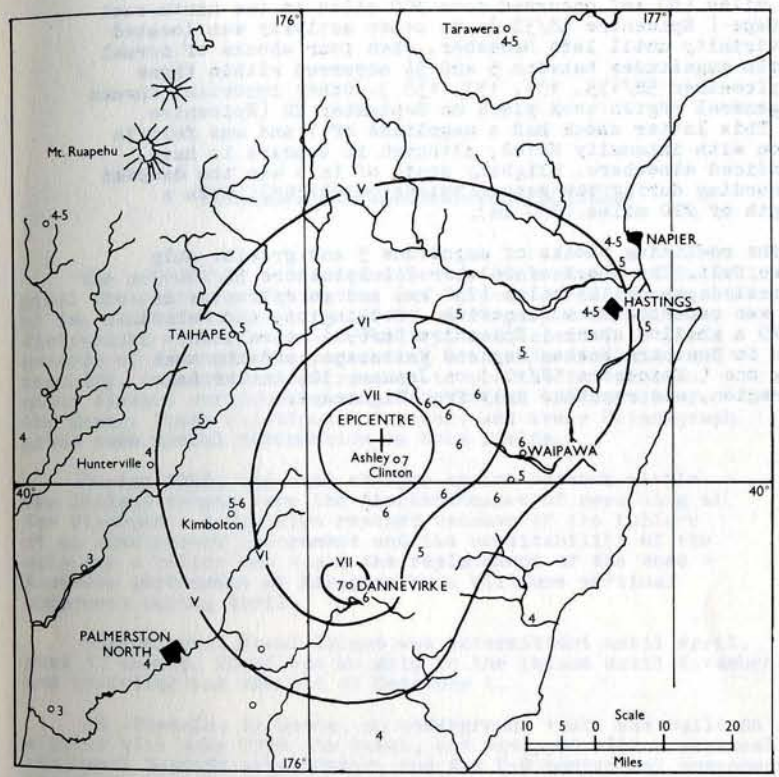
The nature of the damage in Dannevirke itself suggested an epicentre in the immediate vicinity. Cracks in the walls and other structural damage affected the Post Office, the Courthouse, the Bank of New Zealand, and the Regent Cinema, all of which lie within a radius of a few hundred feet. Along the main street, the dis-arrangement of goods in the shops became progressively less in both directions. The same applied to the cracking of plate glass windows, and the glazier confirmed that he had received no calls beyond the town area. There is no obvious difference in foundation conditions over the area.

Outside the business centre, there was a region of cracked chimneys (all poorly constructed) extending east and south-east to parts of Tiratu, about 3 miles from the Post Office. In the north-westerly direction, damage of a similar kind did not extend more than half a mile. A large number of defective chimneys, which could easily have been brought down, were found to be still standing, allowing an outer limit to be assigned to the region of maximum intensity. It was originally considered that the epicentre must lie within the region, and the nature of the cracks in the damaged buildings and the direction of overthrow of objects was consistent with that view. It now seems clear that there was an area of reduced intensity between Dannevirke and Norsewood, the real centre of damage being close to Ashley Clinton, in closer accord with the instrumental epicentre.

The large - scale map shown on the next page, which has been based on the field observations and upon the reports of assessors to the Earthquake and War Damage Commission, indicates a slightly larger region of intensity MM5 and above than do the felt reports sent to the Observatory, which form the basis of Map 3, in the pocket at the back of this Report. The differences are largely accounted for by the fact that minor damage outside the homes of the observers would not come to their notice until after their reports had been made. In all, about 170 insurance claims were lodged, mostly from southern Hawkes Bay, although isolated cases of damage to structures in poor condition occurred in Napier, Wanganui, and even Wellington.

An interesting feature of this earthquake is the absence of identifiable aftershocks ; although a shock of magnitude 4.3 on February 28, with an epicentre some 20 miles to the south east (Epicentre 58/9) and one with a magnitude of 3.9 (Epicentre 58/13) 40 miles to the east, and five hours later than the main shock on January 31 might be regarded as associated events. Shallow shocks of magnitude approaching 6 or greater commonly produce quite a protracted series of small aftershocks.

An even more extensively felt shock was that on December 10 (Epicentre 58/128), at a depth of 200 miles (330 km) under the Bay of Plenty. This shock, of magnitude $6\frac{3}{4}$, was felt with intensities ranging from MM3 to MM6 over the whole of the area between Coromandel Peninsula, East Cape, and Banks Peninsula, with an isolated report from as far south as Queenstown. The intensities produced by a shock at so great a depth would be expected to vary only slowly with epicentral distance. The rather irregular form of the isoseismals (See Map 4, in the pocket inside the back cover) must in consequence be largely attributed to variations in ground conditions.



On the other hand, the pronounced ellipticity of the pattern as a whole must be due to some peculiarity of the deeper structure, or to the mechanism of the earthquake at its source. Approximately 100 insurance claims resulted, none of them serious, although isolated chimneys suffered as far south as Blenheim and Christchurch. Apart from these, there was only a small amount of cracked plaster, and the dis-arrangement of displayed crockery and goods in shops.

There were nine deep shocks in the Bay of Plenty region with magnitudes greater than 5 . Most of these had depths close to 125 miles (200 km). It is perhaps surprising that no felt reports were received for any of them, except the largest (Mag. 5.7) on April 17 (Epicentre 58/46), which was reported from Tolaga Bay, Gisborne, and Dannevirke. The shock of November 8 (Epicentre 58/109) in the South Taranaki Bight had a magnitude of 5.0 and a focal depth of 60 miles (100 km). It was felt in neighbouring parts of both islands.

On March 9, a shock of magnitude 6.5 with a focal depth of about 30 miles (50 km) occurred some 300 miles to the north-east of East Cape (Epicentre 58/32). No other activity was located in this vicinity until late December, when four shocks of normal depth, with magnitudes between 5 and 5½ occurred within three days (Epicentres 58/135, 136, 137, 138). Other important shocks in this general region took place on September 22 (Epicentre 58/94). This latter shock had a magnitude of 7 and was felt in Wellington with intensity MM1-2, although it appears to have gone unnoticed elsewhere. Slightly south of this was the deepest shock recording during the year (Epicentre 58/84), with a focal depth of 220 miles (350 km).

Of the remaining shocks of magnitude 5 and greater only three were felt. The shock of October 7 (Epicentre 58/100) with a focal depth of 145 miles (230 km) and an epicentre in Taranaki was reported from Dannevirke, Wellington, and Nelson. On July 29 a shallow shock (Epicentre 58/69) attracted attention in Southern Hawkes Bay and Wairarapa, and the most southerly one (Epicentre 58/10) on January 30, in the Lake Hauroko region, was reported only from Nightcaps.

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 conditions of the Earth. These functions interlock, and every Seismograph gives some useful information in both fields.

During 1958, the main changes in the network within New Zealand proper were the discontinuance of recording at New Plymouth - a decision reached because of the failure of an obsolescent instrument and the unsuitability of the site for a better one - and the replacement of the Wood - Anderson instrument at Karapiro by a Willmore vertical component during April.

Recording at Raoul Island was intermittent until April, when it ceased. There was no ship to the island until November, and recording was resumed on December 1.

At Afiamalu, in Samoa, an underground vault was built on a quiet site away from the coast, and equipped with a vertical component Benioff seismometer, and the N-S horizontal component, together with a triple recording drum with a trace speed of 30 mm/min. Both short- and long-period records of the vertical component are made, together with the long-period horizontal. It is intended that the station should eventually record all six components, and replace Apia. The station is in the care of the officers at the Apia Observatory. Recordings at Afiamalu began on April 15. During the initial trial period, the Wood-Anderson instruments at Apia have been used to supplement the Afiamalu data.

Instrument 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.

AFIAMALU (AF)

Latitude: 13°54'.6 S
Longitude: 171°46'.6 W
Height above mean sea level: 706 metres,2315 ft.
Geocentric direction cosines: a = -0. 961 070
b = -0. 138 883
c = -0. 238 862
Lithological Foundation: Basaltic lava flows.

Instrument	Component	To	Tg
Benioff	Z	1 sec	0.2 sec
			70 sec
	N	1	70 sec

APIA (AP)

Latitude: 13°48'.4 S
Longitude: 171°46'.5 W
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	Compt.	Period	Damping	Magnification	
Wood-	N	0.80sec	15:1	2050	12/57
Anderson	E	0.80sec	15:1	2050	12/57

RAOUL (RL)

Latitude: 29°15'.1 S
Longitude: 177°55'.1 W
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 = 1sec	Tg = 0.25sec.

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	12sec	20:1	250	12/57

ONERAHI (ON)

Latitude: 35°46'.5 S
Longitude: 174°21'.7 E
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	0.8sec	critical	2,800	7/56

AUCKLAND (AK)

Latitude: 36°51'.7 S
Longitude: 174°46'.7 E
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	10sec	20:1	150	7/57

KARAPIRO (KP)

Latitude: 37°55'.6 S
Longitude: 175°32'.3 E
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	0.77sec	critical	2,800	6/57
		0.79	130:1	2,800	6/57

Constants measured before and after overhaul on June 18.

TUAI (TU)

Latitude: 38°48'.4 S
Longitude: 177°09'.1 E
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 mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	N	0.8sec	critical	1,400	7/57

TONGARIRO (TO)

Latitude: 39°12'.2 S
Longitude: 175°32'.3 E
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	
Jones	Z	0.5sec	10.1	11,000	Nominal

BUNNYTHORPE (BT)

Latitude: 40°17'.0 S
Longitude: 175°38'.1 E
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	
Imamura	NE(X)	8sec.	5:1	2	Nominal
	NW(Y)	8	5:1	2	
	Z	2	5:1	2	

COBB RIVER (CB)

Latitude: 41°05'.2 S
Longitude: 172°44'.o E
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	
Wood-Anderson	E	0.8sec	critical	2,800	Nominal

KAIMATA (KM)

Latitude: 42°31'.4 S
Longitude: 171°24'.6 E
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)	0.8sec	critical	2,800	Nominal

GEBBIES PASS (GP)

Latitude: 43°41'.7 S
Longitude: 172°38'.8 E
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	9/57

ROXBURGH (RX)

Latitude: 45°28'.5 S
Longitude: 169°18'.9 E
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=14sec	critical	217	5/57
	N	24	critical	323	
	E	24	critical	305	

HALLETT (HT)

Latitude: 72°18'.8 S
Longitude: 170°12'.5 E
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	Z	15	75	1,200	until July 8
	N	15	75	1,200	until July 17
	E	15	75	1,200	
	Z	15	60	1,200	after July 9
	N	15	60	1,200	after July 17

SCOTT BASE (SB)

Latitude: 77°51'.0 S
Longitude: 170°12'.5 E
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.

Instrument	Component	To	Tg	Magnification	
Benioff	Z	1.0sec	25sec	1,000	Nominal
	N	1.0sec	10		
	E	1.0	25		
	z	1.0	0.2		
	n	1.0	0.2		
	e	1.0	0.2		

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 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, Afiamalu, 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 1958

	WELLINGTON
Superintendent :	R.C. Hayes
Geophysicists :	R.R. Dibble M.Sc.; G.A. Eiby M.Sc.; M.G. Muir M.Sc.; A.A. Thomson M.Sc.
Technicians :	S.M. Delbridge; B.R. Gibson, J.F.G. Rappange (until April); A.P. Underhill (from April).
	APIA
Officer-in charge :	J.G. Keys
	SCOTT BASE
Observer :	Lt. F. Faggioni (Italian observer with N.Z. I.G.Y. Antarctic Expedition).
	HALLETT
Observer :	K.A. Bargh

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 the other stations are listed independently. This is partly a result of geographical affinity and partly one of administrative convenience. It is not possible to delay epicentre determination until records from the remoter stations reach Wellington.

Details of New Zealand earthquakes have been omitted if the Instrumental Magnitude was less than 5, but the epicentres of all felt earthquakes and others whose magnitude exceeds 4 are listed in a separate section of the Report.

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

When the horizontal components at a recording station are not oriented north-and-south or east-and-west, the directions are designated X and Y, and the corresponding 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, and f is a movement opposite to x,and j a movement opposite to y.

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 given 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 stations of the network. For distant stations, the values given are the unified magnitude m, determined at the station and from the wave opposite which the value appears, by the methods of Gutenberg and Richter, 1956 (Annali di Geofisica Vol 9, p.1). Both surface waves and body waves are used.

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.

N.Z. STATIONS and SUVA.

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 1	WN	eL	N	21	13.8								
2	WN	eL	N	00	43				6	20			5.8
	RX	eL	E	00	42								
		eLr	ZN		44		7	20	3	20			
		Lmax	NE		45				2	20	4	20	5.9
	Epicentre:			00	21	22	5S	152E			USCGS		
4	WN	e(L)	N	22	35¾								
5	KP	eP	N	08	14	50							
	TO	eP	Z	08	14	51							
	WN	eP	ZN	08	14	54	1	1					6.4
	KM	eP	X	08	14	47							
	GP	eP	N	08	14	54							
	RX	e	NE	08	30								
	Epicentre:			08	05	11	2N	122½E	550	km	USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 5	KP	eP	N	12	35	26							
	TO	eP	z	12	35	33							
	GP	eP	N	12	36	00							
	Epicentre:			12	28	20	6S	155E	100	km	USCGS		
6	ON	eP	E	22	29	52							
	KP	eP	N	22	30	34							
7	KP	eS	N	08	27	14							
	TO	eP	z	08	24	51							
		eS	z		27	29							
	WN	eP	N	08	25	14							
		eS	N		28	02							
	CB	eP	E	08	25	17							
		eS	E		28	09							
	KM	eP	X	08	25	34							
		eS	X		28	35							
	GP	eP	N	08	25	39							
		eS	N		28	49							
		e	N			56							
	Epicentre:			08	20	54	Tonga				USCGS		
9	TO	P	z	11	21	41							
	CB	eP	E	11	21	41							
	GP	P	N	11	21	55							
	Epicentre:			11	13	56	5½S	147E	150	km	USCGS		
11	ON	1P	E	13	22	23e							
		eS	E		25	07							
		ScS	E		34	23							
	KP	eP	N	13	22	39							
		ePP	N		23	10							
		S	N		25	33							
		SS	N			52							
		eScS	N		34	22							
	TO	eP	z	13	22	48							
		ePP	z		23	27							
		eS	z		25	45							
	WN	eP	N	13	23	13							
		eP	z			15							
		PP	z			54	2.2	5					
		1	N		24	00				4	5		
		e	N			36				5	6		
		S	ZN		26	25	4	4		7½	2		6.4
		eScP	ZN		30	53	7	10					
		iScS	ZN		34	32				20	5		
		e	N		36	04				8	8		
	KM	eP	X	13	23	38							
		eS	X		27	10							
	GP	eP	N	13	23	42							
		S	N		27	24							
		ScS	N		34	44							
	Epicentre:			13	18	47	23½S	177W			USCGS		
12	ON	P	E	17	44	55½							
	KP	eP?	N		45	03							
		e(P)	N			08							
		eS	N		46	07							
	TO	eP	Z	17	45	13							
		eS	Z		46	32							
	WN	S	N	17	46	57							
		e	N		47	37							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 12	CB	eS	E	17	47	20							
	GP	eP?	N	17	46	23							
		eS	N		48	01							
	Epicentre:			17	43.5		34S	179W					5.3 NZ
13	ON	P	E	03	00	05							
	KP	eP	N	03	00	27							
	TO	P	Z	03	00	36½							
		epP	Z			54							6.4
	WN	e1P	Z	03	00	49d	4	2					
		e	N			54							6.3
		eS	N		05	44			4½	4			
		eS	Z			53	2.2	5					
		Lq	N			10.0			17	20			
		Lr	Z			10.2	18	20					
	CB	eP	E	03	00	52							
	KM	eP	X	03	01	01							
	RX	eS	N	03	06	44			3	7			
		Lq	E		09	20					8½	30	
		eLr	ZN		11	.5	11	28	11	28			
	Epicentre:			02	54	37	11S	166E	100km		USCGS		
13	ON	eP	E	07	15	13							
	Epicentre:			07	10	30	Fiji				USCGS		
14	ON	eP	E	05	58	49							
	AK	eL	N	06	04								
	WN	eL	ZN	06	06	.0	14	20	21	20			5.9
	KM	eP	X	06	10	00							
	RX	eLq	NE	06	07				4	30	6½	30	
		eLr	Z	06	09		14	25					
		Lmax	NE		10				8½	20	9	20	5.8
	SU	eP	N	05	56	47							
		eS	N		58	13							
		eL	N		59								
	Epicentre:			05	54	48	22S	175W			USCGS		
14	ON	P	E	07	22	31w							
		S	E		24	09w							
	KP	eP	N	07	22	45							
		S	N		24	33							
	TO	eP	Z	07	22	52							
		eS	Z		24	49							
	WN	P	ZN	07	23	17							
		S	ZN		25	31							
		i	ZN			33	7	2	16	1			6.8
	KM	eP	X	07	23	43							
		S	X		26	17							
	GP	eP	N	07	23	49							
		S	N		26	28							
	SU	e(P)	N	07	23	08							
	Epicentre:			07	20	25	29S	179W	350km		USCGS		
15	ON	e	E	19	27	.9							
		ePP	E		32	.2							
	KP	e	N	19	27	.9							
	TO	eP	Z	19	27	49							
	WN	P	Z	19	27	44d	4½	6					6.7
		(pP)	Z		28	01	4	6					
		(sP)	Z			16	3½	8					
		i	NZ		31	36	4	6					

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 15	WN	SKS	N		38	11			5	12			
		eS	N			50			5¼	8			6.8
		SS	N		45	34			6	12			
		Lq	N		52	.9			4.7	25			
		Lr	Z		57	.8			10	15			
	SU	S	N	19	40	03							
		eL	N	20	01								
	RX	eP	Z	19	27	50							
		e	N		32	54							
		e	E			56					6½	14	
		iSKS	NE		38	24			5.7	20	16½	20	
		S	NE		39	22			10½	25	22	25	7.0
		e(SS)	NE		45	48			8½	20	16½	25	
		eLq	EN		49				16	28	8½	20	
		eLr	Z		58	.7	35	22					
	Epicentre:			19	14	29	16½S	71½W	100km		USCGS		
15	ON	eP	E	22	21	01							
		eS	E		25	10							
	AK	eP	N	22	21	16							
		S	N		25	34							
	KP	eP	N	22	21	24							
		e	N			36							
		PP	N			59							
		eS	N		26	00							
	TO	eP	Z	22	21	25							
	WN	e	NZ	22	21	57	1.9	5					
		iPP	Z		22	48u	3.7	6					6.5
		eS	N		26	26			8	8			6.3
		eSS	Z		28	02	4	8					
		e	Z		30	12	4.4	7					
		Lmax	N		31	.5			45	20			6.2
		Lr	Z		32	.0	27	20					
	CB	e	E	22	21	.8							
	GP	eP	N	22	22	06							
		e	N			19							
	RX	S	NE	22	27	20			11	20	8½	20	6.3
		Lq	E		29	.8					30	30	
		eLr	Z		31	.0	22	22					
		Lmax	NE		34				15	24	42	24	6.3
	Epicentre:			22	15	44	13½S	167E			USCGS		
16	ON	eP	E	04	21	28							
	KP	eP	N	04	21	40							
	SU	eP	N	04	18	35							
		iS	N		19	53							
	Epicentre:			04	16	46	16S	175W	250km		USCGS		
16	ON	eP	E	11	08	45							
	AK	eL	N	11	17								
	WN	eSS	N	11	15	33			23	20			6.0
		Lmax	N		18	.6							
		eLr	Z		19	.1	18	20					
	RX	eS	NE	11	15	.3							
		eLq	E		17	.2					11	30	
		eLr	Z		20	½							
		Lmax	NE		21				4¾	20	8½	20	5.8
	SU	eL	N	11	09	.6							
	Epicentre:			11	03	32	14S	167E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 17	RX	eP	NE	07	20	16			1¾	12	2½	12	5.6
		e	ZE		21	07	3½	6			3½	4	
		PcP	Z		24	19	8	12					
		Lq	NE		24	11			30	18	31	18	6.1
		Lr	Z			55	17	13					
	KM	e	X	07	20	59							
		eL	X			25½							
	GP	e(P)	N	07	20	51							
		eL	N			25							
	WN	eP	Z	07	21	15	1.6	5					6.0
		e	Z		24	00	3.2	6					
		iS	N		25	46			11	10			6.4
		L	ZN		26	54			6½	9			
		Lmax	N		28				40	16			6.1
	KP	eL	N	07	28								
	AK	eL	N	07	29½								
	Epicentre:			07	15	38	52S	139½E			USCGS		
18	KP	eP	N	19	31	35							
	TO	eP	Z	19	31	44							
	WN	eP	N	19	32.0								
	GP	eP	N	19	32	08							
	Epicentre:			19	24	30	6S	155E	100km		USCGS		
19	WN	e	Z	14	21	33	1.3	6					
		ePP	NZ		25	41	4.5	5	3	10			7.1
		eSKS	N		31	57			6	15			
		S	N		33	20			19	20			7.3
		iPS	NZ		34	55u	3	9	15	20			
		iPPS	NZ		35	30d	14	20					
		SS	N		39	58			44	22			
		e	Z		40	53	6½	15					
		Lq	N		50	25			86	35			
		Lr	Z		55	03	60	24					
		Lmax	N	15	03				47	20			6.8
	RX	ePP	EZ	14	26	02	5¾	16			4	16	7.0
		SKS	NE		32	15e			1½	19	21½	19	
		S	N		33	34			27	23			7.3
		PS	EZ		35	19	20	20			47	20	
		SS	N		41	02			39	24			
		Lq	N		52				42	30			
		Lr	EZ		56		96	26			100	25	
		Lmax	NE	15	02				19	20	52	20	6.9
	SU	e	N	14	35	00							
		eL	N		50								
	Epicentre:			14	07	23	1½N	79½W			USCGS		
20	RX	eL	E	03	00								
20	WN	eL	N	03	16	15			7½	15			
23	ON	eP	E	08	56	27							
	TO	eP	Z	08	57	03							
	CB	eP	E	08	57.3								
	SU	S	N	08	56	14							
	Epicentre:			08	52	23	18½S	170E	150km		USCGS		
23	SU	iP	N	16	23	39							
		(S)	N		25	06							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 24	WN	eL	N	06	42								
	RX	eSKS	N	06	18.5								
		sSS	N		27	00			2½	25			
		eL	N		41				2	30			
		Lmax	N		52				2¼	20			6.0
	Epicentre:			05	53	58	56½N	163E			USCGS		
24	ON	P	E	23	57	23							
	KP	eP	N	23	57	36							
	TO	eP	Z	23	57	43							
	WN	eP	N	23	58	01							
	KM	eP	X	23	58	39							
	SU	eP	N	23	54	50							
		S	N		55	52							
	Epicentre:			23	53	29	17½S	178½W	550km		USCGS		
26	AK	eL	N	03	57								
	WN	eSS	N	03	50	50			2	10			
		eL	N			51.8			7	20			
	RX	eS	NE	03	48.5						2	12	5.8
		Lq	NE		52	01			4.6	20	4.3	20	
		eLr	Z		53½								
	Epicentre:			03	35	21	54S	133W			USCGS		
26	WN	eL	N	18	13½								
	RX	eL	NE	18	11								
27	ON	P	E	07	49	15							
		eS	E		53	41							
	AK	P	N	07	49	11							
		S	N		53	37							
		eL	N		56.0								
	WN	eP	ZN	07	49	53	2	8					6.0
		ePP	Z		50	51							
		e	N		54	55			4	10			
		e	N		56.8								
		eL	NZ		58	20			24	20			6.0
	KM	eP	X	07	50	14							
	GP	eP	N	07	50	21							
	RX	eS	NE	07	56	02			3	20	2	20	6.1
		Lq	NE		58	38			6	30	29	30	
		Lmax	NE	08	02½				7	20	17	20	6.0
		eLr	Z	08	03.3		15	15					
	SU	iP	N	07	46	03							
		S	N		47	42							
	Epicentre:			07	43	58	15S	174W			USCGS		
27	GP	eP	N	08	59	56							
	Epicentre:			08	52	26	Solomon Is.				USCGS		
30	WN	eP	N	06	20	48			3¼	5			6.5
		iPP	N		22	20			4¾	10			6.5
		iPPP	N			33			10	10			
		iS	N		26	36			15	10			6.8
		iSS	N		29	27			30	15			
		iScS	N		30	59			10½	7			
		eL	N		31½								
		Lmax	N		34½				47	20			6.4
	GP	eP	N	06	20	58							
		ePP	N		22	41							
		eS	N		27	00							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 30	RX	eP	Z	06	21	01	3½	8					6.1
		eP	NE			01			2¼	9	2½	4	6.6
		PP	Z		22	36	2.3	10					6.2
		PP	NE			36			9.2	10	7.3	10	6.4
		S	ZNE		27	00	8½	10	19	21	15	19	6.8
		SS	NE		30	19			15	15	53	15	
		Lq	NE		31				30	30	46	30	
		eLr	Z		33		40	25					
		Lmax	NE		34				65	20	51	20	6.5
	SU	eP	N	06	18	58							
		S	N		23	25							
	Epicentre:			06	13	24	7½S	155E			USCGS		
30	ON	P	E	22	44	26							
		S	E		46	50							
	KP	eP	N	22	44	38							
		S	N		47	17							
	TO	eP	Z	22	44	52							
		eS	Z		47	41							
	WN	eP	N	22	45	13							
		eS	N		48	12							
	CB	eP	E	22	45	16							
		eS	E		48	17							
	GP	eP	N	22	45	39							
		S	N		49	04							
	SU	iS	N	22	44	19							
	Epicentre:			22	41	27	600	km	Tonga		USCGS		
30	RX	P*	NEZ	01	26	13							
		iS*	NEZ			36	4¼	4	6¾	4	11¼	4	
	GP	ePn	N	01	26	52							
		i	N			54½							
		Sn	N		27	45							
		e	N		28	03							
	CB	Pn	E	01	27	18							
		Sn	E		28	29							
		e	E			48							
	WN	ePn	N	01	27	31							
		eSn	N		28	52							
	TO	ePn	Z	01	27	55½							
		i	Z			57½							
	KP	e	N	01	28	18							
	ON	e	E	01	28	29							
	Epicentre:			01	25	43	45.9S	167.1E	S		NZ(C)		5.0 NZ
							Felt: Nightcaps MM3						
30	ON	eP	E	02	12	17							
		eS	E		14	56							
	KP	e?	N	02	12	32							
		eS	N		15	29							
	TO	eP	Z	02	12	52							
	WN	eS	N	02	16	19							
	CB	eP	E	02	13	02							
		eS	E		16	25							
	GP	eP	N	02	13	27							
		eS	N		17	00							
	SU	iP	N	02	10	27							
		S	N		11	33							
30	ON	P	E	05	02	40							
	GP	eP	N	05	03	49							
	RX	eL	E	05	14						1.1	19	5.2
	SU	eP	N	05	00	10							
					02	30							
				04	58	01	19S	172½W			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 30	ON	eP	E	06	20	08							
	KP	eP	N	06	20	28							
		ePP	N		21	55							
	TO	eP	Z	06	20	36							
		ePP	Z		22	19							
31													
31	WN	Pn	ZN	06	33	12½d							
		P*	N			16½							
		i	N			22							
		Sn	Z			36							
	KP	iPn	N	06	33	15n							
		eP*	N			20½							
		eSn	N			36							
	CB	Pn	E	06	33	28							
		P*	E			38							
		S*	E		34	19							
	GP	ePn	N	06	33	49½							
		iP*	N		34	02s							
		e(Pg)	N			13							
		iSn				40½							
	ON	Pn	E	06	33	49							
		e(Pg)	E		34	14							
		e(S*)	E		35	09							
	RX	eL	E	06	36.9							7½	12
		eL	N		37.6				15	25			
		eL	Z		37.8		16	15					
	Epicentre:			06	32	44	39.9S	176.2E	S		NZ(C)		5.9 NZ
							Felt: Southern and central parts of the North Island. Maximum MM7 at Ashley Clinton and Dannevirke.						
31	TO	eP	Z	10	27	19							
		eS	Z		29	04							
	WN	eP	N	10	27	39							
		eS	N		29	40							
	CB	eS	E	10	29	56							
	GP	e(P)	N	10	28	20							
		S	N		30	41							
31	ON	eL	E	21	07.9								
	KP	eL	N	21	08½								
	WN	e(S)	N	21	08.1								
		eL	Z			10½	9	18					
	RX	e	N	21	10.2								
		eL	E		11.5							6	30
		eL	Z		14.6		15	20					
FE													
FEB 1	WN	eP?	H	16	24	10				1	5		
		PP	ZN		28	32				2	7		
		S	N		34	48							
		SKS	N		36	00				4	10		
		SS	N		43	05							
		eL	N		53.2								
		eLr	Z		57.6								
		Lmax	N	17	05					14	18		
	RX	eS	E	16	(34	38)							
		eS?	N		(36	06)							
		eS?	Z			(18)							
		SKS	E		(37	48)							
		eSS	NE		(43	30)							
		eL	Z		(57¾)								
		eL	E		(59)								
		eL	N	17	(00)								
	SU	e(S)	N	16	35	40							
		e(L)	N	17	02					6	18		
	Epicentre:			16	10	15	2N	79W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 3	SU	eS	N	08	27	27			8	5			
		e(L)	N		28				6	5			
		eLr	N		29								
		Lmax	N		30½				35	17			
	WN	eP	N	08	30	23							
		e(S)	N		34	22							
		eL	N		36¾				5	18			
	GP	e(P)	N	08	30	48							
	KM	e(P)	X	08	30	55							
	RX	e(L)	E	08	38½						3	20	
		e(L)	N		39¾				3	20			
		e(L)	Z		41½		6	18					
	Epicentre:			08	25	19	21S	174W			USCGS		
6	ON	eP	E	16	02	43					1½	2	
		e(S)	E		04	51							
	TO	eP	Z	16	03	07							
		e(S)	Z		05	19½							
	WN	eP	N	16	03	28							
		eS	ZN		06	02	2	1	4	1			
		PcP	N		08	30							
		(PcS)	N		12	00							
		iScS	N		15	15s			1½	5			
	KM	e(P)	X	16	04	03							
		eS	X		06	53							
	GP	eP	N	16	04	02							
		eS	N		07	01			6	1			
	SU	S		16	04	42			10	8			
	Epicentre:			16	00	12	27½S	178W			USCGS		
7	ON	P	E	01	12	35½					1	1	
		eS	E		14	07					2½	2½	
	AK	e(P)	N	01	12	43							
		eS	N		13	47			6½	5			
	KP	eP	N	01	12	49							
		eS	N		14	16			½	1½			
	TO	eP	Z	01	13	00							
		eS	Z		14	40							
	WN	eP	N	01	13	23							
		iS	N		15	16s			3½	½			
	CB	eP	E	01	13	36							
		S	E		15	28½							
	KM	eP	X	01	13	51							
		eS	X		16	07							
	GP	P	N	01	13	59			2	½			
		S	N		16	18							
	SU	eS	N	01	14	25			6	7			
	Epicentre:			01	10	31	31S	179W			USCGS		
8	KP	eP	N	16	06	53½							
		e(S)	N		07	26							
	TO	P	Z	16	07	00							
		e(S)	Z			45							
	WN	eP	H	16	07	22½							
		eS	H		08	17½							
	CB	e(P)	E	16	07	46							
		e(S)	E		08	29							
	GP	eP	N	16	07	55½							
	KM	eP	X	16	07	58							
		eS	X		09	06							
	Epicentre:			16	06	10	38S	179W	N		NZ(D)		5.0 NZ

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 13	RX	e(S)	N	00	07	56			1½	17			
		e	E		08	06							
		eL	N		30				3½	20			
		eL	E		30.5						3½	22	
		eL	Z		33		7	20					
	WN	e?	N	00	19	40							
		eLr	ZN		29½		5	20	8	20			
	Epicentre:			12	23	43	45		52N	175W	USCGS		
13	KP	eP	N	23	28	06½							
		eS	N			40½							
	TO	P	Z	23	28	12							
		eS	Z			51							
	WN	eP	N	23	28	30							
		eS	N		29	22½							
	CB	eP	E	23	28	35							
		eS	E		29	32							
	KM	eP	X	23	28	58							
		eS	X		30	08							
	GP	P	N	23	29	02							
		eS	N		30	19							
	Epicentre:			23	27	22	37½S	177E	300km±		NZ(D)		5.2 NZ
16	SU	eL	N	06	36				15	20			
	WN	eL	N	06	44½				26	25			
	Epicentre:			06	04	05	39N	142E			USCGS		
18	SU	eP	N	07	36	03			16	6			
		eS	N		39	06			55	8			
	WN	eL	N	07	45				7	15			
	RX	eL	E	07	49						5	18	
		eL	N		49¼				4	15			
		eL	Z		52½		5	12					
	Epicentre:			07	34	07	21S	173½W			USCGS		
18	ON	eP	E	13	23	19½					1	1½	
		e(S)	E		24	46½							
		eL	E		26								
	KP	eP	N	13	23	21			7	4			
		e(S)	N		25	20½							
	TO	e(P)	Z	13	23	53							
	WN	eP	N	13	24	18			6	7			
		eS	N		26	45			6	8			
		eL	N		27.3								
		Lmax	N		31				30	8			
	CB	e?	E	13	24	18							
	SU	eP	N	13	24	26			26	5			
		e(S)	N		27	44			16	7			
		e(L)	N		29				26	8			
		Lmax	N		32				90	8			
	RX	e	N	13	25	31							
		eL	E		29¼								
		eL	N		29¼								
		eL	Z		30¾								
		Lmax	N		31¾				20	20			
		Lmax	E		32						20	20	
		Lmax	Z		32½		30	18					
	KM	e(L)	X	13	31								
	Epicentre:			13	21	30	31S	178½W			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
FEB 18	SU	eL	N	20	20½					12 15			
	WN	e	H	20	21	43							
		e(S)	H		23	42				5 10			
		eL	H		27.3								
		Lmax	H		43					14 15			
	RX	e	N	20	28								
		e(L)	E		34						4	18	
		eL	Z		35½		4	15					
		eL	N		35½					6 15			
	Epicentre:			20	08	43	About 150 miles SE of Admiralty Is.						
											USCGS		
19	WN	e(L)	H	01	44.3					3 10			
	RX	eL	NE	01	48½					2 20	3	20	
		eL	Z		49		7	20					
	Epicentre:			01	20	20	37½S 111W				USCGS		
22	SU	(SKS)	N	11	10	33				7 10			
		(S)	N			35				6 5			
		Lmax	N		23					15 22			
	WN	iSKS	H	11	14	04				4 6			
		iS	H			31				5 8			
		eL	HZ		31½					15 25			
	Epicentre:			10	50	23	50½N 175W				USCGS		
24	KP	eP	N	10	06	41							
		iS	N		07	06s							
	TU	eP	N	10	06	43½							
		iS	N		07	09s							
	TO	P	Z	10	06	49							
		e(S)	Z		07	54							
	ON	P	E	10	06	53							
		e(S)	E		07	43½							
	WN	eP	H	10	07	08							
		eS	H			55½							
	KM	eP	X	10	07	39							
		eS	X		08	46							
	GP	eP	N	10	07	44							
		eS	N		08	55½							
	Epicentre:			10	06	10	37½S 176¾E 200km±				NZ(D)		5.0
25	TU	eP	N	12	45	49							
		eS	N		46	13							
	KP	eP	N	12	45	49½							
		eS	N		46	18							
	TO	P	Z	12	46	00							
		eS	Z			38½							
	ON	eP	E	12	46	02							
		e(S)	E			41							
	WN	eP	N	12	46	24½							
		S	N		47	18							
	CB	e(P)	E	12	46	52							
		eS	E		47	37							
	GP	eP	N	12	47	00							
		eS	N		48	22							
	KM	eP	X	12	47	05							
		eS	X		48	18							
	Epicentre:			12	45	13	27¼S 177½E 200km±				NZ(D)		5.0
27	WN	eL	H	23	50					3 12			
	RX	eL	E	23	57¼						4	22	
		eL	N	24	01					2 30			
				23	27	49	21N 120E				USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 3	ON	eP	E	04	11	14							
	KP	eP	N	04	11	35							
	WN	e	N	04	23								
	RX	eL	E	04	20						3	30	
		eL	N		22								
		Lmax	NE		23					1½ 20	2¼	20	5.5
	SU	e	N	04	09.0								
		eL	N		11.5								
	Epicentre:			04	06	16	14½S 168½E				USCGS		
3	KP	eP	N	04	53	06							
	Epicentre:			04	50	44	Fiji region				USCGS		
3	SU	eP	N	11	06	47							
	Epicentre:			11	04	49	20S 174½W				USCGS		
5	ON	iP	E	05	37	58							
		S	E		38	46							
	KP	P	N	05	38	02							
		S	N			51							
	TU	e(P)	N	05	38	00							
		S	N			50½							
	TO	P	Z	05	38	13							
		e(S)	Z		39	17							
	WN	P	N	05	38	37							
		S	N		39	53							
		i	N			55							
	CB	eP	E	05	38	45							
		S	E		40	12							
	KM	e(P)	X	05	39	11							
		S	X		40	48							
	GP	eP	N	05	39	13							
		S	N		40	57½							
	Epicentre:			05	36	58	35.3S 178.9E 260km				NZ(C)		5.9 NZ
5	TU	eP	N	23	32	18½							
		S	N			37							
	KP	iP	N	23	32	15¾							
		iS	N			33							
	ON	e(P)	E	23	32	41							
		S	E		33	13							
	TO	P	Z	23	32	19½							
		eS	Z			38							
	WN	P	N	23	32	41							
		S	N		33	19½							
	CB	P	E	23	32	49							
		i	E			50							
		S	X		33	35							
	KM	eP	X	23	33	(07)							
		e	X			(12)							
		S	X		34	(07½)							
	GP	P	N	23	33	16							
		i	N		34	21							
		S	N			22							
	Epicentre:			23	31	52	38.3S 176.2E 160km				NZ(B)		5.2NZ
7	WN	e	N	13	38	40							

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag.
MAR 7	KP	eP?	N	17	35	17				
		eS	N		39	07				
	TO	eP	Z	17	35	26				
	WN	eP	N	17	35	46				
		eS	N		39	14				
	CB	eP	E	17	35	50				
		eS	E		39	17				
	GP	eP	N	17	36	15				
		eS	N		39	53				
	SU	eS	N	17	33	03				
		L	N			58				
	Epicentre:			17	30	28	20S 175W		USCGS	
8	WN	e	N	10	37.7					
	RX	e	N	10	33					
9	WN	eL	N	07	46.2					
	RX	eL	E	07	47					
	Epicentre:			07	23	51	6½S 148E		USCGS	
9	ON	P	E	10	23	58w				
		i	E		24	00e				
	AK	iP	N	10	24	02s				
	KP	P	N	10	24	04½s				
		i	N			06n				
		S	N		25	16				
	TU	eP	N	10	24	00½				
		e	N			03				
		S	N		25	09				
	TO	eP	Z	10	24	14				
		i	Z			21				
		eS	Z		25	38				
	WN	eP	N	10	24	38				
		i(sP)	ZN		25	02	5 1½			
		S	ZN		26	16	8 6			
		i	Z			50	22 4½			
		ScS	N		38	00		6¾ 3		
		eScS	N			26		3¼ 2		
	CB	eP	E	10	24	49				
		e	E		25	00				
		S	E		26	36				
	KM	e(P)	X	10	25	19				
		e	X		26	07				
		S	X		27	18				
	GP	eP	N	10	25	16				
		e	N			24				
		S	N		27	22				
	RX	eL	NE	10	29.2			20 30	11 30	
		Lmax	NE		31½			43 20	24 19	
		Lr	Z		31.8		52 20			
	SU	eP	N	10	25	53				
		S	N		28	53				
		eL	N		29½					
	Epicentre:			10	22	32	33¾S 179W 50km		NZ(D)	6.5
10	SU	S	N	21	34	31				
	Epicentre:			21	31	48	20S 176W 200km		USCGS	

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag.
MAR 11	ON	e(P)	E	00	37	57				
		e	E		38	20				
	AK	e(S)	N	00	48	20				
		eL	N		59					
	KP	eP	N	oo	38	03				
		e	N			22				
		(S)	N		48	23				
	TO	eP	Z	oo	38	02				
		e	Z			25				
	WN	eP	ZN	00	38	04	1¼ 2			
		ipP	ZN			25	12 6	3½ 5		
		i	Z		42	00	12½ 8			
		S	N		48	30		24 10		7.4
		PS	N		49	25		35 10		
		eSS	N	00	54	05		22 15		
		i	N		56	25		15 10		
		Lq	N	01	00½			90 30		
	CB	eP	E	00	38	11				
	KM	e(P)	X	00	38	30				
	RX	eP	Z	00	39		28 14			7.0
		eP	NE		39			8.6 15	6.7 15	6.9
		eSKS	NE		49			8½ 12	21 10	7.0
		eS	NE		49½			19 30	21 22	6.9
		Lq	NE	01	01			180 50	190 50	
		Lr	Z		06		170 40			
	SU	eP	N	00	36	56				
		S	N		46	13				
	Epicentre:			00	25	56	25½N 125E 60km		USCGS	
11	ON	P	E	14	04	18				
	KP	eP	N	14	04	36				
	TO	eP	Z	14	04	45				
	WN	eP	N	14	05	01				
		eS	N		09	51				
		eL	N		13			21 20		6.0
	CB	eP	E	14	05	01				
	KM	eP	X	14	05	08				
	GP	P	N	14	05	18				
	RX	eLq	E	14	13				13 29	
		eL	N		14			3½ 30		
		eLr	Z		16					
		Lmax	NE		17			5.9 19	6.7 19	5.9
	SU	iP	N	14	02	16s				
		S	N		04	42				
	Epicentre:			13	59	00	13S 167E		USCGS	
15	RX	eL	ZNE	19	28			2 20	2 20	5.6
	Epicentre:			19	06	10	5S 152E		USCGS	
16	WN	e(L)	N	02	39¾					
18	WN	e(L)	N	11	57					
20	ON	e	E	01	50	56				
	KP	e	N	01	51	00				
	TO	eP	Z	01	51	02				
	WN	eL	N	02	21			13 20		6.4
	SU	eL	N	02	09					
	Epicentre:			01	38	04	51N 173W		USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 20	WN	eL	N	15	07½								
	SU	e	N	14	54	28							
		eL	N		58								
	Epicentre:			14	47	05	10S	161E				USCGS	
22	ON	eP	E	06	21	12							
	TU	eS	N	06	23	10							
	WN	eS	N	06	24	17			4	15			
		eL	N		27½								
	CB	eS	E	06	24	38							
	KM	eP	X	06	22	40							
		eS	X		25	20							
	GP	eS	N	06	25	22							
	RX	eL	E	06	28½						2½	22	
		eL	N		30				1½	20			
		eL	Z		31½								
	Epicentre:			06	18	54	Kermadec I.					USCGS	
22	WN	eL	N	10	54½								
	RX	eLq	N	10	52				9	50			
		eL	E	11	18						2½	20	6.0
	Epicentre:			10	11	27	23½N	94½E				USCGS	
22	WN	eL	N	14	17¼								
	RX	eL	E	14	18.5								
		eL	N		20.6								
24	ON	eP?	E	00	59	40							
	KP	eP	N	01	00	01½							
	TU	eP	N	01	00	11½							
	WN	eP	Z	01	00	36½	1½	2					6.0
		i(PP)	N		01	10			2½	5			
		e(PP)	N			17							
		S	N		04	30			3	10			5.5
		(SS)	N		05.2								
		eL	N		06.6				12	20			5.7
	CB	e?	E	01	00	48							
	KM	e(P)	X	01	00	56½							
	RX	e(S)	E	01	06	20					1¾	25	5.3
		e(S)	N		30				1¾	16			
		(SS)	E		07	08					3½	15	
		eL	E		08½						5½	20	5.6
		eL	N		09				3½	16			
		eL	Z		10		4¼	15					
	SU	eP	N	00	58	19							
		S	N	01	00	16							
	Epicentre:			00	55	55	21S	170½E				USCGS	
24	AK	eL	N	21	56								
	KP	eP	N	21	50	32							
	WN	eL	N	21	57				7	15			
	RX	eL	NE	21	56				2¼	20	2¼	20	
		Lmax	NE		58½				2	20	3½	20	5.5
		eL	Z		59½		4	15					
	SU	e	N	21	49	14							
		eL	N		50	55							
	Epicentre:			21	46	31	21½S	170½E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 25	WN	eL	N	08	39					3½	15		
	RX	eL	E	08	39						1¾	20	
			Z		40		3	17					
	SU	e	N	08	27	55							
		eL	N		32	27							
	Epicentre:			08	25	13	Fiji region					USCGS	
25	WN	eL	N	19	15						7	28	
	RX	eL	E	19	15					1.7	1.4	20	5.4
		eL	NE		17								
		eL	Z		19		3	15					
	SU	e	N	19	04	35							
		e(S)	N		06	31							
	Epicentre:			19	01	52	17½S	167½E				USCGS	
28	WN	e	N	05	40½								
		e	N		43					2	10		
	RX	eL	NE	05	37½								
28	WN	eP	N	14	50	30							
		eL	N		57¾								
	CB	eP	E	14	50	34							
	KM	eP	X	14	50	54							
	GP	eP	N	14	51	03							
	RX	eL	E	14	58						2	30	
		Lmax	NE	15	00					1¼	2½	20	5.4
	SU	eP	N	14	47	24							
		eL	N		48	55							
	Epicentre:			14	45	22	20½S	174W				USCGS	
29	WN	eL	N	06	41½					3½	10		
	RX	S	N	06	31	01				2.1	8		
		eL	N		35.7					5½	30		
		Lmax	NE		36½					4¾	20	5½	20
30	KP	eP	N	14	06	23							
	TO	eP	Z	14	06	31							
		eS	Z		08	14							
	WN	eP	N	14	06	46							
		e	N			57							
		eS	N		08	55							
		i	N		09	00							
	CB	eS	E	14	09	10							
	KM	eS	X	14	09	45							
	GP	eP	N	14	07	30							
		eS	N		09	54							
30	KP	eP	N	17	36	18							
		eS	N		38	57							
	TO	eP	Z	17	36	30							
	WN	eP	N	17	36	49							
		eS	N		39	45							
	CB	eS	E	17	39	50							
	KM	eP	X	17	37	09							
		eS	X		40	17							
	GP	P	N	17	37	14							
		S	N		40	28							
	SU	P	N	17	34	38							
		S	N		35	50							
	Epicentre:			17	33	01	23S	179½E	550km			USCGS	

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag.
MAR 30?	GP	eS	N	22	46	14				
	SU	i	N	22	38	58				
	Epicentre:			22	36	53	22S 176W			
31	KP	eP	N	21	32	38				
	TO	eP	Z	21	32	53				
		e(S)	Z		34	41				
	WN	eS	N	21	34	53				
	KM	e(S)	X	21	36	05				
APR 4	WN	e(P)	N	01	59	26				
		eS	N	02	02	23				
	KM	eP	X	01	59	45				
		eS	X	02	02	58				
	GP	eP	N	01	59	49				
		e(S)	N	02	03	04				
	CB	eS	E	02	02	29				
X 4	WN	eL	N	02	50					
	RX	eL	N	02	46					
	Epicentre:			02	23	20	5½S 152E		USCGS	
4	RX	eS	NE	07	31	15				
		eL	E		38					
		eL	ZNE		40					
	WN	eL	N	07	38					
	Epicentre:			07	16	55	5½S 152E		USCGS	
X 4	WN	eL	N	07	51					
	RX	eL	E	07	51					
		eL	ZN		52			4 20	4½ 20	
	Epicentre:			07	29	55	5½S 152E		USCGS	
4	WN	eS	N	15	51	57				
		eScS	N		55	30		2½ 10		
		eL	N		58			12 20		
	GP	e(P)	N	15	45	59				
	RX	eS	NE	15	52	22		3½ 23	5 25	
		e	N		53	38				
		i	E			52				
		eL	ZNE		59			10 20	12 20	
	Epicentre:			15	38	03	5½S 152E		USCGS	
X 6	RX	eL	ZNE	11	10					
	WN	e	N	11	13					
	Epicentre:			10	36	30	Marianas Is.		USCGS	
7	ON	eP	E	07	12	58				
	WN	e(P)	N	07	13	40				
	Epicentre:			07	09	08	Fiji region		USCGS	
7	SU	i(S)	N	15	54	12s				
		L	N	16	11					
		M	N		15			100 20		
	RX	e(PS)	E	15	58	12			8½ 25	
		e	N	16	00	00		15 25		
		iSS	NE		06	14				
		eSSS	NE		09.6					
		eL	NE		17					
		eL	NE		19					
		eLr	N		24					
		M	N		32			50 20		
					34				30 20	

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag.
APR 7	WN	e	N	15	59	05				
		i	N	16	09	50				
		eLq	N		16					
		eLr	ZN		21					
		M	ZN		30		25 20	35 20		
	ON	eL	E	16	08					
	AK	eL	N	16	09					
		M	N		33			14 19		
	CB	eL	X	16	17					
	Epicentre:			15	30	38	66½N 157W		USCGS	7-7½
7	AK	eL	N	18	48					
	WN	i	N	18	27	55		5½ 12		
		e	N		33	35		5½ 12		
		eL	ZN		47					
		M	N		51			7 20		
	RX	e	NE	18	28	14				
		e	N		30.4					
		eL	NE		48			7 20	9 18	
X 7	RX	eL	E	20	19				5½ 20	
8	ON	P	E	13	25	43				
	TU	e(P)	N	13	26	12				
		e(S)	N		29	38				
	WN	eP	N	13	26	30				
		eS	N		30	26				
	CB	P	E	13	26	34				
		S	E		30	33				
	KM	e(P)	X	13	26	48				
		e(S)	X		31	02				
	GP	eP	N	13	26	54				
		e	N		27	07				
		e(S)	N		31	10				
		e	N			27				
	Epicentre:			13	21	33	19S 176W 250km		USCGS	
10	ON	e	E	15	43	53				
	WN	eP	N	15	44	07				
		eS	N			53				
	CB	eP	E	15	44	14				
		eS	E		45	04				
	GP	P	N	15	44	42				
		S	N		45	53				
	Epicentre:			15	43	08	Bay of Plenty 250km?			5.6 NZ
10	SU	e?	N	19	11	55				
		e	N		12	53				
	ON	eP	E	19	14	39				
	GP	e(P)	N	19	15	55				
	Epicentre:			19	10	13	Tonga 200km		USCGS	
10	KP	iP	Z	23	25	04d				
	RX	eL	ZNE	23	52				4 20	
	Epicentre:			23	12	47	Galapagos Is.		USCGS	6¼
11	RX	eL	NE	01	42				2 20	
11	KP	iP	Z	23	24	08d				
		e	Z			44				
11	KP	iP	23	34	23					
	WN	e	N	23	34	28		4 7		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 11	RX	e	NE	23	34	55							
		i	NE		35	42				6 12			
		eL	E		53								
		eL	N	24	01					1½ 20			
	SU	e	N	23	50								
	Epicentre:			23	11	19	Kurile Is.				USCGS		6½
12	KP	iP	Z	01	09	09							
12	SU	eL	N	12	25								
	RX	eL	NE	12	29								
		eL	ZNE		35		6 20			3½ 20		5½ 20	
	WN	eL	H	12	32								
		M	H		39					4 18			
	Epicentre:			11	46	58	26½N 111W				USCGS		
12	KP	eP	Z	13	37	21							
		i	Z			34u							
	Epicentre:			13	25	22	25N 126E				USCGS		
13	KP	iP	N	01	44	41							
	ON	eP	E	01	45	05							
	WN	P	N	01	45	05							
		S	N			40							
	CB	eP	E	01	45	12							
		S	E			55							
	GP	P	N	01	45	39							
		S	N		46	42							
	Epicentre:			01	44	17	38.5S 175.9E 170km NZ(C)						5.1 M
13	RX	eL	E	09	55								
		eL	N	10	05					1½ 20		1 20	
	Epicentre:			09	07	24	Alaska				USCGS		6½
13	KP	eP?	Z	12	42	15							
		i	Z			19							
		e	Z		43	03							
	WN	eSKS	N	12	52	58							
		iS	N		53	42				5 8			
		ePPS	N		55	59							
		eL	N	13	12								
		M	N		18					9 20			
	RX	eSKS	N	12	53	18				3 15			
		eS	NE		54	20	6½ 14						
		ePS	N		55	34				6 18			
		eSS	NE	13	00	42				1½ 14		2 16	
		eL	E		10								
		eL	NEZ		14								
		M	NE		22					8 20		4 20	
	AK	eL	N	13	16					7 20			
	Epicentre:			12	29	07	53N 161E				USCGS		
13	KP	P	Z	22	06	48							
14	KP	P	Z	03	02	43							
	Epicentre:			02	49	41	47N 152E				USCGS		
14	ON	e(P)	E	19	26	57							
	KP	eP	Z	19	27	16							
		i	Z			18							
		e	Z			51							
	Epicentre:			19	21	54	14½S 168E				USCGS		

Date	Stn	Pgase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 14	WN	eSKS	N	21	57	10							
		eS	N		58	17				8 27			
		eSS	N	22	05	28							
		eLq	N		15								
		Lr	N		20								
		M	N		22								
	RX	iSKS	E	21	57	21							
		eS	N		58	40							
		iPS	ZE	22	00	26							
		eSS	NE		06	14				10 22		10 25	
		eSSS	NE		10								
		eLq	N		15								
		eLr	NEZ		21								
		M	NEZ		23								
	KP	e(PKKP)	Z	22	02	26							
		e	Z			55							
	Epicentre:			21	32	28					USCGS		
15	WN	eL	ZN	02	19								
	RX	eL	ZNE	02	19								
	Epicentre:			01	30	43	1N 79½W				USCGS		6½
15	WN	eL	H	04	43								
	RX	eL	ZNE	04	43								
	Epicentre:			03	52	39	9N 82W				USCGS		6¾
15	KP	eP	Z	10	11	22							
	Epicentre:			09	59	55	15N 120E 100km				USCGS		
16	ON	e(S)	E	06	23	55							
		e	E		24	12							
	KP	e(S)	Z	06	23	57							
		i	Z		24	02							
		e	Z		25	39							
	WN	e(S)	N	06	26	19							
CB	GB	eS	E	06	26	38							
	KM	eS	X	06	27	18							
	GP	eS	N	06	27	23							
		e	N			27							
16	ON	e(S)	E	06	33	00							
	KP	e(S)	Z	06	33	11							
	WN	e(S)	N	06	35	24							
	CB	e(S)	E	06	35	45							
	KM	e(S)	X	06	36	29							
	GP	e(S)	N	06	36	30							
16	KP	P	Z	12	47	38							
	Epicentre:			12	36	24	14N 120½E 150km				USCGS		
16	KP	P	Z	18	15	00							
17	KP	eP	Z	02	08	38							
		i	Z			43							
	Epicentre:			02	01	26	6S 154E				USCGS		
17	KP	P	Z	02	22	47							
		e	Z		25	09							
	Epicentre:			02	15	16	10S 152½E				USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 17	KP	eP	Z	02	57	59							
		e	Z		58	29							
	Epicentre:			02	46	03	32N	139½E			USCGS		
17	TU	iP	N	03	47	17s?							
		S	N			36							
	KP	iP	N	03	47	17½							
		i(S)	N			33							
	TO	iP	Z	03	47	25u							
		e(S)	Z			50							
	ON	iP	E	03	47	37e?							
	WN	P	N	03	47	48							
		S	N		48	33							
	CB	P	E	03	47	58							
		S	E		48	52							
	KM	e	X	03	48	23							
		eS	X		49	29							
	GP	P	N	03	48	24½s?							
		eS	N		49	37½							
	Epicentre:			03	46	50	37.8S	177.0E	170km	NZ(C)			5.6
							Felt: Eastern parts of North Is. Max. MM3						
17	KP	eP	Z	06	28	52u							
	GP	eP?	N	06	29	29							
	RX	eL	NE	06	39				2	20	2	20	
	WN	eL	H	06	44				3½	20			
	Epicentre:			06	21	43	6S	155E			USCGS		
17	KP	eP	Z	10	12	09							
		e	Z		14	25							
	WN	eL	N	10	18								
		eL	N		28								
	RX	eL	N	10	19								
		eL	NE		25								
	AK	eL	N	10	27								
	Epicentre:			10	04	46	5½S	152E			USCGS		
17	KP	eP	Z	11	45	06d							
		ei	Z			20							
	Epicentre:			11	32	48	37N	145½E			USCGS		
18	SU	P	N	07	33	40s							
		(S)	N		34	37							
	ON	eP	E	07	35	39n							
	KP	iP	Z	07	35	52u							
	TO	eP	Z	07	36	00							
	WN	eP	N	07	36	20							
		e	N		39	45							
	CB	eP	E	07	36	23							
		e	E		39	50							
	GP	eP	N	07	36	45							
	Epicentre:			07	32	06	20S	178W	600km		USCGS		
18	KP	eP	Z	09	11	39							
	Epicentre:			09	03	27	5S	143½E			USCGS		
19	KP	eP	Z	00	22	33							
	Epicentre:			00	10	50	30½N	141½E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 19	SU	i(P)	N	10	55	30							
	KP	e	Z		04								
		e	Z		57	06							
		i	Z			13							
	GP	eP?	N	10	56	39							
		e?	N		58	43							
	KM	eP?	X	10	58	06							
	WN	S	N	11	01	20			3½	7			
		eL	N		04								
		eL	Z		05				1½	20	2	20	
	RX	eS	NE	11	02	41							
		eL	NE		05								
	Epicentre:			10	49	50	10½S	161½E			USCGS		
19	KP	e?	Z	14	24	50							
		i(P)	Z		25	12u							
	Epicentre:			14	14	38	22½N	143E	200km		USCGS		
20	SU	e	N	09	58								
	KP	e(P)	Z	09	59	34							
20	KP	iP	Z	11	43	20							
20	GP	eP	N	21	26	48							
	WN	P	ZN	21	27	00							
		e	H			10							
	CB	eP?	E	21	27	02							
		e	E			05							
	KP	iP	Z	21	27	17u							
	ON	P	E	21	27	28w?							
	Epicentre:			21	15	00	Sandwich Is.				USCGS		
21	KP	iP	Z	10	15	06							
21	SU	P?	N	20	16	25n							
		i	N		40n								
		i!	N			43s			11	15			
		S	N		18	04							
	KP	P	Z	20	20	10u							
	ON	e?	E	20	20	21							
		e	E		25	.2							
		eL	E		26								
	RX	e(S)	NE	20	26	.5							
		eL	NE		29								
		eL	Z		31								
		M	E		32						55	20	
	TU	eL		20	27								
	WN	eL	N	20	27								
		eL	ZN		29								
		M	N		30				35	17			
	CB	eL	E	20	28								
	GP	eL	N	20	(29)								
	KM	eL	X	20	31								
	Epicentre:			20	14	47	15S	174½W			USCGS		6½
21	KM	eP?	X	22	48	34							
	CB	eP	E	22	48	40							
		e	E		49	24							
		eS	X		57	39							
		e	X		58	52							
	KP	eP	Z	22	48	49							
		e	Z		49	32							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 21	WN	eP	N	22	48	54			0.2	2/3			
		e	Z		49	31	4	4					
		S	N		57	55			2	7			
		e	N		59	10			4	10			
		eSS	N	23	02	40							
	RX	eS	NE	22	57	22					5	12	
		e	N		58	12							
		eSS	E	23	02	.2							
		eLq	N		05	½			13	25			
		eL	NE		10								
		M	E		15						2	20	
	Epicentre:			22	37	18	4½S	104E			USCGS		6½
22	KP	P	Z	00	06	09d							
		e	Z			38							
		e	Z		07	08							
	CB	eP	E	00	06	22							
	WN	e?	N	00	06	35							
		eS?	N		15	05			3	6			
		eL	N		22								
	RX	eL	N	00	18								
		eL	NE		22								
		M	NE		23				3	20	2	20	
	Epicentre:			21	23	57	05	6½S	131E		USCGS		
22	SU	eL	N	05	42								
	KP	e(P)	Z	05	44	34							
	RX	eL	E	05	54½						1½	20	
	Epicentre:			05	39	07	15S	174½W			USCGS		
22	KP	P	Z	09	18	48u							
	RX	eL	E	09	43								
	Epicentre:			09	08	13	½S	120½E			USCGS		
22	KP	ePKP	Z	10	22	39d							
	Epicentre:			10	02	43	37N	31E			USCGS		
22	KP	1P?	Z	21	20	06d							
	Epicentre:			21	12	45	Solomon Is.				USCGS		
23	SU	e?	N	03	09	20							
		i	N			37							
		eL	N		32								
		M	N		36				9	20			
	KP	eP?	Z	03	10	38							
	RX	e	NE	03	22	02			2	15			
		eL	ZNE		45								
		M	NE		48				2½	20	3½	20	
	WN	e?	H	03	22	36			3½	6			
		L	H		45				3	18			
	Epicentre:			02	57	40	45N	152E			USCGS		
23	KP	eP	Z	06	05	26							
	Epicentre:			05	53	06	30½N	130E			USCGS		
23	SU	i(P)	N	15	13	04s							
		eS?	N		14	05							
		(L)	N			15							
	KP	eP	Z	15	16	56							
	ON	eP?	E	15	16	57							
		e(P)	E		17	02					0.8	2	
		e	E		19	01							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 23	RX	eL	NE	15	26								
		M	E		29								
	WN	iScS	H	15	28	00					3½	6	
		i	H			25							
		e	H		29	45							
	Epicentre:			15	11	39	15½S	176W			USCGS		
23	KP	eP	Z	19	19	58							
		ipP	Z		20	16d							
		i(PP)	Z		22	07d							
	CB	e	E	19	20	29							
	RX	eL?	E	19	36								1 20
	Epicentre:			19	12	36	4½S	153E	100km		USCGS		
24	ON	eP	E	13	13	20							½ 1½
		e(S)	E		17	03							
		e	E		24	35							
	KP	P?	Z	13	13	40d							
		P	Z			41u							
	WN	eP?	ZN	13	14	19u							
		i	Z			22d							
		i	N			26n							
		i	Z		15	27							
		eS	H		17	54							
		e	ZN		18	03					5	5	
		eL	ZN		21								
		M	N		25						17	15	
	GP	eP	N	13	14	44							
	RX	e(S)	NE	13	19	08					8	16	7 18
		eL	E		20½								10 20
		eL	NZ		22								
		M	N		23						8	18	
	Epicentre:			13	09	41	22S	170½E			USCGS		
24	KP	eP	Z	17	25	15u							
	RX	e(S)	NE	17	30	48							
		eL	E		32								
		M	N		34						2	20	
	WN	eL	H	17	33								
	Epicentre:			17	21	10	22S	170½E			USCGS		
24	KP	P	Z	17	44	40d							
		e	Z		45	12							
	Epicentre:			17	38	35	New Hebrides				USCGS		
26	KP	P	Z	01	17	46d							
	Epicentre:			01	13	34	22S	170E			USCGS		
26	ON	eP?	E	09	30	45							
		i	E			48w							
	KP	iP	Z	09	31	05u							
	TO	P	Z	09	31	17							
	WN	P	N	09	31	36							
	RX	eL	E	09	40								
	Epicentre:			09	25	54	15S	168E			USCGS		
27	ON	eP?	E	08	16	49							
		e	E			58							
	KP	P	Z	08	16	59							
		e	Z		18	42							
	WN	eP	N	08	17	38							
		eS	N		21	08							
	CB	eP	E	08	17	44							
		e(S)	E		21	20							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 27	GP	eP	N	08	18	05							
		eS	N		22	05							
	TU	e(S)	N	08	20	20							
	Epicentre:			08	12	58	22S	176W	100km		USCGS		
27	WN	eL	N	19	51								
	RX	eL	N	19	51								
	Epicentre:			19	03	50	52½N	169W		1½ 20	USCGS		
28	RX	eL	NE	06	18								
	WN	eL	ZN	06	22								
28	KP	P	Z	11	35	39							
	Epicentre:			11	28	14	5S	153½E			USCGS		
28	RX	eS	NE	12	12	04							
		ePPS	NE		14	32						1½ 17	
		eSS	NE		20	.0						3 20	
		eLq	N		29	½						3½ 25	
		eLr	ZNE		34	½							
		M1	NE		38								
	WN	eL	ZN	12	33					3 19		3 19	
		M			40								
	Epicentre:			11	47	40	11S	74W		6½ 17	USCGS		6½
29	KP	iP	Z	22	17	23u							
MAY 1	ON	P	E	00	34	07							
	AK	eP	N	00	34	16							
		e	N		39	34							
	KP	iP!	Z	00	34	27u							
		pP	Z		35	13d							
		iPcP	Z		37	55d							
		ScP	Z		41	16							
		PcS	Z			29							
	TU	eP	N	00	34	31							
		eS	N		38	50							
	WN	iP	ZN	00	34	52	10	5					
		eS	N		39	21				3¼ 5			6.3
		Lq	N		40	.6				26 25			5.8
	TO	P	Z	00	34	37u							
		epP	Z		35	21							
	CB	eP	E	00	34	52							
	GP	iP	N	00	35	10s							
		ePcP	N		38	08							
		eS	N		39	53							
	RX	iP	Z	00	35	23u	7	6					
		iP	NE			23s							6.6
		S	NE		40	17				3¼ 6			6.4
		Lq	E		43	37				11 20		4 20	6.0
	SU	P	N	00	32	08						17 30	
	Epicentre:			00	29	15	13½S	167½E	200km		USCGS		
1	KP	P	Z	06	25	03							
1	KP	P	Z	09	42	17							
	Epicentre:			09	31	43	½S	120E			USCGS		
1	KP	P	Z	12	44	21							
		e	Z		45	47							
	TO	eP	Z	12	44	24							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 1	ON	eP	E	15	25	57							
	KP	P	Z	15	26	09							
	TU	eS	N	15	27	51							
	WN	eS	N	15	28	51							
	CB	eS	E	15	29	07							
	GP	S	N	15	29	52							
	RX	eS	NE	15	31	47							
3	KP	P	Z	06	48	09							
	Epicentre:			06	37	55	4N	128½E			USCGS		
3	KP	eP	Z	09	36	30							
		e	Z		37	09							
4	KP	P	Z	20	04	10							
		i	Z			13u							
		i(S)	Z		06	50							
	TO	eP	Z	20	04	22							
	GP	eP	N	20	05	09							
		eS	N		08	23							
	SU	e	N	20	03	08							
		iS	N		04	04							
	Epicentre:			20	01	.1	S of Fiji		600km		USCGS		NZ
5	WN	eL	N	17	10								
										3½ 10			
8	KP	P	Z	07	26	53							
8	KP	P	Z	10	53	45½							
	TO	eP	Z	10	53	59							
	Epicentre:						New Hebrides Is. region						NZ
8	KP	iP	Z	12	53	51½u							
		pP	Z		54	38							
	TO	eP	Z	12	53	47							
		e(pP)	Z		54	36							
	GP	eP	N	12	53	43							
	Epicentre:			12	40	46	24S	67W	200km		USCGS		
8	KP	P	Z	14	49	06u							
9	KP	PKP	Z	03	00	48							
		PKP_2	Z		01	05							
	Epicentre:			12	40	49	37N	27½E			USCGS		
9	KP	P	Z	04	53	18½d							
		pP	Z		54	05							
		PKKP	Z	05	10	40							
		P'P'	Z		18	47							
	Epicentre:			04	40	20	31S	65½W	100km		USCGS		
9	KP	P	Z	18	47	34							
	GP	eP	N	18	48	35							
12	SU	eL	N	06	45	.2							
14	KP	P	Z	04	05	37							
		e	Z			47							
	GP	eP	N	04	06	10							
	RX	eL	N	04	15								
		eL	E		19					3½ 25			
	Epicentre:			03	58	09	4½S	153E			6 23 USCGS		5.9

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 14	KP	P	Z	23	55	11							
		e	Z			28							
	SU	eP	N	23	52	58							
		eS	N		54	31							
15	KP	P	Z	04	37	49							
		i	Z		38	05							
		e	Z			15							
	Epicentre:			04	24	50	51½N	173½W			USCGS		
15	ON	P	E	04	44	53							
		S	E		47	28							
	KP	P	Z	04	45	08							
		i	Z			12							
	WN	eP	N	04	45	43							
		eS	N		48	56							
	GP	eP	N	04	46	06							
	SU	iS	N	04	44	20							
	Epicentre:			04	40	54	Tonga region				USCGS		
15	ON	e(P)	E	07	07	42							
	KP	eP	Z	07	07	53							
	Epicentre:			07	01	56	11½S	165E			USCGS		
15	ON	eP	E	09	49.2								
	KP	eP	Z	09	49	31							
	SU	e	N	09	51								
	Epicentre:			09	43	46	13S	166½E			USCGS		
15	KP	eP	Z	15	51	48							
	SU	eL	N	15	53								
	Epicentre:			14	45	53	13S	166½E			USCGS		
16	KP	eP	Z	02	16	07							
		e	Z		17	17							
16	RX	eL	NE	13	36				2¼	25	2½	15	
		eL	Z		37		3½	15					
	WN	eL	N	13	40				6	14			
17	KP	eP	Z	07	10	41							
	WN	S	N	07	17	36							
		L	ZN		27				12	20			6.1
	RX	eL	NE	07	22				2¼	20	2	20	5.7
		eL	Z		32		3	15					
	SU	eS	N	07	14	55							
		eL	N		18½								
	Epicentre:			07	02	25	3S	147½E			USCGS		
17	KP	P	Z	17	48	33							
	WN	eP	N	17	49	04							
	KM	eP	X	17	49	27							
	GP	eP	N	17	40	28							
	SU	eL	N	17	47								
	Epicentre:			17	43	45	18½S	174½W			USCGS		
18	AK	eL	N	02	45								
	KP	eP	Z	02	38	04							
		i	Z			24							
	WN	P	Z	02	38	54u	2	6					6.1
		PP	Z		39	52	4½	7					6.5
		PP	N			52			5	7			6.6
									2½	6			5.9

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 18	WN	SS	N		44	50				13	17		
		Lq	N		45	58				12½	15		
		eLr	Z		48		6½	15					
		Lmex	N		50					80	20		6.4
	KM	eP	X	02	39.1								
	GP	eP	N	02	39	13							
		e	N			30							
	SU	P	M	02	36	03							
	Epicentre:			02	32	52	13S	167E			USCGS		
18	KP	eP	Z	02	45	36							
18	KP	e	Z	03	37.1								
	WN	eL	ZN	03	46½		7	15		8	15		
	SU	P	N	03	34	36							
	Epicentre:			03	31	18	13S	167E			USCGS		
18	KP	e(P)	Z	05	32	21							
		e	Z			33							
	WN	eL	NZ	05	43		3½	20		6	20		
	SU	eL	N	05	33								
	Epicentre:			05	26	44	13S	167E			USCGS		
18	AK	eL	N	12	35								
	KP	eP	Z	12	26	56							
		e	Z		27	12							
	WN	P	Z	12	27	21d	2.1	7					6.1
		S	N		32	27				8	20		
		eLq	N		34½					7½	15		
		Lr	Z		37½		45	19					
		Lmex	N		38					35	20		6.2
	KM	eP	X	12	27.5								
	GP	eP	N	12	27	34							
		e	N			51							
	SU	P	N	12	24	31							
	Epicentre:			12	21	18	13S	167E			USCGS		
18	KP	eP	Z	12	34	02							
18	KP	P	Z	13	23	07							
	KM	eP	X	13	24.0								
19	KP	eP	Z	00	11	35							
		i	Z			54							
	WN	eL	N	00	18	30							
		Lmex	ZN		22		4¼	17		9	15		
	GP	eP	N	00	12	23							
	SU	P	N	00	09	12							
		S	N		11	41							
		eL	N		12	38							
	Epicentre:			00	06	00	13S	167E			USCGS		
19	KP	eP	Z	12	54	58							
		i	Z		55	20							
	Epicentre:						New Hebrides						NZ
19	ON	P	E	13	33	48							
	KP	P	Z	13	33	51							
		e	Z		35	12							
	WN	e	N	13	35	36							
		e	N		36	42							

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag.
MAY 19	KP	P	Z	16	21	45				
20	ON	P	E	05	47	29w				
		S	E		49	42				
	KP	P	Z	05	47	44u				
		eS	Z		50	12				
	TU	eP	N	05	47	48				
		S	N		50	15				
	WN	eP	N	05	48	17				
		iS	N		51	08				
	CB	eP	E	05	48	21				
		eS	E		51	12				
	KM	eP	X	05	48	38				
		eS	X		51	40				
	GP	eP	N	05	48	42				
		S	N		51	50				
	SU	eP	N	05	46	35				
		iS	N		48	00n				
	Epicentre:			05	44	47	25S 180	550km	USCGS	
20	KP	P	Z	05	56	34				
20	SU	e(S)	N	16	34	30				
		eL	N		37.1					
20	SU	e(S)	N	19	16	36				
		eL	N		18½					
21	KP	iP	Z	03	30	08				
	Epicentre:						Samoa region		USCGS	
22	ON	P	E	04	21	40				
	KP	P	Z	04	21	44u				
		i	Z			48				
		e	Z		23	06				
	WN	S	N	04	23	56				
	GP	S	N	04	25	01				
22	KP	P	Z	08	46	41				
22	KP	P	Z	11	45	47				
22	KP	eP	Z	13	43	20				
22	KP	P	Z	15	16	09				
	WN	eL	N	15	30½					
	Epicentre:			15	08	00	3S 146E		USCGS	
23	KP	iP!	Z	15	54	11d				
	GP	eP	N	15	54	54				
	Epicentre:						S. of Santa Cruz Is		USCGS	
24	WN	eL	N	07	41	45	4½ 15			
		eL	Z		43	20				
	RX	eL	NE	07	38	30	5 15	3¾ 15		
24	KP	P	Z	10	09	24				
		e	Z			36				
	RX	eL	NE	10	23		1¾ 20	1¾ 20		
24	KP	eP	Z	16	40	47				
		e	Z		41	13				
							6S 146E		USCGS	

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag.
MAY 25	KP	P	Z	15	07	27				
		e	Z			57				
	Epicentre:			14	54	30	51½N 177W		USCGS	
25	KP	eP	Z	16	59	52				
	RX	eL	NE	17	13					
	SU	iS	N	16	58	01				
		L	N		58½					
	Epicentre:			16	54	26	14½S 174W		USCGS	
25	KP	P	Z	21	25	36				
		PKKP	Z		41	41				
	WN	eL	ZN	22	00		7 20	9 20		
	Epicentre:			21	11	45	3S 77W 100km		USCGS	
26	KP	P	Z	11	09	38				
	Epicentre:			10	56	30	53N 169½W		USCGS	
26	SU	eP	N	16	19	39				
		S	N		20	38				
27	KP	iP	Z	23	40	34u				
		i	Z		41	02				
		i	Z		42	31d				
	Epicentre:			23	32	43	5½S 146E		USCGS	
29	KP	eP	Z	03	43	40				
		i	Z			41½d				
	SU	iS	N	03	41	55n				
	Epicentre:			03	39	36	20S 177W 350km		USCGS	
29	KP	P	Z	05	32	21				
	Epicentre:			05	21	29	27½N 139½E 450km		USCGS	
29	KP	eP	Z	11	25	04				
29	KP	P	Z	18	23	09				
30	TU	eP	N	12	01	23				
		S	N		02	55				
	KP	P	Z	12	01	(28)				
	TO	eP	Z	12	01	(38)				
		S	Z		03	(19)				
	WN	eP?	N	12	02	01				
		S	N		04	00				
	GP	eS	N	12	04	59				
	Epicentre:			11	59	25	34S 176W	>N?		5¾ NZ
30	WN	eL	NZ	19	01					
	RX	eL	N	18	52			2 30		
		Lmax	N		59			2¼ 19		6.0
	SU	eL	N	18	43					
	Epicentre:			18	04	50	52½N 169W		USCGS	
31	ON	P	E	14	14	21				
	TU	P	N	14	14	20				
		S	N		15	17				
	WN	eP?	N	14	14	59				
		S	N		16	25				
	CB	e(S)	E	14	16	53				
	Epicentre:			14	13	06	34¾S 179½W	>N? NZ(D)		5.3 NZ

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 31	ON	P	E	19	37	25							
		eS	E		41	24							
	TU	eP	N	19	37	54							
	WN	iP	Z	19	38	10	8½	6					6.7
		iP	N			10			8	6			6.9
		i	ZN			42	18	6	24	6			
		eS	N		42	50			26	10			6.6
		eL	N		46				91	20			
		Lmax	N		52				200	20			6.6
	CB	eP	E	19	38	12							
		eS	E		42	41							
	RX	P	Z	19	38	42d	15	6					7.0
		P	N			42			11	19			6.6
		iS	NE		43	43			25	9	106	23	7.0
		e	Z		44	10	26	10					
		Lq	E		45	54					290	27	
		Lr	ZN		47¼		150	30	155	31			
		Lmax	NE		50				83	20	140	20	6.6
	Epicentre:			19	32	30	15S	169E			USCGS		
JUN 3	ON	eP	E	19	36	42					2½	½	
		e	E			47					2½	½	
		e?	E		38	00							
		eS	E		40	40					8	7	
	WN	P	ZN	19	37	28u	5	9	9	10			
		(S)	N		42	27			14	10			
		eL	N		45								
	RX	P	ZN	19	38	00us	7	6	3½	20			
		S	NE		42	58			16	22			
		Lq	E		45								
		M	E		47						80	23	
		M	ZN		51		80	15	60	15			
	Epicentre:			19	31	52	15S	168E			USCGS		6½-
4	RX	e(S)	N	14	54	18							
		eL	N	15	17								
		M	N		27				0.7	20			
	SU	eL	N	15	07								
	WN	e	N	15	20								
	Epicentre:			14	29	50	52½N	167W			USCGS		6-
5	SU	iP?	M	08	24	56							
		e(S)	N		27	48							
	ON	eP	E	08	26	41							
	RX	eL	NE	08	39						1.2	18	
	WN	e(L)	N	08	40								
	Epicentre:			08	21	07	10½S	166E			USCGS		
5	ON	e(P)	E	10	24	51							
	RX	eL	NE	10	56								
	WN	e	N	11	00								
6	RX	e?	N	09	37.9								
		i	E		39	29					4	20	
		i	E		40	30					6	22	
		e	N		45	18				3	26		
		i	E			34					10	22	
		e	E		49.0								
		eLq	N		56								
		eLr	ZNE	10	00								
		M	ZE		08		6	17			9	17	
	WN	eSS	H	09	44	25							
					45.1								
					55								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 6	WN	eLr	ZN	10	01								
		M	ZN		04		4	19	5	20			
	SU	e(Lq)N		09	53	05							
	Epicentre:			09	11	14	8N	84½W			USCGS		6½
6	RX	eL	EZ	20	07							1	20
	Epicentre:			19	15	28	5½N	82½W			USCGS		6
7	RX	i(S)	NE	13	03	32							
	WN	e(S)	N	13	05	10							
		e	N			43							
		eL	ZN		07								
	SU	eL	N	13	16								
	Epicentre:			12	55	01	53S	140E			USCGS		
8	SU	eL	N	00	48								
		M	N		49				4	10			
8	SU	eL	N	01	13								
	RX	e	NE	01	30								
	Epicentre:			00	38	52	53N	167W			USCGS		6½-6¾
10	ON	eP	E	04	02	18							
		i	E			29					1½	1½	
	WN	e(P)	N	04	03	17							
		eS	N		05	11			1	⅓			
		eL	ZN		07								
		i	N		22	43			3	6			
	SU	e	N	04	03	34							
		e(S)	N			40			4	6			
		eL	N		05½								
	GP	eP	N	04	03	44							
		i	N			49							
		eS	N		06	16							
	KM	e(S)	X	04	06	12							
	RX	eL	NE	04	08							4	20
	Epicentre:			04	00	04	30½S	177W			USCGS		
							Felt Raoul Is. MM3						
11	SU	eL	N	03	50								
11	SU	eS	N	07	58	27							
		M	N		59								
12	RX	e	NE	05	10	56						2	20
		e	ZE		12	18	6	20				7	33
12	RX	eSKS	N	21	17	23			2	16			
		eS	E		18	24						2	20
		eSP	N		19.7				2	20			
		eLq	E		35								
		L	N		39								
		M	ZN		50				5	18			
	SU	M	N	21	31				12	20			
	WN	M	H	21	45				6	20			
	Epicentre:			20	52	57	53N	167W			USCGS		6½
13	RX	eL	NE	11	11								
		e	E		13							2	20
		eL	Z		15								
	Epicentre:			10	58	44	50S	126E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 15	SU	S	N	02	43	42				7 3			
	TU	eP	N	02	44	58							
		eS	N		47	58							
	WN	eP	N	02	45	25							
	CB	eP	E	02	45	28							
	KM	eP	X	02	45	43							
		e(S)	X		49	17							
	GP	P	N	02	45	50							
		eS	N		49	32							
	Epicentre:			02	41	10	20S	178W	550km		USCGS		
15	SU	e(S)	N	07	21	03				8 3			
	WN	eP	N	07	22	18							
	KM	e(P)	X	07	22	36							
		e(S)	X		25	40							
		e	X		26	06							
	TU	e(S)	N	07	24	37							
	GP	eP?	N	07	22	47							
		eS?	N		26	20							
		e	N			26							
	Epicentre:			07	17	29	22S	178W			USCGS		
15	RX	e(S)	E	11	46	28					1 16		
		eL	NE		49	22							
		M	NE		55					1 20	1 20		
	WN	eL	N	11	56								
	Epicentre:			11	32	38	9S	150E			USCGS		
15	SU	i(P)	N	14	55	53							
		S	N		56	55							
	ON	eP	E	14	58	28e					9 ¾		
		e(S)	E	15	01	34							
		e	E			36							
		i	E			42					40 3½		
	TU	eP	N	14	58	45							
		eS	N	15	01	58							
		eScS	N		08	55							
	WN	P	N	14	59	11dn				0.5 ½			
		e	N			17				0.7 ¾			
		esP	ZN	15	01	40							
		eS	N		02	46							
		e	N			55				7 2			
		eScP	N		05	13				7 7			
		eScS	N		09	08				4 4			
		e	Z		11	51							
		isScS	H		12	57				10 6			
	CB	P	E	14	59	14							
		eS	E	15	02	52							
	KM	eP	X	14	59	28							
		e	X			36							
		e(S)	X	15	03	16							
	GP	eP	N	14	59	34							
		eS	N	15	03	29							
		e	N			54							
	RX	e(P)	N	14	59	56				1 15			
		e	NZ	15	01	28	2	3					
		e	N		02	34				2 16			
		e(S)	NE		04	04				4 30	7 40		
		eL	NE		06	.8					10 15		
		e(L)	NEZ		09					3 10			
	Epicentre:			14	54	37	18S	178½W	600km		USCGS		6¼

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 15	SU	eL	N	17	33½								
	RX	e	NE	17	34	46						2 18	
		e	NE		37	42							
		eL	NE		40								
		M1	NE		43					2 21		3 20	
	AK	eL	N	17	40								
	WN	eLr	HZ	17	41								
		M	H							7 15			
	Epicentre:			17	20	56	9½S	150E				USCGS	
16	SU	e	N	01	13	16							
		(S)	N		15	26							
	ON	iP	E	01	15	05e						0.3 ¼	
	KP	iP	Z	01	15	24u							
	TU	e(P)	N	01	15	35							
	CB	e(P)	E	01	15	49							
	WN	P	N	01	15	53							
	GP	P	N	01	16	09						0.2 ¾	
	Epicentre:			01	10	12	14½S	167E	100km			USCGS	
16	ON	eP?	E	07	18	19							
	KP	P	Z	07	18	50							
	Epicentre:			07	13	39	15S	169E				USCGS	
16	SU	i(P)	N	08	14	33							
		i	N			44							
		L	N		15	25							
	ON	eP	E	08	18	11						0.8 1¾	
		e(S)	E		22	20							
		eL	E		25								
	KP	P	Z	08	18	24							
	WN	e(S)	N	08	23	29							
		eL	ZN		26								
		M	N		28					12 17			
	RX	e(S)	N	08	25	02							
		eL	E		27½								
		M	NE		30					6 22		10 20	
	Epicentre:			08	13	07	14½S	177½W				USCGS	
16	SU	e(P)	N	18	54	26							
		iS	N		55	24							
	ON	P	E	18	56	10				0.5		1	
	KP	P	Z	18	56	22							
	WN	e(P)	N	18	56	52							
	CB	e(P)	E	18	56	54							
	GP	eP	N	18	57	15							
17	ON	eP	E	19	17	40							
	KP	P	Z	19	17	48							
	RX	eL	E	19	38								
	Epicentre:			19	06	43	25N	142½E	60km			USCGS	
19	KP	P	Z	05	30	56d							
		e	Z		31	15							
	SU	eS	N	05	38	36				4 6			
		eL	N		50								
		M	N	06	05					4 17			
	WN	e?	N	05	42	05							
		eL	N		59								
		eL	ZN	06	02								
		M	N		06					5 20			
	RX	eL			06	05							
		M	NE		12					2 20		4 22	
	Epicentre:			05	18	00	49½N	156E				USCGS	6½

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 19	KP	eP	Z	07	52	41							
19	ON	P	E	11	16	16							
	KP	iP	Z	11	16	35u							
		e	Z			43							
	GP	eP	N	11	18	20							
	Epicentre:			11	11	20	15½S	168½E				USCGS	
19	KP	P	Z	13	49	11d							
	RX	e	NE	13	42	26							
19	RX	eL	NE	18	10	42							
	WN	eL	ZN	18	14								
	Epicentre:			18	02	15	52½S	140E				USCGS	
19	KP	iP	Z	21	59	23u							
20	SU	e	N	00	50	13							
		e(S)	N		51	31			5	4			
		L	N		52								
		M	N		53				50	16			
	ON	e(P)	E	00	52	59							
		e	E		53	16							
	KP	P	Z	00	53	11							
	WN	eL	ZN	01	02								
	RX	eL	NE	01	03								
		e	E		06								
		e	N		08				5	18	6	16	
	Epicentre:			00	47	58	16S	173W				USCGS	
20	KP	iP	Z	01	21	27u							
		i	Z			30u							
20	SU	iP	N	17	34	01n			4	6			
		i	N		35	02							
	ON	P	E	17	36	00							
	KP	P	Z	17	36	12							
	Epicentre:			17	32	36	20½S	179W	600km			USCGS	
20	KP	P	Z	19	29	28							
	Epicentre:			19	17	10	31½N	129½E				USCGS	
21	SU	e	N	02	03	38			4	6			
21	KP	P	Z	04	13	14							
22	KP	P	Z	05	41	23u							
	Epicentre:			05	29	29	37N	135E	350km			USCGS	
23	SU	i	N	07	21	56			1	3			
		L	N		23	50							
	ON	P	E	07	23	56					0.8	1½	
	KP	iP	Z	07	24	14u							
	CB	e(P)	E	07	24	40							
	GP	P	N	07	24	58							
	RX	e	E	07	28	26							
	Epicentre:			07	19	02	15½S	168½E				USCGS	
23	SU	eP	N	18	54	53							
		iS	N		55	57			6	4			
	ON	eP	E	18	57	09							
	KP	P	Z	18	57	22u							
				18	57	50							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 23	GP	eP	N	18	58	16							
		e	N	19	02	07							
	Epicentre:			18	53	23	18S	178W	650km			USCGS	
23	SU	eP	N	19	19	11							
		iS	N		20	18				5	5		
	KP	P	Z	19	21	43							
	GP	eP	N	19	22	36							
	Epicentre:			19	17	43	18S	178W	650km			USCGS	
23	KP	P	Z	22	34	48							
		e	Z		35	02							
24	GP	eP?	N	00	19	32							
		e?	N			54							
	KP	P	Z	00	19	39							
	RX	eLr	E	00	40.5							3	30
	Epicentre:			00	09	18	8½S	112E	200km			USCGS	
24	KP	eP	Z	06	47	57							
		i	Z		48	02							
	RX	e	NE	06	57	10				3	30	3	30
		eL	ZNE	07	09								
		M	ZNE		11		7	21		3	21	5	20
	WN	eL	ZN	07	09								
		e	N		13					2	20		
25	SU	e(S)	N	02	25	39							
		eL	N		27								
	KP	e(P)	Z	02	29	03							
	WN	e(L)	N	02	38								
	RX	eL	E	02	39							2	20
25	SU	iP	N	09	31	37n							
	ON	P	E	09	31	52						0.9	1
		e	E		34	22						1	2
	KP	eP	Z	09	32	06u							
		e	Z		34	52							
	TO	eP	Z	09	32	17							
		e	Z		35	15							
	WN	P	N	09	32	37				0.4	3		
		e	N		35	35							
		i	N			44							
	CB	P	E	09	32	41							
		eS	E		35	39							
	GP	P	N	09	33	01				0.3	3		
		S	N		36	19				0.1	4		
25	SU	e(P)	N	09	43	52							
	ON	eP?	E	09	44	36							
		e	E			46						0.8	2
	KP	eP	Z	09	44	44							
		i	Z			47							
	TO	e(P)	Z	09	44	52							
	CB	eP?	E	09	44	54							
		e	E		45	04							
		e(S)	E		51	35							
	WN	P	ZN	09	45	03d	4	5		2	5		
		ePP	Z		46	46							
		ePPP	ZN		47	34				4	7		
		ePcS	ZN		49	17							
		S	N		51	43				8	11		
		e(SS)	N		55	20							
		eL	ZN	10	03								
		M	N		09					60	14		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 25	GP	eP	N	09	45	08							
	RX	eP	ZNE	09	45	12	4	7					
		ePP	ZE		46	45	4	6					
		iS	NE		51	58			14	25	10	18	
		e	E		54	.0							
		eL	E		56								
		eL	E	10	03								
		M	N		10				26	20			
	Epicentre:			09	36	30	3S	144½E			USCGS		6½-6¼
25	SU	e(L)	N	12	44								
		eL	N		52				2	20			
	RX	eL	E	12	18								
		L	E		26								
		M	NE		31				2	20	2	20	
	WN	eL	N	12	20								
		L	N		25								
		M	ZN						4	20			
	KP	P	Z	12	51	27d							
		e	Z			43							
		e	Z		53	35							
	GP	e(P)	N	12	52	07							
	WN	eL	ZN	13	04								
		M	N		07				4	20			
	RX	M	NE	13	07				2	20	3	20	
	Epicentre:			12	43	55	5S	152E			USCGS		
25	KP	eP	Z	15	57	14							
26	KP	(P)	Z	00	00	06d							
26	KP	P	Z	03	58	54							
26	SU	e?	N	04	00	48							
		e	N			57							
		e(L)	N		02	34							
		M	N		04				7	6			
	KP	eP?	Z	04	02	29							
		i	Z			32							
	WN	e?	N	04	03	08							
		e	N			11			0.2	1½			
		eL	ZN		08								
		M	N		09				4	20			
	GP	eP?	M	04	03	35							
	RX	e	N	04	08	08							
		L	NE		11				1	21	1	20	
26	KP	eP?	Z	04	51	54							
		i	Z		52	03							
		i	Z			15							
	SU	i	N	04	59	12			2	5			
	Epicentre:			04	38	12	54½N	159½E	>N		USCGS		6½-6¼
26	KP	iP	Z	16	45	17d							
26	KP	P	Z	19	22	38u							
		i	Z			40d							
		i	Z		23	08d							
	TU	eP	N	19	22	41							
		eS			24	07							
	WN	eP	N	19	23	16							
		eS	N		25	11							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 26	GP	eP	N	19	23	47							
		e	N		26	09							
		eS	N		11				0.2	⅔			
	CB	eS	N	19	25	23							
26	KP	eP	Z	23	41	23							
	RX	eS	E	23	52	.0						1	25
		eL	E	24	06							1	20
		M	E		12							1	18
	Epicentre:			23	29	32	31N	141½E			USCGS		
27	KP	eP	Z	04	08	03							
27	RX	eLr	E	06	35								
		M	E		37								
	Epicentre:			05	44	28	13N	88½W	60km		USCGS		6
27	SU	S	N	07	10	51							
		M	N		12								
27	KP	P	Z	11	09	45							
27	KP	(P)	Z	18	19	58							
27	SU	(S)	N	19	42	45							
		M	N		44								
28	KP	eP	Z	03	24	15							
28	SU	iP	N	05	15	38s				2	2		
	KP	P	Z	05	15	43							
		e	Z		16	03							
	WN	eP?	N	05	16	15							
		eS	N		19	12							
	KM	eP?	X	05	16	35							
		eS	X		19	39							
	TU	e(S)	N	05	18	19							
28	SU	e(S)	N	08	34	53				3	5		
		L	N		37	.4				25	20		
		M	N		38	½				30	15		
	ON	eP?	E	08	35	09						0.8	2
		e	E			21							
		e	E		38	.1						25	15
	KP	eP	Z	08	35	09							
		e	Z			25							
	WN	e(P)	N	08	35	55							
		e(S)	N		38	25							
		e	N			34							
		eL	N		40								
		eL	N		42								
	TU	e(S)	N	08	37	20							
	GP	eS	N	08	39	38							
	RX	eL	NE	08	41								
		M	E		43							8	20
		eL	NZ		45								
		M	NZ		46		9	18		6	18		
28	ON	eP	E	11	40	35							
	KP	eP	Z	11	40	53							
	RX	eL	NE	11	49					1	20	2	24

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 28	KP	P	Z	16	15	09							
		e(S)	Z		20	36							
		e	Z			42							
		e	Z			54							
28	KP	iP	Z	19	39	03u							
		e	Z			25							
		e	Z		40	20							
	WN	eP	N	19	39	24							
	KM	eP	X	19	39	30							
	GP	e(P)	N	19	39	39							
		Epicentre:		19	29	58	12N	162E			USCGS		
29	KP	(P)	Z	03	32	48							
		Epicentre:		03	25	42	15½S	70½W	150km		USCGS		6½
29	KP	iP	Z	09	13	18							
	SU	eP	N	09	16	59			6	5			
		e	N		17	26			9	5			
		i	N		18	46			16	5			
		eL	N		19	.3							
		1	N		21	26			40	10			
	ON	eP	E	09	19	39							
		e	E			47					2	3	
		eS	E		23	47					4	5	
	KP	eP?	Z	09	19	51u							
		i	Z			53d							
	KM	e(P)	X	09	20	58							
	WN	eL	N	09	29								
		eL	ZN		31								
	RX	eL	E	09	29						3	20	
		eL	NZ		34								
		Epicentre:		09	14	37	16½S	172W			USCGS		
29	SU	e(P)	N	12	43	14							
		e	N			35							
		e	N		45	04							
		eL	N			54			50	11			
	ON	eP	E	12	45	43					0.8	1½	
		e	E		49	54					0.5	2	
		e	E		50	03					1	2½	
	KP	P	Z	12	45	57							
		i	Z		46	07							
	KM	e(P)	X	12	46	57							
	WN	eL	ZN	12	57								
	RX	eL	ZNE	12	59								
		Epicentre:		12	40	48	15½S	173W			USCGS		
29	KP	P	Z	23	25	25							
		e	Z			33							
		e	Z		26	07							
		Epicentre:		23	14	59	3½N	127E			USCGS		
30	KP	PKP1	Z	09	02	34u							
		e	Z			48							
		i(PKP2)	Z			50u							
		e	Z		03	03							
		e	Z			17							
		Epicentre:		08	42	33	36½N	27½E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 30	KP	P	Z	18	38	06d							
		e	Z			19							
	SU	iS	N	18	44	48s					6	6	
		eScS	N		46	46					3	5	
		e(SSS)	N		51								
		M	N	19	01						5	20	
	WN	S	N	18	48	14					5	9	
		eL	N	19	10						2	15	
	RX	eS	NE	18	48	38					4	9	
		eL	E	19	01								
		eL	ZN		07								
		M	NE		09						3	18	
		Epicentre:		18	26	20	31N	141½E			USCGS		6¾
JUL 1	KP	iP	Z	06	06	04							
		P	Z			18							
	RX	eL	NE	06	40						3	20	6.0
		Epicentre:		05	53	07	51½N	176W			USCGS		
2	KP	P	Z	04	13	54							
2	KP	P	Z	04	52	18u							
		epP	Z		53	13							
		PcP	Z		56	14							
	TU	eS	N	04	55	52							
	WN	P	N	04	52	46							
		eS	N		56	37							
	CB	eP	E	04	52	51							
	KM	eP	X	04	53	05							
		eS	X		57	04							
	GP	eP	N	04	53	12							
		eS	N		57	15							
	SU	eP	N	04	49	19							
		S	N		50	18							
		Epicentre:		04	48	03	18S	177W	350km		USCGS		
2	KP	P	Z	11	21	26							
2	KP	P	Z	16	46	30							
3	ON	P	E	06	29	50							
		S	E		31	29							
	AK	iP	N	06	29	57n							
		S	N		31	39							
	KP	iP	Z	06	30	02.4u							
	WN	iP	ZN	06	30	36d	4½	6					7.1
		S	N		32	52							
	CB	eP	E	06	30	42							
		eS	E		33	04							
	GP	P	N	06	31	06							
		e	N		33	46							
		S	N			50							
	RX	eP	N	09	31	32					2	15	6.4
		S	ZNE		33	24					6	15	6.6
		eL	E		36	18							
		eL	Z		40	.1	11	10					
	SU	iP	N	06	30	23n							
		S	N		32	36							
		Epicentre:		06	27	44	28½S	179E	400km		USCGS		
3	KP	P	Z	08	49	01							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 3	RX	e	E	10	37	35					2½	18	5.6
		eL	NE			41							
		Epicentre:		10	23	02	55S	126W				USCGS	
3	KP	P	Z	13	00	15½							
4	KP	P	Z	00	24	13							
	RX	eL	NE	00	35				2	15	2	15	
	SU	eS	N	00	22	43							
		eL	N			23.5							
		Epicentre:		00	19	28	19S	173½W				USCGS	
4	KP	P	Z	13	11	07½d							
	GP	eP	N	13	10	06							
	WN	eL	N	13	18				5¾	10			
	RX	eL	NE	13	14				7½	22	11	9	
		eL	Z			15							
4	KP	P	Z	18	44	42d							
		e	Z			46 12							
	GP	eP	N	18	44	51							
		Epicentre:		18	34	03	6N	125E				USCGS	
5	KP	P	Z	13	55	55							
	WN	eP	N	13	56	27							
		eS	N			59 25½							
	KM	eS	X	14	00	03							
	GP	eS	N	14	00	16							
	SU	S	N	13	55	49							
6	KP	eP	Z	10	38	16							
		e	Z			31							
6	KP	eP	Z	23	47	03							
		e	Z			16							
7	KP	P	Z	05	29	53							
		e	Z			30 11							
7	KP	P	Z	16	17	34							
8	KP	eP	Z	06	10	50							
	WN	eL	ZN	06	18				2¾	12			
	RX	eL	NE	06	20				3¼	16	4¾	20	5.6
		eL	Z			22½	3	12					
		Epicentre:		06	06	28	21½S	174W				USCGS	
8	KP	iP	A	08	42	26½							
8	WN	eL	ZN	19	42¼				1¾	15			
	RX	eL	NE	19	36¼				4¼	25			
9	KP	eP	Z	12	22	03							
9	ON	P	E	13	57	54							
	KP	iP	Z	13	58	07							
	TU	eS	N	14	01	05							
	WN	eP	N	13	58	36							
		eS	N	14	01	52							
	KM	eP	X	13	58	56							
		eS	X	14	02	29							
	GP	eP	N	13	59	00							
						5							
						2n							
						0							
						7	20½S	178½W	600km			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 10	AK	eSKS	N	06	40	36							
		SS	N		49	21							
		Lr	N	07	03½								
	KP	ePP	Z	06	34.2								
	WN	ePP	Z	06	34	40	3.2	10					7.4
		ePP	N			40			2½	7			7.7
		eSKS	N		40	50			7.5	10			
		PS	N		43	50			23	20			
		SS	N		50	04			87	30			
		Lq	N	07	01				260	45			
		eLr	ZN		05		81	30	125	30			
		Lmax	NE		12				300	20			7.4
	RX	ePP	Z	06	35	17	5.6		8				8.2
		ePP	N			17			3.5	10			8.3
		eSKS	NE		41	10			14	26	7	26	
		e	E		43	10					38	26	
		PS	ZN		44	56	3.5	22	50	22			
		SS	NE		51	21			67	30	60	26	
		eLq	E	07	03						52	32	
		Lr	Z		12		8.7	22					
		Lmax	NE		18				95	20	48	20	7.1
	SU	eP	N	06	28	41							
		iS	N		39	07							
		eL	N		52								
		Epicentre:		06	15	54	58½N	136W				USCGS	
11	KP	P	Z	00	30	33							
11	KP	P	Z	06	21	57							
11	KP	P	Z	08	13	42							
11	WN	eL	N	18	42.0				3	15			
		eL	ZN		43½				9¼	20			
	RX	eL	E	18	39						10½	30	
		eL	ZN		40		6¼	18	5½	20			
11	RX	eL	E	19	54						4	22	6.1
		Epicentre:		19	10	20	21S	69W				USCGS	
12	KP	eP	Z	01	00	41							
	RX	eL	E	01	27½						8.8	24	
		Lmax	E		30						5¾	20	6.2
		Epicentre:		00	48	30	5S	106½W				USCGS	
12	KP	iP	Z	03	38	58u							
		i	Z		40	18							
		Epicentre:		03	29	58	12N	165E				USCGS	
12	KP	P	Z	04	37	29							
12	KP	P	Z	21	59	26							
13	KP	P	Z	12	10	00							
		pP	Z			25							
		isP	Z			35							
		PcP	Z		12	55							
	GP	eP	N	12	10	38							
		Epicentre:		12	03	50	10S	161½E	100km			USCGS	
13	KP	P	Z	16	40	52							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Az	Tz	Mag.
JUL 14	ON	eP	E	01	08	36							
	KP	P	Z	01	09	08							
14	KP	P	Z	04	35	41							
14	KP	P	Z	10	17	22							
		pP	Z			40							
14	KP	iP	Z	13	24	23u							
14	KP	P	Z	20	48	39							
15	KP	iP	Z	16	16	01u							
15	KP	eP	Z	23	14	34							
	WN	S	N	23	16	49							
	CB	eS	E	23	17	06							
	KM	eS	X	23	17	47							
	GP	eP	N	23	15	27							
		eS	N		17	51							
16	KP	eP	Z	13	04	24							
	WN	eL	ZN	13	21		8¼	18	4½	15			
	RX	eL	E	13	22						11½	30	
		eL	Z		24		7	20					
		Lmax	E		25						8½	20	6.1
	Epicentre:			12	54	18	29½S	113W			USCGS		
16	KP	eP	Z	17	00	09							
	WN	eL	N	17	08	02			3¼	10			
		eL	ZN		11				6	15			
	GP	eP	N	17	00	50							
	RX	eLq	E	17	09						5½	30	
		Lmax	NE		13						8½	18	5.8
	SU	eL	N	17	00.3								
	Epicentre:			16	54	17	12S	166½E			USCGS		
16	KP	e(P)	Z	18	46	18							
	WN	eL	ZN	18	57½						5¼	15	
	RX	eLq	E	18	55								
		Lmax	NE		59						4¾	20	5.7
	SU	eL	N	18	46.5								
	Epicentre:			18	40	21	12S	166½E			USCGS		
17	KP	P	Z	05	57	40							
17	KP	eP	Z	21	12	22							
	RX	eL	N	21	46								
		Lmax	NE		50				2	22	1.8	22	6.0
	Epicentre:			20	59	17	51N	177½W			USCGS		
18	KP	P	Z	00	52	25							
		i	Z		53	02							
	RX	eL	N	01	26				3	23			
		Lmax	NE		29				3	20	1.9	20	6.1
	Epicentre:			00	39	18	51N	176½W			USCGS		
19	KP	eP	Z	01	23	41							
		e	Z			48							
	SU	e	N	01	20	28							
		eL	N		21	50							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 19	ON	eP	Z	05	28	04							
19	ON	eP	E	06	38	32							
	KP	iP	Z	06	38	47d							
		ipP	Z		39	22d							
	TU	eP	N	06	38	58							
	WN	P	N	06	38	57							
	GP	eP	N	06	39	01							
		pP	N			34							
	RX	S	NE	06	45	48			1.7	12	3	22	5.9
	SU	eL	N	06	47								
	Epicentre:			06	30	19	4S	138½E	150km		USCGS		
19	KP	P	Z	17	48	48d							
19	KP	P	Z	18	26	33							
	TU	eP	N	18	26	45							
	WN	P?	N	18	26	40							
		e	Z		27	44	5.0	6					
		e	N		30	18			2.4	10			
		iS	N		34	40			6.6	7			6.6
		e(SS)	N		39	44			2.8	10			
		i(SSS)	N		41	10			4½	10			
		eLq	N		41¾				65	40			
		eLr	ZN		46½		9	20	14	20			
	CB	eP	E	18	26	33							
	KM	eP	X	18	26.6								
	GP	eP	N	18	26	44							
	RX	eP?	Z	18	26	37							
		P	Z			42	8	4					7.1
		e?	E		30	54					1¼	12	
		eS	N		34	30							
		eS	E			35					7¼	20	6.5
		eS	Z			44	3.7	10					
		e(SS)	NE		38	20	20		6¾	25	4	25	
		eL	ZN		40¾		6	15	16½	25			
		eL	E		41				12	25			
		Lmax	NE		45				14	20	28	20	6.6
	SU	e	N	18	26	47							
		S	N		33	15							
		eL	N		37½								
	Epicentre:			18	16	52	0	129½E			USCGS		
19	KP	P	Z	18	53	58							
19	KP	P	Z	22	23	43½							
		i			48								
	Epicentre:			22	14	01	½S	129E			USCGS		
21	KP	P	Z	04	12	42							
	WN	eP	N	04	13	09							
21	KP	eP	Z	07	37	55							
	WN	eL	N	08	07¾				10½	25			
	RX	S	NE	07	49	08			3.3	15			6.2
		eSS	NE		55	15			2.3	20	2.7	25	
		eL	E	08	04						3¼	32	
		eL	ZN		11				2.3	23			
		Lmax	NE		13				2.5	20	2.5	20	6.0
	SU	eL	N	07	59								
	Epicentre:			07	24	58	44½N	147½E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 21	KP	P	Z	14	50	12u							
	WN	eL	N	15	22¾				7	20			6.1
		eL		23¼									
	RX	SKS	N	15	01	32			2¾	6			
		eS	E		02	12					2¼	20	
		eL	N	15	23				2	25			6.3
		Lmax	NE		28				3	20	2¾	20	
	SU	eS	N	14	57	32							
		eL	N	15	12								
	Epicentre:			14	37	18	51½N	178W				USCGS	
21	KP	P	Z	18	38	23½							
		i	Z			25½							
		i	Z			55							
	SU	e(P)	N	18	36	01							
		e(S)	N		38	13							
	Epicentre:			18	32	58	14S	167½E				USCGS	
22	ON	eP	E	14	57	08							
	KP	P	Z	14	57	21							
	WN	eP	N	14	57	52							
	GP	eP	N	14	58	19							
	SU	S	N	14	56	39							
	Epicentre:			14	54	00	22S	180	600km			USCGS	
23	KP	eP	Z	10	39	10							
		pP	Z			25							
	WN	iS	N	10	49	13			4¼	10			6.4
		eL	NZ	11	09				6	20			6.2
	RX	S	NE	10	49	40			2¾	14	2½	14	6.1
		eLq	E	11	03						4¼	30	
		Lmax	NE		05				1¾	20	2½	20	6.0
	SU	S	N	10	45	47							
		eL	N		56								
	Epicentre:			10	27	19	31N	142E				USCGS	
24	KP	iP	Z	02	58	21u							
		i	Z			24							
	GP	eP	N	02	59	01							
25	KP	eP	Z	14	19	12							
26	WN	eL	N	06	56½								
	RX	eL	NE	06	36				3¼	35	5½	35	
		Lmax	NE		55				2¾	20	1¼	20	6.0
	Epicentre:			06	13	50	40S	45½E				USCGS	
26	KP	eP	Z	08	41	34							
	WN	eL	NZ	08	47½								
	RX	eL	NE	08	45				9	25			
		eL	Z			47			2¼	20	2¼	20	5.3
	Epicentre:			08	35	10	60½S	168½W				USCGS	
26	KP	iP!	Z	11	48	03u							
	WN	e	N	11	49	17							
	GP	e	N	11	50	21							
26	ON	e	E	17	50	14							
		ePP	E		54	35							
		eS	E		59	48							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 26	KP	eP	Z	17	49	58							
		pP	Z		52	10							
		PP	Z		54	23							
		e	Z	18	00	04							
		eSP	Z		02	30							
		PKKP	Z		06	09							
		SKKP	Z		08	55							
		ePcPPKP	Z		10	28							
		P'P'	Z		14	27							
	TU	eS	N	17	59	32							
	TO	e(P)	Z	17	49	59							
		epP	Z		52	10							
		ePP	Z		54	20							
		eS	Z		59	45							
	WN	e	N	17	50	13½							
		e	NZ			20	3.0	4					
		epP	Z		52	08	7.6	10					
		epP	N			15			3	8			
	PP	epP	ZN		54	12			5	6			7.1
		eS	N		59	37			12	5			7.3
	CB	eS	E	17	59	36							
	GP	eP?	N	17	49	49							
		e(P)	N		50	03							
		eS	N		59	35							
	RX	epP	Z	17	52	11	4.5	8					
		epP	NE			24			3	5	2	10	
		PP	Z		54	21	2¾	6					6.5
		PP	NE			21			2¼	20	4½	22	6.5
		iS	NE		59	40			18	8	33	12	7.4
		PS	ZNE	18	02	22	14½	11	11	20	33	25	
	SU	ePP	N	17	55	05							
		i	N	18	01	40							
		(SP)	N		03	39							
		SSS	N		12	51							
	Epicentre:			17	37	09	13½S	69W	50km			USCGS	
26	KP	eP	Z	18	32	00							
		i	Z			23							
27	KP	P	Z	00	25	52							
	TO	eP	Z	00	25	56							
	GP	eP	N	00	26	45							
		S	N			30	37						
	SU	(P)	N	00	24	05							
27	ON	P	E	00	25	39							
	KP	P	Z	00	26	11u							
	TU	eS	N	00	29	12							
	TO	eP	N	00	27	04							
		S	N			30	56						
	SU	(P)	N	00	25	04							
	Epicentre:			00	23	32	20½S	178½W	600km			USCGS	
27	KP	P	Z	00	29	20							
27	KP	P	Z	01	40	21							
27	KP	eP	Z	03	33	27							
		e				34	12						
27	KP	P	Z	04	26	42							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 27	KP	eP	Z	17	06	36							
		e	Z			42							
		Epicentre:		17	01	29	15½S 169E				USCGS		
27	KP	P	Z	17	42	51							
27	ON	eP	E	18	53	47							
	KP	P	Z	18	54	00							
28	KP	P	Z	01	30	24							
	TO	eP	Z	01	30	35							
		Epicentre:		01	23	05	5S 151½E 200km				USCGS		
28	KP	P	Z	09	18	36							
28	ON	eP	E	17	28	16							
		i	E			19							
		S	E			31	14						
	KP	eiP	Z	17	28	30u							
	TU	P	N	17	28	31							
		S	N			31	35						
	TO	P	Z	17	28	23							
		eS	Z			31	31						
	CB	eP	E	17	29	02							
		eS	E			32	29						
	KM	P	X	17	29	19							
		eS	X			32	57						
	GP	P	N	17	29	24							
		S	N			33	09						
	SU	P	N	17	26	02							
		iS!	N			27	07n						
		Epicentre:		17	24	40	20S 177½W 500km				USCGS		
28	KP	P	Z	18	43	42							
		Epicentre:		18	33	45	26½S 115½W				USCGS		
28	ON	e	E	21	26	58							
	KP	P	Z	21	27	07							
		i	Z			17							
	TU	eS	N	21	30	15							
		e	N			26							
	TO	e	Z	21	27	28							
	WN	eP	N	21	27	37							
	GP	eS	N	21	31	33							
	SU	eP	N	21	24	56							
		S	N			26	08						
		Epicentre:		21	23	25	20S 178½W 650km				USCGS		
29	KP	P	Z	01	36	27							
29	KP	P	Z	04	04	07							
29	KP	iP	Z	05	25	24d							
29	ON	eP	E	09	18	15							
	KP	P	Z	09	18	30							
		e	Z			20	32						
29	ON	eP	E	10	53.7								
	KP	eP	Z	10	53	49							
		e	Z			54	33						
	TO	eP	Z	10	54	08							
									2	5			
									3	12			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 29	RX	Lq	NE	11	01¼					5	35	16	35
		eLr	Z		03½		5	15					
		Lmax	NE		04				4.7	20	14	20	5.9
	SU	P	N	10	51	03							
		S	N		52	06							
		L	N		52½								
		Epicentre:		10	49	27	20½S 175½W				USCGS		
29	WN	Pn	N	22	21	44½							
		P*	N			48¼							
		Pg	N			51							
	TO	(Pn)	Z	22	21	47¼							
		P*	Z			48¾							
	KP	Pn	Z	22	22	02							
		P*	Z			07							
		e	Z			12							
		e	Z			57							
	CB	Pn	E	22	22	04							
		iP*	E			11							
		i	E			30							
		S*	E			49							
	KM	P*	X	22	22	35							
		i	X			38½							
		S*	X		23	37							
	GP	ePn	N	22	22	24							
		P*	N			38							
		i	N			56							
		Sn	N		23	06							
	ON	eP*	E	22	22	53							
	Pg	E			23	02							
		e(S*)	E		24	05							
		Epicentre:		22	21	21	40.5S 176.3E Felt Pongaroa Maximum MM4.	S	NZ(B)				5.0 NZ
30	KP	P	Z	04	53	36							
		i	Z			45							
	TO	eP	Z	04	53	43							
	WN	eL	NE	05	11				4½	15			
	SU	eS	N	04	58	49							
		eL	N	05	04								
		Epicentre:		04	44	53	2½S 140E				USCGS		
30	KP	P	Z	07	44	16							
30	WN	eL	NZ	15	33				7	22			
	RX	eS	NE	15	26	26			1.5	12	3	16	
		eL	E		33						3¾	25	
		eL	Z		34								
		Lmax	NE		35				1¾	20	3¾	20	
	SU	e(S)	N	15	10	18	1800miles S.W. of Easter IS.				USCGS		
AUG 1	SU	P	N	05	39	10							
		iS	N		40	21			70	5			
	ON	eP	E	05	42	04					2	2	
	KP	eP	Z	05	42	17d							
		e	Z		43	23							
	TU	e	N	05	42	25							
		e	N		46	03							
		e(S)	N			35							
	WN	P	N	05	42	47			0.2	1			
		e(S)	N		47	41							
	GP	eP	N	05	43	11							
		e	N		47	39							
		e(S)	N		48	36							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 1	KM	e(P)	X	05	43	20							
	CB	e(S)	E	05	46	58							
	RX	e(S)	N	05	48	22							
		e	NE		50	46					3	20	
		e	N		53	33			3	10			
	Epicentre:			05	37	50	16S	176½W	450km		USCGS		
1	SU	e(P)	N	14	28	50							
		e(S)	N		29	52			4	3			
	KP	i(P)	Z	14	31	33							
	Epicentre:			14	27	31	19S	177½W	500km		USCGS		
3	SU	iP	N	01	07	55n							
		e(S)	N		09	00							
	ON	e(P)	E	01	09	40					2	2	
		eS	E		12	16					30	3	
	KP	iP	Z	01	09	52u							
		e	Z		12	42							
		e(S)	Z			52							
	TU	P	N	01	09	54							
		eS	N		12	40			1	1½			
		e	N		20	28							
	WN	P	N	01	10	21							
		e	N		13	26			0.8	½			
		i(S)	N			34			6	3			
		i	N		14	20			5	4			
		iScS	N		20	39			8	5			
		eScS	N		24	43			6	5			
	KM	P	X	01	10	39							
		S	X		14	00							
	GP	eP	N	01	10	45			0.3	½			
		S	N		14	10			0.6	½			
		e	N			28			0.7	½			
	RX	e(S)	E	01	14	58							
		iScS	E		21	01					8	9	
		eScS	E		25	02					6	9	
	Epicentre:			01	06	24	21S	179W	550km		USCGS		6½
4	KP	P	Z	04	22	19							
		e	Z			54							
	CB	e	E	04	22	53							
	WN	e	Z	04	23	02							
		e(S)	N		31	25			3	5			
		e	N		35	52			3	8			
		e(L)	ZN		44								
	GP	e	N	04	23	30							
		e	N		24	17							
	RX	e	NE	04	29	18						3	24
		e	N		31	52							
		e	NE		34	13			6	20	5	20	
		eL	N		41								
	Epicentre:			04	13	19	6S	130E	150km		USCGS		
4	KP	eP	Z	08	48	37							
		i	Z			42							
	GP	e	N	08	53	04							
	Epicentre:			08	44	27	Fiji				USCGS		
4	KP	P	Z	17	34	28							
	Epicentre:			17	29	43	15½S	175W	250km		USCGS		
4	RX	eL	E	21	10								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 5	ON	e	E	09	13	09							
	KP	eP	Z	09	13	17							
		i	Z			19							
	TU	eP	N	09	13	19							
		S	N		14	35							
	WN	P	N	09	13	51							
		eS	N		15	36							
	GP	eP	N	09	14	26							
		S	N		16	35							
	CB	eS	E	09	15	49							
	KM	eS	X	09	16	26							
	Epicentre:			09	11	39	33S	179W		N	NZ(D)		5.9 NZ
5	RX	eL	NE	16	00								
5	SU	e(L)	N	17	26	21							
	KP	e(P)	Z	17	25	47							
	GP	e(S)	N	17	30	32							
	RX	eL	NE	17	35								
		e	N		39								
	Epicentre:			17	21	47	24½S	175W			USCGS		
6	KP	P	Z	14	29	58							
	Epicentre:			14	23	25	Solomon Is.				USCGS		
6	SU	P	N	21	11	21s							
		(S)	N		12	21							
	ON	eP	E	21	14	08						3	1
	e	e(S)	E		18	11							
		i	E			16						3	2
	KP	P	Z	21	14	22							
		e(S)	Z		18	39							–
	TU	e(P)	N	21	14	24							
		e(S)	N		18	35							
	WN	e(P)	N	21	14	52							
		e(S)	N		19	26					2	2	
		eScS	N		25	45					5	5	
	CB	eP	E	21	15	00							
		eS	E		19	41							
	GP	e(P)	N	21	15	26							
		e(S)	N		20	15							
	RX	e(P)	N	21	15	52					1	16	
		e	NE		20	48					6	28	4 30
		M			27						11	20	9 20
	Epicentre:			21	09	09	17S	173W			USCGS		6½-6¾
6	KP	e(P)	Z	21	56	29							
	GP	eP?	N	21	57	16							
	Epicentre:			21	51	00	12S	167E	150km		USCGS		
9	KP	iP	Z	02	11	38d							
	TO	eP	Z	02	11	51							
		i	Z			54							
		e(S)	Z		12	30							
	ON	P	E	02	11	56							
		e(S)	E		12	29							
	WN	e(P)	N	02	12	23							
		i	N			36							
		S	N		13	11							
	KM	eP?	X	02	13	06							
		e(S)	X		14	15							
	Epicentre:			02	11	11	37.0S	177.3E		N	NZ(D)		5.1 NZ

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 10	KP	e(P)	Z	18	13	36							
	WN	e(L)	N	18	27								
	RX	eL	NE	18	27								
		M			30								
	Epicentre:			18	05	53	3½S 150E						USCGS
									2	20	3	20	
10	KP	i(P)	Z	19	17	48							
		i	Z			50							
10	KP	P	Z	23	52	14							
		e	Z			46							
	Epicentre:			23	41	37	21½N 144E		150km		USCGS		
11	SU	e?	N	07	55	47							
		e	N			54							
		e	N		57	36							
	ON	eP	E	07	57	41							
	KP	P	Z	07	57	58							
		i	Z		58	02							
	TO	eP	Z	07	58	14							
	CB	e(P)	E	07	58	30							
	WN	eP	H	07	58	33							
	RX	eL	E	08	05								
		eL	N		07						3	18	
	Epicentre:			07	53	12	18S 168½E				USCGS		
									2	20			
11	TO	P	Z	22	16	44							
		S	Z		17	06							
	KP	iP	Z	22	16	47							
		S	Z		17	13							
	TU	P	N	22	16	52							
		S	N		17	18							
	WN	iP	N	22	16	56							
		e	N		17	15							
		S	N			28							
	CB	P	E	22	16	59							
		S	E		17	34							
	ON	P	E	22	17	09							
		S	E			51							
	KM	P	X	22	17	20							
		S	X		18	09							
	Epicentre:			22	16	15	39.0S 175.0E		200km		NZ(D)		5.1 NZ
							Felt at Dannevirke MM2						
12	KP	e	Z	07	17	21							
		e	Z		24	49							
	SU	e(L)	N	07	25	17							
									4	12			
12	KP	e	Z	08	29	14							
	Epicentre:			08	15	59	51½N 175W				USCGS		
12	KP	eP	Z	17	03	20							
		e	Z			32							
	Epicentre:			16	53	13	½N 126E				USCGS		
12	KP	P	Z	17	49	54							
12	KP	P	Z	18	37	06							
12	KP	P	Z	19	13	53d							
		e	Z			58							
	Epicentre:			19	04	20	9½S 123½E				USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 12	RX	eP?	E	19	34	42							
		e	E		35	46						3	21
		eS	N		43	20				3	6		
		iS	NE			25				15	40	20	40
		e(SS)	E		47.2							10	30
		e(Lq)	N		51								
		eLr	ZNE		54								
		M		20	01			20	23	8	24	20	23
	SU	P	N	19	35	04s				3	2		
		e	N		42	34				6	6		
		eL	N		50	13				50	25		
	KP	P	Z	19	35	12							
		e	Z			17							
		e	Z		40	10							
	TO	eP	Z	19	35	16							
	KM	e(P)	X	19	35	17							
	WN	eP	N	19	35	21							
		(PPP)	N		39	35				3	10		
		S	N		43.7								
		SS	N		48.4					10	28		
		(SSS)	N		50.7					6	20		
		eL	ZN		55								
		M		20	02			16	22	14	18		
	TU	eP	N	19	35	26							
	CB	e(P)	E	19	35	29							
	Epicentre:			19	25	05	0	126½E				USCGS	
12	KP	eP	Z	23	19	28							
	RX	eL	NE	23	32								
		M			35							3	20
	Epicentre:			23	12	17	6S	152E				USCGS	
13	KP	P	Z	00	18	47							
		e	Z		19	28							
	Epicentre:			00	11	28	6S	152E				USCGS	
13	KP	P	Z	04	00	40							
		e	Z		01	05							
		e	Z		02	54							
	RX	eL	E	04	25								
	Epicentre:			03	50	35	½N	126E				USCGS	
13	KP	PKP	Z	07	52	30							
	Epicentre:			07	33	29	36½N	66½E				USCGS	
13	SU	e(P)	N	14	50	46							
		iS	N		51	47							
	ON	eP	E	14	53	16							
		eS?	E		56	31						1	2
	KP	P	Z	14	53	28d							
		e	Z		54	54							
	KM	eP	X	14	54	16							
		e(S)	X		58	07							
	Epicentre:			14	48	24	17½S	176W				USCGS	
13	ON	e(P)	E	16	54	52							
		eS?	E		57	20							
	SU	e	N	16	54	54				10	5		
	KP	P	Z	16	55	05							
		e	Z			09							
		e	Z		57	44							
	WN	eP	N	16	55	38							
		eS	N		58	37							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 13	CB	e(P)	E	16	55	41							
		eS	E		58	40							
	KM	eP	X	16	55	59							
		eS	X		59	04							
	TU	eS	N	16	57	46							
	Epicentre:			16	51	55	23½S	180	550km		USCGS		
13	KP	P	Z	20	25	52d							
		e	Z		26	06							
	RX	M	N	21	07				1	20			
	Epicentre:			20	13	00	51N	177½W			USCGS		
13	KP	e	Z	21	58	24							
13	KP	P	Z	22	03	41d							
		i	Z		04	23							
	Epicentre:			21	56	31	4½S	154E	200km		USCGS		
14	KP	e	Z	02	39	01							
	Epicentre:			02	28	25	19½N	146½E			USCGS		
14	SU	eL	N	09	49								
	KP	eP	Z	09	49	05							
	ON	e?	E	09	49	20							
	WN	eL	HZ	09	56								
	RX	eL	E	09	57								
		eL	NZ	10	00				2	20			
	Epicentre:			09	45	14	23½S	175½W			USCGS		
14	KPe(PKP$_2$)Z			11	50	03							
	Epicentre:			11	27	00	34½N	48E			USCGS		
14	KP	P	Z	12	48	56							
		e	Z		49	01							
14	KP	e	Z	15	08	06							
	SU	e	N	15	16				16	20			
		M	N		32				14	20			
	RX	e(S)	N	15	19	21			3	18			
		e	E			58					3	20	
		eL	E		36								
		eL	ZNE		40								
		M	ZN		45		9	22	7	22			
		M	E		47						7	20	
	WN	eL	N	15	40								
		ee	Z		43								
		M			46		5	20	12	20			
	Epicentre:			14	55	10	52N	175W			USCGS		6¼-6½
14	KP	eP	Z	15	31	05							
	Epicentre:			15	18	07	51½N	175W			USCGS		
15	KP	e	Z	02	34	31							
		e	Z			50							
		e	Z		36	35							
		e	Z			46							
	RX	eL	E	02	45½								
	WN	eL	HZ	02	50								
		M	H		51				3	16			
	Epicentre:			02	26	51	6S	150½E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 15	ON	e?	E	20	08	40					0.1	¼	
		e	E			50					0.8	2	
		e?	E		09	08					0.2	⅓	
	RX	e(P)	N	20	09	32			1	20			
		eSKS	NE		19	48			6	28	3	28	
		eS	NE		20	55			6	20	8	20	
		e(PS)	N	22	16				10	20			
		eSS	NE		27	44			26	30	12	30	
		eSSS	NE		31	16			12	26	9	28	
		eL	NE		35.1								
		eL	ZN		41								
		M			45		24	24	40	25	30	25	
		M		49½			30	20	30	21	18	20	
	WN	eSKS	N	20	19	38							
		e(S)	N		20	18			4	4			
		e	N		21	00			6	6			
		eSS	N		27.0								
		eSSS	N		30.1				26	30			
		eL	ZN		39								
		M1			42		30	25	60	25			
		M2		45	45		20	22	40	22			
	Epicentre:			19	55	39	53N	160½E	60km		USCGS		6¾
15	SU	eP	N	22	38	40			2	2			
		i	N			51			7	5			
		i(pP)	N		39	16			12	5			
		e(PcS)	N		42	49			20	6			
		eS	N		46	19			20	5			
		e(SS)	N		47	53			30	7			
		eL	N		53								
	ON	P	E	22	39	04w					1	2	
		e	E			32					1.5	1½	
		e	E			54					1.5	1½	
		e(S)	E		47	01							
		eL	E		54								
	CB	eP	E	22	39	14							
		eS	E		47	20							
		e(SS)	E		48	46							
		e	E		49	47							
	KP	iP!	Z	22	39	16d							
		i	Z			23							
		e	Z		40	00							
		e	Z			10							
		e	Z		48	49							
	KM	eP	X	22	39	16							
		e	X			20							
		eS	X		47	16							
		eL	X		54								
	RX	iP	ZNE	22	39	16dnw	10	6	4	23	7	25	
		e	Z		40	00							
		iS	ZNE		47	19	10	22	50	22	20	20	
		e	NE		48.0+				60	30	80	30	
		i(SSS)	ZNE		54	26	30	22	330	28	240	28	
		M	ZNE	23	04		50	18	30	18	80	19	
	TO	P	Z	22	39	20d							
		e	Z			28							
		e	Z		49	00							
	WN	iP	ZN	22	39	22dn	13	5	6	5			
		i	Z		41	19	10	5					
		iPP	H			42			5	4			
		i	ZN			52	10	5	4	5			
		i	Z		42	56	7	5					
		ePPP	ZN		43	16			8	5			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 15	WN	iS	N		47	30			35	20			
		(SS)	N		48	55			16	7			
		eSS	N		51	46			18	20			
		i	N		52	15							
		L	ZN		54.5								
		M	N	23	04				90	15			
	TU	eP	N	22	39	26							
		e	N			40							
		e	N		47	36							
		e	N			44							
		eL	N		55								
	Epicentre:			22	29	17	1½N	125E	200km		USCGS		6¾-7
15	KP	e	Z	23	08	40							
		e	Z			52							
		e	Z		09	04							
	TO	e	Z	23	08	40							
16	SU	e(S)	N	11	15	54							
		e	N			59							
		L	N		17	33			9	6			
		M			19				14	10			
	KP	eP?	Z	11	17	23							
		e	Z			30							
	WN	e?	N	11	18	05							
		e	N		21	09							
		e	N			25							
		eL	N		22½								
		M	N		25				15	15			
	RX	eL	NE	11	24½								
		M	E		27						30	20	
		M	ZNE		29		20	16	10	16	20	15	
16	KP	P	Z	13	30	49							
		e	Z		32	10							
		e	Z			45							
	SU	e	N	13	38	35			9	21			
		eL	N		53								
	RX	e	N	13	42	06							
		e	E			54							
		eL	E		58								
		eL	N	14	04								
		M			09				3	20	3	20	
	WN	eL	H	14	05								
		M			09				5	20			
	Epicentre:			13	17	52	51½N	176W			USCGS		
16	KP	P	Z	19	33	04							
		i	Z			17							
		e	Z		36	44							
		e	Z			47							
	RX	e(PKP)	Z	19	37	06							
		e	E		48								
		e	N		53	58							
		eL	N	20	04								
		e	N		09								
		M			32				4	17	10	18	
	WN	eL	N	20	12								
		M			32				6	20			
	Epicentre:			19	13	45	34½N	48E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 17	SU	e(L)	N	02	06								
	KP	e	Z	02	04	37							
	WN	e	Z	02	04	37							
	RX	eL	NE	02	14							3	20
		eL	ZN		16								
17	KP	iP	Z	09	07	05u							
		P	Z	09	21	04							
	SU	e	N	09	19	35							
		e(L)	N		22								
	WN	e	N	09	28								
		e	N		30						2	12	
		eL	N		57								
		M		10	00						2	20	
	RX	e	ZNE	09	30±								
		eL	N		55								
		eL	E		59								
		M	N	10	10						1	18	
	Epicentre:			09	08	35	51 ½N	176W			USCGS		
17	SU	e(L)	N	12	17								
	KP	e(P)	Z	×17	29	14	11	29	14	?			
	RX	e(L)	ZNE	12	37								
	Epicentre:			11	16	13	51½N	176W			USCGS		
17	SU	e	N	15	57	45							
	ON	eP	E	15	58	57							
	KP	iP	Z	15	59	12d							
		(S)	Z	16	01	53							
	TU	eP?	N	15	59	18							
		S	N	15	01	56							
	WN	e(P)	N	15	59	46							
		eS	N	16	02	47							
	RX	e	E	16	00	36							
17	KP	P	Z	18	09	17							
		e	Z			21							
		e	Z		11	04							
		e	Z		14	40							
	ON	e	E	18	09	18							
	TO	e	Z	18	09	29							
	WN	iP	Z	18	09	33d	3	5					
		e	Z		10	02	4	6					
		eS	N	16	14						4	6	
		e	N			29					5	6	
		M			36						18	14	
	SU	e	N	18	10	35					8	5	
		e	N		13	48							
		eL	N		16								
	RX	eS	NE	18	16	28					7	24	
		eL	NE		20								
		M			30		10	20	10	16	14	16	
	Epicentre:			18	01	05	3S	145½E			USCGS		
17	KP	iP	Z	21	12	17u							
	TO	eP	Z	21	12	24							
		i	Z		13	21							
	ON	P	E	21	12	27						0.6	⅔
		i	E			42							
		S	E		13	38						12	2
	WN	e(P)	N	21	12	49							
		e	N		13	05							
		(S)	N		14	00							
		i	N			02					4	½	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 17	CB	e?	E	21	13	10							
		e	E			30							
		eS	E		14	23							
	KM	e(S)	X	21	15	04							
	SU	eP	N	21	15	20			4	6			
		e	N		17	43			5	6			
		e	N		18	38			7	6			
	Epicentre:			21	11	09	35½S	179½W			USCGS		6.0 Rl
17	KP	P	Z	21	24	50							
	ON	e	E	21	25	02					0.1	1	
17	TU	e	N	21	39	27							
		(S)	N		40	10							
	KP	e(P)	Z	21	39	33							
		i	Z			35							
	ON	e	E	21	39	47					0.1	⅔	
	TO	e	Z	21	40	56							
	WN	e?	N	21	41	20							
	GP	e	N	21	43±								
17	RX	eL	Z	22	14		7	20					
17	KP	P	Z	22	17	21u							
		i	Z			30							
	TU	e	N	22	17	54							
		e(S)	N		18	26							
	TO	e	Z	22	18	03							
	ON	eP?	E	22	18	08					0.5	1½	
		e	E			13							
	WN	e(S)	N	22	19	36							
	CB	e?	E	22	20	02							
		e	E			11							
19	SU	e(P)	N	04	46	35							
	ON	e(P)	E	04	49	55					2	2	
	KP	P	Z	04	50	15							
	TU	e(P)	N	04	50	25							
	TO	P	Z	04	50	27							
	WN	e(P)	N	04	50	55							
		S	N		55	19			3	6			
	RX	eS	NE	04	56	10							
	Epicentre:			04	45	45	19S	175E			USCGS		
19	KP	P	Z	21	56	19							
		e	Z		58	07							
	TO	eP	Z	21	56	28							
	CB	eP	E	21	56	31							
	SU	eL	N	22	02								
		M			05				12	20			
	RX	eS	NE	22	03	50			3	22	5	24	
		M	E		15						8	19	
	Epicentre:			21	48	07	1S	149½E			USCGS		
19	CB	eP	X	23	00	36							
	KP	P	Z	23	03	22							
	Epicentre:			22	55	18	1S	149E	100km		USCGS		
20	SU	iP	N	01	11	13n							
		(S)	N		12	00							
	KP	P	Z	01	12	15							
	TO	eP	Z	01	12	25							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 20	SU	P	N	03	43	11				12	15		
		S	N		45	39				70	10		
		M	N		48					120	9		
	ON	eP?	E	03	45	16							
		e	E			22						2	1½
		e	E		49	22							
	KP	P	Z	03	45	33d							
		e	Z			42							
	TU	e	N	03	45	53							
		e(S)	N		50	33							
	CB	e?	E	03	45	58							
		e	E		46	11							
	WN	(P)	Z	03	46	17							
		e	N		47	10				8	7		
		e(S)	N		50	50							
		M		04	02					40	13		
	KM	e(P)	X	03	46	20							
	RX	e(P)	N	03	46	33							
		S	NE		51	39				16	20	10	20
		eL	E		53								
		eL	ZN		55								
		M	N		57					40	22		
		M	E		59							40	16
	Epicentre:			03	40	07	14S	167E			USCGS		6½
20	KP	P	Z	05	09	09							
	Epicentre:			05	00	59	1S	149E			USCGS		
20	KP	e	Z	08	58	30							
	Epicentre:			08	46	04	24N	122E			USCGS		
20	KP	P	Z	09	54	12							
		e	Z	10	00	59							
	SU	e(L)	N	09	56								
	Epicentre:			09	48	38	New Hebrides				USCGS		
20	KP	e?	Z	16	04	09							
		e	Z			17							
20	SU	P	N	17	41	28							
		e(S)	N		43	07							
	KP	P	Z	17	43	18							
	WN	eP	ZN	17	44	00							
		e(S)	N		48	10							
		M	N		54					4	15		
	RX	e(S)	N	17	48	56							
		eL	ZNE		52								
	Epicentre:			17	39	38	19S	170E			USCGS		
21	KP	P	Z	22	55	27							
	Epicentre:			22	48	05	5S	149E	250km		USCGS		
21	SU	P	N	01	11	05				8	4		
		S	N		12	32				6	5		
		L	N		13								
	ON	e	E	01	12	40							
		eL	E		18								
	KP	P	Z	01	19								
	WN	eL	ZN	01	19								
	RX	eL	NE	01	20								
		eL	ZNE		23								
		M	ZNE		24					10	16	8	17
	Epicentre:			01	09	00	24S	176W			USCGS		6 16

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 21	SU	e	N	04	05	43							
		L	M		08								
	ON	e?	E	04	07	12							
		e	E			19							
	KP	P	Z	04	07	13							
	WN	eL	N	04	14								
	RX	eL	E	04	15						3	23	
		eL	ZN		17								
		M	N		18				2	17			
	Epicentre:			04	03	26	Tonga				USCGS		
21	KP	P	Z	12	05	26							
		e	Z		07	08							
	Epicentre:			11	53	55	28½N	139½E			USCGS		
21	ON	eP	E	21	03	26							
		i	E			30					1.6	1	
		e	E		06	58							
		i	E		07	04					20	3	
	KP	eP?	Z	21	03	39							
		i	Z			42							
		e(S)	Z		07	28							
	TU	eP	N	21	03	43							
		e	N		04	01							
		e	N		07	14							
		e(S)	N			24							
	WN	P	ZN	21	04	09	2	4	2	5			
		e	N			13							
		e	N		05	30							
		eS	N		08	09							
		e	N			14			7	5			
		eScS	ZN		14	49	4	6	8	6			
	CB	eP	E	21	04	15							
		eS	E		08	18							
		e	E			34							
	RX	e	N	21	06	06							
		e(S)	E		08	37							
		eL	NE		09	36							
		i	NE		15	18					9	12	
	Epicentre:			20	59	10	18S	176W	250km		USCGS		
22	RX	e	N	00	16	26			2	25			
	Epicentre:			00	01	14	14½S	115E			USCGS		
22	KP	e?	Z	01	44	42							
		e	Z			44							
22	SU	e(S)	N	04	23	41							
		e	N			56							
22	SU	e(S)	N	10	01	23							
	KP	P	Z	10	01	47							
		e	Z		02	04							
	Epicentre:			09	56	40	15S	167E	100km		USCGS		
22	KP	iP	Z	22	24	10u							
		e	Z			22							
		i	Z		29	25u							
		e	Z		30	07							
	KM	e(P)	X	22	24	26							
	GP	P	N	22	24	37							
	RX	e	NE	22	29	24			1	20	1	20	
					33								
					38				1	20			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 22	TO	e	Z	22	30	49							
	WN	e(L)	N	22	40								
	Epicentre:			22	16	56	6S	149E	250km		USCGS		
22	KP	eP	Z	23	28	34							
	Epicentre:			23	18	33	26½S	115W			USCGS		
23	KP	P	Z	01	37	57							
23	KP	e	Z	08	04	59							
	GP	eP	N	08	05	42							
	Epicentre:			07	59	09	12S	167E			USCGS		
24	TO	e(P)	Z	17	05	03							
		e	Z		06	08							
	KP	e(P)	Z	17	05	40							
		e	Z			52							
		e	Z		06	07							
	Epicentre:			16	54	25	14N	121E	150km		USCGS		
25	SU	e(L)	N	06	33								
	RX	eL	E	06	43								
	Epicentre:			06	27	15	24S	176W			USCGS		
25	SU	eL	N	08	30								
	KP	P	Z	08	30	21							
26	KP	eP	Z	05	12	45							
		e	Z			53							
	Epicentre:			05	00	29	37½N	142E			USCGS		
26	KP	iP	Z	11	29	47u							
26	SU	e	N	12	25	17							
		i	N		26	30					6	5	
	ON	eP	E	12	25	52							
		e	E		26	29							
	KP	iP	Z	12	26	10u							
		i	Z			15							
	GP	e	N	12	26	53							
	RX	e	N	12	32	32					1	22	
		eL	E		34								
		eL	ZN		38						2	20	
		M	E		40								4 15
	WN	eL	ZN	12	37						6	16	
	Epicentre:			12	20	43	14S	167E			USCGS		
26	SU	e	N	12	48	12							
		iS	N		50	23					10	7	
	ON	e(P)	E	12	50	12							
	KP	P	Z	12	50	29							
		e	Z			35							
	GP	e?	N	12	56	13							
	RX	e	N	12	56	42					2	22	
		eL	E		58								
		eL	ZNE	13	02						3	20	4 20
		M			04						3	18	5 14
	WN	eL	ZN	13	01								
		M			02		14S	167E			USCGS		
26	KP	1(P)	Z	13	04	07							
26	KP												
		e	Z	13	22	13							
		i	Z			18							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 26	KP	e(P)	Z	14	48	13							
26	KP	P	Z	16	03	28							
		Epicentre:		15	57	57	12S	167E	150km			USCGS	
26	KP	e(P)	N	17	58	35							
		i	N			53n			3	2			
		iS	N	18	01	00			8	4			
	ON	P	E	18	00	43							
	KP	P	Z	18	01	02							
		i	Z			08							
		e	Z		08	25							
	KM	e	X	18	01	39							
	GP	P	N	18	01	45s							
	WN	e(P)	N	18	01	50							
		e(S)	N		07	12			1	15			
		eL	ZN		11				10	17			
	RX	e	N	18	07	20			1	22			
		eL	E		09								
		eL	ZN		12								
		M			15				4	16	7	15	
		Epicentre:		17	55	34	14S	167E				USCGS	
26	ON	e	E	23	28	24							
	KP	eP	Z	23	28	48							
		e	Z			51							
	SU	e?	N	23	29	30							
	RX	eL	E	23	37								
		eL	E		39½							2	20
		Epicentre:		23	23	20	14S	167E				USCGS	
26	SU	eP?	N	23	34	40							
		e	N			53			5	5			
		i	N		36	52			3	4			
		i	N			59			14	7			
	ON	e(P)	E	23	36	43							
		e	E		37	00							
	KP	eP	Z	23	37	05							
		e	Z			10							
		e	Z		39	26							
	WN	e?	N	23	39								
		eL	ZN		48								
		M			50				8	15			
	RX	eL	E	23	45								
		M	E		48							9	20
		M	N		49				4	20			
		Epicentre:		23	31	38	14S	167E				USCGS	
26	ON	e	E	23	40	10							
	KP	P	Z	23	40	39							
		i	Z			44							
26	KP	P	Z	23	45	30							
	ON	e	E	23	46	30							
	WN	eL	ZN	24	02				5	15			
26	KP	P	Z	23	50	35							
		i	Z			40							
		e	Z		51	07							
	ON	e	E	23	50	20							
		e	E			41							
	SU	iS	N	23	50	38			9	16			
						07	14S	167½E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
UG 27	KP	e	Z	00	47	52							
		e(P)	Z		48	45							
		i	Z			50							
27	KP	e	Z	00	55	11							
		e	Z			17							
27	KP	P	Z	01	02	14							
27	KP	P	Z	01	33	48							
27	KP	P	Z	01	46	17							
27	KP	eP?	Z	02	37	47							
		e	Z			50							
	ON	e?	E	02	45	32							
	RX	e	E	02	54	33						1	20
		eL	ZNE	03	05								
		M			07					1	23	5	24
		Epicentre:		02	25	32	4½S	104½W				USCGS	
27	KP	eP	Z	05	08	06							
27	KP	PKP	Z	15	37	16							
		i	Z			33							
	RX	e	N	16	00	13				2	15		
		eL	NE		55								
		M			57					1	18		
	WN	eL	N	16	44								
		eL	N		54					3	20		
		Epicentre:		15	16	35	38N	20½E				USCGS	
29	SU	iP	N	02	22	47							
		e(S)	N		23	08							
		M			24					80	6		
	ON	e	E	02	26	12						0.3	1½
	KP	P	Z	02	26	38u							
		e	Z			43							
29	SU	iP	N	12	27	31					4	5	
		i	N		28	19							
		(S)	N		29	49							
		M			32					50	10		
	TU	e(P)	N	12	29	16							
	ON	e	E	12	29	38						0.3	1½
		e	E			49						0.8	1½
		e	E		33	45							
		e	E		34	29							
	KP	P	Z	12	29	51						6	6
	GP	e(P)	N	12	30	34							
	RX	iS	NE	12	35	55							
		eL	NE		38					5	22	2	21
		eL	ZN		40							14	26
		M	NE		41								
		M	E		44					10	20	10	20
	WN	eL	H	12	36							20	16
		eL	ZN		40								
		M		43	43					12	18		
		Epicentre:		12	24	23	14½S	167E				USCGS	5¾-6
29	SU	e	N	12	55	24							
	ON	e	E	12	57	15						0.2	1½
	KP	P	Z	12	57	24							
		Epicentre:		14S	167E							USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 29	ON	e	E	12	59	41						
	KP	P	Z	13	00	07						
		e	Z		03	20						
30	SU	i	N	12	32	09s			4	4		
		i	N		33	10			3	4		
	KP	P	Z	12	33	57						
		i	Z			59						
		e	Z		35	13						
30	KP	P	Z	14	38	59						
30	SU	eL	N	19	18				2	20		
	Epicentre:			18	38	18	27½N	112W			USCGS	
31	KP	P	Z	16	25	47						
	Epicentre:			16	19	57	11S	166½E			USCGS	
31	SU	i	N	23	29	14			3	3		
		e	N			31			5	4		
		M			34				20	8		
	KP	e	Z	23	31	07						
	WN	eL	ZN	23	39				8	15		
	RX	eL	NE	23	39						6	21
		M			43				3	15	4	15
	Epicentre:			23	00	16	63N	144½W			USCGS	
SEP 1	AK	eL	N	01	06							
	KP	eP	Z	01	01	04						
	WN	eL?	N	01	06¾							
	RX	eL	NE	01	09						10	25
		Lmax	NE		10				4¼	20	12	20
		eLr	Z		12		6	18				
	SU	eP	N	00	59	59						
		eL	N	01	01	00						
	Epicentre:			00	57	10	24S	175½W			USCGS	
1	KP	P	Z	15	41	26						
		epP	Z		43	53						
	Epicentre:			15	29	41	38N	134½E	400km		USCGS	
2	KP	P	Z	02	33	43						
		i	Z		34	03						
		e	Z			22						
	TU	eP	N	02	33	54						
	GP	eP	N	02	34	24						
	SU	S	N	02	34	16						
	Epicentre:			02	27	41	10½S	164½E			USCGS	
2	KP	eP	Z	03	03	35						
		e	Z			42						
		ePcP	Z		06	08						
	RX	eL	NE	03	17				2¾	20	2	20
	Epicentre:			02	56	34	6½S	155E	100km		USCGS	
2	ON	eP	E	14	33	21						
	KP	P	Z	14	33	37d						
		ePcP	Z		35	27						
		ScP	Z		39	13						
	TO	P	Z	14	33	43						
	GP	eP	N	14	33	58						
					34	25						
				14	25	37	5½S	145½E			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 2	KP	1P	Z	17	36	26½u							
2	ON	P	E	22	12	06							
		S	E			55							
	KP	P	Z	22	12	12							
		e	Z		13	15							
	TO	eP	Z	22	12	22							
	WN	P	N	22	12	46							
		S	N		14	06							
	CB	eS	E	22	14	21							
	KM	eS	X	22	14	59							
	GP	eP	N	22	13	22							
		S	N		15	08							
	Epicentre:			22	11	02	34¾S	178½E	350km		NZ(D)		5.6 NZ
2	KP	(P)	Z	23	44	08							
3	WN	eL	N	04	49¾								
	RX	eL	N	04	48				3½	30			
	Epicentre:			03	44	24	0	18W			USCGS		
3	KP	P	Z	04	26	00							
3	KP	P	Z	05	56	19							
3	KP	P	Z	08	22	54							
		e	Z		23	41							
	WN	eL	N	08	54								
	RX	eL	NE	08	54				40½N	30	2½	25	
	Epicentre:			08	10	26	40½N	143E	60km		USCGS		
4	KP	P	Z	00	20	52							
4	KP	P	Z	12	59	33							
4	KP	P	Z	22	03	55							
		i	Z		05	11							
		PP	Z		07	54							
	WN	eP	Z	22	03	50	3.0	4					6.9
		ePP	ZN		07	51	2.1	4					7.0
		iS	N		14	16			4¼	10			6.5
		eLq	N		26½				31	35			
		Lr	ZN		30¾		12	20					
		Lmax	N		33				20	20			6.5
	TO	eP	Z	22	03	52							
	RX	iS	NE	22	14	15			3.0	14	12	20	6.7
		ePS	NE		16	12			6¾	25	7	25	
		SS	NE		19	55			4¼	20	7	20	
		eL	NE		30				15	30	34	20	
		Lmax	NE		35				7	20	16½	20	6.5
	SU	eSKS	N	22	15	25							
		eSS	N		37								
	Epicentre:			21	51	08	33½S	69½W			USCGS		
4	KP	1P	Z	23	14	24½u							
	SU	S	N	23	12	37							
	Epicentre:			23	10	22	18½S	178W	500km		USCGS		
5	KP	P	Z	02	37	44							
5	KP	P	Z	10	44	34½							
6	KP	P	Z	00	28	44							

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag
SEP 7	WN	eL	N	05	00			7½ 15		
	RX	eL	NE	05	00					
	SU	eL	N	04	55					
	Epicentre:			04	40	57	10S 153E		USCGS	
7	KP	eP	Z	04	50	41				
	Epicentre:			04	43	57	9½S 152½E		USCGS	
8	KP	P	Z	05	38	44				
		i	Z		39	00				
	RX	eL	N	06	13					
	Epicentre:			05	25	37	53½N 159E		USCGS	
8	SU	P	N	08	31	15				
		S	N			36				
8	KP	P	Z	13	38	42				
8	KP	iP	Z	14	07	29u				
8	KP	P	Z	15	05	31½d				
		e				54				
8	KP	P	Z	15	38	39				
9	KP	iP	Z	05	49	26u				
9	KP	P	Z	22	36	45				
				04	26	54				
11	ON	eS	E	04	26	54				
	KP	P	Z	04	25	30				
		S	Z		27	06				
		i	Z		29	06				
	TO	eS	Z	04	27	18				
11	SU	P	N	04	53	35				
		e(S)	N			55				
	KP	P	Z	04	57	44				
11	KP	P	Z	13	06	32				
11	KP	P	Z	18	12	22				
	Epicentre:			18	01	45	7N 126½E		USCGS	
11	KP	eP	Z	23	41	48				
		e	Z		42	07				
	Epicentre:			23	37	33	21S 170½E		USCGS	
12	KP	eP	Z	02	38	24				
		e	Z		40	34				
12	KP	P	Z	10	02	29				
12	KP	eP	Z	14	09	32				
12	KP	eP	Z	16	25	32				
		e	Z		26	18				
12	KP	P	Z	18	58	58				
13	KP	P	Z	03	42	45				
		i	Z			58				
						26				

Date	Stn	Phase		h	m	s	Az Tz	An Tn	Ae Te	Mag.
SEP 14	SU	eSKS	N	14	45	24				
		eL	N	15	03					
	Epicentre:			14	21	37	56½N 120½E		USCGS	
14	KP	P	Z	18	02	43				
14	KP	eP	Z	19	54	35				
	Epicentre:			19	42	13	31N 133E		USCGS	
15	KP	P	Z	01	44	10				
	SU	(P)	Z	01	41	17				
		eL	N		43	12				
15	ON	P	E	16	48	47e				
	KP	iP	Z	16	49	51½u				
	TU	e(P)	N	16	49	48				
		S	N	16	50	58				
		eL	N		51	30				
	TO	eP	Z	16	50	02				
		e	Z		51	52				
	WN	eP	N	16	50	26		4¼ 3		
		i	N		52	07				
		S	N			09		6 2		
CB?	ZB	eS	E	16	52	27				
	KM	e(P)	X	16	51	08				
		eS	X		53	09				
	GP	eP	N	16	51	04				
		eS	N		53	12				
	Epicentre:			16	48	10	33S 180		USCGS	
15	ON	P	E	19	55	15				
	KP	iP	Z	19	55	26u				
		PcP	Z			53				
		e(pP)	Z		57	03				
		e	Z	20	00	31				
		(S)	Z		03	17				
		P'P'	Z		23	17				
	TU	P	N	19	55	34				
	TO	P	Z	19	55	29				
		ePcP	Z			54				
	WN	iP	Z	19	55	28u	8¼ 5			6.4
		P	N			28		4¾ 1		
		S	N	20	03	14		11½ 8		6.7
		SS	N		06	52		2½ 7		
	CB	P	E	19	55	21				
	KM	eP	X	19	55	21				
	GP	P	N	19	55	29				
		eS	N	20	03	26				
	RX	P	Z	19	55	22	5 5			6.2
		(S)	Z	20	03	37	6 8			
	Epicentre:			19	45	40	2½W 120½E 600km		USCGS	
17	KP	P	Z	12	36	55				
		e	Z		37	07				
	Epicentre:			12	23	50	48½N 155E		USCGS	
17	WN	eL	ZN	15	24			4½ 15		
	RX	eL	Z	15	23					
18	KP	eP	Z	01	57	20				
		e	Z			29				
18	KP	eP	Z	03	48	05				

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 18	ON	P	E	05	13	24½							
		S	E			58							
	KP	iP!	Z	05	13	06½							
	TU	eP	N	05	13	10							
		S	N			32							
	WN	P	N	05	13	35							
		S	N			14 16½							
	CB	eP	E	05	13	42							
		S	E			14 32							
	KM	e(P)	X	05	14	09							
		S	X			15 09							
	GP	eP	N	05	14	09							
		S	N			15 18							
	Epicentre:			05	12	41	38.1S		176.2E		185km	NZ(B)	5.3
18	KP	P	Z	06	59	45							
	Epicentre:			06	51	09	2½S		141E			USCGS	
18	KP	P	Z	07	48	39							
18	KP	P	Z	17	50	14							
18	KP	eP	Z	17	53	13							
19	KP	P	Z	08	22	46							
	Epicentre:			08	12	33	2½N		127E			USCGS	
20	ON	eP	E	17	16	17							
	TU	e(P)	N	17	17	44							
		eS	N			22 31							
	WN	iP	ZN	17	16	54	5¾	6					6.4
		ePP	N			18 29			3	8			6.3
		ePP	Z			40	3	8					
		e	N			21 31							
		iS	N			22 47			5¼	8			
		eSS	ZN			25 50	5¼	15	15	15			
		eL	ZN			28.9	27	25	26	25			
	CB	eP	E	17	16	48							
	KM	eP	X	17	17	00							
	GP	eP	N	17	17	03							
	SU	eP	N	17	15	12							
		i	N			22							
		L	N			20 15							
	Epicentre:			17	09	24	6½S		154½E			USCGS	
20	WN	eP	N	17	23	26							
	KM	eP	X	17	23	46							
	GP	eP	N	17	23	50							
	SU	eS	N	17	20	50							
	Epicentre:			17	18	43	400miles S. of Fiji					USCGS	
? 22	WN	e(L)	N	06	05	25							
	RX	eL	Z	06	04								
21	ON	eP	E	13	34	25							
	WN	eL	N	13	45	17							
	SU	eP	N	13	31	05							
		iS	N			32 31							
	Epicentre:			13	29	03	15S		174W		150km	USCGS	

data ?

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 22	ON	iP	E	19	07	30w							
	AK	iP	N	19	07	36n							
		iS	N			08 51							
	TU	eP	N	19	07	24							
		S	N			08 36							
	TO	eP	Z	19	07	41							
		eS	Z			09 10							
	WN	eP	N	19	08	05							
		S	N			09 47							
	CB	eP	E	19	08	17							
		S	E			10 07							
	KM	e(P)	X	19	08	43							
		S	X			10 46							
	GP	P	N	19	08	44							
		S	N			10 52							
	RX	P	ZN	19	09	30	8¼	4	6½	9			
		eS	N			12 20			10½	18			
		eL	N			13.2			50	30			
		eL	Z			13¾	43	22					
		Lmax	N			16			43	21			
	SU	iP!	N	19	09	27s							
		S	N			12 27							
		eL	N			13.2							
	Epicentre:			19	05	44	33½S		177½W			USCGS	
22	WN	eL	N	23	04.5								
		eL	Z		08								
	RX	eL	N	23	06					2¾ 20			
	SU	eS	N	22	56	14							
		eL	N			57							
	Epicentre:			22	51	44	16½S		168½E			USCGS	
23	ON	eP	E	16	21	58							
	TU	eP	N	16	21	49							
		S	N	16	23	04							
	TO	eS	Z	16	23	33							
	WN	S	N	16	24	11							
	CB	eS	E	16	24	33							
	GP	eS	N	16	25	16							
	SU	eL	N	16	29								
25	WN	eL	NZ	08	25								
	RX	eL	NE	08	23					4 35			
		eL	Z		32								
		Lmax	N		33					2¼ 20			
	Epicentre:			07	20	02	9N		39½W			USCGS	
25	SU	L	N	15	00	51							
25	ON	eP	E	15	17	22							
		e	E			41							
	AK	eL	N	15	19.8								
	TU	eP	N	15	17	18							
		eS	N			18 33							
	TO	eP	Z	15	17	40							
		e	Z			19 22							
	WN	S	N	15	19	41							
		eL	ZN			22	5¼	15	9	15			
	CB	eS	E	15	20	02							
	KM	eS	X	15	20	43							
	GP	eS	X	15	20	47							
	SU	eL	N	15	23½								
	RX	eL	NE	15	24					3¼ 20		2¼ 20	
		eL	Z		26		5	15					
	Epicentre:			15	15	37	32½S		178W			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 25	ON	eP	E	20	57	35							
		e	E			48							
	AK	eL	N	20	59½								
	TU	eP	N	20	57	33							
		S	N		58	48							
	TO	eP?	Z	20	58	03							
		e	Z		59	18							
	WN	S	N	20	59	58							
		eL	ZN	21	02.2		9	20	9	15			
	CB	eS	E	21	00	18							
	KM	eS	X	21	00	54							
	GP	eS	N	21	01	00							
	RX	eLq	N	21	04.3				2¼	20			
		eLr	ZE		06.5		5	18			2¼	15	
	Epicentre:			20	55	53	33S	178W			USCGS		
25	ON	eP	E	22	42	14							
	TU	eP	N	22	42	04							
		S	N		43	25							
	TO	eS	Z	22	43	53							
	WN	S	N	22	44	36							
	CB	eS	E	22	44	56							
	GP	S	N	22	45	41							
	Epicentre:			22	40	19	34S	176W			NZ		
27	ON	P	E	14	00	01							
	TO	eP	Z	14	00	24							
	WN	eP	N	14	00	40							
	CB	eP	E	14	00	48							
	KM	eP	X	14	01	00							
	GP	eP	N	14	01	08							
	SU	S	N	13	58	33							
	Epicentre:			13	55	02	15S	174W	150km		USCGS		
29	SU	eL	N	00	07.7								
	Epicentre:			00	03	46	16½S	173W			USCGS		
30	WN	eL	ZN	08	58								
	RX	eL	E	09	00								
	SU	eL	N	08	50	53							
	Epicentre:			08	47	06	23S	172½E			USCGS		
30	TU	P	N	18	39	13½							
		S	N			31							
	TO	P	Z	18	39	16							
		eS	Z			35							
	WN	P	N	18	39	38							
		S	N		40	17							
	CB	S	E	18	40	32							
	KM	S	X	18	41	09							
	GP	P	N	18	40	12							
		S	N		41	18							
	ON	eP	E	18	39	38							
		eS	E		40	13							
	Epicentre:			18	38	49	38.4S	176.4E	160km	NZ(C)			5.0 NZ
OCT 1	SU	P	N	09	38	01			5	8			
		S	N		44	46			10	9			
		L	N		51								
			N		52				24	20			
	ON	e	E	09	44.2						40	16	
	CB	P	E	09	34	46					11	7	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 1	WN	iP	ZN	09	34	56un	15	7	8	6			
		S	N		39	13n			30	7			
		i	Z			46							
		L	N		41								
		M	N		43				80	15			
	KM	e0	X	09	34	22							
	RX	P	ZNE	09	33	53u	27	8	Drum speed erratic.				
		e(S)	N		37	10							
		i	E			18							
		L	ZNE		38								
		M	NE		39				100	12	90	10	
	Epicentre:			09	29	43	57S	146E			USCGS		6¼
2	TO	eP	Z	04	37	51							
		e	Z		38	00							
	WN	eP	Z	04	37	56							
		eL	N	05	14				2	15			
	RX	eL	NEM	05	05								
			N		08								
	Epicentre:			04	25	30	58½S	10W			USCGS		
3	CB	eS	E	19	02	03							
	WN	eP	N	19	00	05							
		S	N		01	38							
	KM	eS		19	02	41							
6	SU	eP	N	00	50	40							
		eS	N		53	19							
	ON	iP	E	00	48	55e						6	1
		iS	E		50	09e							
	KP	iP	Z	00	49	02d							
		e(S)	Z		50	17							
	TO	eP	Z	00	49	15							
	CB	eP	E	00	49	48							
		e	E			55							
		e	E		51	37							
		S	E			40							
	WN	eP	N	00	49	37							
		S	N		51	23			0.2				
	KM	e(P)	X	00	50	22							
		S	X		52	14			1	1			
	GP	e(P)	N	00	50	14			0.1	0.4			
		S	N		52	27			2.5	0.7			
	Epicentre:			00	46	56	32S	179W			USCGS		
6	SU	eS	N	02	11	39							
	ON	eP	E	02	11	37							
	KP	P	Z	02	11	51u							
		i	Z			56							
		e	Z		12	20							
		eS	Z		14	30							
	TO	eP	Z	02	12	04							
	CB	P	E	02	12	28						1.1	0.4
		S	E		15	29						0.1	1
	WN	P	N	02	12	24			0.3	0.7			
	GP	e(P)	N	02	12	50			0.1	0.5			
		S	N		16	07			0.1	0.8			
	Epicentre:			02	08	41	23S	179½W	550km		USCGS		
6	WN	e(L)	N	07	30								
	RX	e(L)	N	07	29				2	23			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 6	ON	P	E	13	36	18							
	KP	iP	Z	13	36	20u							
	CB	eS	E	13	38	27							
	WN	e(P)	N	13	36	55							
		S	N		28	11			0.3	0.3			
	GP	P	N	13	37	31s							
		S	N		39	14			0.1	0.4			
7	KP	eP	Z	03	17	47							
7	KP	eP	Z	03	31	48							
7	KP	eP	Z	06	05	17							
7	ON	iP	E	07	38	51w							
		S	E		39	34w							
	KP	iP	Z	07	38	30d							
		eS	Z			56							
	TU	P	N	07	38	33s							
		S	N		39	01							
	TO	P	Z	07	38	26u							
		e(S)	Z			48							
	CB	iP	E	07	38	41w							
		S	E		39	15							
	WN	iP	N	07	38	38s							
		S	N		39	09							
	GP	P	N	07	39	07s							
		S	N		40	01							
	Epicentre:			07	37	56	39.1S	175.1E		NZ(C)			5.5 M
							Felt Wellington, Nelson and Dannevirke MM2.						
7	KP	iP	Z	11	19	45d							
7	SU	eP	N	12	38	33					3		
		e	N			59							
		e	N		39	32			6	5			
		S	N		43	25							
		eL	N		46				8	10			
	ON	eP	E	12	39	54					0.5	2	
			E		41	20					0.8	2	
	KP	iP	Z	12	40	07d							
		i	Z			10u	1						
		e	Z			40	1						
		e	Z		42	19	2						
		S	Z		46	07	2						
		e	Z			33	1						
	TU	eP	N	12	40	26							
		M	N		55								
	TO	eP	Z	12	40	16							
	CB	eP	E	12	40	22							
	WN	eP	ZN	12	40	27							
		e	Z		39		10	3					
		e	N		41	18							
		e	N		42	23							
		eS	N		46	34				5.5	7		
7	WN	i	N	12	50	03							
		eL	ZN		53								
		M_1	N		55					23	20		
		M_2	N		59½					26	17		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 7	KM	eP	X	12(40)						1	2		
	GP	eP	N	12	40	35			0.3	1½			
		e?	N		41	01				6	5		
	RX	eS	N	12	46	48				4	20±		
		eL	NE		50								
		eL	ZNE		53								
		M_1	ZNE		57		30	20		35	20	5	20
		M_2	ZNE	13	01		35	15		20	15	8	15
	Epicentre:			12	32	40	5S	151½E				USCGS	6¼-6½ NZ
8	KP	e(P)	Z	00	57	06							
8	KP	Z		02	21	35							
8	SU	e(P)	N	03	16	07				1	4		
		eL	N		18.8					8	15		
		M	N		21					9	10		
	ON	eP?	E	03	15	40						1	2
		i	E			42e						1.4	3.5
		e	E		18	40							11
	AK	P	N	03	15	53n				6	3		
		e(S)	N		19	11							
		e	N			32							
		M	N		20					3.5	10		
	KP	eP	Z	03	15	52d							
		i	Z			59							
	TU	eS	N	03	17	53							
	WN	S	N	03	19	00				0.2	0.9		
	GP	eS	N	03	20	07					0.7		
	RX	M	NE	03	25					2	17	1	15
8	ON	eP	E	03	26	59							
		i	E			03						0.5	2
	AK	e(P)	N	03	27	20				3	3		
	KP	eP	Z	03	27	14							
		i	Z			40							
	TU	eS	N	03	29	11							
	WN	eS	N	03	30	21				0.2	0.4		
	GP	eS	N	03	31	26					0.5		
8	KP	eP	Z	04	10	39							
8	KP	eP	Z	04	11	50							
8	SU	eL	N	04	49½					8	15		
		M	N		52					9	10		
	ON	P	E	04	46	32w						1	2
		e	E		49.6								11
	AK	P	N	04	46	44				4	3		
		e(S)	N		50	00				3	4		
		M	N		51					4	5		
	KP	eP	Z	04	46	46	2						
	TU	eS?	N	04	48	42							
		e	N			54							
	WN	S	N	04	49	50				0.1	0.4		
	GP	eS	N	04	50	56					0.6		
	RX	M	NE	04	56					1	16		
							Felt Raoul Is. MM1						
8	KP	eP	Z	05	26	47							

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te	Mag
OCT 8	SU	eL	N	05 34				
		M	N	37				
	KP	eP	Z	05 31 01		3 9		
	TU	e(S)	N	05 32 55				
8	SU	iM	N	06 04				
	KP	e	Z	05 58 54		3 7		
8	KP	eP	Z	06 31 31				
8	SU	M	N	07 04				
	KP	P	Z	06 59 02		3 8		
8	KP	eP	Z	07 38 53				
8	SU	eL	N	07 45				
		M	N	47				
	KP	eP	Z	07 42 07		3 8		
8	KP	(P)	Z	08 37 18				
8	SU	M	N	09 24				
	KP	e(P)	Z	09 19 19		1.5 10		
	Epicentre:				Kermadec Region			
8	KP	eP	Z	09 52 12				
		e	Z	53 37				
		e(S)	Z	54 20				
	Epicentre:				Kermadec Region			
8	SU	eL	N	10 23				
		M	N	25				
	ON	eP	E	10 19 36		3 8		
	AK	P	N	10 19 54			0.4 2	
	KP	eP	Z	10 19 55		3 3		
	WN	eS	N	10 25 56				
	GP	eS	N	10 24 05				
	Epicentre:				Kermadec Region			
8	KP	P	Z	10 40 38				
	Epicentre:				Kermadec Region			
8	KP	P	Z	10 53 04				
	Epicentre:				Kermadec Region			
8	SU	P	N	11 15 33				
		eL	N	18.6		3 5		
		M	N	21		8 12		
	ON	eP	E	11 15 18		12 9		
		e	E	18.5			1 3	
	AK	P	N	11 15 34n			12 11	
		M	N	20		4 4		
	KP	eP	Z	11 15 35		5 10		
	WN	eS	N	11 18 36				
		M	N	23		0.1 0.5		
	GP	eS	N	11 19 48				
	RX	L	N	11 25				
	Epicentre:			11 12 50	29S 177½W		USCGS	
					Felt Raoul Is. MM2.			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 8	KP	eP	Z	11	49	00							
8	KP	P	Z	11	51	36							
	Epicentre:						Kermadec Region.						
8	KP	P?	Z	12	04	07							
	Epicentre:						Kermadec Region.						
8	KP	P?	Z	12	29	52							
	Epicentre:						Kermadec Region.						
8	KP	eP	Z	12	40	18							
	Epicentre:						Kermadec Region.						
8	SU	eL	N	13	18	29							
		M	N			31			3	8			
	AK	e(P)	N	13	23	34			2	4			
	KP	e(P)	Z	13	25	34							
	TU	e(S)	N	13	26	32							
	Epicentre:						Kermadec Region.						
8	KP	eP	Z	13	37	12							
	Epicentre:						Kermadec Region.						
8	KP	eP?	Z	13	59	18							
		i	Z			24							
	Epicentre:						Kermadec Region.						
8	KP	eP	Z	14	07	47							
		e	Z		08	03							
		e	Z		10	15							
		e	Z			33							
	CB	eP	E	14	08	03							
	GP	nP	N	14	08	19s							
		e				35							
	RX	M	N	14	22	n			1	20			
	Epicentre:			14	00	47	7S	155½E				USCGS	
8	KP	e(P)	Z	14	32	01							
	Epicentre:			14	24	47	7S	156½E				USCGS	
8	SU	eP	N	15	41	03				3 1			
		eL	N			44				8 14			
		M	N			46				10 10			
	ON	iP	E	15	40	45w						2 3½	
		e	E			43.7						13 11	
	AK	iP	N	15	40	57s				9 3			
		M	N			45				4 10			
	KP	P	Z	15	40	50d							
	TU	e(S)	N	15	42	58				0.2 0.4			
	WN	S	N	15	44	04				3 10			
		M	N			49							
	GP	eS	N	15	45	07				0.5			
	RX	L	NE	15	50					20		2 14	
	Epicentre:			15	38	17	29S	178W				USCGS	
8	KP	eP	Z	17	25	46							
	Epicentre:						Kermadec Region.						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 8	SU	eP	N	18	02	34			2	4			
		eL	N		05.5				3	13			
		M	N		08				6	10			
	ON	eP?	E	18	02	29						1	
		e?	E			49						2	
	AK	S?	N	18	06	09							
	KP	P	Z	18	02	33							
		e				33							
		e(P)			03	14							
	TU	e(S)	N	18	04	22							
	WN	eS	N	18	05	35				0.4			
	GP	eS	N	18	06	35				0.5			
	RX	eL	E	18	11							1 15	
	Epicentre:						Kermadec Region.						
8	KP	eP	Z	19	32	41							
	Epicentre:						Kermadec Region.						
8	KP	eP	Z	19	49	17							
	Epicentre:						Kermadec Region.						
8	ON	eP	E	20	58	54							
	KP	iP	Z	20	59	12							
	Epicentre:						Kermadec Region.						
8	KP	eP	Z	22	31	36							
9	KP	P	Z	00	22	26							
	Epicentre:						Kermadec Region.						
9	SU	L	N	01	50								
		M	N		52				4	8			
	AK	M	N	01	50				2	10			
	WN	M	N	01	55				2	5			
	Epicentre:						Kermadec Region.						
9	SU	eP	N	04	12	43				2 4			
		L	N		15					5 10			
		M	N		18								
	AK	P	N	04	12	32				4 3			
		M	N		17					3 8			
	ON	P	E	04	12	19						1 2	
	KP	P	Z	04	12	35u							
		e	Z			40							
	WN	eS	N	04	15	37				0.4			
		M	N		21					1.5 10			
	Epicentre:						Kermadec Region.						
9	SU	e	N	07	43					2.5 5			
9	KP	P?	Z	10	09	04							
		i	Z			13u							
9	KP	P	Z	10	32	09							
	Epicentre:			10	22	08	14N	145½E				USCGS	
9	GP	eP	N	11	32	32				0.1 1			
	WN	P	H	11	32	42				0.3 1			
		eLr	ZN		59								
		M_1		12	05					5 20			
		M_2			11					4 18			
	CB	eP	E	11	32	46							
		e	E			55							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 9	KP	P	Z	11	32	52u							
		e	Z		33	06							
	RX	e(S)	N	11	43±				2	30			
		e(SS)	N		48±				2	22			
		eL	N	12	00								
		eL	Z		03								
		M_1			04				5	20			
		M_2			11		9	16	6	17			
	SU	eSS	N	11	53.8				2	18			
		eSSS	N		58								
		eLr	N	12	09								
		M	N		13				6	20			
	Epicentre:			11	20	17	55½S	27½W				USCGS	
9	KP	eP	Z	14	34	06							
	WN	S	N	14	37	05			0.1	0.4			
9	ON	eP	E	14	35	55					0.4	2	
	KP	eP	Z	14	36	12							
	WN	S	N	14	39	11			0.1	0.4			
10	KP	eP?	Z	01	42	49							
	SU	e	N	01	46								
		M	N		48				3	7			
10	KP	iP	Z	05	43	52u							
	SU	M	N	05	50				4	7			
10	SU	M	N	06	53				4	7			
10	KP	eP	Z	08	43	29							
	RX	M	N	09	19				2	26			
		e	N		24				1	22			
	Epicentre:			08	30	17	53N	160E				USCGS	
10	KP	eP?	Z	11	45	39							
		e	Z			50							
		e	Z		46	28							
	Epicentre:			11	35	24	5½N	127E				USCGS	
10	KP	eP	Z	14	45	36							
	SU	M	N	14	52				3	7			
11	KP	eP	Z	02	13	14d							
		e	Z			48							
	Epicentre:			02	00	40	53N	159½E				USCGS	
11	KP	eP?	Z	14	50	46							
		i	Z			51u							
	Epicentre:			14	37	42	23½S	65W 200km				USCGS	
11	SU	P	N	21	29	27							
		S	N		30	31			5	6			
11	KP	eP?	Z	21	43	05							
		e	Z			14							
		4	Z			17							
	SU	e	N	21	48				2	10			
12	SU	(S)	N	09	47	41							
	KP	iP	Z	09	49	30u							
	Epicentre:			09	44	50	17S	175½W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
	ON	eP	E	10	09	09e						3 1	
OCT 12	KP	P	Z	10	09	24d							
	TU	e	N	10	11	55							
		e	E	10	12	55							
	CB	e	N	10	13	37							
	GP	eS											
12	KP	eP?	Z	12	55	53d							
		i	Z			54d							
	WN	e(P)	H	12	56	11							
	GP	eP	N	12	56	14							
	Epicentre:			12	47	42	4½S	144E				USCGS	
12	KP	P	Z	15	30	31							
		pP	Z		31	33d							
	GP	eP	N	15	30	46							
		e	N		31	32							
	RX	i(S)	E	15	41							3 9	
	Epicentre:			15	18	42	25½S	125½E 250km				USCGS	6¾
12	KP	e(P)	Z	17	32	30							
	Epicentre:			17	27	00	14S	167E				USCGS	
12	WN	eP	H	18	41	54							
	KP	iP	Z	18	42	24d							
13	SU	e	N	05	30	13							
		i	N		31	34							
	ON	eP	E	05	32	10						0.2 1½	
	KP	iP	Z	05	32	29							
		i	Z			34							
	CB	eP	E	05	32	55							
		eS	E		36	49							
	WN	P	N	05	32	56n			0.2	0.5			
	Epicentre:			05	26	56	14S	173½E				USCGS	
13	KP	iP	Z	19	23	43u							
		i	Z			54							
		e	Z		24	08							
		e	Z		25	13							
	WN	eP	N	19	24	18							
		e	N		26	11							
		(S)	N			15			0.7	0.4			
		e	N			33							
	GP	eP	N	19	24	52							
		e	N		27	08							
	(S)	N				11	27	11?	0.2	0.6			
	CB	eS	E	19	26	24							
15	ON	e	E	11	33	38							
	WN	eP?	H	11	34	01							
		e	N			17							
		eS	N		36	19			0.5	⅓			
	GP	eP?	N	11	35	01							
		e	N		37	23							
		e(S)	N			28							
	CB	eS	E	11	36	37							
	Epicentre:			11	31	30	31S	178½W				USCGS	
15	WN	e?	N	17	08	38							
	SU	e	N	17	09				3	6			
	RX	e(L)	E	17	21								
	Epicentre:			17	03	10	17S	169E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 15	SU	e	N	18	05							
16	SU	e	N	03	24							
16	SU	eP	N	18	05	25						
		i	N		06	14						
		iS	N		07	58s			6	5		
	CB	eP	E	18	08	14						
	WN	eP	N	18	08	16						
		e(S)	N		13	07						
	GP	eP	N	18	08	33						
		i	N			38						
	RX	eL	E	18	23							
	Epicentre:			18	02	01	11S	167E	100km		USCGS	
17	SU	P	N	10	25	18						
		S	N		26	17						
	ON	eP	E	10	27	49						
	KP	P	Z	10	27	56u						
		e	Z		29	00						
	CB	eP	E	10	28	32						
		e(S)	E		32	12						
	WN	e(P)	N	10	28	26						
		e(S)	N		32	07						
	GP	eP	N	10	28	53						
		eS	N		32	57						
	TU	e(S)	N	10	31	20						
	Epicentre:			10	23	56	19½S	177½W	400km		USCGS	
17	KP	iP	Z	12	36	02u						
	TU	eP	N	12	36	13						
18	KP	eP	Z	22	55	30						
		eS	Z		56	40						
	TU	e(P)	N	22	55	50						
		(S)	N		56	17						
		e	N			31						
	ON	e(S)	E	22	55	52						
	WN	S	N	22	57	37						
	CB	eS	E	22	57	59						
	GP	S	N	22	58	42						
19	SU	eP	N	01	56	12			9	5		
		e(S)	N		58.0							
		M	N	02	01							
	ON	eP	E	01	58	40					0.5	2
		e	E			55					2	2
	KP	eP	Z	01	58	50u						
		e	Z			55						
		e	Z	02	02	14						
		e	Z		03	30						
	CB	eP	E	01	59	35						
	KM	eP	X	01	59	55						
		e(S)	X	02	03	19						
		e	X		04	51						
	GP	P	N	01	59	58						
		e(S)	N	02	04	49						
	WN	M	N	02	07				8	10		
	Epicentre:			01	53	54	19S	172½W			USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 19	ON	eP	E	02	18	48			0.5	2			
	KP	eP	Z	02	19	00							
		e	Z		22	32							
	KM	e	X	02	20	06							
	GP	eP	N	02	20	07							
19	KP	e(P)	Z	09	27	33							
19	TU	P	N	11	44	10							
		e	N			15							
		S	N		45	15							
	KP	i(P)	Z	11	44	15u							
		e	Z			18							
		e(S)	Z		45	28							
		i	Z		50	20							
		i	Z			35							
	ON	eP	E	11	44	20							
		i	E			26						10	0.7
		eL	E		47.3							50	15
	WN	eP	N	11	44	57							
		S	N		46	24					6	0.7	
		e	N		54	00							
		M	N		56						16	9	
	CB	eP	E	11	45	08							
		e	E			59							
		eS	E		46	46							
	GP	eP	N	11	45	29							
		e	N			34							
		e	N		47	28							
		S	N			31					2	0.8	
		e	N		55	06							
	KM	P	X	11	45	35							
		e	X		47	29							
		eS	X			32							
		i	X			44							
	SU	eP	N	11	46	35					4	5	
		e	N		47	00					4	5	
		S	N		51	29							
		M	N		53						27	14	
	RX	eL	NE	11	(50)								
		M	N		(54)						11	14	
	Epicentre:			11	42	42	34½S	178W			USCGS		
19	KP	P	Z	14	37	15							
19	KP	eP	Z	15	24	53							
19	ON	e(P)	E	15	41	01							
	KP	P	Z	15	41	13							
	KM	eP	X	15	42	23							
	GP	e(P)	N	15	42	26							
20	KP	P	Z	01	08	33							
		e	Z			50							
	Epicentre:			00	55	34	52N	175W			USCGS		
20	KM	eP?	X	01	23	04							
		e	X			13							
	CB	P	E	01	22	53							
		e	E		23	16							
		e	E			31.7							
	GP	eP	N	01	22	57							
		e	N		23	20							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 20	KP	P	Z	01	23	04							
		e	Z			06							
		e	Z		27	13							
	WN	eP	N	01	23	11							
		e	ZN			25							
		S	N		31	24			5	10			
		e	N			50			4	18			
		e	N		39	10			3	10			
	TU	eP	N	01	23	15							
		e	N			24							
		e	N		31	43							
	SU	eP	N	01	23	29			2	2			
		i	N		24	10			3	6			
		e	N		28	10			5	6			
		e	N		31	46			6	8			
		e	N		39				10	30			
	RX	M		01	46±				5	20			
	Epicentre:			01	12	30	9½S	112½E				USCGS	
21	SU	eP	N	06	21	54			2.5	5			
	ON	eP?	E	06	22	31							
	KP	iP	Z	06	22	43u							
		e	Z			54							
		e	Z		24	36							
		e	Z		28	11							
	CB	P	E	06	22	50							
	TU	P	N	06	22	55							
	WN	P	ZN	06	22	59u	3	3	0.4	1			
		eS	N		29	07			3	8			
		eL	N		33								
		eL	N		35				8	20			
	KM	eP?	X	06	23	01							
	GP	P	N	06	23	05			0.5	1			
	Epicentre:			06	14	50	5½S	147E				USCGS	
21	KP	eP	Z	15	51	17							
	Epicentre:			15	40	40	11S	111E				USCGS	
21	ON	eP	E	17	35	27							
		e	E		37	11							
	TU	eP	N	17	35	44							
		S	N		37	29							
	KP	eP	Z	17	35	39							
		i	Z			41							
		i(S)	Z		37	10							
	WN	eP	N	17	36	14							
		e(S)	N		38	30							
	GP	eP	N	17	36	48							
		e	N		39	29							
		eS	N			33							
	CB	eS	E	17	38	38							
	KM	eS	X	17	39	23							
	Epicentre:			17	32	45	29S	179W				USCGS	
21	ON	eP	E	18	13	46							
	KP	iP	Z	18	13	51							
	WN	eP	N	18	14	26							
		eS	N		15	49							
	GP	eP	N	18	15	01							
		eS	N		16	55							
	KM	eS	X	18	16	44							
	Epicentre:			18	12.6		35S	180	250km±		NZ(D)		5.2

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 21	KP	eP	Z	18	55	52							
		i	Z		56	02							
	Epicentre:			18	48	38	6S	154½E				USCGS	
22	KP	P	Z	19	20	39							
22	SU	P	N	23	45	36s							
		e(S)	N		47	25					28	13	
		M	N		51						60	9	
	ON	e(P)	E	23	47	47							
		e	E		48	20							
	KP	P	Z	23	48	05							
	TU	e(P)	N	23	48	20							
	GP	eP	N	23	48	52							
	WN	e	N	23	49	00					2	5	
		e(S)	N		53	20					3	7	
		M	N	24	04						8	11	
	RX	eS	N	23	53	46					3	20	
		M	N		59						6	20	
	Epicentre:			23	42	47	14½S	168E				USCGS	
23	KP	P	Z	16	50	41							
	Epicentre:			16	45	12	15S	173W				USCGS	
24	KP	P	Z	09	02	47							
	Epicentre:			08	57	33	15½S	168E				USCGS	
24	KP	iP	Z	12	18	15							
		e	Z			25							
24	KP	P	Z	15	57	45							
24	KP	eP?	Z	21	23	16							
		e	Z			39							
	Epicentre:			21	13	06	0	125E				USCGS	
25	ON	eP	E	10	12	18							
	KP	iP	Z	10	12	32u							
25	KP	P	Z	13	06	43u							
26	KP	P	Z	02	28	45d							
	Epicentre:			02	17	32	5½N	117S				USCGS	
26	KP	e?	Z	18	56	22							
		e(P)	Z	57	07								
	Epicentre:			18	47	35	3N	127E				USCGS	
27	SU	e(P)	N	15	06	55							
		M	N		10						11	11	
	KP	eP?	Z	15	08	40							
		e	Z			45							
	WN	eL	H	15	16								
	RX	eL	NE	15	18								
		M			20						2	20	
	Epicentre:			15	04	44	23½S	175½W				USCGS	
28	KP	eP?	Z	04	21	12							
	KM	eP?	X	04	21	47							
	WN	e?	N	04	25	53					0.4	2	
		M	N		31						8	9	
		M	Z		32				7	8			
	RX	eL	N	04	28						4	20	
		M	NE		33						6	8	14 8
	SU	M	N	04	42						3	17	
	Epicentre:			04	14	55	62½S	157W				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 28	RX	L?	N	08	48				1.5	20			
	Epicentre:			07	44	10	51½N	179½E				USCGS	6¼-6½
28	ON	eP	E	10	04	49							
	KP	iP	Z	10	05	02d							
		i	Z			13							
		e	Z			29							
		e	Z			50							
	SU	i	N	10	05	16			1.6	10			
		e	N		06	30			5	7			
28	RX	eSS	N	11	20								
		eLq	N		31								
	WN	eL	N	11	36								
		M	N		38				14	45			
	Epicentre:			10	46	27	30½N	85E				USCGS	
28	KP	P	Z	18	25	33							
		e	Z			48							
		e	Z			53							
		e	Z		27	42							
	Epicentre:			18	18	03	4½S	153½E				USCGS	
28	KP	e(P)	Z	19	13	31							
28	ON	P	E	23	11	41					0.7	0.9	
		e	E		13	04					0.5	1.3	
	KP	P	Z	23	11	51							
		i	Z			53							
	TU	eP	N	23	11	53							
		e	N		13	20							
		S	N			25							
	WN	eP	N	23	12	26							
		S	N		14	24			0.4	0.3			
	GP	eP	N	23	12	59							
		S	N		15	20			0.7	1			
	CB	eS	E	23	14	34							
	KM	eS	X	23	15	09							
29	KP	eP?	Z	00	03	04							
		e	Z			14							
		i	Z		06	26							
	Epicentre:			23	50	08	52N	179½E				USCGS	
29	ON	eP	E	03	31	13							
	KP	iP	Z	03	31	22d							
	SU	e	N	03	32				4	10			
29	KP	P	Z	06	02	23							
	RX	eL	NE	06	10				2.4	18			
	WN	eL	N	06	18				2	18			
29	KP	iP	Z	07	57	06							
		e	Z			19							
	SU	iS	N	08	04	(00)s							
		e	N		05				55	22			
		L	N		16								
		e?	N		26				13	19			
	WN	e(SKS)	N	08	07	46							
		e	N		09½								
		e(SSS)	N		18								
		eLr	ZN		27								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 29	WN	M_1	N		34					19	20		
		M_2	ZN		42		10	20		12	20		
		M	H	10	12					2.4	20		
	RX	iSKS	N	08	08	20				7	20		
		eS	NE		09	06				5	14	4	14
		e(PS)	N		10.4					6	20		
		eSS	N		15½					9	36		
		eLr	ZNE		29					13	35		
		M	ZN		33		14	24		18	25		
		M	NE		35					11	20	13	22
		M	ZN		37		15	22		12	22		
		M	ZN		40		13	20		12	20		
		eL	N	10	00								
		e	N		05					2	23		
	Epicentre:			07	44	10	51½N	179½E				USCGS	6½
29	KP	iP	Z	08	08	10d							
	Epicentre:			07	55	14	51½N	179E				USCGS	
29	KP	eP	Z	08	19	20							
	Epicentre:			08	06	15	51N	179E				USCGS	
30	GP	P	N	08	06	48							
	RX	eL	NE	08	26							15	15
	WN	e	N	08	29								
30	SU	e	N	10	06	53							
		i(S)	N		08	01				5	3		
	TU	e(P)	N	10	09	40							
		e(S)	N		13	06							
	TO	eP	Z	10	09	44							
	WN	P	N	10	10	08							
		eS	N		14	04							
	CB	P	10	10	12								
	KM	P	X	10	10	29							
	GP	eP	N	10	10	34							
		eS	N		14	54							
	Epicentre:			10	05	00	20½S	176W				USCGS	
31	RX	eL	ZNE	06	13					4	18	3.5	16
	WN	e(L)	N	06	14								
		eL	ZN		17					2.4	16		
31	KP	eP	Z	19	11	12							
	WN	eS?	N	19	17	55				1	5		
		e	N		18	12				2	8		
		(ScS)	N		21	38				1.6	6		
		eL	N		24								
		M	ZN		32		2	15		2	15		
	RX	e(S)	N	19	18	28							
		eL	N		22					6	45		
		L	N		31					2	20		
		M	N		35					2	14		
	Epicentre:			19	02	52	3½S	143½E				USCGS	
31	KP	iP	Z	23	51	28							
		e	Z			51							
	Epicentre:			23	39	27	25N	122½E	100km			USCGS	
NOV 1	KP	P	Z	03	46	28							
		PP	Z		48	24							
	TU	eP	N	03	46	41							
	TO	eP	Z	03	45	35							
	WN	P	ZN	03	46	47	5.2	7		3	7		6.3

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 1	WN	P	ZN	03	46	47	5.2	7	3	7			
		ePP	Z		48	30	5.5	9					6.3
		ePP	N			35							6.5
		S	N		53	17			9½	12			6.7
		SS	N		56	42			7	14			6.2
		eLr	ZN		58¼				6	10			
		Lmax	N	04	02		19	30	4¾	25			
	CB	eP	E	03	46	48			42	20			
	RX	e	NE	03	49	16							6.4
		S	NE		53	38			4.7	9	3.7	9	
		eLq	NE		57	16			15	22	9	22	
		eLr	Z	04	00				7½	22	9¼	12	6.4
		Lmax	NE		03		43	28					
	SU	S	N	03	49	58			36	20	18	20	6.4
		eL	N		52	05							
	Epicentre:			03	38	36	3S	150E			USCGS		
1	KP	P	Z	06	15	01							
	TO	eP	Z	06	15	10							
	WN	e(S)	N	06	22	00							
		eL	ZN		23½				2	10			5.8
		Lmax	NE		36								
	Epicentre:			06	06	47	3½S	145½E	4	12	USCGS		
1	KP	P	Z	12	13	11½							
	TO	eP?	Z	12	13	27							
	SU	e	N	12	12	58							
		eS	N		13	49							
		eL	N		14	45							
	Epicentre:			12	09	21	17½S	168E			USCGS		
1	KP	P	Z	12	20	31							
		e	Z			36							
	TO	eP	Z	12	20	53							
	GP	eP	N	12	21	26							
	SU	S	N	12	19	39							
	Epicentre:			12	15	43	17½S	169E			USCGS		
1	ON	eP	E	12	21	01							
		ePP	E			28							
		eL	E		25.5								
	KP	P	Z	12	21	25							
	TU	eP	N	12	21	39							
		eL	N		25.7								
	TO	eP	Z	12	21	42							
	WN	P	Z	12	21	54u	9½	7					
		P	N			54							6.4
		ePP	Z		22	36	6.7	11	5¾	7			6.4
		S	N		26	21							
		eL	N		28.7				20	16			
		eLr	Z		30½				41	20			6.3
		Lmax	N		32		43	18					
	CB	P	E	12	22	00			73	17			6.3
		eS	E		26	08							
	KM	eP	X	12	22	16							
	GP	eP	N	12	22	21							
	RX	eP	Z	12	22	26	2.6	6					
		eP	E			30							6.2
		eS	E		27	08					3.8	16	6.1
		eLq	E		29.0						15	12	6.4
		eLr	Z		31½						26	30	
		Lmax	NE		32		38	18					
	SU	S	N	12	21	10			40	20	33	20	6.2
	Epicentre:			12	17	07	17½S	168E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 1	KP	P	Z	12	34	00							
	Epicentre:						New Hebrides				NZ		
1	ON	eP	E	15	54	36							
		e	E			44							
		ePP	E		55	00							
	KP	P	Z	15	55	03							
		i	Z			13							
	TU	eP	N	15	55	20							
	TO	eP	Z	15	55	18							
		e	Z			26							
	WN	P	Z	15	55	34	3.2	6					6.1
		eP	N			36			3¾	6			6.3
		PP	N		56	18			6¼	7			
		e	N	16	00	12			3½	10			
		SS	N			44			6	8			
		eLr	ZN		01¾		7½	20	8	15			
		Lmax	N		04				18	17			5.9
	CB	eP	E	15	55	35							
	GP	eP	N	15	55	57							
	RX	eS	E	16	00	48					3	12	5.8
		eLq	E		02.5						10½	30	
		Lmax	NE		05				9¾	20	15½	20	6.0
	SU	e	N	15	52	59							
		S	N		54	42							
	Epicentre:			15	50	10	17½S	168E			USCGS		
1	KP	P	Z	16	02	06							
		i	Z			14							
	Epicentre:						New Hebrides						
1	KP	P	Z	17	30	55							
	Epicentre:			17	25	45	15½S	169E			USCGS		
1	KP	P	Z	17	33	55							
1	KP	P	Z	18	06	02							
	Epicentre:						New Hebrides						
1	KP	P	Z	19	30	58							
	Epicentre:			19	26	09	18S	168½E			USCGS		
1	KP	P	Z	19	33	16							
1	ON	P	E	19	44	20							
	KP	iP	Z	19	44	34d							
	TU	e	N	19	44	40							
1	KP	P	Z	21	33	39							
	Epicentre:						New Hebrides						
1	KP	P	Z	23	33	44							
	Epicentre:						New Hebrides						
2	KP	P	Z	05	28	20							
2	KP	P	Z	08	03	54							
2	KP	P	Z	09	38	48							
2	KP	P	Z	10	57	43							

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
NOV 3	KP	P	Z	04 02 51				
	TU	eP	N	04 02 50				
		S	N	04 26				
	WN	S	N	04 05 35				
		eL	N	08¾				
	KM	eP	X	04 04 07				
		eS	X	06 38				
	GP	eP	N	04 04 05				
		S	N	06 39				
	RX	eL	NE	04 10				
	SU	eL	N	04 09.2				
	Epicentre:			04 00 30	31S 177½W		USCGS	
3	KP	eP	Z	07 40 23				
4	KP	P	Z	08 40 00				
		i	Z	09				
	GP	eP	N	08 40.3				
	Epicentre:			08 28 28	28N 140½E		USCGS	
4	KP	P	Z	08 42 32				
		i	Z	41				
	GP	eP	N	08 42.8				
	Epicentre:			08 31 00	28N 141E		USCGS	
4	KP	P	Z	20 01 08				
	SU	eP	N	20 01 19				
	WN	eP	N	20 01 36				
	GP	P	N	20 01 50				
	SU	e	N	19 58 49				
		eS	N	20 01 19				
	Epicentre:			19 55 11	11S 166E		USCGS	
4	KP	eP	Z	23 03 44				
	RX	S	NE	23 10 58		6¼ 14	5 14	6.4
		eLq	N	16		3¼ 24		
		eLr	ZE	18	7½ 25		3½ 20	
		Lmax	NE	19		3½ 20	5½ 20	6.0
	Epicentre:			22 54 46	50S 115W		USCGS	
4	ON	eP	E	23 39.3				
	KP	P	Z	23 39 44				
		i	Z	53				
		S	Z	43 20				
	RX	eL	NE	23 52		5¾ 12	2½ 12	
	Epicentre:			23 34 50	17½S 168E		USCGS	
5	KP	P	Z	04 32 43				
	RX	eL	E	04 45			3 15	
	SU	e	N	04 31 00				
		eL	N	33½				
	Epicentre:			04 27 50	17S 168E		USCGS	
5	KP	P	Z	06 36 44				
	SU	eL	N	06 35				
5	KP	1P	Z	13 05 03½				
		e	Z	06 02				
	Epicentre:			12 59 39	1 ½S 175½W		USCGS	
6	KP	P	Z	15 39 05u				
		PcP	Z	40 08				

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
NOV 6	GP	eP	N	15 39 09				
	Epicentre:			15 30 06	6S 128E 250km		USCGS	
6	ON	eP	E	23 10 36				
		S	E	20 54				
	AK	iS	N	23 21 00				
		eSS	N	26 41				
		eL	N	33				
		Lmax	N	38				
	KP	P	Z	23 10 44u				
		eLr	Z	38				
		e	Z	57 20				
	TU	eP	N	23 10 51				
	TO	eP	Z	23 10 50				
		ePP	Z	14 27				
		eLr	Z	39				
	WN	iP	ZN	23 10 59n	115 6	145 35		7.7
		e	N	20 37		31 20		
		iSKS	N	21 20		275 18		
		S	N	40				
		iPS	Z	22 52				
		iSS	N	27 33		1050 32		
		SSS	N	30 10		280 25		
		eL	N	31¼		2000 45		
		Lmax	NE	39½				
	KM	P	X	23 11 03				
		(pP)	X	41				
		eS	X	21 48				
	GP	eP	N	23 11 08				
		eSKS	N	21 31				
		eS	N	22 05				
	RX	iP	Z	23 11 15u	135 24			
		iP	NE	15		90 29	29 26	7.6
		e	N	21 04		65 30		7.7
		SKS	ZNE	39	105 20	140 17	125 14	
	SU	iP	N	23 09 10n				
		S	N	18 05s				
	Epicentre:			22 58 10	44½N 148½E 100km		USCGS	
7	KP	eP	Z	00 48 55				
		e	Z	49 05				
	Epicentre:			00 36 12	44N 149E		USCGS	
7	KP	eP	Z	00 50 32				
		i	Z	50				
7								
7	KP	eP	Z	01 26 29				
		i	Z	42				
	Epicentre:			01 13 46	45N 141E		USCGS	
7	KP	eP	Z	01 55 37				
		e	Z	56				
	Epicentre:			01 42 56	44½N 149½E		USCGS	
7	KP	eP	Z	02 08 17				
		i	Z	33				
	Epicentre:			01 55 33	44½N 149E		USCGS	
7	KP	P	Z	02 22 57				
		e	Z	23 04				

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
NOV 7	KP	eP	Z	05 12 34				
		e	Z	49				
	Epicentre:			04 59 50	44½N 149E		USCGS	
7	ON	eP	E	07 50 58				
		e	E	54 16				
	KP	P	Z	07 51 14				
		e	Z	52 22				
	TU	eS	N	07 54 34				
	WN	eP	N	07 51 44				
	CB	eS	E	07 55 27				
	KM	eS	X	07 55 55				
	GP	eP	N	07 52 07				
	SU	eP?	N	07 48 20				
		iS	N	49 25n				
	Epicentre:				Fiji. Deep.		NZ	
7	KP	eP	Z	11 37 00				
	Epicentre:			11 24 19	44½N 149½E		USCGS	
7	KP	eP	Z	19 27 12				
	Epicentre:			19 41 31	44½N 149½E		USCGS	
7	KP	eP	Z	20 29 27				
		i	Z	42				
		e	Z	30 08				
	SU	eP	N	20 25 26				
		eS	N	26 13				
	Epicentre:				Fiji. Deep.		NZ	
8	KP	P	Z	09 35 57				
	RX	eL	N	10 18		2 26		
	SU	eL	N	10 03				
	Epicentre:			09 22 53	52N 159½E		USCGS	
8	KP	eP	Z	12 21 13				
		e	Z	36				
	Epicentre:			12 08 30	44½N 149E		USCGS	
8	WN	iP	ZN	13 20 40u				
		S	N	20 58¾				
	CB	P	E	13 20 43				
		S	E	21 05½				
	TO	iP!	Z	13 20 39d				
		eS	Z	57				
	TU	eP	N	13 20 52				
		S	N	21 22				
	KP	iP!	Z	13 20 50½d				
	ON	eP	E	13 21 18				
		e	E	55				
		eS	E	22 06				
	KM	eP	X	13 21 06				
		S	X	41				
	GP	P	N	13 21 10s				
		S	N	51¼s				
	Epicentre:			13 20 15	40.0S 174.3E	100km	NZ(B)	5.0 NZ
8	KP	eP	Z	17 12 26				
		e(S)	Z	13 34				
8	KP	eP	Z	19 50 01				
	Epicentre:			19 36 48	11½N 93E		USCGS	

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
NOV 9	KP	P	Z	09 34 09				
	Epicentre:				Loyalty Is.		NZ	
10	KP	P	Z	11 24 35				
	RX	eL	ZE	11 49	3½ 20		2 20	
		eL	N	50		2 20		
	Epicentre:			11 13 05	9S 110W		USCGS	
10	KP	eP	Z	13 43 26				
10	KP	eP	Z	18 19 23				
11	KP	eP	Z	13 03 52				
		i	Z	55				
		e	Z	04 18				
		e	Z	06 16				
12	KP	P	Z	10 10 32				
12	ON	eP	E	10 46½				
	KP	P	Z	10 46 43				
		pP	Z	47 03				
		PcP	Z	49 10				
		e	Z	23				
	WN	eP	N	10 47 08				
		eL	N	59				
	CB	eP	E	10 47 00				
	GP	eP	N	10 47 14				
	RX	eL	NEZ	11 00	5 20	3½ 22	3 20	
	SU	eP?	N	10 44 25				
		e(S)	N	47 51				
		e(L)	N	48.9				
	Epicentre:			10 39 47	7S 156E	100km	USCGS	
12	KP	eP	Z	11 19 06				
		i	Z	17				
12	ON	eP	E	18 16 50				
		e	E	17 00				
	KP	P	Z	18 17 09				
		i	Z	22				
		i	Z	18 35				
	WN	S	N	18 19 59				
	CB	eS	E	18 20 15				
	KM	eS	X	18 20 59				
	GP	eP	N	18 18 16				
		S	N	21 02				
	Epicentre:				Kermadec Region		NZ	
12	ON	eP	E	20 35 59				
		e	E	36 07				
		eS	E	46 24				
	AK	eP	N	20 36 01				
		S	N	46 31				
		eL	N	52.0				
	KP	P	Z	20 36 08u				
		i	Z	50				
		i	Z	37 09				
		eLr	Z	21 11				
	WN	P	Z	20 36 21	8 14			6.8
		eP	N	21		2¾ 4		7.2
		ePP	Z	40 04	3 10			6.8
		iS	N	47 05		31 15		7.1
		PS	Z	20 48 16	10½ 15			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 12	WN	eSS	N		53	10			38	30			
		eLr	Z	21	06¼		115	22					
		Lmax	N		09				120	20			
	CB	eP	E	20	36.3								7.0
	KM	eP	X	20	36	25							
	GP	eP	N	20	36	30							
	RX	P	Z	20	36	37u	11½	13					
		P	N			37			7½	18			7.1
		PP	Z		40	32	5½	14					7.1
		PP	N			32			9	20			6.8
		SKS	NE		47	19			15	15	6½	10	7.1
		S	ZE			48	12	16			43	12	
		eSS	NE		54	20			46	21	17	21	7.4
		eLq	E	21	02						40	30	
		eLr	Z		09		34	25					
		Lmax	NE		12				72	20	32	20	6.9
	SU	P	N	20	34	33							
	Epicentre:			20	23	26	44½N	149E			USCGS		
12	ON	P	E	23	09	52							
		S	E		11	08							
	KP	eP	Z	23	10	02							
		i	Z			03½							
		S	Z		11	25							
	TO	eP	N	23	10	04							
		eS	N		11	24							
	WN	eP	N	23	10	35							
		S	N		12	23							
	CB	eS	E	23	12	34							
	KM	eS	X	23	13	08							
	GP	eP	N	23	11	06							
		S	N		13	19							
	Epicentre:			23	08	15	33S	179W	>N		NZ(D)		5.5
13	KP	eP	Z	03	09	17							
		e	Z			50							
13	KP	P	Z	04	17	19							
		e	Z			33							
	WN	eL	ZN	04	47¼								
	RX	eS	NE	04	28	54			2.5	12	1.8	10	6.4
	Epicentre:			04	04	37	44½N	148E			USCGS		
13	KP	eP	Z	06	12	42							
		e	Z			51							
	Epicentre:			05	59	53	43½N	139E			USCGS		
13	ON	eP	E	08	36	39							
	KP	eP	Z	08	37	03							
		i	Z			05½							
		e	Z			34							
	Epicentre:			08	31	40	15S	167½E			USCGS		
13	KP	eP	Z	16	22	34							
13	ON	e	E	16	29	15							
	KP	eP	Z	16	29	54							
	Epicentre:			16	16	25	9N	93½E			USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 14	ON	eP	E	05	15	08							
	KP	P	Z	05	14	55							
	WN	eL	N	05	33						2½	6	6.4
	RX	eS	NE	05	24	08							
		eL	ZNE		34		3.7	20	1.9	20	1.7	20	5.8
	Epicentre:			05	04	25	36S	102W			USCGS		
14	KP	P	Z	05	47	34							
		i	Z			47							
	GP	eP	N	05	47	56							
	Epicentre:			05	34	53	44N	149E			USCGS		
14	ON	eP	E	13	57.2								
	AK	eL	N	14	09								
	KP	eP	Z	13	57	25							
		e	Z			43							
	TU	e	N	13	57.9								
	TO	e?	Z	13	57	34							
		e	Z			55							
	WN	eP	ZN	13	57	37½	1.6	4					6.3
		eS	N	14	04	42			1.4	10			5.8
		eLq	N		10				9	25			
		eLr	ZN		14½		3¼	20	16	27			
	KM	e	X	13	57	50							
	GP	eP	N	13	57	33							
		e	N			55							
	RX	S	N	14	04	38			4	20			5.8
		L	NE		09				12	20	4½	20	6.1
		eL	Z		10								
	SU	eL	N	14	04¼								
	Epicentre:			13	48	20	6S	131E			USCGS		
15	KP	P	Z	00	11	38							
15	KP	P	Z	04	28	18							
		e	Z			28							
	Epicentre:						Loyalty Is.				NZ		
15	KP	P	Z	06	03	18							
		i	Z			47							
15	KP	P	Z	09	13	29							
		i	Z			50							
	RX	eS	NE	09	24	59			1.5	12	2.3	7	6.4
	Epicentre:			09	00	45	44N	149E			USCGS		
15	KP	eP	Z	19	20	28							
	WN	eL	ZN	19	30		1½	15	16	27			
	RX	eS	ZNE	19	36				1.6	15	1.9	15	5.6
	SU	iS	N	19	18	27							
		eL	N		18.9								
	Epicentre:			19	15	03	15½S	174W			USCGS		
16	ON	eP	E	17	50	01							
		eS	E		54	24							
	AK	S	N	17	54	35							
	KP	P	Z	17	50	12							
		i	Z			18							
	TU	eS	N	17	54	45							
	TP	eP	Z	17	50	41							
	WN	eP	N	17	50	41							
		e(S)	N		55	43			17	20			6.2
		eL	ZN		59¾		6½	20	5	15			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 16	CB	eP	E	17	50	54							
	GP	eP	N	17	51	21							
	RX	eL	NE	18	01				7	20	5	15	
		eL	Z	18	03		5	15					5.8
	SU	P	N	17	47	12							
		eS	N		48	08							
	Epicentre:			17	44	48	16S	172W			USCGS		
16	KP	eP	Z	18	06	50							
	TO	e(P)	Z	18	07	20							
	WN	eL	N	18	14				9½	15			
	RX	eL	NE	18	15				5½	20	7	20	
		eL	Z		18		12	15					5.7
	SU	P	N	18	05	00							
		S	N		07	23							
	Epicentre:			18	02	25	20S	169E			USCGS		
17	KP	eP	Z	09	52	42							
	WN	eL	ZN	10	02¼		9	25	7	22			
		Lmax	ZN		09		5¾	15	9	15			
	GP	eP	N	09	53	20							
	RX	eL	ME	10	02½				3½	30	3	25	
		eL	Z		05		1.8	20					
		Lmax	N		06				7½	20			
	SU	P	N	09	50	45							5.8
		S	N		54	10							
	Epicentre:			09	46	30	10½S	162½E			USCGS		
17	KP	eP	Z	18	49	15							
	RX	eL	NE	18	57½				1.7	20	2.0	20	
		eL	Z	19	00		3½	15					5.4
	SU	eP	N	18	47	30							
		eS	N		48	46							
	Epicentre:			18	44	49	20½S	169E			USCGS		
19	ON	eP	E	03	56	15							
		i	E			16½							
		S	E		57	37							
	KP	eP	Z	03	56	27							
		i	Z			29½							
		eS	Z		58	02							
	TU	eP	N	03	56	26							
		eS	N		57	57							
	TO	eP	Z	03	56	35½							
		i	Z			37½							
	WN	eP	N	03	56	59½							
		iS	N		58	54			6	1			
	CB	eP	E	03	57	06							
		S	E		59	06							
	GP	eP	N	03	57	32							
		S	N		59	53							
	SU	eP?	N	03	57	45							
		e(S)	N		59	54							
	Epicentre:			03	53	56	31S	179W			USCGS		
19	KP	P	Z	09	36	30							
		e	Z			51							
	WN	eL	ZN	10	18				5	18			
	Epicentre:			09	23	45	44N	149E			USCGS		
20	KP	iP	Z	01	44	22u							
	TO	eP	Z	01	44	34							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 20	KP	eP	Z	05	49	38							
	WN	eL	ZN	06	24								
	Epicentre:			05	36	33	52N	159½E			USCGS		
20	RX	e?	E	05	12	22							
		eS	NE		13	00			4	1	4	1	
		eL	NE			20			9½	17	11	16	
		eL	Z			40	6	12					
	GP	eP	N	06	12	43							
		eS	N		14	11							
	KM	e(P)	X	06	12	55							
		S	X		14	19							
	CB	eP	E	06	13	12							
		eS	E		14	58							
	WN	eL	ZN	06	16½				2.8	12			
	TO	eP	Z	06	13	53							
	KP	P	Z	06	14	03							
	Epicentre:			06	10	50	48¾S	164E	S		NZ(D)		5.2 NZ
20	KP	eP	Z	14	30	41							
		ipP	Z			55							
	Epicentre:			14	18	04	45N	149½E	60km		USCGS		
21	KP	P	Z	08	20	58							
	SU	e(P)	Z		16	35							
		e(S)	Z			53							
21	KP	P	Z	09	44	22							
21	KP	P	Z	15	27	47							
22	KP	P	Z	00	14	47							
	WN	eL	ZN	00	35¾								
		eL	Z		52		4½	15					
	CB	eP	E	00	14	37							
	GP	eP	N	00	14	44							
	RX	eS	N	00	22	32			1.6	11			5.8
		e	E		23	05					1.8	11	
		eLq	N		33				2.3	21			5.8
		eL	Z		38		4	15					
	Epicentre:			00	04	20	10½S	112½E			USCGS		
22	KP	P	Z	02	06	09d							
		ipP	Z			24							
	TO	eP	Z	02	06	14							
		epP	Z			28							
	WN	eL	N	02	21								
		eL	ZN		24½		3½	18	6	20			6.0
	RX	eLq	N	02	21				2.2	30			
		eLr	Z		28		5	20					
		Lmax	NE								2.8	20	6.0
	Epicentre:			01	56	56	4S	131½E			USCGS		
24	KP	P	Z	07	00	22							
		e	Z		01	28							
		P'P'Z			28	04							
	Epicentre:			06	48	57	57½S	65½W			USCGS		
24	KP	eP	Z	17	53	05							
	Epicentre:			17	42	20	8N	127E			USCGS		
25	KP	P	Z	03	34	47							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 25	KP	P	Z	08	30	23							
	KP	eP	Z	09	25	04							
	KP	P	Z	13	19	36							
	Epicentre:			13	14	10	16½S	17W				USCGS	
	KP	P	Z	13	25	06							
	Epicentre:			13	14	40	10½S	113E				USCGS	
26	KP	eP	Z	00	27	36							
	Epicentre:			00	17	09	10½S	112½E				USCGS	
26	WN	eL	ZN	21	47				2.9	10			
	SU	e(L)	N	21	51								
27	WN	eL	N	13	51½				4½	20			
	RX	eL	ZN	13	50		7	20	5	20			5.4
		eL	E		51						8	10	
	Epicentre:			13	41	47	N.E. of Balleny Is.					USCGS	
28	WN	eL	N	15	16½								
	RX	eL	N	15	11½				2	18			
		eL	E		13½						4½	11	
		eL	Z		14								
28	RX	eL	N	15	26				2.3	20			
		eL	ZE		27½						4½	12	
29	KP	eP	Z	04	49	31							
	TU	eS	N	04	51	31							
	TO	eS	Z	04	51	54							
	WN	S	N	04	52	38							
	KM	eS	X	04	53	29							
	GP	eP	N	04	50	44							
		S	N		53	41							
	Epicentre:			04	46	36	28S	177½W				USCGS	
29	KP	iP	Z	10	44	00							
30	KP	iP	Z	01	44	34½d							
		pP	Z			49							
	WN	eP	N	01	44	50							
		eL	N	02	13½				3½	20			6.0
	CB	eP	E	01	44	46							
	KM	eP	X	01	44	54							
	GP	eP	N	01	45	00							
	SU	eL	N	02	05½								
	Epicentre:			01	32	41	32N	137½E				USCGS	
30	KP	P	Z	02	07	22							
		pP	Z			36							
	Epicentre:			01	55	28	32N	137½E				USCGS	
DEC 2	ON	P	E	01	57	28							
		iS	E		58	51							
	KP	P	Z	01	57	40							
		i	Z			50							
		e	Z		58	10							
		e(S)	Z		59	20							
	TU	e(P)	N	01	57	41							
		e(S)	N		59	09							
						08							
						12							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 2	CB	e(S)	E	02	00	26							
	GP	eP	N	01	58	47							
		e	N	02	01	06							
		(S)	N			10							
	Epicentre:			01	55	40	Kermadec Is region						5.5 NZ
2	ON	P	E	07	16	34						6	11
		e	E		24½								
	KP	iP	Z	07	16	43d							
		i	Z			59							
		e(S)	Z		24	30							
	WN	e(L)	N	07	26	49				1	15		
	RX	eL	NE	07	27					1	22		
2	KP	P	Z	23	26	28							
		e	Z			41							
	SU	e(L)	N	23	26.7					22	7		
	WN	eL	N	23	37					2	13		
3	KP	P	Z	10	00	19u							
		e	Z			38							
	GP	e	N	10	00	32							
	Epicentre:			09	48	26	19N	121½E				USCGS	
4	KP	eP	Z	00	23	06							
		e	Z		24	37							
	TU	eP	N	00	23	09							
		eS	N		24	35							
	WN	eP	N	00	23	41							
		eS	N		25	30							
	GP	P	N	00	24	12							
		eS	N		26	27							
	ON	e	E	00	24	14							
	KM	e(P)	X	00	24	15							
		e(S)	X		26	18							
	Epicentre:			00	21	20	31S	176E	N			NZ(D)	5.4 NZ
6	KP	P	Z	06	25	10							
	WN	e(P)	N	06	25	48							
		eS	N		29	18							
	TU	e(S)	N	06	28	10							
	CB	eS	E	06	29	33							
	GP	eS	N	06	30	18							
6	WN	eL	ZN	10	27							1	20
	RX	eL	ZNE	10	27								
6	KP	P	Z	22	47	46							
	Epicentre:			22	35	43	33N	141E				USCGS	
7	CB	e(P)	E	02	56	10							
	KP	P	Z	02	56	11d							
	KM	eP	X	02	56	17							
	GP	P?	N	02	55	37							
		e(P)	N		56	21							
	TU	e	N	02	56	24							
	RX	eL	N	03	12								
	WN	eL	N	03	15								
	Epicentre:			02	45	49	4N	127E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 7	WN	e(S)	N	06	40	20				1 14			
		eL	ZN		44								
		M	N		48					1 18			
	RX	eL	N	06	45								
		M	NE		48					1 16	0.5	18	
	Epicentre:			06	21	46	Bismarck Sea					USCGS	
7	RX	eL	NE	18	45								
		M	NE		48					1 19		1 19	
	WN	eL	N	18	48								
	Epicentre:			17	58	08	18N 105W		100km			USCGS	6
8	KP	iP	Z	03	15	36d							
		e	Z		16	19							
		i	Z		18	59u							
	GP	P	N	03	16	19n							
	Epicentre:			03	10	17	13S 167E		200km			USCGS	
8	KP	eP	Z	12	21	05u							
		e	Z			19							
	RX	e	N	12	32	34							
		e	N			39.1							
		eL	N			53							
		M	N			57				0.7 20			
	Epicentre:			12	08	23	44N 149½E					USCGS	5.7
9	TU	e(P)	N	02	41	11							
		e	N			27							
		eS	N			42 27							
	KP	eP	Z	02	41	14							
		i	Z			24u							
	ON	eP	E	02	41	15							
		e	E			33							
		e	E			47							
		e	E			43.9					12	11	
	WN	e(P)	N	02	41	52							
		eS	N			43 37							
		e	N			44 45				3 4			
		M	N			47				4 15			
	CB	eS	E	02	43	57							
	GP	S	N	02	44	44							
	KM	i(S)	X	02	44	44							
	SU	e(L)	N	02	47	35							
		e	N		48	19							
		e	N		49	35							
		e	N			55				7 7			
	RX	eL	ZNE	02	48								
		M	NE		51					2 17		2 17	
	Epicentre:			02	39.6		33S 179W					NZ(D)	
9	TU	eP	N	03	06	08							
		e	N			38							
		eS	N		07	22							
	KP	e(P)	Z	03	06	17							
		e	Z			31							
	ON	e(P)	E	03	06	18							
		e	E			31							
	WN	eS	N	03	08	30							
	GP	eS?	N	03	09	35							
		e(S)	N			40							
	Epicentre:			03	04.5		33S 179W					NZ(D)	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 9	KP	P	Z	08	10	46d							
		e	Z		11	34							
	KM	eP	X	08	10	48							
	Epicentre:			08	00	30	8S 118E					USCGS	
9	SU	(P)	N	12	20	49s							
		eS?	N		23	26							
	KP	P	Z	12	23	07u							
	WN	e	N	12	24	28							
		e(S)	N		28	50							
		M	N		35					2 15			
	RX	e(L)	N	12	29								
		M	NE		35					1 20		2 20	5.4
	Epicentre:			12	17	47	14½S 167E					USCGS	
10	KP	iP	Z	07	03	45							
	AK	iP	N	07	03	(45)n							
		S	N		04	(18)							
		ScS	N	17	(41)					50 4			
	TU	iP	N	07	03	47s							
		(S)	N		04	18							
		eScS	N		17	31							
		esScS	N		20	01							
	TO	iP	Z	07	03	51u							
	WN	iP	ZN	07	04	14us	100	6	200	5			
		S	N		05	12							
		e	Z		10	02	70	7					
		e	Z		11	53	65	10					
		ScS	N		17	29n			30	5			
		esScS	N		19	52							
	ON	iP	E	07	03	53e							
		e	E			55							
		eS	E		04	36							
	CB	P	E	07	04	20w							
		S	E		05	24							
		e(ScS)	E		17	29							
	KM	P	X	07	04	42sw							
		eS	X		06	00							
		ePcS	X		14	31							
	GP	iP	N	07	04	48s							
		(S)	N		06	09							
	RX	P	ZNE	07	05	22usw	16	10	20	12	15	10	
		e	ZNE		06	25	10	10	20	10	12	10	
		i	N			55n							
		i(S)	ZNE		07	08usw			75	24			
		e	N		10	00			50	12			
		(PcP)	Z			48u	73	8					
		ScS	NE		17	35s			35	9	35	9	
	SU	iP	N	07	06	59n			30	9			6.9
		i	N		08	27			50	10			
		e	N		09	09			70	9			
		e(S)	N		10	28			30	6			6.4
		e	N			59							
		e	N		11	18			90	8			
		e	N		16	44n			40	11			
		e	N			51			30	8			
	Epicentre:			07	02	59	37S 176½E 300km					USCGS	6¾
				07	03	03	37.2S 176.9E 330km					NZ(B)	6.9

Felt extensively from Bay of Plenty and East Cape, southwards, as far as Queenstown. Max. MM6-7 in East Cape region.

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 10	SU		N	10	00		Small local shock.						
10	KP	1P	Z	14	49	12u							
		e	Z			49							
	GP	e(P)	N	14	49	20							
	WN	P	N	14	49	20							
		Epicentre:		14	39	00	5N 126E 200km				USCGS		
10	RX	M	N	17	02				4	20			
		Epicentre:		16	11	02	3N 83W				USCGS		
10	SU	L	N	16	47								
10	RX	M	NE	22	54				0.5	19	0.5	16	
		Epicentre:		21	49	20	24½N 109W				USCGS		5.7 5¾
11	RX	e(L)	NE	02	36						1	8	
		M	E		40				2	7			
	WN	e(L)	N	02	38								
12	SU	i(S)	N	08	53	47							
		M	N		56½				5	5			
	KP	eP	Z	08	57	32							
		Epicentre:					Fiji region.				NZ		
12	SU	eP?	N	14	23	23							
		iS	N			44			8	2			
		M	N		26½				9	5			
	ON	e?	E	14	26	05							
		S	E			10							
		Epicentre:					Fiji region.				NZ		
12	SU	iS	N	18	12	29	Local.						
12	SU	iS	N	18	17	58	Local.						
12	SU	i(P)	N	18	54	39	Local; possibly two shocks.						
		iS	N		55	50							
13	CB	e	E	09	19	59							
	TO	eP	Z	09	20	03							
	KP	1P	Z	09	20	09d							
	ON	eP	E	09	20	22							
	RX	M	N	09	54				0.7	17			
		Epicentre:		09	07	30	55½S 22W				USCGS		
14	KP	1P	Z	03	59	21u							
14	KP	eP	Z	07	21	34							
		e	Z			44							
	WN	e	N	07	29	38			2	9			
		e?	N		35	10			2	4			
		eLq	N		36	.0			7	19			
		eLr	ZN		38				7	15			
	RX	eS	NE	07	30	11			2	12	11	8	6.0
		e(L)	N		36	46			2	20			
		eL	E		39						3	12	
		eL	Z		41				3	18			
	SU	eL	N	07	39				12	30			
		M	N		41				4	12			
		Epicentre:		07	11	18	35S 108½W				USCGS		6
15	KP	1P	Z	01	26	39							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 15	ON	eP	E	12	42	39							
	KP	eP	Z	12	42	43							
		e	Z			53							
		e	Z		43	09							
	TU	e	N	12	42	48							
		eS	N		44	19							
	KM	e(P)	X	12	44	06							
		eS	X		46	29							
	GP	eP	N	12	44	08							
		S	N		46	33							
	WN	eS	N	12	45	27							
	CB	eS	E	12	45	46							
	SU	e(S)	N	12	46	35			2	4			
		e	N		52				2	5			
	RX	L	N	12	50				1	20			
		Epicentre:		12	40	27	31S 177½W				USCGS		
15	KP	1P	Z	14	24	03u							
16	KP	P	Z	03	22	20u							
		e	Z			53							
		i(S)	Z		24	44u							
	TO	e	Z	03	22	36							
		e(S)	Z		24	57							
	SU	i(S)	N	03	22	50			4	4			
	WN	eP	N	03	22	55							
		(S)	N		25	39							
		e	N		42				2	2			
	CB	eP	E	03	22	59							
		eS	E		25	49							
	KM	eP	X	03	23	17							
		e(S)	X		26	13							
	GP	e(P)	N	03	23	29							
		e	N		26	27							
		(S)	N			33							
	TU	e	N	03	24	45							
		e(S)	N			49							
		i	N			58							
		Epicentre:		03	19	26	About 450 miles south of Fiji.				NZ		
17	KP	P	Z	09	08	36u?							
		Epicentre:		08	57	10	33N 137E 400km				USCGS		
17	KP	P	Z	20	41	09d?							
		e	Z			30							
	RX	eS	N	20	48	30			2	8			
		e(ScS)	N		51	34			2	6			
		eSS	N		51	.6			1	25			
		eL	N		54				2	30			
		Epicentre:		20	33	58	4½S 153½E				USCGS		
18	KP	P	Z	01	43	34d?							
		e	Z			40							
		i	Z			54u							
		Epicentre:		01	39	26	Loyalty Is. 100km				USCGS		
18	KP	1P	Z	07	38	07u							
		e	Z			19							
		e	Z			43							
		Epicentre:		07	26	16	18N 120½E				USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 18	KP	iP	Z	08	30	52u							
18	KP	P	Z	18	09	00							
		e	Z			08							
		i	Z		11	24							
		i	Z			34							
18	SU	e	N	19	26	06							
		e	N			26			6	3			
		i	N		27	54			35	12			
		M	N		30½				35	9			
	ON	eP	E	19	28	59							
		e	E		29	10							
		e	E			45							
		eS	E		33	11							
		eL	E		36						10.2		
	KP	P	Z	19	29	11(u)							
		e	Z			15							
		eS	Z		33	47							
	TU	e(P)	N	19	29	15							
		e(S)	N		33	36							
	TO	e(P)	Z	19	29	29							
	WN	e(P)	N	19	29	50							
		eL	ZN		38		3	18	5	15			
	CB	eP	E	19	29	50							
	KM	e(P)	X	19	30	05							
	GP	eP?	N	19	30	13							
		e	N			18							
	RX	eL	NE	19	39								
		e(ScS)	E		41	14					4	8	
		eL	ZN		41½								
		M	ZN				7	16	3	19			
	Epicentre:			19	23	53	16S 173W				USCGS		5.3
18	KP	iP	Z	04	29	41d							
		eY	Z		31	42							
	TO	eP	Z	04	29	50							
	CB	eP?	E	04	29	52							
	TU	eP	N	04	29	53							
19	ON	eP?	E	10	00	29							
	KP	P	Z	10	00	35							
	RX	e(S)	NE	10	08	58			0.5	16			
		eL	ZNE		19.1								
		M	ZNE		22		3	19	1	19	1	19	
	WN	eL	N	10	17								
		eL	ZN		19		2	20	2	20			
	Epicentre:			10	49.5		Near 37S 100W				NZ		5½ NZ
19	KP	iP	Z	11	28	04u							
		epP	Z			19d							
	Epicentre:			11	14	40	16S 72W 100km				USCGS		
19	KP	eP?	Z	18	49	28							
		i	Z			31d							
	SU	M	N	18	57				3	20			
	RX	eL	N	19	23								
		M	N		27				1	20			
		eL	ZE		30								
		M	N		31				1	19			
	WN	eL	N	19	25								
			N		26				2	20			
		:		18	36	23	51½N 177½W				USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 20	KP	e(P)	Z	09	35	29							
21	KP	ePKP	Z	06	05	19(d)							
	RX	eL	N	06	40								
		M	N		54				0.6	20			
		e(L)	N	07	09				0.5	18			5.8
	Epicentre:			05	46	26	44½N 81E				USCGS		-
21	ON	P	E	10	00	28							
		e	E		02	18							
	KP	P	Z	10	00	42(u)							
		S	Z		02	50							
	TU	eP	N	10	00	44							
		e	N		02	43							
		e(S)	N			51							
	TO	e(P)	Z	10	00	56							
		e	Z		02	59							
		e(S)	Z		03	06							
	WN	e(S)	N	10	03	40							
	CB	e(S)	E	10	03	52							
	KM	eS	X	10	04	33							
	GP	e	N	10	04	37							
		e(S)	N			42							
	Epicentre:			09	58.0		27S 178E		>N?		NZ		
21	SU	e?	N	13	06	10							
	ON	eP	E	13	08	01							
	KP	P	Z	13	08	14d							
		e	Z		09	35							
	WN	e	N	13	08	55							
	Epicentre:			13	03	30	Fiji region.				USCGS		
21	KP	eP	Z	18	28	26							
22	KP	P	Z	02	24	26							
		e	Z			39							
		e	Z		28	05							
	RX	e(S)	N	02	31.9								
		eL	NE		34½								
		eL	ZNE		38								
		M	ZN		40		3	21	2	22			
	Epicentre:			02	17	14	6S 155E				USCGS		5.6
22	SU	e	N	07	59	30							
		M	N	08	01				6	6			
	ON	e	E	07	59	54							
		e(S)	E	08	02	17							
	KP	P	Z	08	00	08u							
		i	Z			11d							
		i	Z			33u							
		e	Z		02	44							
	TU	S	N	08	02	48							
	WN	eS	N	08	03	37							
	CB	eS	E	08	03	42							
	KM	e	X	08	04	07							
		eS	X			14							
	GP	eS	N	08	04	21							
	Epicentre:			07	56	06	Tonga.				USCGS		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 22	TU	P	N	19	22	23n							
		e	N			45							
		e	N		23	31							
	KP	P	Z	19	22	26u?							
		e	Z			38							
		i	Z		23	30u							
		e	Z		28	47d							
	ON	P	E	19	22	27e							
		e	E			35							
		e(S)	E		25	.0					16	12	
	GP	e	N	19	23	45							
		e(S)	N		25	46							
		e	N			49							
	WN	S	N	19	24	39							
		e	N		25	59							
		e	N		26	45							
		eL	N		27½								
	CB	S	E	19	25	01							
	KM	eS	X	19	25	39							
	RX	eL	ZNE	19	28				3	20	2	20	
		M	NE		31				4	15	3	14	
	SU	e(L)	N	19	29	.7			7	12			
23	SU	e	N	03	35								
	KP	e	Z	03	35	44							
		i	Z			45u							
	RX	eL	N	03	50				0.5	18			
	Epicentre:			03	30	18	Tonga.				USCGS		
23	TU	P	N	19	17	35							
		e	N		18	42							
	KP	P	Z	19	17	38							
		e	Z		18	05							
	ON	e	E	19	17	44							
		i	E		18	21							
	TO	e	Z	19	18	11							
		e	Z		19	17							
	GP	e?	N	19	19	16							
		eS	N		20	59							
		e	N		21	06							
	WN	e	N	19	19	51							
		eS	N			53							
	CB	eS	E	19	20	15							
	KM	eS	X	19	20	54							
	RX	eL	NE	19	24				1	20	1	20	
		M	ZN		26				2	15			
	SU	e	N	19	26								
	Epicentre:			19	16	08	34S	179W	N		NZ(D)		5.4 NZ
23	TU	P	N	19	22	10							
		eS	N		23	19							
	KP	P	Z	19	22	14							
	WN	eS	N	19	24	29							
	GP	eS	N	19	24	34							
	CB	eS	E	19	24	49							
	Epicentre:			19	20	41	34S	179W	N		NZ(D)		5.2 NZ
23	TU	P	N	19	36	27							
		eS	N		37	36							
	ON	e	E	19	36	27							
		i	E			55							
	KP	P	Z	19	36	39							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 23	TO	e	Z	19	36	56							
		e	Z		38	13							
	GP	e?	N	19	37	50							
		eS	N		39	50							
	WN	S	N	19	38	46							
	CB	eS	E	19	39	06							
	KM	eS?	X	19	39	49							
	RX	eL	NE	19	43				1	22	2	22	
		M	ZN		45				3	16			
	Epicentre:			19	34	58	34S	179W	N		NZ(D)		5.3 NZ
24	RX	M	N	01	39				0.4	18			
	Epicentre:			01	13	17	6½S	150½E	100km		USCGS		
24	KP	P	Z	06	38	13							
24	RX	eL?	N	07	13								
		eL?	N		18								
24	TU	e(P)	N	20	16	07							
		e	N		17	14							
		e(S)	N			17							
	KM	e?	X	20	16	07							
		e?	X			52							
		eS	X		19	25							
	ON	P	E	20	16	12							
		e	E			43							
	KP	P	Z	20	16	12d							
		e	Z			24							
	TO	eP?	Z	20	16	27							
		e	Z			43							
		e(S)	Z		17	45							
	WN	eS	N	20	18	24							
	GP	S	N	20	19	29							
	RX	eL	ZN	20	23				0.4	17			
24	SU	e(S)	N	20	38	05			3	3			
		e	N		40	11							
	KP	P	Z	20	39	04d							
		i	Z			22							
		e	Z		40	10							
	ON	eP	E	20	39	04							
	TU	eP	N	20	39	02							
		e	N		40	09							
	TO	eP?	Z	20	39	32							
		e	Z		40	23							
	WN	e	N	20	40	42							
		e	N		41	09							
		e	N			14							
		eL	N		48				2	20			
	GP	eP	N	20	40	56							
		e	N		41	17							
		e	N		42	24							
	RX	eL	N	20	46								
		eL	ZNE		48								
		M	ZNE		51		3	22	2	20	2	20	
	Epicentre:			20	35	20	18S	169E			USCGS		5.4 NZ
24	SU	e(L)	N	22	05½		Traces only						
	KP	P	Z	22	05	43							
	RX	eL	NE	22	15	.1			0.6	20	0.6	20	
		eL	ZNE		17		1	16	0.6	17	0.8	15	
	Epicentre:			22	00	.9	New Hebrides region. NZ						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 24	SU	e?	N	22	11	00							
		e(S)	N		13	41			2	2			
	KP	P	Z	22	15	43u							
		e	Z		16	13u							
	TO	P	Z	22	16	00							
	KM	e(P)	X	22	16	12							
	WN	e(P)	n	22	16	16							
	GP	eP	N	22	16	33							
	RX	eL	N	22	25								
		M	N		26				0.7	20			
	Epicentre:			22	10	56	18S	169E			USCGS		4.8
25	SU	e?	N	08	12	01							
		i	N			10							
		iPP	N			51			6	6			
		iS	N		16	52s			12	6			
		i	N		17	15							
		iScS	N		22	25n			12	6			
	ON	eP?	E	08	12	50							
		e	E		13	02							
		e	E		14	23							
	KP	iP	Z	08	13	05d							
		ipP	Z			15(d)							
		e	Z		14	20							
		iPcP	Z		15	14u							
		e	Z			25							
		e(S)	Z		18	57							
		e	Z		19	21							
	TO	P	Z	08	13	13u							
		epP	Z			23							
	TU	e(P)	N	08	13	18							
	CB	e(P)	E	08	13	21							
		eS	E		19	21							
		eSS	E		22	54							
	WN	eP?	ZN	08	13	23d							
		epP	ZN			32d	2	5	3	5			
		e	Z		14	25							
		i?	Z		15	04u							
		e(PP)	ZN			12	1	12	4	10			
		e	Z			34d	5	6					
		e	N		16	00			4	6			
		iS	ZN		19	33ds	3	5	10	5			
		esS	N			45			9	6			
		eSS	ZN		22	55			4	15			
		eScS	N		23	15s			4	5			
		eL	ZN		26								
		M	ZN		27		14	20	14	20			
	KM	e(P)	X	08	13	25							
		epP	X			35							
		e	X		14	21							
		e(PP)	X		15	15							
	GP	eP	N	08	13	33							
		epP	N			43							
		ePP	N		15	28							
		S	N		19	49s							
		e	N		20	09							
		e(SS)	N		23	.3							
		eL	N		28								
	RX	i(P)	ZN	08	13	44dn	3	12	2	15			
		e	ZNE		15	.5			3	14	3	10	
		eS	NE		19	54se			5	20	5	9	
		e	ZE		20	12							
					23	17			4	12	6	14	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 25	RX	e	Z			27	8	23					
		eLr	ZNE		26								
		M	E		27						7	22	
		M	ZN		28½		16	20	15	20			
		M	ZNE		35½		16	15	9	15	28	14	
	Epicentre:			08	05	33	5½S	151½E			USCGS		6¾
25	RX	eL	N	10	54								
		M	N	11	09				0.6	20			
25	KP	P	Z	11	16	28							
		e	Z		18	33							
25	KP	P	Z	14	39	06d?							
26	TU	eP	N	01	36	14							
		e	N		37	22							
		eS	N			24							
	KP	eP	Z	01	36	18							
		e	Z			33							
		e	Z			59							
	TO	e(P)	Z	01	36	38							
	WN	e(S)	N	01	38	31							
	GP	eS	N	01	39	38							
	Epicentre:			01	34	46	34S	179W			NZ(D)		5.0 NZ
26	SU	iP	N	05	52	(42)n?							
		iS	N		53	(52)s							
	KP	P	Z	05	54	32d?							
	To	eP	Z	05	54	45							
		eS	Z		57	45							
	GP	eP?	N	05	55	27							
		e	N		58	49							
		e(S)	N		59	06							
	TU	eS	N	05	57	16							
	WN	e(S)	N	05	58	06							
	CB	e(S)	E	05	58	21							
	KM	e(S)	X	05	58	50							
	Epicentre:			05	51	04	South of Fiji				600km	USCGS	
26	KP	P	Z	08	46	38							
26	KP	iP	Z	17	22	52u							
		i	Z			54d							
	TU	e(P)	N	17	23	03							
26	KP	e?	Z	22	22	01							
	WN	e?	N	22	36	29			2	5			
		eL	N		45				20	70			
	RX	e	N	22	47	19							
		e	EN			58			1	14			
26	KP	eP	Z	23	23	50							
		e	Z		31	21							
	TU	e	N	23	24	25							
	SU	e	N	23	27	55							
		i(S)	N		28	06s			6	6			
		i	N		29	00			16	5			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 28	KP	iP	Z	01	35	27u							
		i	Z		40	51u							
	CB	e(P)	E	01	33	23							
		e	E		37	11							
		e	E		38	51							
	TU	e(P)	N	01	35	30							
28	SU	e	N	06	46	19							
		e	N			53							
		S	N		47	16			5	6			
		e	N			29			5	2			
	ON	e?	E	06	48	46							
		eS	E		51	51					0.4	2	
	KP	iP	Z	06	48	58u							
		e	Z		49	05							
		e	Z		58	56							
	WN	eP	N	06	49	26							
	RX	e	N	06	51	18			0.4	16			
	Epicentre:			06	44	08	Fiji region				USCGS		
28	KP	iP	Z	13	28	46u							
28	KP	iP	Z	17	29	57d							
28	KP	P	Z	23	49	17							
29	KP	P	Z	01	08	32d							
29	KP	iP	Z	22	50	40u							
		i	Z			43u							
		e	Z		51	18							
	Epicentre:			22	38	22	2½N 99E				USCGS		
30	SU	i	N	08	04	22			3	5			
30	TO	eP?	Z	08	48	09							
	ON	eP	E	08	48	27							
	RX	eS	NE	08	57	00							
		eL	ZNE	09	07								
		M	ZNE		09		3	18	2	19	2	19	
	WN	eL	ZN	09	06								
		e	ZN		08		3	20	2	20			
		M	Z		10		4	18					
		M	N		14				2	15			
	SU	eL	N	09	06								
		M	N		16				2	15			
	Epicentre:			08	37	56	35½S 105½W				USCGS		6
31	SU	L	N	01	38	45							
		M	N		40				5	10			
	KP	eP	Z	01	40(00)								
		S	Z		(44.2)								
	GP	eS?	N	01	44	52							
	Epicentre:			01	34	15	15½S 172½W						
31	SU	iP	N	01	47	26n			30	8			
		iS	N		48	40s			60	8			
	ON	eP	E	01	49	03w							
		e	E			19							
		e	E			29							
		e	E			58							
		e	E		50	39							
						39e							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
		P	Z	01	49(10)u								
DEC 31	KP	eS	Z		(52.1)								
	TU	eP	N	01	49	22							
		e	N		50	01							
		e	N		51	03							
		e	N		52	10							
		iS	N			17							
		eScS	N	02	00	30							
	TO	eP	Z	01	49	29							
		e	Z			33							
		eS	Z		52	31							
	WN	P	N	01	49	52n							
		e	N			58							
		eS	N		53	05s							
		e	N			09				8	3		6.3
		eScS	N	02	00	41				5	5		
	CB	eP	E	01	49	57							
		e	E		53	14							
	KM	P	X	01	50	14							
		e	X		53	42							
		e(S)	X			48							
	GP	P	N	01	50	18							
		e	N			24							
		eS	N		53	57							
	RX	e	N	01	54	40				1	15		
		e	N		56.8								
		e(ScS)	E	02	01	06					4	7	
	Epicentre:			01	45	52	23S 178½W 400km				USCGS		

APIA and AFIAMALU

Readings from the stations at Apia are given only during those periods when Afiamalu was not operating. During the months January, February, and March, the amplitudes appearing in the column Az are the larger of the two amplitudes given on the horizontal components. After that, they are properly identified by the column headings. All amplitudes are in millimetres as measured directly on the photographic record.

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JAN 1	AP	eP	NE	10	13	09	0.6					
		eS	NE		15	22	0.4					
1	AP	eP	NE	23	03	22	2.5					
		iS				54wn	15.5					
11	AP	iP	NE	13	21	37	8.5					
		P	NE			40	14.0					
		iS	NE		23	31	6.0					
		S	NE			34	12.0					
13	eP	eP	NE	02	59	31	1.7					
13	AP	iP	E	07	13	18w	1.1					
		eS	NE		14	48	0.6					
13	AP	eP	NE	18	00	02	2.5					
		iS	NE			28	4.5					
13	AP	eP	NE	23	00	46	1.1					
		iS	NE		01	06	8.0					
14	AP	eP	NE	05	56	56	1.7					
		iS	NE		58	28	2.5					
14	AP	eP	NE	07	24	06	0.5					
		eS	NE		26	56	0.5					
15	AP	iP!	E	22	20	39w	1.7					
		e	E			24(27)	1.0					
					25	54	1.3					

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JAN 16	AP	iP!	NE	04	17	53sw	8.0					
		iS	E		18	40w	18.5					
16	AP	eP	NE	06	54	39						
		eiS	NE			59						
16	AP	iP	N	21	08	33n	9.0					
		eiS	NE			50	15+					
18	AP	iP	NE	22	38	46ne	0.5					
		iS	E		39	23e	0.6					
19	AP	eLq	E	14	51.3		0.5					
		eLr	E		56.3		0.5					
23	AP	eP	NE	08	56	35						
		eS	E			00(01)						
23	AP	iP!	NE	16	23	24	2.4					
		i	NE		24	20	1.2					
		iS!	NE			23	4.0					
23	AP	eP	NE	23	49	03	0.8					
		eS	NE		51	18	0.8					
24	AP	e(P)	E	06	06.1							
24	AP	eP	NE	13	10	48	0.3					
		eS	NE		12	07	0.4					
24	AP	eiP	NE	23	55	28	4.5					
		eS	NE		57	02	1.5					
26	AP	eP	NE	12	28	35	0.8					
		eS	NE		29	27	0.9					
27	AP	eiP	NE	07	44	36						
		eS	NE			45(04)						
28	AP	iP	NE	08	32	18mw	0.6					
		eS	NE		33	06	0.5					
29	AP	eiP	NE	18	40	52	3.5					
		eiS	NE		41	29	11.0					
30	AP	eP	NE	02	11	29	0.5					
		eS	NE		13	21	3.0					
30	AP	eP	NE	04	59	22	1.1					
		eS	NE		00	17	5.0					
30	AP	eP	NE	06	20	03	0.6					
		eLr	NE		29.4		0.8					
30	AP	eP	NE	22	44	09	0.9					
		eS	NE		46	14	1.2					
31	AP	eP	NE	21	01	52	0.7					
		eS	NE		03	28	1.0					
FEB 1	AP	eL	E	16	57.6		0.3					

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
FEB 3	AP	eP	NE	08 27 07	0.7		
		eS	NE	28 08	1.5		
		eT	NE	34 28	0.5		
6	AP	eP	NE	16 03(40)	0.7		
		eS	NE	05 55	1.1		
7	AP	eP	NE	01 15 03	0.5		
		eS	NE	18 13	0.7		
8	AP	eP	NE	22 53 21	0.8		
		eS	NE	54 27	2.0		
12	AP	eP	E	23 54(55)			
15	AP	eP	NE	13 23(02)	0.5		
		iS	NE	56n	1.0		
18		eP	NE	07 35 53	1.1		
		iS	NE	37 11ne	3.0		
		eT	E	42(57)	0.8		
18		eL	E	13 30.0	0.5		
22		iP!	N	18 06 42s	2.2		
		iS!	NE	07 12w	8.5		
22		eP	E	11 01(10)	0.5		
23		eP	E	10 57.7	0.5		
		i	E	58 24	0.5		
24		eP	NE	21 25 58	2.2		
		iS!	E	26 20w	10.2		
27		eP	NE	23 39 40	0.5		
MAR 1		eP	NE	06 24 46	2.0		
		iS	E	25 25w	4.5		
1		eP	NE	07 26 58	0.5		
		eS	NE	27 33	1.5		
		eT	T	30.1			
1		eP	NE	11 23 46			
		iS	NE	24 18			
1	AP	eiP	NE	16 16 52	0.5		
				17 25	0.5		
					Felt: Apia MM2.		
3	AP	iP	NE	04 51 37ne	4.5		
		iS	E	52 06e	20		
3	AP	iP	E	07 56 59w	3.7		
		iS	NE	57 28ne	23		
3	AP	eP	NE	08 29 29	1.5		
		iS	NE	47nw	8.0		
3	AP	eP	NE	11 06 32	0.6		
		eS	NE	07 33	3.0		

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
MAR 3	AP	eP	NE	14 45 31	1.3		
		iS	NE	47ne	16		
4	AP	eP	NE	04 39 53	0.4		
		eS	NE	41 18	0.8		
5	AP	eP	NE	05 41 47	0.2		
5	AP	eP	NE	22 26 31	1.0		
		iS	NE	51ne	5.0		
6	AP	eP	NE	01 10 17	0.3		
		iS	NE	42nw	0.5		
6	AP	iP!	NE	03 22 48ne	2.9		
		iS!	NE	23 33sw	4.5		
7	AP	eP	NE	17 33 34	2.9		
		iS!	NE	35 09sw	4.5		
8	AP	eP	NE	10 27 08	0.5		
		eS	NE	30 36	0.7		
10	AP	eP	NE	21 33 33	1.0		
		eS	NE	34 43	6.5		
11	AP	eP	E	14 03(56)	0.5		
		iPP	E	04 09e	0.8		
15	AP	eP	NE	07 53(20)	0.5		
		iS	NE	54(52)	1.6		
24	AP	e(P)	NE	21 51(19)	0.5		
28	AP	eP	NE	09 00.1	0.3		
		iS	N	01(57)n	1.1		
28	AP	eP	NE	14 47.1	1.0		
		eS	NE	48.3	2.6		
30	AP	eP	NE	14 37 56	1.7		
		iS	NE	38 45se	20		
30	AP	iP	N	17 35 49	1.2		
		eS	NE	38 00s	0.7		
30	AP	eP	NE	22 39 06	0.5		
		eS	NE	40 36	0.7		
31	AP	eS	N	21 36 05	0.2		
APR 4	AP	eP	NE	01 58 30		0.4 0.4	0.5 0.6
		eS	NE	02 00 32		0.5 0.4	0.5 0.7
5	AP	eP	N	23 37 46		0.4 0.3	
		iS	N	38 20n		6.3 0.3	
7	AP	eP	NE	07 11 04		0.6 0.5	0.7 0.5
		eS	NE	12 34		0.4 0.4	0.6 0.9
7	AP	eP	NE	13 03 56		0.7 0.4	0.8 0.4
		eS	NE	05 23		0.9 0.3	0.6 1.0

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
APR 7	AP	eP	NE	15	43	06			0.3	1.3	0.3	1.4
		eLq	E	16	04	.2					0.5	30
		eLr	E		07	.1					0.5	13
8	AP	eP	NE	13	23	04			2.7	0.3		
		iS	N		34	07n			5.0	0.4		
8	AP	eP	N	23	39	43			1.5	0.2		
		eS	N		40	10			10.5	0.2		
10	AP	iP	NE	00	39	16ne			8.6	0.2		
		eS	NE			36						
10		eP	NE	19	11	30			3.0	0.2	1.7	0.2
		e	N			59			2.5	0.2		
		iS	N		12	22s						
11	AP	eP	NE	23	22	23					0.5	2.0
13	AP	iP	NE	08	27	09			0.8	0.8	1.8	0.7
		eS	NE		28	21			0.5	1.0	0.8	1.0
15	AF	P	Z	05	33	57						
		i	Z		34	49						
		S	Z		35	11						
15	AF	i	Z	08	01	30						
15	AF	i(P)	Z	08	29	13						
15	AF	i(P)	Z	20	04	51						
17	AF	P	Z	12	56	18						
		S	Z			53						
17	AF	P	Z	15	05	19						
		S	Z			38						
17	AF	iP	Z	15	36	16						
		S	Z			48						
18	AF	i(P)	Z	07	33	49						
18	AF	P	Z	18	57	27						
		S?	Z		58	35						
18	AF	i(P)	Z	22	22	02						
18	AF	iP	Z	22	35	24						
20	AF	eP	Z	08	43	22						
		S	Z			50						
20	AF	iP	Z	09	54	35d?						
		e(P)	N			37						
		i	N			51						
20	AF	iP	Z	10	10	59d						
20	AF	e	Z	10	23+							
20	AF	P	Z	11	27	40						
					28	00						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
APR 20	AF	iP	Z	12	24	53						
20	AF	P	Z	18	05	35						
20	AF	iP	Z	23	39	54d						
		S	Z		40	25						
		e	Z		42	24						
21	AF		Z	00	45±							
21	AF		Z	01	35±							
21	AF	e	Z	01	49	40						
21	AF	P?	Z	01	51	18						
		S?	Z			42						
21	AF	P?	Z	01	53	12						
		S?	Z			28						
21	AF	P	Z	06	11	54						
		(S)	Z		12	31						
21	AF	eP	Z	13	39	25						
		(S)	Z			48						
21	AF	eP	Z	16	02	36						
		S	Z			57						
21	AF	iP	Z	20	15	33u	4					
21	AF		Z	20	27±							
21	AF	P	Z	21	26	46						
		(S)	Z		27	20						
21	AF	P	Z	21	33	03						
		S	Z			35						
21	AF	Z		21	36							
21	AF	P	Z	21	55	56						
		(S)	Z		56	30						
21	AF	iP	Z	22	07	46u						
		S	Z		08	20						
21	AF	(P)	Z	22	10	34						
21	AF	Z		22	32±							
21	AF	(P)	Z	22	48	01						
		e	Z			21						
21	AF	iP	Z	22	49	47d						
		(S)	Z		50	56						
21	AF	P	Z	23	26	09						
		S	Z			41						
21	AF	P	Z	23	39	59						
		S	Z		40	36						
21	AF		Z	23	43±							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
APR 22	AF	i	Z	00	06	50u						
22	AF	iP	Z	01	11	32d						
		(S)	Z			50						
22	AF	e	Z	01	30±							
22	AF	e	Z	02	40±							
22	AF	iP	ZN	05	39	51u	3		2			
		S	ZN		40	20						
		(L)	N		41	08			8			
		i	Z		42	53						
22	AF	P	Z	06	23	45						
		(S)	Z		24	05						
22	AF	P?	Z	06	49	53						
22	AF	e	Z	07	43±							
22	AF	P	Z	10	11	04						
22	AF	P	Z	11	16	23						
		S	Z			43						
22	AF	e	Z	22	02±							
23	AF	e	Z	01	43±							
23	AF	e	Z	02	15±							
23	AF	P	Z	3	46	25						
		S	Z		47	16						
23	AF	e	Z	03	51±							
23	AF	P	Z	04	33	49						
		S	Z		34	09						
23	AF	P	Z	06	53	08						
		S	Z			44						
23	AF	P	Z	07	04	27						
		S	Z			43						
23	AF	e	Z	08	20±							
23	AF	P	Z	09	34	58						
		iS	Z		35	20						
23	AF	eP	Z	09	43	25						
		(S)	Z			45						
23	AF	iP	ZN	10	36	53d?						
		i(S)	Z		37	24						
		e(S)	N			33						
23	AF	(P)	Z	10	38	55						
23	AF	e	Z	13	41	47						
				13	56	09						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
APR 23	AF	eP	ZN	15	12	47		1				
		(L)	N		14	19			5	13		
		e	Z		15	39						
23	AF	P?	Z	15	16	55						
23	AF	e	Z	17	12±							
23	AF	e	Z	17	36±							
23	AF	e	Z	19	49±							
23	AF	iP	Z	20	06	28d						
		iS	Z			48						
23	AF	e	Z	21	56±							
24	AF	e	Z	01	26							
24	AF	eP	Z	04	07	14						
24	AF	eP?	Z	11	29	02						
		(S)	Z		30	16						
24	AF	iP	ZN	12	10	33						
		S	N			53						
24	AF	e	Z	13	14±							
24	AF	e	Z	17(25)								
24	AF	e	Z	17(45)								
24	AF	e	Z	19(18)+								
24	AF	iP	Z	23	28	(00)u						
		S	Z			(22)						
25	AF	e	Z	01	52±							
25	AF	P	Z	02	42	32						
		(S)	ZN			52						
25	AF	e	Z	04	16±							
25	AF	P	Z	04	30	16						
		S	Z		31	06						
25	AF	e	Z	08	19±							
25	AF	e	Z	08	29±							
25	AF	eP?	Z	13	45	40						
		(S)	Z		46	00						
25	1P	Z	19	08	50							
		1S	Z		09	19						
25	AF	i(P)	Z	19	10	58						
25	AF	iP	ZN	19	19	43						
		iS	N		20	03s						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
APR 26	AF	P?	Z	04	21	(15)						
		S	Z			(39)						
26	AF	e	Z	04	51	±						
27	AF	P?	Z	05	01	36						
		S?	Z		02	00						
27	AF	P	Z	08	15	09						
		(S)	Z		16	37						
27	AF	i	Z	08	20	47						
27	AF	i	Z	08	23	40						
27	AF	e	Z	09	59	±						
27	AF	P?	Z	12	55	04						
		(S)	Z			24						
27	AF	P	Z	16	17	20						
		(S)	Z			38						
28	AF	e(L)	N	12	33	±						
29	AF	e	Z	03	17	±						
29	AF	e(P)	Z	03	32	10						
29	AF	eP	Z	08	02	43						
		S	Z		03	04						
29	AF	P	Z	17	08	00						
		S	Z			18						
29	AF	P?	Z	19	13	09						
		S	Z			44						
30	AF	e	Z	01	15	±						
30	AF	eP	ZN	01	31	36						
		i	Z			46						
		i	ZN			51						
		S	ZN		32	07						
		i	N			14						
30	AF	i	ZN	01	34	06						
30	AF	e	Z	16	28	29						
		e	Z		31	10						
MAY 1	AF	P	Z	00	32	48						
		e(pP)	Z		33	18						
		e	Z			41	3½					
		i	Z			43d	13	2				
		i	N			45n			2	2		
		i(PP)	Z			47d	9	2				
		e	Z		34	16	3	4				
		e	N			23			1	5		
		e	ZN			45	8	10	1½	15		
		e	N		35	26			1	4		
							5	15				
									2	12		
							4	2				

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
MAY 1	AF	eP?	Z	01	53	36						
		(S)	Z		54	04						
1	AF	P	Z	03	23	58						
		S	Z		24	21						
1	AF	eP	Z	06	36	55	1½	2				
		i	Z		37	21	5	2				
		i(S)	ZN		39	12u	2½	2				
		e	N			32				1		
1	AF	P	Z	14	31	10						
		S	Z			30						
1	AF	iP	Z	14	55	05d						
		S	ZN			29						
		e	Z			32						
1	AF	e	Z	17	00	±						
2	AF	e	Z	02	50	±						
2	AF	e	Z	03	46	±						
2	AF	eP?	Z	04	40	15						
		S	Z			31						
2	AF	P	Z	06	09	20						
		(S)	Z			42						
2	AF	i	Z	07	59	00						
2	AF	P?	Z	12	05	19						
		S	Z		06	01						
2	AF	e	Z	20	32	±						
2	AF	iP	Z	22	28	19						
		S	ZN			46						
		e	Z			49						
		e	Z		29	41						
		e	N		30	.3						
3	AF	(S)	ZN	01	59	38						
3	AF	i(S)	ZN	02	06	18						
3	AF	e	Z	23	07	±						
4	AF	iP	ZN	00	02	(08)u		6				
		S	ZN			(26)						
4	AF	e	Z	16	19	±						
4	AF	e	Z	16	52	±						
4	AF	iP	Z	20	04	(05)u	1	2				
		(S)	Z		05	(15)	½	2				
5	AF	P	Z	00	34	(15)						
		(S)	Z			(30)						
5	AF	i	Z	06	51	26u	2½	2				
		i	Z			37d	4	3				

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
MAY 5	AF	P	Z	14 51 12			
		(S)	Z	52 07			
5	AF	i	Z	14 56 11			
5	AF	(P)	Z	17 16 14			
		i	Z	36			
		e(S)	N	40		½ 3	
		i	Z	18 12			
		e	N	24		1 2	
5	AF	e	Z	17 26±			
6	AF	e	Z	01 29±			
6	AF	iP	ZN	03 34 15d	3½ 2		
		i(S)	ZN	36 22	½ -	½ 2	
6	AF	e	Z	20 28.4			
6	AF	P?	Z	22 11 51			
		(S)	Z	12 21			
7	AF	P	Z	02 56 48			
		(S)	Z	57 10			
7	AF	iP	ZN	05 49(29)	½ 1		
		(S)	Z	(50)	1½ 1		
7	AF		Z	15(20)			
7	AF	e(P)	Z	16(04)(33)			
		S	Z	(05)(01)			
				(43)d			
9	AF	e	Z	02 59 08			
		i(PKP)	Z	43u	2 3		
9	AF	P	Z	16 04 08			
		(S)	ZN	39			
		e	Z	06 14			
9	AF	e	Z	08 38±			
9	AF	P	Z	18 43(33)	½ 2		
		(S)	ZN	44(12)	1 2		
10	AF	P	Z	04 41 04			
		S	Z	28			
10	AF	e	Z	11 39±			
10	AF	P?	Z	11 44 29			
		S	Z	57			
10	AF	iP	Z	20 50 34			
		S	Z	59			
10	AF	eL	N	23 36.5			
11	AF	e	Z	05 13±			

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
MAY 11	AF	iP	ZN	07 49 20u	1 2	½ 2	
		i(S)	ZN	51du	3 2	2 1	
		i(S)	Z	53u	7 2		
11	AF	P?	Z	13 43 05			
		S	Z	36			
11	AF	P	Z	22 36 11			
		S	Z	40			
12	AF	eP?	Z	04 20 12			
		S	Z	37			
12	AF	P	ZN	06 41(23)	1 2	½ 2	
		eL	N	42.7		1 15	
		eL	Z	43.0	1 10		
12	AF	e	Z	12(38)±			
12	AF	e	Z	13(08)±			
12	AF	e	Z	17(03)±			
15	AF	iP	Z	04 44 36u	2½ 2		
		S	Z	46 35	2 1		
15	AF	e	Z	05 23±			
15	AF	iP	Z	06 07 26u	7 1		
		iS	Z	39			
15	AF	e	Z	09(18)±			
15	AF	e	Z	10(35)±			
15	AF	P	Z	10 46(09)			
		S	Z	(25)			
15	AF	e	Z	12(52)			
15	AF	e	Z	13(11)			
15	AF	e	Z	13(17)			
15	AF	e	Z	13(20)			
15	AF	e	Z	13(26)			
15	AF	e	Z	13(56)			
15	AF	e	Z	14(04)			
15	AF	e	Z	14(34)±			
15	AF	e	Z	15(00)±			
15	AF	e	Z	15(59)±			
15	AF	i	Z	18(13 00)			
15	AF	e	Z	19(18)±			
15	AF	e	Z	19(56)±			

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
MAY 15	AF	e	Z	22(32)±			
16	AF	e	Z	00(52)±			
17	AP	eP	NE	17 45 11		1.0 0.3	0.8 0.3
		eS	NE	46 06		5.0 0.3	4.5 0.3
18	AP	eP	NE	01 51 00		0.4 0.3	
		e(S)	NE	28		0.8 0.3	
		e	NE	53 37		0.4 1.0	0.4 1.0
18	AP	eP	E	02 37 42			0.6 1.5
		e(PPP)	E	38 34			0.7 2.0
		eL	E	42.3			0.4 18.0
18	AP	e(P)	E	03 36 11			0.5 2.0
18	AP	eP	E	05 31 27			0.3 2.0
		ePP	E	51			0.4 2.0
18	AP	eP	E	12 26 06			0.4 2.4
		ePP	E	22			0.7 2.1
		e	E	36			
		eL	NE	31.8			0.6 17.0
19	AP	eP	NE	03 48 53		1.2 0.2	
		iS	N	49 20s		7.9 0.2	
20	AP	eP	NE	05 47 40n		1.1 0.3	
		iP	N	44		2.9 0.3	
		eS	N	49 56		0.3 1.0	
		S	NE	50 00		0.9 0.7	
		e	E	14			1.2 1.0
21	AP	e	NE	03 30 05		0.7 0.3	0.9 0.3
21	AP	eP	NE	13 01 47		0.8 0.3	
		iS	NE	02 23ae		5.4 0.3	
22	AP	iP	NE	11 10 47ne		10.1	
		iS	N	11 11		18.5±	
22	AP	eP	NE	13 42 04		0.6 0.4	
		eS	NE	43 53		0.8 0.4	
22	AP	eP	NE	14 44 41		7.0	
		iS	NE	50		33.0±	
23	AP	eP	N	07 44 09		0.5 0.4	
		iS	N	45 09s		3.2 0.4	
25	AP	eP	NE	16 55 07			
		eS	NE	34			
25	AP	e(P)	NE	16 57 23			
		e	N	43			
		e	E	55			12.0 4
26	AP	eP	E	12 28 51			0.4 0.4
		e	E	29 17			0.7 0.5
		e(S)	E	31 12			0.4 0.7

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
MAY 26	AP	eP	NE	16 20 10		0.4 0.4	
		eS	NE	21 41		0.6 0.4	
26	AP	e(S)	NE	23 10 42			
27	AP	eP	E	04 03 10			
		eS	E	05 09			0.4 1.0
28	AP	eP	E	12 33 46			
		iS	E	34 28e			
29	AP	eP	N	03 41 34		1.0 0.4	
		eS	N	43 02		1.2 0.4	
29	AP	eP	N	15 07 50		3.2 0.3	
		iS	N	08 10		17.5	
29	AP	eP	N	18 30 32		1.0 0.3	
		eS	N	31 44		2.5 0.3	
30	AP	eP	N	04 58 04			
		e	N	50			
		iS	N	52			
30	AP	eP	N	05 18 43			
		eS	N	20 03			
30	AP	eP	NE	21 23 08		0.6 0.4	
		ePP	E	25		0.5 1.4	
		e(PPP)	E	38		0.6 1.4	
		eS	NE	24 52		0.8 1.2	0.9 1.9
31	AP	eP	E	19 36 59			1.4 2.2
		iPP	E	37 16			
		iPPP	E	40			
		i	E	38 00			
		S	E	40 02			1.8 2.4
		SS	E	41 16			
		eL	NE	42.1			
JUN 2	AP	eP	N	13 30 14			
		eS	N	31 11		0.4 0.3	
2	AP	eP	N	19 08 55			
		iS	E	09 14		0.4	
3	AP	eP	E	19 36 24			
		e(PP)	E	31			1.4 2.0
		ePPP	E	37 02			
		e(S)	E	39 50			
		eL	E	41.4			0.5 15.0
4	AP	iP	N	10 54 05n		3.0 0.3	
		iS	NE	48		12±	
7	AP	eP	NE	10 27 44		0.9 0.3	
		eS	NE	28 10		5.0 0.3	
8	AP	eP	NE	00 44 54			
		iS	N	45 20		18±	
8	AP	eP	N	04 40 26		0.6 0.4	
		eS	NE	41 14		0.9 0.4	1.0 0.4

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 9	AP	eP	NE	10	40	00						
		S	NE			15			12±			
9	AP	eP	NE	13	22	04						
		1S	NE			20			1.8	0.3	3.0	
10	AP	eP	NE	01	22	55			0.3	0.5		
		e	NE		24	24			0.3	0.6		
10	AP	eP	NE	04	04	06						
		e	E			47					0.4	1.2
		e(S)	E		07	09					0.5	0.5
10	AP	eP	NE	21	26	44						
		eS	NE		27	22			1.8	0.3		
11	AP	eP	NE	06	22	00			0.4	0.3		
		1S	N			27			2.0	0.3		
11	AP	eP	NE	12	44	28			2.0	0.3		
		1S	N			49					14±	
12	AP	eP	NE	18	09	09						
		1(S)	E			55					0.7	1.1
12	AP	e	E	18	13	50						
		i	E		14	26						
13	AP	eP	NE	00	25	02			0.3	0.3		
		1S	N			39			5.0±	0.3		
13	AP	1P	BE	08	55	23			4.0±	0.2		
		S	NE			43			10±	0.2		
13	AP	eP	NE	14	04	17			0.3	0.2		
		1S	N			40			3.0	0.2		
13	AP	eP	NE	15	12	14						
		1S	N		13	05s			3.0	0.3		
14	AP	eP	N	12	00	54se						
		1S	NE		01	36			1.7	0.3		
15	AP	eP		02	43	14						
		1S			44	49						
15	AP	1P		14	56	33						
		eS			58	00						
16	AP	eP	NE	00	57	23			1.0	0.2	0.8	0.2
		1S	NE			40s?			9.0	0.2		
16	AP	eP	NE	05	47	36						
		1S	N			56			3.7	0.2		
16	AP	eP	NE	06	39	16			3.0	0.2		
		1S	N			37			8±			
16	AP	e(P)	NE	08	14	30					0.6	1.0
		i	E			45						
		e(S)	E		16	29					0.5	1.2
									1.2	10	2.0	8.0

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 16	AP	eP	NE	18	55	02						
		eS	NE		56	48			0.9	0.8		
17	AP	eP	NE	10	49	02			0.7	0.4		
		1S	NE			23			3.7	0.4		
17	AP	eP	NE	20	01	34			0.8	0.4		
		S	NE		02	00			3	0.4		
18	AP	eP	N	04	41	28			0.3	0.3		
		e(P)	E			30						
		eS	NE		42	19			0.5	0.3		
		e(T)	N		46	16						
19	AP	eP	N	08	54	56			0.4	0.3		
		eP	E			58						
		1S	E		55	22			1.2	0.4	1.6	0.4
19	AP	eP	NE	21	55	01			1.7	0.4		
		eS	NE			38			0.7	0.4	0.6	0.4
		e	NE		58	26						
20	AP	eP	NE	00	48	39						
		i	N			41						
		S	NE		49	09			11±			
20	AP	eP	NE	17	34	52						0.4 0.4
		1S	NE		36	38se			1.5	0.4		
21	AP	eP	N	07	45	43			0.7	0.3		
		eS	NE		46	08						
21	AP	eP	NE	18	15	42			0.4	0.4		
		eS	NE		16	15			1.2			
21	AP	eP	NE	21	03	51						
		eS	NE		04	20			1.5	0.3		
22	AP	eP	NE	16	18	56						
		1S	N		19	16			7.5±			
22	AP	eP	NE	16	28	46						
		eS	NE		29	15			4.5			
23	AP	P	NE	16	43	00						
		(S)	E			14						
24	e(P)		NE	00	46	09						
		eS	NE			38			5.0	0.4		
25	AP	eP	NE	02	24	38						
		1(S)	N		25	22						2.2 6.0
		eL	NE			30						
25	AP	eP	NE	09	31	34			0.4	0.4	0.4	0.5
		eS	NE		33	42			0.4	1.0	0.4	1.0
25	AP	eP	E	09	44	54						0.6 2.2
		e(S)	E		51	13						
		eL	E		55	12						0.3 10.0

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 25	AP	eP	NE	10	49	36			3.5	0.2		
		1S	N		50	01			12±			
26	AP	e(P)	NE	03	56	48			0.4	0.8		
		e(S)	NE		58	18			0.4	1.0		
26	AP	eP	NE	09	41	55						
		1S	N		42	30			2.0	0.3		
26	AP	eP	NE	15	43	34			0.4	0.4	0.4	0.4
		eS	NE		45	07			0.4	1.0	0.5	0.7
28	AP	e(P)	NE	05	15	30					0.3	0.8
		e(S)	NE		17	43					0.3	0.9
28	AP	eP	NE	08	35	30						
		e(S)	NE		37	55			0.4	0.4		
		e(L)	E		38.9							
29	AP	e(P)	NE	03	30	06			0.6	0.3		
		eS	NE		31	23			0.6	0.3		
		e(T)	NE		37	54						
29	AP	1P	N	05	14	04s						
		eS	NE			24			4±			
29	AP	eP	NE	09	15	12			3.0	0.3		
		S	NE			54						
29	AP	eP	NE	12	41	27						
		1S	N			58s			13.0±			
30	AP	eP	NE	05	59	22			0.3	0.3		
		1S	NE			51ne			2.0	0.3		
JUL 2	AF	e	Z	04	13	22	½	2				
		1	Z			24u	3½	2				
2	AF	1P	ZN	04	49	42u						
		e(S)	ZN		51	05u?	2	3	1	2		
		1	Z			10d	2	3				
		1	Z			14d	4	3				
3	AF	1P	ZN	06	31	22u	4½	3	1	3		
		eS	ZN		34	16	2	3	2	2		
3	AF	e	Z	06	43±							
3	AF	e	Z	11	31±							
3	AF	1P	Z	11	50	53						
		1S	Z		51	11						
3	AF	e	Z	14	20±							
3	AF	1P	Z	20	35	17						
		1S	Z			30						
3	AF	1P	Z	23	45	07						
		S	Z			25						
4	AF	1P	Z	00	20	45	1	1				
							2	3	1	2		
							3	10				

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 4	AF	eP	Z	00	25	43						
		e(P)	Z			49						
		1	Z		26	16						
		e	Z		27	04	2	5				
		i(L)	Z			31u	7	8				
4	AF	1P	Z	00	49	46d						
		S	Z		50	16						
5	AF	1	Z	08	43(57)d							
		1	Z		46(29)d?							
		i	Z		54(55)u?							
5	AF	P?	Z	09	10(20)							
		(S)	Z			(50)						
		e	Z		13(08)							
5	AF	(S)	Z	13	28(28)							
5	AF	1(P)	Z	13	48(53)u		1	2				
		1	Z		50(05)d		1	2				
5	AF	P	Z	14	19(51)							
		S	Z		20(13)							
5	AF	e(P)	Z	21	14 (57)							
5	AF	1P	Z	22	55(56)u							
		1S	Z		56(16)							
6	AF	P	Z	00	02(00)							
		S	Z			(20)						
6	AF	e	Z	02	11±							
6	AF	e	Z	05	28±							
6	AF	e	Z	05	37±							
6	AF	1P	Z	11	07(18)d							
		1S	Z			(50)u						
7	AF	P	Z	06	58(27)							
		S	Z		59(08)							
7	AF	(S)	Z	07	03(07)							
7	AF	1P	Z	16	11(58)d							
		(S)	Z		13(02)d							
7	AF	1P	Z	23	44(47)u		2					
		1S	Z		45(08)d		1½	3				
8	AF	e	Z	00	45±							
8	AF	e	Z	00	48±							
8	AF	e	Z	05	25±							
8	AF	eP	Z	06	05(24)							
		S	Z		06(49)		2	5				
		L	ZN		47(24)		3	8	1	8		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 8	AF	e	Z	06	13	(30)						
		L	N		14	(20)			2	7		
		L	Z			(30)	7	7				
8	AF	e	Z	18	23	±						
9	AF	iP	Z	07	12	(14)u						
		iS	Z		52	(58)						
		e	Z		58	±						
9	AF	iP	Z	14	30	(06)u						
		iS	Z			(41)						
10	AF	e	Z	04	56	±						
10	AF	iP	Z	06	27	(58)d	2	2				
		i	ZN		28	(12)d	3½	2				
		i	Z		29	(25)	2½	2				
		i(PP)	Z			(53)	4	2				
		e(S)	Z		36	(06)	2½	10				
		e(SKS)	Z		37	(58)	3½	10?				
		Lr	ZN		51		10	30	5	15		
		M	Z		52		30	30				
		M	Z		58		40	20				
10	AF	iP	Z	07	43	(33)u						
		iS	Z			(54)						
10	AF	eP?	Z	07	51	(10)						
		e	Z			(35)						
		S	Z			(45)						
10	AF	e	Z	11	45	±						
10	AF	e	Z	11	50	±						
10	AF	iP	Z	17	53	(43)u						
		iS	Z		54	(03)						
10	AF	iP	Z	18	50	(23)						
		S	Z			(52)						
11	AF	iP	Z	09	54	28						
		(S)	Z			41						
11	AF	e	Z	11	00	±						
11	AF	P?	Z	15	16	43						
		(S)	Z		17	20						
11	AF	e(P)	Z	16	29	32						
		e(S)	Z		32	03						
11	AF	e(P)	Z	22	37	26						
		e	Z		39	12						
12	AF	P	Z	08	35	(20)						
		(S)	Z			(54)						
		e	Z		28	(18)						
12	AF	e	Z	21	30	ca						
				1	36	35u						
					37	00						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 12	AF	eP	Z	21	57	17						
		(S)	Z		58	45						
12	AF	i	Z	22	43	00u						
13	AF	i(P)	Z	01	26	46u						
13	AF	e	Z	01	31	.7						
13	AF	iP	Z	02	43	23u						
		iS	Z			42						
13	AF	P	Z	06	47	56d						
		i	Z		48	26	2	1				
		(S)	Z		50	54d?	1½					
13	AF	e	Z	09	46	±						
13	AF	iP	Z	12	09	08u	1½	2				
13	AF	i(P)	Z	18	26	55						
14	AF	(P)?	Z	00	09	13						
		S	Z			33						
14	AF	e(P)	Z	01	06	51						
14	AF	P	Z	13	21	04d?	2	2				
		i	Z		22	08u						
14	AF	iP	ZN	20	44	41u	4	2				
		iS	ZN		45	12	4	-				
15	AF	P	Z	00	40	23						
		S	Z			38						
15	AF	e	Z	02	13	±						
15	AF	e	Z	10	28	±						
15	AF	e	Z	14	45	±						
15	AF	P	Z	16	13	49						
		(S)	Z		15	12						
16	AF	P	Z	02	49	27						
		iS	Z			59						
16	AF	iP	Z	06	29	51						
		S	ZN		30	26	1	2	2	10		
16	AF	eL	ZN	13	20	±						
16	AF	L	Z	17	05	±						
16	AF	eL	Z	18	50	±						
16	AF	iP	Z	23	32	47	½	1				
		(S)	Z		33	09						
		(L)	ZN			57	5	5				
		M	Z			35.2	10	4				
18	AF	P	Z	18	48	31						
		S	Z		49	01						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 18	AF	P	Z	19	50	17						
		S	Z			51						
18	AF	eP	Z	20	28	27						
		(S)?	Z		29	00						
		e	Z		31	57						
18	AF	P?	Z	20	49	54						
		(S)	Z		50	10						
		e	Z		52	07						
18	AF	P	Z	21	24	26						
		(S)	Z			45						
18	AF	e	Z	21	48	03						
19	AF	iP	Z	06	38	55u						
		S	Z		39	33						
19	AF	iP	Z	18	26	58d	2	3				
		eS	Z		35	26	1½	18				
		eLr	Z		46		1	2				
		i(PKKS)	Z		51	34d?	1½	2				
19	AF	e	Z	20	53							
19	AF	i	Z	21	10	53u						
20	AF	iP	ZN	09	06	(02)u						
		iS	ZN			(22)						
20	AF	e	Z	22	28±							
22	AF	e	Z	07	26	43						
22	AF	e?	Z	07	35	28						
		i	Z			34d?						
22	AF	P?	Z	08	15	56						
		S	Z		16	30						
22	AF	iP	Z	10	20	50d						
		iS	Z		21	31						
22	AF	i(P)	Z	10	30	40						
22	AF	iP	Z	14	56	45d						
		(S)	Z		58	42						
23	AF	e	Z	10	56±							
		eL	Z		59±		1½	20				
24	AF	e	Z	02	16±							
24	AF	P	Z	09	39	54						
		S	Z		40	14						
24	AF	iP	Z	10	50	29d						
		iS	Z			45						
24	AF	P	Z	17	48	00						
		S	Z			15						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 24	AF	P	Z	23	38	38						
		(S)	Z			53						
25	AF	P?	Z	00	08	10						
		S	Z			19						
		i	Z		10	03						
25	AF	P?	Z	00	45	35						
		(S)	Z		47	00						
25	AF	e	Z	03	34±							
25	AF	iP	Z	17	32	22u						
		iS	Z			36d						
26	AF	e	Z	02	09±							
26	AF	P	Z	02	29	13						
		S	Z			32						
26	AF	e	Z	03	18±							
26	AF	iP	Z	05	40	36						
		(S)	Z		41	05						
26	AF	P?	Z	09	37	10						
		S	Z			28						
26	AF	eP	Z	17	49	24	1	3				
		e	Z			44	2	3				
		i	Z			58d	3	3				
		ipP	Z		51	47	5	5				
		i(PP)	Z		53	39u	6½	5				
		i	Z			49d	6	2				
		e(S)	Z		59.4		2	5				
		e	Z	18	01.7		6	20				
		i(SS)			05	54u	2½	3				
		e	Z		14	07	3	20?				
26	AF	P?	Z	20	50	34						
		S?	Z		51	04						
26	AF	iP	Z	22	18	30						
		(S)	Z			53						
		i	Z		20	51u						
		i	Z		21	03						
26	AF	P	Z	23	34	42						
		(S)	Z		35	10						
		i	Z		37	04d						
27	AF	iP	Z	00	24	20u						
		i	Z			38u?						
		i(S)	Z		26	23u						
27	AF	P	Z	04	31	09						
		S	Z			28						
27	AF	iP	Z	05	52(11)d							
27	AF	eP	Z	17	40	27						
		i	Z		41	47						
28	AF	P	Z	02	57(45)							
		S	Z		58(02)							

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
JUL 28	AF	iP	ZN	17 26 38			
		e	N	27 14			
		iS	N	28 10			
28	AF	iP	Z	19 11 50d?			
		iS	Z	12 09			
28	AF	iP	Z	21 25 39u?			
		iS	Z	27 25d			
29	AF	iP	ZN	04 00 35			
		iS	N	01 25			
29	AF	eP	Z	10 41 19			
		iP	Z	22d	1 3		
		e(S)	ZN	52 54	2 5	1 -	
		eL	ZN	53 24	2 10	1 10	
		M	ZN	55.1	7 10	5 10	
29	AF	e(P)	Z	18 46 08			
30	AF	P	Z	08 27(57)			
		S	Z	28(18)			
30	AF	P	Z	10 30(08)			
		(S)	Z	(28)			
30	AF	P	Z	10 32(58)			
		(S)	Z	33(30)			
30	AF	eP	Z	15 21(40)			
		e	Z	23(05)			
		(S)	Z	31(45)			
		e	Z	33(17)			
		e(L)	N	36			
AUG 1	AF	L	Z	05 37±			
1	AF	e	Z	13 13±			
1	AF	iP	Z	14 29 23u			
		(S)	Z	30 48			
		i(S)	Z	51			
1	AF	iP	Z	15 11 28			
		iS	Z	48u			
1	AF	e	Z	18 22±			
2	AF	P	Z	00 48 27			
		S	Z	57			
2	AF	e	Z	08 16±			
2	AF	P?	Z	09 57 55			
		S	Z	58 24			
2	AF	P	Z	23 55 11			
		S	Z	37			
3	AF	iP	Z	01 08 52d	2 2		
		i	Z	09 10u	3 2		
					4 2		

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
AUG 3	AF	P?	Z	05 15 48			
		S	Z	16 54			
4	AF	iP	Z	06 27(24)d?			
		S?	Z	(54)			
4	AF	P	Z	08 47(34)			
		S	Z	49(39)			
4	AF	iP	Z	09 51(50)			
		(S)	Z	52(04)			
4	AF	eiP	Z	17 30(32)ud	2½ 3		
		S	Z	31(16)	1½ 3		
4	AF	e	Z	21 10±			
5	AF	iP	Z	01 28(30)u	3½ 2		
5	AF	P	Z	(17)24(27)			
		i	Z	25(13)			
		(S)	Z	27(00)			
5	AF	P	Z	(17)33(50)			
		S	Z	35(16)			
6	AF	iP	Z	04 16 18			
		S	Z	38			
8	AP	eP	E	90 28 36			2± 0.3
		eS	E	55			
8	AP	eP	E	00 33 40			
		iS	E	56e			3±
9	AF	(P)	Z	07 28(15)			
9	AF	P	Z	10 20 59			
9	AF	P	Z	17 57(10)			
		S?	Z	(30)			
10	AF	e	Z	05 48±			
10	AF	e	Z	06 53±			
12	AF	e(P)	Z	07 57(50)			
12	AF	e	Z	00 16±			
12	AF	e	Z	07 23(42)			
		i	Z	25(28)			
11	AF	e	Z	09 10±			
12	AF	eP	Z	19 35(38)	2 3		
		eS	Z	44(08)	1 20?		
		eSS	Z	48.0	1 30		
		eL	Z	56±	2 30		
12	AF	(P)	Z	30 50(34)			
		S?	Z	(55)			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 13	AF	P	Z	00	13	29						
		(S)	Z			47						
13	AF	iP	Z	14	51	16d						
13	AF	iP	Z	16	54	39u						
		S	Z		56	42						
14	AF	e(P)	Z	00	15	28						
		i	Z			56						
		(S)	Z		16	32						
14	AF	iP	Z	09	48	44d						
		i(S)	Z		50	34						
		eL	Z		52.2		2	10(max)				
14	AF	e(P)	Z	15	04(45)							
		e(S)	Z		13(30)							
		eLq	Z		23.5		1	40				
14	AF	iP	Z	16	56	17						
		(S)	Z		58	16						
14	AF	iP	Z	21	12	32(d)						
15	AF	P	Z	16	50	56						
		(S)	Z		53	12						
15	AF	e(P)	Z	20	07	09						
		i(PcP)	Z			28						
		eSS	Z		20	18	3	25				
		eLr	Z		29	00	1	-				
		eL	Z		32±		3	35				
		M	Z				6	25				
15	AF	iP	Z	22	39	11d	5½	-				
		iS	Z		47	46	3	20				
		eSS	Z		53	51	2	10				
		eLr	Z	23	00±		3	50				
16	AF	iP	Z	01	29	57						
		(S)	Z		32	43						
16	AF	eP	Z	07	12±							
16	AF	eP	Z	11	16	20						
		i(PcP)	Z			23						
		iPP	Z		18	22						
		e(PcP)	Z		19	39	3	10				
		iS	Z		25	04	3	7				
		e	Z		27	19						
		eSS	Z		29.4		6	10				
		e(Lq)	Z		34.4		5	15				
		e	Z		41½		3	10				
16	AF	eL	Z	20	29							
17	AF	e(P)	Z		23	02						
		(S)	Z		23	02						
17	AF	P	Z	01	05	16						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 17	AF	P	Z	02	04	30						
		(S)	Z		06	27						
17	AF	P	Z	09	03	32						
		(S)	Z		04	02						
17	AF	eiP	Z	15	58	53						
		iS	Z	16	00	47						
17	AF	iP	Z	18	09	15u						
		eS	Z		15	30	1	-				
		e(SS)	Z		18	40	1	5				
		e(L)	Z		20.0		2	20				
		eLr	Z		21.6		1	25				
17	AF	eiP	Z	21	16	16	2	3				
		e(S)	Z		20	45	1	15				
		e(L)	Z		22	54	1	10				
		M	Z		23½		2½	10				
17	AF	e(P)?	Z	21	39	52						
		i	Z		40	07d						
17	AF	e	Z	21	51±							
18	AF	iP	Z	06	54(38)							
		(S)?	Z		55(00)							
19	AF	e(P)	Z	04	49	13						
		eL	Z		49½							
19	AF	eL	Z	22	09±							
20	AF	iP	Z	01	10	49d						
		i	Z		11	49						
		S	Z		12	29						
20	AF	eP	Z	03	44	56	1½	5				
		i	Z		45	33	3	10				
		eS	Z		48	56	2	10				
		L	Z		50.3		3	25				
		M	Z		52+		6	15				
20	AF	iP	Z	13	16	26						
		S	Z			59						
20	AF	iP	Z	01	11	38						
		S	Z		13	31						
		i	Z			51	2	14				
		(Lr)	Z		14	36	2	13				
		M	Z		15.0		5	10				
		M	Z		24.5		5½	10				
21	AF	eP	Z	04	05	57						
		(S)	Z		07	52						
		e(L)	Z		09.7							
21	AF	iP!	Z	21	00	21d						
		iS	Z		01	18						
21	AF	iP	Z	23	45	54						

Felt: Apia MM 1-2.

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 23	AF	e(P)	Z	08	08(37)							
		e(P)	Z		10(57)							
		(S)	Z		11(19)							
23	AF	iP	Z	08	18)42)							
		iS	Z		19(04)							
23	AF	iP	Z	09	52	20						
		iS	Z			40d						
23	AF	e	Z	10	07±							
23	AF	P	Z	15	29	47						
		S	Z		30	19						
23	AF	e	Z	16	28±							
24	AF	i(P)	Z	03	56	56						
24	AF	P	Z	04	45	30						
		S?	Z			49						
24	AF	e	Z	08	33±							
24	AF	iP	Z	10	30	32						
		S?	Z		31	15						
24	AF	iP	Z	12	40	13						
		S?	Z			33						
24	AF	e	Z	13	38±							
24	AF	e	Z	14	01±							
25	AF	iP	Z	04	24	47						
25	AF	P	Z	06	29	40						
		(S)	Z		31	20						
25	AF	iP	Z	13	33	47						
		S?	Z		34	09						
25	AF	P	Z	23	04	32						
		(S)	Z		06	48						
26	AF	e	Z	04	42(55)							
26	AF	iP	Z	11	25(57)							
		S?	Z		27(25)							
26	AF	P	Z	12	23(39)							
		e(L)	Z		30							
26	AF	e(P)	Z	12	49(00)							
		eL	Z		55							
26	AF	P	Z	18	00(30)							
		eL	Z		06							
26	AF	P	Z	23	37	30						
					15	26±						
				15	46±							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 27	AF	iP	Z	18	58	42						
27	AF	iP	Z	19	06	12						
29	AF	P	Z	03	37	44						
		S?	Z			59						
29	AF	P	Z	12	29(38)							
		e	Z		33.5							
		L	Z		35		2	15				
29	AF	e(P)	Z	12	57(00)							
29	AF		Z	18	23±							
29	AF	iP	Z	21	19(13)							
30	AF	eL	Z	19	15±							
30	AF	iP	Z	23	38(00)							
31	AF	SS	Z	23	28(32)							
		eSSS	Z		31.5							
		eLr	Z		38.8							
		i	Z		41.2							
SEP 1	AF	P	Z	00	26(22)							
1	AF	P	Z	00	58(30)							
		S	Z	01	00(24)							
		eL	Z		01.5		2	-				
		M	Z		02.5		3	10				
		M	Z		11		6	10				
1	AF	P	Z	02	55(12)							
		S?	Z		(34)							
1	AF	P	Z	03	01(32)							
		e	Z		03.5							
1	AF	P	Z	05	(31)50							
		e	Z		(34)08							
1	AF	P	Z	08	(14)05							
		S	Z		32							
1	AF	P	Z	08	(16)02							
		(S)	Z		43							
1	AF	i(P)	Z	18	(29)31u							
2	AF	e(P)	Z	14	(34)20							
2	AF	e(P)	Z	15	(27)17							
		e	Z		(31)47							
2	AF	P	Z	15	(45)00							
		e	Z		32							
		S	Z		(47)10							
2	AF	iP	Z	17	(33)27							
		S	Z		(34)17							
2	AF	iP	Z	19	(02)20		½	2				
		S	Z		(04)34		2	?				

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
SEP 2	AF	iP	Z	23(40)00d			
		(S)	Z	40			
3	AF	eP?	Z	04 55 49			
		(S)	Z	56 21			
3	AF	P	Z	05 52 35			
3	AF	P	Z	17 30 01			
		(S)	Z	26			
4	AF	PPP	Z	22 08 57			
		e(SKSP)	Z	15.8	1 12		
		e	Z	21	½ -		
		eLr	Z	33	2 25		
		M	Z	36	6 20		
4	AF	iP	Z	23 12 10			
		S	Z	13 33			
5	AF	iP	Z	04 54 34			
		(S)	Z	56			
5	AF	eP	Z	10 40 36			
		S?	Z	41 06			
		i	Z	44 19			
5	AF	P	Z	19 32(18)			
6	AF	e	Z	17 45±			
7	AF	P	Z	04(31)52			
		S?	ZN	(32)09			
7	AF	iP	ZN	11 41(18)			
		S	Z	(37)			
7	AF	e	Z	12 44±			
7	AF	e	Z	13 26±			
7	AF	P	ZN	22 09 57			
		S	N	10 20			
7	AF	P	Z	22 35 29			
		S	Z	36 01			
8	AF	eP	Z	05 37 06			
		eL	N	58±			
8	AF	P?	Z	06 51 55			
		S	Z	52 19			
9	AF	iP	Z	08 10(05)			
		S	N	(27)			
		i	N	(37)			
9	AF	e	Z	08 26±			
9	AF	P	Z	16 50(02)			
		S?	Z	(35)			

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
SEP 10	AF	P	Z	07 47 44			
		iS	Z	48 02			
10	AF	P?	Z	09 52 20			
		(S)	Z	50			
10	AF	e(P)	Z	11 16 47			
10	AF	e(P)	Z	11 24 55			
10	AF	e(P)	Z	11 46 23			
10	AF	iP	Z	17 13 10d?			
		(S)	Z	29			
10	AF	P	Z	18 06(37)			
		(S)	Z	07(00)			
12	AF	e	Z	18 26±			
12	AF	e	Z	04 32±			
12	AF	P?	Z	09 41±			
12	AF	P?	Z	09 47±			
12	AF	P	Z	14 05(00)			
		(S)	Z	(42)			
12	AF	i(P)	Z	14 10(00)			
12	AF	P	Z	16 21 54			
		e	ZN	22 39			
		e	N	23 42			
		e(L)	N	24.4			
12	AF	P	ZN	16 26 08			
		e	Z	32.1			
		e(L)	N	37.6			
12	AF	e	Z	16 39±			
12	AF	P	Z	18 17(45)			
		S	Z	18(30)			
12	AF	P	ZN	18 22(25)			
		S?	N	(55)			
12	AF	e	Z	18 34±			
12	AF	P?	Z	19 15(00)			
12	AF	e	Z	19 55±			
12	AF	e	Z	20 25±			
12	AF	e	Z	20 30(00)			
		i	Z	(36)			
12	AF	e	Z	20 46±			
12	AF	e	Z	21 28(20)			
		i	Z	29(15)			
12	AF	e	Z	21 45±			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 13	AF	P	Z	03	13	(00)						
		S	Z			(45)						
13	AF	P?	Z	03	17	(00)						
		1S	Z			(21)						
13	AF	1P	ZN	03	52	53						
13	AF	e	Z	08	19	±						
13	AF	e	Z	08	23	±						
13	AF	e	Z	09	17	±						
13	AF	e	Z	10	20	±						
13	AF	e	Z	10	26	±						
13	AF	e	Z	11	12	±						
13	AF	e	Z	11	21	±						
13	AF		Z	12	10	±						
13	AF	e	Z	12	18	±						
13	AF	e	Z	13	12	±						
13	AF	e	Z	15	29	±						
13	AF	P	Z	16	43	(35)						
		(S)	Z			(55)						
		i	Z			45(51)						
13	AF	P?	Z	17	17	(00)						
		1S	Z			(12)						
13	AF	1P	ZN	17	26	40						
		S	N			58						
13	AF	1P	ZN	18	18	41						
		1S	N		19	02						
		i	N			26						
13	AF	P	Z	18	59	(00)						
		(S)	Z			(45)						
13	AF	1P	ZN	19	03	(25)d						
		S	ZN			(38)						
14	AF	e	Z	01	21	±						
14	AF	1P	ZN	04	38	57						
		e	N		39	08						
		(S)	Z			27						
		i	Z		40	37						
14	AF	e	Z	05	32	±						
14	AF	i(PKP)	Z	14	34	37u	1½	2				
14	AF	e	Z	21	08	±						
					1	09						
						28						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 15	AF	P	ZN	01	40	21						
		S	ZN		41	12						
		(L)	N			40						
		i	ZN		44	52						
15	AF	e	Z	02	08	±						
15	AF	e	Z	02	56	±						
15	AF	e	Z	13	30	±						
15	AF	e	Z	16	02	±						
15	AF	e	Z	16	34	±						
15	AF	eP	Z	16	52	(35)	1	2				
15	AF	P	Z	17	13	(38)						
		i	Z		14	(22)						
15	AF	e	Z	17	43	±						
15	AF	P	Z	17	47	(05)						
		e	Z		48	(55)						
15	AF	e	Z	18	22	±						
15	AF	P	Z	18	32	(40)						
		S	Z		33	(07)						
15	AF	1P	Z	19	55	(27)	1	2				
		eS	Z	20	04	.0	1	-				
		eSS	Z		08	.0	½	10				
15	AF	e	Z	23	28	±						
16	AF	P?	Z	05	43	(15)						
		S	Z			(42)						
16	AF	P?	Z	12	14	(12)						
		(S)	Z			(25)						
16	AF	1P	Z	12	47	(35)						
		(S)	Z		49	(03)						
17	AF	1P	Z	12	36	(00)u						
		e	Z		37	(12)						
17	AF	e	Z	13	50	±						
17	AF	P	Z	19	00	(35)						
		1S	Z			(55)						
17	AF	P	Z	21	04	(13)						
		(S)	Z		05	(50)						
18	AF	P?	Z	00	00	(00)						
		S	Z			(20)						
18	AF	e	Z	00	11	±						
18	AF	e	Z	01	58	±						
18	AF	e	Z	02	23	±						

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
SEP 18	AF	P	Z	08 20(30)			
		S	Z	(50)			
18	AF	P	Z	09 26(40)			
		S	Z	(58)			
18	AF	e	Z	11 34±			
18	AF	e(P)	Z	15 49(25)			
		(S)	Z	53(35)			
18	AF	e	Z	16 43±			
18	AF	e(P)	Z	17 20(18)			
		e	Z	21(00)			
		(S)	Z	25(30)			
18	AF	e	Z	17 36±			
18	AF	e	Z	23 52±			
19	AF	e	Z	01 12±			
19	AF	e	Z	07 55±			
19	AF	e	Z	08 24±			
19	AF	iP	Z	11 57(45)u			
		(S)	Z	58(05)			
19	AF	P	Z	12 23(43)			
		(S)	Z	24(11)			
19	AF	eP	Z	12 27(40)			
		(S)	Z	28(00)			
19	AF	P	Z	17 17(00)			
		S	Z	18(33)			
19	AF	P	Z	18 46(43)			
		S	Z	47(28)			
19	AF	(P)	Z	18 51(00)			
19	AF	P	Z	21 26(25)			
		(S)	Z	(54)			
20	AF	P?	Z	04 38(52)			
		S	Z	39(27)			
20	AF	e	Z	11 20±			
20	AF	iP	Z	11 59(52)d			
		(S)	Z	12 01(48)			
20	AF	P?	Z	14 17(30)			
		S	Z	(48)			
20	AF	eP	Z	17 16 20		1 2	
		e	N	23			
				45			
						20 1	
				13u		2 1	
				46		1½ 2	½ 1
							½ 2

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te	
SEP 20	AF	P	Z	22 47(38)				
		(S)	Z	48(02)				
21	AF	P	Z	03 18(11)				
		S	Z	(30)				
21	AF	eP	Z	04 05(50)				
		S	Z	06(08)				
21	AF	e(L)	ZN	06 56±				
21	AF	iP	Z	07 51(00)u				
		iS	ZN	(37)				
21	AF	P	Z	09 46(32)				
		i	Z	(43)				
		iS	ZN	47(03)				
21	AF	iP	ZN	12 32 12u				
		iS	ZN	42				
21	AF	iP!	ZN	13 29 45				Felt: Apia MM2.
		S	ZN	30 15				
21	AF	iP	Z	13 59 22u				
		iS	ZN	14 00 00				
21	AF	eP	Z	16 37(40)				1 3?
		e	Z	38(41)				1 1
		i	Z	41(10)d				2 2
21	AF	P?	Z	22 13(55)				
		S	Z	14(27)				
21	AF	iP	Z	22 16(07)u				
		(S)	Z	27				
22	AF	e	Z	00 57±				
22	AF	P	Z	03 13(40)				
		S	Z	14(05)				
22	AF	e(P)	Z	03 26(25)				
		(S)	Z	29(48)				
		e	ZN	33(28)				
22	AF	iP	ZN	03 57 30				
		iS	ZN	51				
22	AF	e?	N	10 47(48)				hours?
22	AF	e	N	48(05)				
		e	N	50(10)				
22	AF	P	N	19 10 30				1 2
		e(S)	N	14 00				½ 1
		e(S)	N	16				1 3
		(L)	N	15.1				1 -
25	AF	eL	N	15 31±				
26	AF	e	Z	07 09±				
27	AF	P	Z	01 55(23)				
		S		(40)				

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 27	AF	e	Z	10	28	±						
27	AF	iP	Z	12	22	(23)						
		(S)	Z		23	(55)						
27	AF	iP	ZN	13	55	42						
		iS	N		56	09						
27	AF		Z	15	31	±						
27	AF	iP	ZN	16	13	44						
		S	ZN		14	04						
28	AF	P	Z	01	54	(30)						
		S	Z			(49)						
28	AF	P?	Z	17	40	(50)						
		S	Z		41	(34)						
		i	Z			(52)						
28	AF	e	Z	19	42	±						
29	AF	iP	ZN	00	04	22u?	1	1	½	2		
		i	ZN			38	5	3	1½	2		
		i	ZN			59	13	-	6	3?		
29	AF	P?	ZN	14	23	55						
		S	ZN		24	19						
		e	ZN			57						
29	AF	e	Z	16	03	±						
29	AF	e	Z	19	12	±						
29	AF	e	Z	21	22	±						
29	AF	e	Z	22	52	±						
30	AF	e	Z	07	25	±						
30	AF	e	Z	08	45	±						
30	AF	e	Z	09	27	±						
30	AF	P?	Z	13	18	(10)						
		S	Z			(30)						
OCT 1	AF	P?	Z	00	09	(05)						
		S	Z			(37)						
1	AF	P	Z	06	16	02						
		S	ZN			17						
1	AF	i(PP)	Z	09	38	57u	2	5				
		e(SS)	ZN		46	37	2	15				
		e(Lr)	ZN		55	.0	1	25	½	25		
1	AF	P	Z	17	59	42						
		S	ZN	18	00	19						
2	AF	P	Z	12	24	(25)						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 2	AF	P	Z	20	17	(43)						
		S	Z		18	(10)						
3	AF	iP	Z	07	41	(40)u						
		S	Z		42	(11)						
3	AF	iP	Z	12	04	(05)						
		(S)	Z		06	(10)						
3	AF	e	Z	13	29	±						
3	AF	P	Z	17	46	(20)						
		S	Z			(36)						
3	AF	P	Z	18	25	07						
		S	ZN			29						
		e	ZN			50						
3	AF	eP	Z	18	32	24						
		i	Z			31						
		S	ZN			51						
		e	Z		34	51						
3	AF	iP	Z	23	50	(45)						
		S	Z		51	(05)						
4	AF	iP	Z	11	17	(33)						
		iS	Z			(52)						
4	AF	iP	ZN	11	57	51d						
		iS	ZN		58	26						
4	AF	eiP	Z	14	24	43						
		e	Z		26	18						
4	AF	eP	Z	18	14	23						
		e	Z			28						
4	AF	eP	Z	23	33	(00)						
		S	Z			(45)						
4	AF	eiP	Z	23	40	(35)						
		e	Z		42	(10)						
5	AF	e	Z	00	58	ca						
5	AF	eP?	Z	02	33	(07)						
		i(S)	ZN			(24)						
		e	Z		35	(09)						
5	AF	eP?	ZN	05	07	(29)						
		i(S)	ZN			(44)u						
		i	Z		08	(06)						
5	AF	e	Z	13	53	ca						
5	AF	iP	Z	20	33	(20)						
		(S)	Z			(55)						
5	AF	e(P)	Z	21	03	(05)						
		(S)	Z		05	(08)						
5	AF	e?	Z	21	15	ca						

Date	Stn	Phase		h m s	Az	Tz	An	Tn	Ae	Te
OCT 5	AF	iP	Z	22 09 51						
		S	Z	10 13						
5	AF	P?	Z	23 01(37)						
		S	Z	(55)						
6	AF	iP	Z	00 51 35u	1	2				
		e(S)	ZN	55 03						
		(S)	ZN	12			½	1		
6	AF	e	Z	01 06ca						
6	AF	iP	Z	02 11 26						
		S	Z	13 33						
6	AF		Z	08 19ca						
6	AF	eP?	Z	09 58(40)						
		S	Z	59(08)						
6	AF	P	Z	19 08(52)						
		S	Z	09(08)						
6	AF	e?	Z	20 36ca						
6	AF	iP	Z	21 18 41						
		(S)	Z	21 36						
	AF	e	Z	23 16						
6	AF	i(P)	Z	22 35(45)						
7	AF	iP	Z	01 41(48)u						
		S	Z	43(23)						
7	AF	P?	Z	01 52 05						
		iS	Z	48						
7	AF	e	Z	03 48(40)						
		e	Z	50(00)						
7	AF	iP	Z	05 54(37)						
		iS	Z	55(03)						
7	AF	P	Z	06 44(57)						
		S	Z	45(30)						
7	AF	iP	Z	11 17(52)d						
		S	Z	19(20)						
7	AF	eP	Z	12 39 49	1	2				
		e	Z	40 13	2	5				
		eS	Z	45 34	1	-				
		eLr	ZN	50.0	2	30				
		M	Z	51	3	22				
7	AF	P	Z	15 35 22						
		(S)	Z	42						
7	AF	e	Z	15 53±						
7	AF	iP	Z	19 18(40)						
		iS	Z	19(00)						

Date	Stn	Phase		h m s	Az	Tz	An	Tn	Ae	Te
SEP 7	AF	P?	Z	20 02(15)						
OCT		S	Z	(50)						
		e	Z	06						
		e	Z	10						
7	AF	e	Z	20 25±						
8	AF	eP?	Z	03 44(00)						
		(S)	Z	45(18)						
8	AF	iP	Z	07 12(30)u						
		e(S)	Z	14(15)						
8	AF	e(P)	Z	11 16(00)						
		e(S)	Z	18(45)						
8	AF	e	Z	11 32.0						
8	AF	iP	ZN	14 12 18u						
		i	Z	25d						
8	AF	iP	ZN	14 26 42u						
		iS	ZN	27 02						
8	AF	P?	Z	15 58(00)						
		(S)	Z	59(05)						
8	AF	iP	Z	16 33(00)u						
		S	Z	(55)						
8	AF	eP	Z	21 38 02						
		S	Z	51						
8	AF	eP	Z	23 22 52						
		S	ZN	23 10						
9	AF	iP	Z	04 03 49						
		iS	Z	04 05						
9	AF	P	ZN	10 04 16						
		e	ZN	30						
		i	Z	44						
		S	ZN	47						
		i	ZN	59						
		i	Z	05 08						
		i	Z	06 31						
9	AF	e	Z	11 34±						
9	AF	P?	Z	11 53(10)						
		S	Z	54(00)						
9	AF	eL	ZN	12 10±						
9	AF	e	Z	12 37±						
9	AF	eP	Z	14 23(00)						
		S	Z	(22)						
9	AF	P?	Z	19 39(25)						
		S	Z	(42)						
9	AF	P?	Z	20 49(30)						
		S	Z	50(37)						

Date	Stn	Phase		h m s	Az	Tz	An	Tn	Ae	Te
OCT 9	AF	iP	Z	23 27 29						
		S	ZN	49						
10	AF	e	Z	02 14±						
10	AF	P?	Z	04 33(40)						
		S	Z	34(13)						
10	AF	e	Z	06 01±						
10	AF	P	Z	09 49(50)						
		S	Z	51(25)						
10	AF	e	Z	13 42±						
10	AF	e	Z	13 50±						
10	AF	e	Z	19 32±						
10	AF	e	Z	20 29±						
10	AF	P	ZN	21 01 03						
11	AF	P	Z	03 09(34)						
		(S)	Z	10(07)						
11	AF	e	Z	04 01±						
11	AF	P	Z	08 06(00)						
		(S)	Z	07(48)						
11	AF	e	Z	10 01±						
11	AF	P?	Z	10 47(35)						
		S	Z	(49)						
11	AF	P	Z	14 46(47)						
		S	Z	47(18)						
11	AF	e	Z	15 00.5±						
11	AF	P	Z	16 58 32						
		S	Z	59 03						
11	AF	e	Z	17 56±						
11	AF	iP	Z	18 07 00						
		S	ZN	20						
12	AF	e	Z	00 01±						
12	AF	e	Z	01 22±						
12	AF	e	Z	04 47±						
12		P	Z	06 43(25)						
		(S)	Z	(52)						
12	AF	iP	ZN	09 46 11d	2	2	1	1		
		(S)	ZN	47 04	2	2	2	2		
		i	Z	09	7	2				

Date	Stn	Phase		h m s	Az	Tz	An	Tn	Ae	Te
OCT 12	AF	P?	Z	14 43(00)						
		S	Z	(20)						
12	AF	iP	ZN	15 29 48d	3	2	1½	2		
		e	Z	30 50	1	1	½	2		
12	AF	(P)	Z	18 08(00)						
12	AF	e	Z	23 20±						
12	AF	e	Z	23 30±						
13	AF	e	Z	09 30±						
13	AF	P?	Z	09 57(08)						
		S	Z	(28)						
14	AF	i(P)	Z	12 36(32)d						
14	AF	P	Z	18 15 55d						
		S	ZN	17 10						
14	AF	P	Z	19 28(00)						
		S	Z	(20)						
14	AF	P	Z	22 40 17						
		S	Z	59						
15	AF	P	Z	05 46 53						
		iS	ZN	47 41						
		e	Z	50 44						
15	AF	P	Z	07 56(10)						
		S	Z	57(18)						
15	AF	e	Z	11 39±						
15	AF	P	ZN	18 29 10						
		i	Z	20						
		i	Z	30						
15	AF	eP	Z	18 50 04						
		iP	Z	05u						
15	AF	e	Z	19 56±						
16	AF	P	Z	08 25(24)						
		S	Z	(50)						
16	AF	P	Z	15 37 18						
		i	Z	29						
		S	ZN	38						
16	AF	iP	ZN	18 07 55d						
16	AF	iP	Z	19 25(20)d						
		S	Z	26(20)						
16	AF	iP!		22 53 22u						
		iS	Z	54 02						
16	AF	P	Z	23 33(08)						
		S	Z	30						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 17	AF	e	Z	05	43±							
17	AF	P	Z	08	37(20)							
17	AF	iP	ZN	10	26	01d	1	1				
		i	Z			41d						
		iS	ZN		27	27	1	2	1	2		
		e	Z		32							
		e	Z		35							
18	AF	P?	Z	00	01(00)							
		S	Z			(20)						
18	AF	iP	Z	04	03	57d						
		S	Z		04	22						
18	AF	iP	Z	09	04	48d						
		iS	ZN		05	53						
18	AF	P	Z	13	55	29						
		S	ZN			46						
18	AF	P?	Z	14	10(00)							
		S	Z			(15)						
18	AF	P	Z	17	37(12)							
		S	Z			(32)						
18	AF	P	Z	19	26(00)							
		S	Z			(22)						
19	AF	eP	ZN	01	55	08	2	1	<½	-		
		i	Z			11	5	1				
		i	Z			17	5	-				
		S	Z			58	3	2				
		e	Z		56	11	3	3				
		i	ZN			25	4	3	2	2		
		(L)	ZN			36	6	7	3	3		
		eL	N		57	13			4	7		
19	AF	P?	Z	01	59	10						
		S	ZN			50						
		(L)	ZN	02	00	13	8	5	10	5		
		M	Z			28	42	7				
19	AF	(S)	ZN	02	03	01						
19	AF	e	Z	02	10±							
19	AF	e	Z	02	12±							
19	AF	P	ZN	02	15	15						
		S	ZN		16	05						
		(L)	ZN			28						
19	AF	P?	Z	02	19	01						
		i(S)	ZN		20	01						
		(L)	ZN			23						
19	AF	(S)	Z	02	23	23						
19	AF	e	Z	02	33e							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 19	AF	e	Z	02	54±							
19	AF	P	ZN	03	55	33						
		i	Z			38						
		i	Z			41						
19	AF	e	Z	04	45½							
		e	Z		49							
19	AF	e	Z	06	26±							
19	AF	e	Z	06	55							
		e	Z		59							
19	AF	e	Z	10	02±							
19	AF	P	Z	11	47	27						
		i	ZN			32						
		i	Z			52						
		e	ZN		51	39						
19	AF	e	Z	12	16±							
19	AF	e	Z	12	27±							
		e	Z		29							
19	AF	e	Z	12	49±							
19	AF	e?	Z	15	25	42						
		iP	ZN			45u						
		i	Z			55						
		i	Z		26	05						
19	AF	iP	ZN	15	37	28d						
		S	ZN		38	18						
		L	ZN			38						
19	AF	e(S)	ZN	15	42	06						
		i(S)	ZN			13						
		L	ZN			38						
		i	Z		44	33						
19	AF	i(P)	Z	18	13(00)d							
19	AF	e	Z	19	17±							
19	AF	e	Z	20	47±							
19	AF	e	Z	23	13±							
20	AF	eP	ZN	01	24	13(u)	2	2	½	-		
		i	ZN			32u	9	2	½	2		
		e(S)	Z		34	31	2	12				
		eLr	Z		48		1	40				
20	AF	(S)	ZN	01	50	33						
20	AF	e	Z	02	43±							
20	AF	P?	Z	03	53(25)							
		S	Z		54(37)							
20	AF	P	Z	04	22(00)							
		S	Z			(19)						

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 20	AF	e	Z	05 08±			
20	AF	e	Z	05 36±			
20	AF	e	Z	06 30±			
20	AF	P?	Z	06 42(37)			
		S	Z	(57)			
20	AF	e	Z	07 06±			
20	AF	P	Z	08 02(21)			
		S	ZN	(41)			
20	AF	P	Z	09 26(10)			
		S	ZN	(33)			
20	AF	e	Z	13 08±			
20	AF	e	Z	13 43±			
21	AF	1P	ZN	06 25(05)u	5 1		
21	AP	eP		17 36 56			
		eS		39 44			
23	AP	1P		16 45 43			
		S		(59)	Felt: Apia MM1		
23	AP	eP		19 42 46			
		eS		43 42			
25	AP	eP		10 08(04)			
		S		(37)			
25	AP	1		10 11 26			
25	AP	eP		13 03 44			
		eS		04 56			
26	AF	1P	ZN	09 20 15(d)			
		S	ZN	25			
		e	Z	22 25			
26	AF	PY	Z	13 04(35)			
		S	Z	(55)			
26	AF	P?	Z	13 54(00)			
		(S)	Z	(25)			
26	AF	e	Z	22 43±			
26	AF	P	Z	22 51(18)			
		S	Z	(34)			
26	AF	P	Z	22 53(48)			
		S	Z	54(08)			
28	AF	e	Z	05 17±			
28	AF	1P	Z	05 21 26u			

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 28	AF	1P	Z	10 00 49			
		i	Z	01 09			
		S	ZN	29			
		eL	Z	02 09			
		e	N	26			
28	AF	P?	Z	10 04 17			
		(S)	ZN	32			
		i(S)	Z	45			
28	AF	P?	Z	16 57 48			
		S	Z	58 10			
28	AF	P	Z	17 02 05			
		S	Z	26			
28	AF	P	Z	21 04(00)			
		S	Z	(19)			
28	AF	eP	Z	22 13 42			
		1P	Z	43d			
		e	Z	17 07			
29	AF	P	Z	00 02 16			
		S	ZN	56			
		eL	ZN	03.7			
29	AF	P?	Z	00 05 14			
		(S)	ZN	44			
		i	Z	06 01			
29	AF	P	Z	06 51(50)			
		S	Z	52(25)			
29	AF	eP	Z	07 46 38			
		S	ZN	58			
29	AF	eP?	Z	07 54			1 2
		e(S)	ZN	08 04 08			2 20 2 20
		eLr	ZN	14			3 35 1 35
		M	ZN	20			4 20 1 20
		e	ZN	27			
29	AF	e	Z	09 05±			
29	AF	e	Z	15 27±			
29	AF	1P!	ZN	17 57 44d			
29	AF	P	Z	22 12(20)			
		S	Z	13(08)			
30	AF	e	Z	04 31±			
30	AF	eP	Z	04 54 40u			
		1S	ZN	55 06			
30	AF	eP	ZN	06 40 52d			
		1S	ZN	41 32			
30	AF	1P	ZN	07 56 55d			
		1S	ZN	57 15			
		i	Z	58 55			
		i	Z	59 55			

Date	Stn	Phase		h m s	Az	Tz	An	Tn	Ae	Te
OCT 30	AF	iP	ZN	10 06 57d						
		S	ZN	08 22						
30	AF	P	Z	13 51(00)						
		S	Z	(20)						
30	AF	P?	Z	16 32 20						
		(S)	ZN	55						
		e	ZN	36 00						
30	AF	P	Z	19 29(33)						
		S	Z	(54)						
NOV 3	AF	P	ZN	07 37 24						
		S	ZN	41 16						
		(SS)	ZN	37						
3	AF	e(S)	ZN	10 41 57						
3	AF	e(S)	ZN	18 51 40						
4	AF	e	Z	07 43 57						
		e?	N	44 04						
		e(S)	N	22						
		e(S)	Z	30						
5	AF	iP	ZN	06 52 13u						
		S	ZN	33						
5	AF	e	Z	07 41±						
5	AF	P	ZN	13 01 25						
		S	ZN	02 17						
6	AF	(S)	ZN	00 49 23						
6	AF	(S)	ZN	03 19 23						
6	AF	P?	Z	06 32 50						
		S	ZN	33 23						
6	AF	eP	ZN	23 09 06u	2½	2	½	-		
		iP	ZN	10dn	15	7?	2½	4		
		i	Z	25u	29	5				
		(PPP)	ZN	13 43	12	-	2	-		
		eS	ZN	17 48s	6	-	4	-		
		iS	ZN	18 08ds	10	53	12	15		
		i(ScS)	N	35			30	33		
		eSS	N	21.5			3	40?		
		e	Z	22.5	33	20				
		eLq	ZN	26 10			10	35		
		e	Z	27.3	23	30				
		eLr	ZN	28.3	46	40?	10	30		
		M	ZN	31	110	20	70	25		
		M	Z	38±	75	20				
7	AF	P	Z	04 26 17						
		S	ZN	41						
7	AF	iP!	Z	07 48 51(u)						
		e(S)	ZN	50 21						

Date	Stn	Phase		h m s	Az	Tz	An	Tn	Ae	Te
NOV 7	AF	iP	Z	20 27 35						
		e(S)	N	30.1						
7	AF	P	Z	23 55 00						
		S	Z	54						
8	AF	P	Z	02 23 08						
		iS	ZN	27						
8	AF	e(P)	Z	06 53 35						
		e(S)	Z	57 27						
8	AF	iP!	ZN	07 16 45d						
		iS	ZN	17 05						
8	AF	e	Z	09 32 54						
		eP	Z	34 14						
		eL	ZN	10 00.3						
8	AF	e	Z	13 34 26						
8	AF	P	Z	16 23 11						
		S	Z	31						
8	AF	P	Z	17 51 01						
		S	ZN	45						
9	AF	P?	Z	00 15 48						
		S	Z	16 19						
9	AF	P	Z	03 46 11						
9	AF	(P)	Z	07 02 40						
		(S)	Z	06 30						
9	AF	iP	ZN	08 21 25u						
		S	ZN	45						
9	AF	e(P)	Z	11 26 57						
9	AF	iP	ZN	11 38 57u						
		S	ZN	39 29						
9	AF	e	Z	13 12±						
9	AF	e	Z	17 13±						
10	AF	(P)	Z	07 27 02						
10	AF	P	Z	18 16 47						
		S	Z	17 57						
10	AF	e	Z	21 13±						
10	AF	e	Z	21 29±						
11	AF	e	Z	00 53±						
11	AF	e	Z	01 35±						
11	AF	e	Z	03 13±						
11	AF	e	Z	05 16 25						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 11	AF	P	Z	05	32	05						
		S	Z			24						
11	AF	P	Z	06	40	22						
		S	Z			43						
11	AF	iP	ZN	11	38	07d?						
		iS	ZN			27						
11	AF	eP	Z	13	04	01						
		e	Z		06	06						
11	AF	P	Z	13	25	09						
		S	Z			29						
11	AF	e	Z	15	11±							
11	AF	eP	Z	15	29	50						
		(S)	Z		30	00						
11	AF	e	Z	18	12±							
11	AF	e	Z	18	59±							
11	AF	e	Z	19	41±							
12	AF	e	Z	01	43±							
12	AF	e	Z	03	13±							
12	AF	iP	Z	10	46	18d						
		i	Z			27u?						
		eL	Z		56							
12	AF	e	Z	18	06±							
12	AF	e	Z	18	38±							
12	AF	e	Z	18	55±							
12	AF	e	Z	19	18±							
12	AF	e	Z	19	33±							
12	AF	iP	ZN	19	38	48d						
		iS	ZN		39	12						
12	AF	e	Z	19	50±							
12	AF	e	Z	20	07±							
12	AF	e	Z	20	14±							
12	AF	e	Z	20	25±							
12	AF	eP	Z	20	34	30u	3	-	-	-		
		i	Z			45d	4	-	-	-		
		i(PcP)	ZN			56u	2	-	½			
		eS	ZN		43	35	4	15	2	15		
		eLq	ZN		51½		2	25	2	30		
		eLr	ZN		54½		3	30	3	25		
		M	ZN		57		17	25	4	25		
							11	20	3	20		
							12	17	3	2-		
							6	17				

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 12	AF	eP?	Z	21	48	31						
		(S)	Z		49	18						
12	AF	e(P)	Z	22	31	34						
		(S)	Z			41						
13	AF	e	Z	00	02±							
13	AF	iP!	ZN	02	40	04u						
		iS	N			27						
13	AF	P?	Z	05	30	32						
		(S(	Z	31	01							
13	AF	e	Z	08	08±							
13	AF	e	Z	08	14±							
13	AF	P	Z	08	58	28						
		S	Z			38						
13	AF	P?	Z	11	03	10						
		S	Z			28						
14	AF	P?	Z	04	54	38						
		S	Z		55	00						
14	AF	P	Z	05	21	27						
14	AF	eP	Z	05	45	57						
14	AF	e	Z	07	00±							
14	AF	P	Z	11	15	18						
		iS	Z			39						
14	AF	P	Z	13	49	22						
		S	Z			40						
14	AF	iP	Z	13	58	10						
		e	Z			30						
		eLr	Z	14	12							
14	AF	e	Z	16	55±							
15	AF	e(P)	Z	03	28	41						
15	AF	e	Z	06	02±							
15	AF	iP	Z	07	05	06u						
16	AF	P?	Z	04	42	(29)						
		S	Z		43	(10)						
		e	Z		46	(08)						
16	AF	P	Z	06	32	(10)						
		S	Z			(31)						
16	AF	e	Z	07	05±							
16	AF	eP	ZN	09	56	43						
		i	Z			50						
		i	Z			59						
		S	ZN		57	10						
		i	Z			21						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 16	AF	i(P)	Z	15	59	32						
16	AF	iP	ZN	17	45	24d	13	1	2	2		
		i	Z			32	25	2				
		i	N			35			10	2		
		iS	ZN			55	Felt: Apia MM2.					
16	AF	P	Z	18	07	01						
16	AF	P?	Z	19	05	29						
		S	Z			52						
16	AF	iP	Z	20	46	06u						
		iS	Z			27						
17	AF	P	Z	01	02	48						
		(S)	Z		03	10						
17	AF	P	Z	03	20	03						
		S	Z			39						
17	AF	e	Z	08	33±							
17	AF	iP	Z	09	33	06u						
		iS	Z			39						
17	AF	P	Z	09	52	05	1½	2				
		e(SS)	N		57.8				2	15		
		eL	Z		58.8		2	20				
18	AF	P	ZN	04	55	06						
		S	ZN			30						
		i	Z			35						
19	AF	P	ZN	03	58	32						
		(S)	ZN	04	01	48						
		(S)	N			52						
19	AF	iP	Z	04	55	07						
		S	ZN			27						
19	AF	iP	ZN	07	33	27						
		S	ZN			47						
19	AF	eP	Z	11	23	30						
		(S)	Z			40						
		i	Z		26	02						
19	AF	eP	Z	16	53	25						
		S	ZN			57						
		i	Z		56	37						
19	AF	iP	ZN	18	00	27						
		S	ZN			56						
19	AF	e	Z	18	36	04						
19	AF	P	ZN	18	38	13						
		S	ZN			41						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 19	AF	iP	ZN	20	54	03						
		S	ZN			21						
20	AF	P	Z	01	43	31						
		(S)	ZN		45	26						
20	AF	P	ZN	07	30	40						
		S	ZN		31	08						
20	AF	i(P)	Z	07	33	16						
20	AF	iP	ZN	09	44	22u						
20	AF	iP	ZN	20	27	54d?						
		iS	ZN		28	14						
20	AF	P	Z	23	26	56						
		S	Z		27	35						
21	AF	P?	Z	00	22	51						
		S	Z		23	26						
21	AF	e	Z	02	32ca							
21	AF	P	Z	03	22	23						
		(S)	Z			44						
21	AF	eP	Z	09	36	28						
		e	N			50						
		(S)	Z		37	01						
		e(S)	ZN			10						
		e	Z		38	28						
21	AF	P	Z	09	40	08						
		S	ZN			50						
		e	ZN		43.7							
21	AF	iP	Z	11	03	58						
		S	Z		04	40						
		e	Z			45						
22	AF	(S)	Z	00	28(30)							
22	AF	iP	Z	01	00(30)d							
		S	Z			(50)						
22	AF	e	Z	02	02±							
23	AF	(S)	Z	06	44(30)							
23	AF	P?	Z	09	10(00)							
		S	Z			(30)						
25	AF	e	Z	06	12±							
26	AF	(P)	Z	07	51	24						
26	AF	P	Z	23	15	27						
		S	ZN			47						
27	AF	i(P)	Z	14	14	08d						
		e	Z		19	28						

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
NOV 27	AF	P?	Z	14 50 21			
		S	Z	51 08			
27	AF	P	ZN	19 25 41			
		S	ZN	26 10			
27	AF	e	Z	21 06±			
28	AF	e	Z	02 25±			
28	AF	e	Z	04 32±			
28	AP	eP	E	10 34 48			
		iS	E	35 34w			1.5 0.6
29	AP	eP	N	04 50 26			
		eP	E	29			
		eS	NE	52 58		0.5 0.4	
29	AP	iP	NE	10 39 56		1.7 0.3	
		S	NE	40 34sw		6± 0.3	
DEC 2	AF	P	Z	05 13 40			
		(S)	Z	16 31			
2	AF	e	Z	06 14±			
2	AF	P	Z	06 41 14			
		S	Z	31			
2	AF	P	Z	07 12 02			
		S	ZN	12			
2	AF	(S)	Z	07 15 02			
		(S)	N	09			
2	AF	iP	ZN	07 19 59u			
		(S)	Z	20 09			
		(L)	N	34			
2	AF	(P)	Z	07 22 41			
		(S)	ZN	49			
2	AF	e	Z	10 05±			
2	AF	P	Z	10 13 34			
		iS	ZN	55			
2	AF	iP	Z	16 18 29			
		S	Z	57			
2	AF	iP	Z	23 20 56			
		iS	Z	21 16			
3	AF	P	Z	17 11 00			
		S	Z	21			
3	AF	e	Z	18 22±			
3	AF	P	Z	22 39 47			
		S	Z	40 08			

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
4	AF	P	Z	00 59 21			
		S	Z	40			
4	AF	i(P)	Z	09 36 16u			
4	AF	eP	Z	10 17 55			
		(S)	ZN	18 22			
		i	Z	34			
		i	ZN	20 21u			
4	AF	P	Z	12 12 36			
		S	Z	44			
4	AF	P	Z	17 36 50			
		S	ZN	37 23			
		i	Z	40 05			
4	AF	iP	Z	19 39 08d			
		e	N	14			
		S	ZN	42			
4	AF	iP	ZN	21 01 22(u)			
		iS	ZN	44			
4	AF	P	Z	22 05 44			
		S	ZN	06 20			
5	AF	e	Z	00 40±			
5	AF	P?	Z	07 32 06			
		S	Z	49			
6	AF	e	Z	03 24±			
6	AF	P	ZN	06 23 00			
		(S)	Z	35			
6	AF	e	Z	07 34±			
6	AF	(S)	Z	12 16 34			
6	AF	e	Z	15 38±			
6	AF	P?	Z	16 31 27			
		S	Z	45			
6	AF	e	Z	23 05±			
7	AF	e	Z	00 32±			
7	AF	iP	Z	02 56 28			
7	AF	eP?	Z	05 59 27			
		S	ZN	55			
7	AF	eP?	Z	06 52 18			
		(S)	Z	45			
7	AF	P	Z	10 44 00			
		S	ZN	21			
7	AF	(P)	Z	11 26 11			
7	AF	e	Z	14 02±			

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
DEC 7	AF	e	Z	16 28±			
7	AF	e	Z	21 04±			
7	AF	e	Z	21 51±			
7	AF	iP	ZN	22 48 12d			
		S	ZN	28			
8	AF	e	Z	04 54±			
8	AF	e	Z	05 26±			
8	AF	P	Z	09 35 02			
		S	ZN	34			
8	AF	P	Z	19 22 12			
		S	Z	55			
		e	Z	25 57			
9	AF	eP	Z	02 43 48			
9	AF	P?	Z	06 04 56			
		S	ZN	05 25			
9	AF	e	Z	06 30±			
9	AF	e(P)	Z	12 22 36			
9	AF	iP	Z	17 50 17			
		S	Z	51 17			
9	AF	P?	Z	23 25 58			
		S	Z	26 13			
10	AF	P	Z	03 30 08			
		i	Z	21			
		S	ZN	34			
		e	Z	32 21			
10	AF	iP	ZN	07 07 59u	6 1	2 1	
		e	N	09 17		1 15	
		e	Z	27	4 15		
		i	Z	11 30d	7 1		
		e(PeP)		12 17		1 3	
		e	Z	30	4 1		
		e(SS)N		13 27		1 25	
10	AF	P?	Z	07 32 44			
		(S)	Z	34 47			
10	AF	e(P)	Z	12 54 04			
10	AF	P?	Z	15 50 44			
		S	Z	51 05			
10	AF	P	Z	18 29 43			
		S	Z	30 16			
11	AF	e	Z	05 35±			
11	AF	e	Z	09 38			

Date	Stn	Phase		h m s	Az Tz	An Tn	Ae Te
DEC 11	AF	P?	Z	15 21 04			
		S	Z	26			
11	AF	P	Z	23 09 03			
		S	Z	19			
11	AF	(P)	Z	23 59 38			
12	AF	e?	Z	02 12 48			
		i	Z	14 50			
12	AF	iP	ZN	02 19 15d			
		S	ZN	58			
12	AF	iP!	ZN	03 01 31u			
		iS	ZN	52n			
12	AF	iP	ZN	03 59(30)			
		S	ZN	04 00(00)			
12	AF	P	Z	09 44(27)			
		S	ZN	(50)			
12	AF	P	Z	10 40(23)			
		S	ZN	(45)			
12	AF	P	Z	17 57(05)			
		S	ZN	(25)			
12	AF	iP	Z	21 09(27)u			
		S	ZN	(48)			
12	AF	P	Z	21 29(15)			
		S	ZN	(35)			
13	AF	P	Z	00 04(55)			
		S	ZN	05(13			
13	AF	e	Z	00 40±			
13	AF	iP	ZN	05 37(42)u			
		i	Z	38(10)			
13	AF	e	Z	06 33±			
13	AF	P?	Z	13 50(45)			
		S	Z	51(16)			
13	AF	e	Z	17 03±			
13	AF	e	Z	19 38±			
14	AF	P?	Z	02 09(28)			
		S	ZN	(44)			
14	AF	eLq	N	07 36			½ 20
		eLr	Z	38	2 25		
14	AF	e	Z	08 31±			
14	AF	e	Z	18 51±			

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 15	AF	eP	Z	02	15	(25)						
		e	ZN			(35)						
		i	ZN			(40)						
		(S)	ZN			17(00)						
15	AF	eP?	Z	05	34	(43)						
		e	Z			(47)						
		i	ZN			35(00)						
		i	Z			(28)						
		(S)	Z			(56)						
15	AF	P	Z	12	42	(35)						
		(S)	Z			45(35)						
15	AF	e	Z	13	00	±						
15	AF	e	Z	13	28	±						
15	AF	e(P)	Z	15	54	(20)						
		e(S)	Z			58(15)						
15	AF	iP	Z	16	09	(14)d						
		(S)	Z			(52)						
16	AF	(P)	Z	02	19	(38)						
16	AF	P	Z	03	21	(17)						
		(S)	Z			23(45)						
16	AF	e	Z	05	22	±						
16	AF	e	Z	06	34	±						
16	AF	P	Z	11	40	(31)						
		S	Z			(50)						
16	AF	e	Z	13	41	±						
16	AF	P	Z	21	32	(48)						
		S	Z			34(35)						
18	AF	e	Z	04	19	±						
18	AF	iP	Z	08	26	(17)u						
		e	Z			27(42)						
18	AF	e	Z	23	21	08						
		iP	Z		22	20u						
		iS	ZN			40						
18	AF	iP!	Z	23	50	50u						
		iS	ZN		51	15						
19	AF	e(P)	Z	05	48	22						
		e	Z		52	42						
		e	Z		55	02						
19	AF	P	Z	20	21	52						
		S	ZN		22	38						
20	AF	eP	Z	00	49	41						
		S	Z		50	07						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 20	AF	P	Z	01	02	52						
		(S)	Z		03	23						
		e	Z		05	02						
20	AF	e	Z	01	52	±						
20	AF	(P)	Z	01	59	08						
20	AF	e	Z	08	11	±						
20	AF	P?	Z	09	45	16						
		S	Z			51						
20	AF	e	Z	10	08	±						
20	AF	e	Z	14	04	±						
20	AF	P	Z	14	11	21						
		S	Z			43						
20	AF	P	Z	20	29	39						
		(S)	Z			55						
		(S)	Z		30	00						
20	AF	e	Z	22	34	±						
21	AF	e	Z	06	57	±						
21	AF	P	Z	07	55	23						
		S	Z			48						
21	AF	P?	Z	10	01	36						
		e(S)	Z		04	15						
21	AF	P?	Z	10	25	45						
		S	Z		26	20						
21	AF	P	Z	13	06	48						
		(S)	Z		08	35						
21	AF	P	Z	13	14	16						
		S	Z			46						
		e	Z		16	28						
21	AF	P	Z	14	24	26						
		S	Z			49						
21	AF	P?	Z	14	34	(18)						
		S	Z			(38)						
24	AF	eP?	Z	02	36	29						
		(S)	Z			56						
		(S)	Z		37	02						
		e	Z		38	44						
24	AF	eP	Z	06	34	14						
		(S)	Z			56						
		e	Z		39	18						
25	AF	e	Z	08	09	37						
25	AF	iP	Z	08	12	51u		4		4		
		i	Z		13	08u		4		3		
		ePP	Z		14	01		1		2		
		eS	Z		18	44		2		12		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 25	AF	eSSS	Z		21	34	2	-				
		eLr	Z		23	.3	1	25				
		eL	Z		25	.3	3	20				
		M	Z		26		4	20				
		M	Z		31		5	15				
25	AF	P	Z	11	16	16						
		(S)	Z		18	26						
27	AF	P?	Z	09	58	03						
		(S)	Z			45						
		e	Z	10	00	54						
		e	Z		02	35						
27	AF	e	Z	23	48	07						
28	AF	eP	Z	06	46	45						
		iP	Z			46u						
		i	Z			48u						
		e(S)	Z		48	12						
		i(S)	Z			17u						
28	AF	P?	Z	20	03	02						
		iS	Z			35						
28	AF	eP	Z	23	49	07						
29	AF	(S)	Z	00	10	31						
29	AF	e(P)	Z	06	30	10						
29	AF	e	Z	11	12±							
29	AF	e	Z	12	03±							
29	AF	P	Z	13	00	55						
		S	Z		01	23						
29	AF	eP?	Z	15	02	52						
		(S)	Z		03	15						
		e	Z		04	58						
30	AF		Z	00	09±							
30	AF	P	Z	07	47	48						
		S	Z		48	25						
30	AF	e	Z	09	02	.4	1	3				
		e(SSS)	Z		06	.6	1	25				
30	AF		Z	12	20±							
30	AF		Z	14	10±							
30	AF	P	Z	14	28	27						
		S	Z			56						
30	AF	P	Z	14	36	47						
		S	Z		37	08						
30	AF	e	Z	14	42	54						

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 30	AF	P	Z	20	26	55						
		(S)	Z		27	19						
30	AF	P	Z	23	33	55						
		S	Z		35	06						
31	AF	P	Z	01	34	42						
		i	ZN			47						
		(S)	ZN		35	04						
31	AF	e	Z	04	14±							
31	AF	P	Z	14	06	07						
		S	Z			44						
31	AF	P?	Z	14	59	09						
		S	Z			33						
31	AF	iP	Z	17	56	00u						
		iS	Z			20						
31	AF	P?	Z	21	02	38						
		S	Z		03	12						

RAOUL ISLAND

Trace amplitudes given in the column Az are in millimetres, as measured on the screen of a viewer enlarging the original film by a factor of 8.

Date	Phase	h	m	s	Az	
JAN 9	eP	18(00)	06			
	(S)		17			
	i		21			
10	iP	19	15	56		
	(S)		16	18		
	i			25		
	i			34		
	i			53		
22	iP	15	58	11		
	(S)			32±		
	Large amplitudes; trace unreadable for several mins.					
23	iP?	08	56	04		
	e		57	06		
	? seismic: confused with microseisms.					
25	eP	14	25	07±		
	i(S)			25		
	i			29		Small.

Date	Phase	h	m	s	Az	
JAN 30	iP	02	10	49	8	
	(S)		12	03	10	
	i(S)			11	15+	
	Large amplitudes.					
30	i(P)	18	23	20±		
31	e	19	18±			Tremors.
31	iP	22	43	08	8	
	iS		44	28	10±	
				52	20±	
	Large amplitudes; Confused motion.					
MAR 1	e	16	21±			Tremors.
4	iP	22	10	09	3	
	iS			18	12	
7	P?	16	55	13		
	S			24		
	Confused motion.					

Date	Phase	h	m	s	Az	
MAR 7	P?	16	55	13		
	S			24		
	Confused motion.					
7	iP	17	33	35		
	e		35	02		
	Possibly a separate shock.					
	(S)			24		
8	eP	04	04	57	2	
	i		05	00	5	
	i(S)			08	7±	
	i			10	20±	
9	P	12	01	34		
	iS			43		
13	eP	15	24	19		
	iS			30		
	i			32		
14	iP	16	(46)	21	15ca	
	(S)			24		
	Very large amplitudes; trace indistinct.					
14	iP	17	(23)	06		
	iS			10		
14		17	33±			
	Local tremors.					
14	eP	18	(06)	08		
	e			10		
	(S)		(07)	08		
	i			12		
14	e	18	09±			
	Local tremors.					
14	e	18	12±			
	Local tremors.					
14	iP	20	(06)	35	3	
	i			40	5	
	iS			44	12±	
14	eP	20	(33)	59	1	
	(S)		(34)	04	4	
	i			08	13	
14	iP	22	(49)	14		
	i			23		
	i			30		
	i			37		
	(S)			45		
	Phases poorly defined.					
15	e	02	49±			
	Tremors for 3 mins.					

Date	Phase	h	m	s	Az	
MAR 15	eP	18	(09)	12	1	
	i			29	6	
	S			49	9	
APR 13	e(P)	15	28	34		
	i			42		
	i			54		
14	P	05	44	27	4	
	In microseisms.					
	i			31	7	
	(S)			50	10	
	(S)			54	6	
	i		45	02	9	
16	e	04	54±		Tremors.	
16	P	05	20	16		
	Conspicuous movements for 3 mins; no definite phases.					
16	P	06	30	04		
	i			10		
	i			18		
	(S)			54±		
17	eP	05	39	11±		
	Tremors follow.					
18	iP	01	04	28	8	
	(S)			43±		
	Large amplitudes; Confused motion.					
19	iP	23	31	36		
	S		32	02		
20	eP	01	07	06	2	
	i			08	8	
	i			23	6	
	(S)			37	10	
20	e	01	15±		Tremors.	
20	e	02	18±		Tremors	
20	P	08	33	46	2	
	i			56	10ca	
	(S)		34	06	10ca	
20	e	10	39±		Tremors.	
20	P	12	04	07	2	
	i			13	10	
	S			23	10ca	
20	P	12	37	20	2	
	i			22	10	
	(S)			45±		
	Large amplitudes.					

Date	Phase	h	m	s	Az	
APR 20	P	15	39	07		
	i			10		
	(S)			29		
20		15	50±		Tremors	
20	P	18	39	44±		
	Tremors follow.					
21	eP?	00	28	05	Very small.	
	i			16		
	(S)			29		
21	P	00	41	16		
	i			27		
	(S)			35		
26		04	33±		Tremors.	
DEC 1	e	05	07±		Tremors.	
1	e	05	35±		Tremors.	
1	P	08	45	07	2	
	i(S)			17	7	
	i(S)			19	12	
1	e	10	03	04		
	Brief tremors.					
1	e	10	21	09		
	Brief tremors.					
1	iP	13	45	09	4	
	i			11	3	
	i			14	3	
	iS			27	4	
	i			33	6	
	i			40	5	
1	e	14	05	45±		
	Tremors for 2 mins.					
1	e(P)?	15	44	43±	Small.	
	iS			51		
1	e	23	05ca		Tremors.	
2	e	00	25	00		
2	iP	01	57	48		
	iS		58	38		
	i			47		
	i			54		
5	e	21	15±			
	Local tremors.					
6	P	06	22	52	3	
	e		24	06	3	
	iS			13	-	
	i			16	20±	
	Large amplitudes.					
	i			28	10±	

Date	Phase	h	m	s	Az	
DEC 6	eP?	16	31	06a		
	Small and doubtful.					
	iS			24		
6	eP	16	35	25		
	eS			44		
	i			46		
7	i	11	(19)	36	Tremors.	
7	eP	15	(15)	10	1±	
	i(P)			12	4	
	i			14	3	
	i			21	3	
	iS			33	25±	
	Large amplitudes for ½ min.					
9	P?	01	(08)	59		
	i(S)		(09)	13		
	i			15		
	Very small.					
9	eP	02	45	21		
	i			24		
	i			35		
	iS		46	13		
9	eP?	03	10	22	Doubtful.	
	e(S)			53		
	i			59		
	i		11	03		
10	i(P)!	05	14	56	5	
	Confused tremors follow.					
	i		15	00	3	
10	e	12	23±		Tremors.	
10	e	18	(00)±			
	Local tremors.					
11	e	01	00±			
	Brief tremors.					
12	eP?	11	22	46		
	Very small and doubtful.					
	S			58	2	
	i		23	00	6±	
24	eiP	03	49	09		
	S			32		
	i			35		
24	e	19	41±		Tremors.	
24	e	20	20±		Tremors.	
25	eP?	00	11	50		
	Very small and emergent.					
	S		12	03	3	
	i			07	12	

Date	Phase	h	m	s	Az
DEC 25	eP?	11	05	50±	
	i(P)			56	
	i		06	00±	
	(S)		07	00±	
25	eP	12	16	50	2
	S		17	07±	8
		In minute mark.			
	i		11		22
27	iP		10(50)16		3
	i		21		15ca
	i(S)		24		35
		Large amplitudes, Confused motion.			
	i		28		50ca
DEC 27	e		23(35)±		Tremors.
28	eP		01(40)08		
	iS			34	
	i			39	
28	e(P)?		10(40)10±		
		Very small and emerg.			
	(S)			21	
	i(S)			23	
28	P?		22(59)42±		
		In minute mark.			
	i			46	3
	(S)			56	3
	i			58	7

SCOTT BASE

The amplitudes quoted in this section are measured in millimetres, on the screen of a viewer which always enlarges the film by a factor of 8.

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 1	eP	Z	Z	10	19	17						
1	e		ZNE	21	40.3							
1	eP		Z	23	12	52						
2	eP		ZN	11	36	02						
2	e		ZN	15	06	50						
2	eP		ZN	19	05	57						
2	ePKP		ZN	21	29	35						
	PKKS		ZN		43	21ds	2.2	½	1.4	½		
2	e(P)		ZN	22	03	57						
2	e(PKP)		ZN	22	48	16						
	e		ZN		53	37ds						
3	e(PKP)		N	02	15	00						
3	iP		ZN	17	58	36d	3	⅔				
3	e		N	21	15	54						
3	i		ZN									

Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
4 iP	ZN	23	33	02							
5 e	ZN	05	03	45							
5 iP	ZN	08	16	43u	1.6	1¼					
5 e	Z	11	50	11							
5 i(P)	ZN	20	25	14							
7 e	ZNE	00	57	45							
7 iP	ZN	00	58	25u	2	⅔					
e	ZNE			11							
7 i	E	00	59	21							
7 iP	Z	03	43	19							
7 e	ZNE	07	24	35							
i	ZNE			52							
i!	ZNE		25	08							
i!	ZNE			15							
7 eP	Z	08	30	20							
7 iP	ZNE	11	50	41ne			1	½	2	⅔	
7 e	ZNE	13	10	56							
7 iP	ZNE	13	13	7uw	2.5	½			2	½	
7 iP	Z	19	01	58							
8 eP	ZNE	02	54	48							
8 e	Z	02	59	35							
8 e	ZNE	12	12	37							
9 iP	ZN	11	25	17							
e	E			20							
10 eP	ZN	21	10	16							
10 e	ZN	21	54	41							
11 iP	ZNE	13	28	23d	3.5	1					
PcP	Z		29	16							
PP	Z		30	25							
PPP	ZN		31	42							
PcS	ZN		32	28							
iS	ZNE		35	58ue	4.8	6					
ScS	Z		37	48							
ScS	NE		37	56							
(Lq)	E		41								
13 eP	Z	03	05	29							
14 iP	Z	06	04	36u			3	⅔			
14 iP	Z	07	28	44d	3.8	½					

Date	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
JAN 15	iP	ZNE	19 26 33de	9.5 1¼			
	PP	Z	29 37				
	iS	NE	36 35				
	L	N	50 00				
	Lr	Z	50 35				
	Lr	E	51 45				
15	iP	ZNE	22 26 21u	1.4 ¾			
	eS	E	35 03				
	(ScS)	E	36 17				
	L	Z	50 00				
15	iP	ZNE	24 10 39				
16	iP	ZE	11 14 10u	2.4 ¾			
17	e	Z	04 26 33				
17	eP	ZE	07 21 36				
	(PPP)	Z	22 55				
		Z	23 33				
	PcP	ZN	24 43				
	eS	NE	26 39				
	Lr	ZNE	29 00				
17	eP	ZNE	13 06 56				
18	eP	Z	15 26 06				
	PP	Z	28 38				
	PPP	Z	30 10				
19	eP	ZE	14 21 05				
	PPP	Z	26 00				
	L	ZNE	53				
20	eP	Z	02 30 46				
20	eP	ZNE	03 07 31				
	e	Z	09 33				
	e	E	47				
	L	E	12 30				
20	eP	ZNE	10 03 51				
21	e	ZNE	20 28 48				
22	eP	Z	18 14 55				
23	iP	Z	23 54 54				
24	iP	Z	06 57 09				
24	e(P)	Z	18 11 47				
24	iP	Z	24 02 52½u	3 ⅔			
26	eP	Z	04 50 28				
30	iP	Z	22 50 12u	3 1			

Date	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
FEB 2	eP	Z	08 30 56				
2	eP	Z	09 34 55				
2	eP	ZNE	13 16 16				
2	eP	Z	18 27 34				
2	e	Z	23 23 08				
3	eP	ZE	03 23 02				
	iP	N	07				
5	eP	ZNE	03 57 10				
5	eP	ZNE	04 16 44				
	iPP	Z	17 07				
	iPPP	ZE	20				
	iS	Z	20 26				
	i(PcP)	Z	21 17				
	iSSS	Z	40				
5	e	ZN	08 20 54.5				
5	iP	ZNE	13 24 53				
6	e	ZNE	08 05 55				
6	iP	ZNE	16 08 54d	5 1½			
7	iP	Z	01 19 07u				
	iPcP	ZE	20 36u	4 1			
7	e(P)	Z	05 41 28				
	e	NE	32				
7	iP	N	06 52 30				
	i(PP)	N	53 43				
7	eP	E	07 49 20				
7	e(P)	Z	10 42 53				
8	iP	ZNE	22 24 26				
	iS	ZN	27 16				
11	eP	N	16 40 31				
11	eP	Z	17 48 53				
12	iP	Z	02 40 12d	3 ½			
12	eP	Z	22 34 11				
13	e	Z	00 40 45				
13	iP	Z	06 35 40u	3 ⅔			
16	i(P)	Z	22 27 08d	3 ⅔			
17	i	E	00 36 40				
17	i(P)	ZNE	00 49 17				
17	e	ZE	08 13 15				

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te
FEB 19	eP	ZNE	03 29 03						
19	iP	Z	19 39 14u	2	1¼				
23	e(P)	ZNE	15 43 22						
25	e(P)	Z	17 15 26						
MAR 1	eP	ZN	16 24 29						
1	eP	Z	17 25 32						
3	iP	Z	05 01 13u	2.5	1				
7	eP	Z	17 40 39						
11	eP	ZE	00 44						
11	iP	ZE	14 09 42u	3.5	1½				
	iPcP	Z	10 18u						
13	iP	Z	00 57 39u	3	⅔				
13	iP	Z	06 18 38						
14	iP	Z	12 25 07						
16	iP	Z	14 51 38d	2	⅓				
16	iP	ZE	16 03 42½d	2	½				
18	eP	Z	09 38 27						
18	eP	ZN	21 33 05						
20	eP	Z	01 57 13						
20	e	Z	18 41 18						
22	eP	ZN	08 40 08						
22	eP	ZN	17 59 20						
22	eP	ZN	21 45 45						
23	eP	ZN	08 56 15						
23	iP	ZN	09 50 56						
	e	ZN	51 23						
	e	ZN	41						
	e	ZN	52 12						
	i	ZN	52						
23	eP	ZN	21 19 13						
23	eP	ZN	22 12 12						
23	eP	ZN	22 47 10						
24	iP	Z	15 14 23d	18	¼				
[illegible]			[illegible]	1.5	⅓				

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 27	eP	ZN	21 29 04							
28	iPKP	Z	12 25 05d	2	1					
	iPP	Z	55							
28	eP	Z	14 55 19							
30	eP	ZN	14 04 37							
31	eP	Z	07 58 18							
31	eP	Z	13 04 25							
31	eP	Z	15 27 50							
APR 2	eP	ZN	07 07 26							
2	iP	ZN	07 09 21							
2	eP	ZN	17 41 37							
3	eP	Z	05 34 01							
3	eP	Z	08 21 58							
3	eP	Z	22 56 08							
5	eP	Z	19 55 09							
	i	Z	59 49							
7	iPKP	ZN	15 50 20							
	L	ZN	16 45 28							
8	iP	Z	13 31 18d	3.5	⅔					
8	eP	Z	17 37 47							
9	iP	Z	13 14 55u	1.8	½					
9	eP	Z	16 11 46							
9	eP	Z	18 10 29							
10	eP	Z	01 11 45							
10	eP	Z	03 46 18							
	e	Z	47 14							
10	e	Z	04 59 54							
10	iP	ZN	13 30 10							
10	e	Z	16 07 56							
10	eP	ZN	17 10 06							
10	eP	Z	19 20 09							
10	iP	Z	20 38 10d	1.2	⅔					
11	eP	Z	11 53 49							
11	eP	Z	14 38 58							

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 11	iP	Z	23 36 34u	2	1					
12	e	Z	03 50 45							
12	e	Z	22 38 30							
13	eP	Z	09 27 04							
13	e	Z	09 53 55							
14	eP	Z	03 49 05							
14	e	Z	19 28 25							
14	iP	Z	19 32 26u	1	¾					
14	e	Z	22 08 40							
15	eP	Z	07 04 15							
16	e	Z	01 15 15							
16	eP	Z	07 04 15							
16	eP	Z	17 55 35							
17	eP	Z	06 33 09							
17	e	Z	07 27 38							
17	e	Z	09 38 04							
17	eP	Z	10 16 18							
	PKKP	Z	32 04							
	e	Z	20							
17	e(P)	Z	13 18 25							
17	(PKKS)	Z	14 38 15							
17	eP	Z	17 18 27							
	e	Z	32							
17	e(P)	Z	18 52 28							
18	i(P)	N	02 36 30							
18	e	ZN	05 45 19							
18	eP	Z	07 41 11							
	PcP	Z	43 07							
18	eP	ZN	13 29 52							
	e	ZN	30 08							
18	eP	ZN	17 17 48							
18	PKP	Z	18 08 41							
18	eP	ZN	18 45 30							
			5 13							
			3 18							

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
APR 19	iP	ZN	09 00 25							
19	iP	ZN	09 10 50.5u	2	½					
19	eP	Z	11 00 47							
19	eP	Z	11 43 28							
19	iP	Z	14 51 14u	2.5	½					
20	i(P)	ZN	10 50 14							
20	eP	ZN	11 12 50							
	i	ZN	13 41d	1.5	½					
	e	Z	18 50							
20	e	Z	14 00 17							
20	e	Z	16 54 28							
20	iP	Z	21 22 58							
	PcP	Z	24 49d	3.2	1					
	S	Z	28 33d	1.5	1¼					
21	eP	ZN	08 49 13							
21	iP	ZN	10 11 12u	2	¾					
21	eP	Z	11 12 31							
21	eP	ZN	20 05 19							
21	eP	Z	20 25 21							
21	(SKKKS)	Z	20 59 31							
21	e	Z	22 36 49							
21	eP	ZN	22 49 30							
22	eP	ZN	00 08 44							
22	eP	Z	05 49 40							
22	eP	Z	06 18 23							
22	eP	ZN	07 46 41							
22	eP	Z	21 24 23							
22	iP	ZN	23 18 23n			1.2	¾			
23	e	Z	12 00 46							
23	e	Z	13 31 46							
23	eP	Z	14 10 41							
23	eP	Z	19 24 06							
23	eP	Z	21 58 46							
24	eP	Z	07 35 39							

Date	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
APR 24	iP	N	08 02 59n		½ 2		
24	eP	ZN	13 19 24				
24	eP	Z	21 58 12				
	e	Z	56				
24	eP	ZN	22 59 33				
25	iP	ZN	00 49 54				
	e	ZN	50 21				
	i	ZN	45				
	i	Z	52 59				
25	iP	N	00 59 17e		2.5 ⅔		
25	eP	ZN	01 01 13				
	e	ZN	24				
25	eP	Z	11 51 17				
26	iP	ZN	09 36 16				
26	e	Z	10 46 45				
26	P'P'	Z	17 48 23				
27	iP	ZN	08 22 38d	1.5 ¾			
28	eP	Z	06 15 07				
28	eP	Z	09 47 42				
28	eP	Z	11 39 47				
28	iP	Z	12 00 16				
	e(PP)	N	03 12				
	ePP	Z	40				
	eS	ZE	10 48				
	PPS	N	12 14				
	Lr	ZE	28 40				
28	eP	Z	12 43 15				
28	eP	Z	13 28 48				
	e	Z	29 47				
	e	Z	31 48				
29	eP	ZN	04 57 08				
29	eP	Z	05 33 18				
	e	Z	46 51				
29	eP	Z	06 35 37				
29	eP	Z	11 51 14				
29	eP	Z	20 40 06				
29	iP	Z	22 22 52u	2.5 ¾			
30	eP	Z	05 04 35				

Date	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
APR 30	eP	Z	05 57 44				
30	eP	Z	06 46 37				
	e	Z	51 31				
30	iP	Z	19 39 12				
30	eP	Z	22 59 22				
MAY 1	iP	ZNE	00 39 32.5dn	17 1¼	2 1		
	PcP	N	40 33				
	PP	N	43 13				
	eS	N	48 02				
1	eP	Z	01 08 11				
1	eP	Z	09 43 05	Local.			
1	eP	Z	19 42 31				
1	iP	Z	21 17 10	Local.			
1	eP	Z	22 30 09	Local.			
2	eP	Z	23 59 12	Local.			
3	eP	ZN	10 01 58				
3	iP	N	12 09 51				
3	eP	ZN	12 57 48				
4	eP	Z	14 59 50	Local.			
5	eP	Z	06 44 42				
5	eP	Z	11 31 07				
5	eP	Z	11 47 20				
5	eP	Z	17 01 00				
6	eP	Z	22 54 21	Local.			
7	eP	Z	06 17 09				
7	eP	Z	08 17 07				
7		Z	35				
7	e	Z	08 18 48				
7	eP	Z	11 10 34				
8	iP	Z	01 13 54				
8	eP	Z	07 19 25	Local.			
8	iP	ZNE	12 52 03				
	PP	Z	54 20				
	eS	ZE	13 01 25				

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 8	eP	Z	14 44 54							
9	iP	Z	04 51 01u	1.2	⅔					
	PcP	Z	52 16							
9	eP	Z	05 19 25							
9	iP	Z	18 52 49u	2	1					
10	eP	Z	05 57 24							
10	eP	Z	09 52 41							
10	eP	Z	13 52 06							
10	iP	Z	23 14 17d	2	1					
11	eP	Z	00 48 18							
11	ePKP	Z	05 43 30							
11	ePKP	Z	05 56 38							
11	eP	Z	06 38 11							
11	iP	ZN	10 09 34							
11	iP	Z	15 59 42d	2.2	⅔					
11	eP	Z	21 34 11							
12	eP	Z	03 46 22							
12	eP	Z	05 35 14							
12	eP	Z	09 39 25							
12	eP	ZN	10 41 40							
12 11	eP	ZNE	16 21 12							
12	eP	ZN	16 43 59							
12	eP	Z	21 11 45							
12	eP	Z	21 40 25							
12	eP	Z	22 39 50							
13	eP	ZNE	06 13 39							
13	eP	ZNE	12 08 25							
13	eP	ZNE	19 01 41							
13	eP	ZNE	19 45 55							
14	eP	ZN	04 09 45							
14	eP	Z	10 49 20							
			25							

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
MAY 14	iP	ZN	15 58 07n			2	⅔			
14	eP	ZNE	16 45 07							
14	eP	Z	17 19 57							
14	iP	ZN	21 01 41							
	i	ZN	51							
	e	ZN	12 36							
14	iP	Z	21 29 26d	2.2	½					
14	eP	ZN	22 18 15							
15	eP	Z	03 30 48							
15	eP	ZN	09 54 27							
15	e	ZN	10 48 25							
15	eP	Z	15 56 36							
16	eP	ZNE	13 01 13							
16	eP	ZN	13 31 50							
	e	Z	32 19							
16	eP	Z	18 21 32							
16	eP	Z	18 57 03							
16	eP	ZE	22 40 57							
17	iP	ZN	17 53 54.u	2.5	1					
	PcP	Z	54 11							
17	eP	Z	20 58 50							
17	e	ZN	22 00 10							
17	eP	Z	23 02 42							
18	eP	ZNE	02 43 34							
	(PcS)	Z	49 50							
	eS	ZNE	52 20							
	Lr	Z	03 05 00							
18	iP	Z	05 37 20u	2	1					
18	e	ZN	08 42 51							
18	iP	ZNE	12 31 59u	5.5	1¼					
	L	Z	54 30							
18	iP	ZN	19 43 32n			2	¾			
18	e	N	20 05 58							
19	eP	ZN	00 16 41							
19	eP	Z	10 02 07							
19	eP	Z	11 49 05							

Date	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
MAY 19	eP	ZN	13 00 24				
20	eP	Z	05 53 22				
20	eP	Z	12 20 41				
20	eP	Z	16 41 14				
20	iP	Z	21 56 46d	1 ½			
21	eP	Z	03 45 54				
21	eP	Z	13 20 41				
	e	Z	30 03				
21	eP	Z	14 55 57				
21	iP	Z	23 27 40				
	e	Z	32 28				
22	eP	Z	04 55 37				
22	iP	Z	13 49 03u	2 ⅔			
22	eP	ZN	16 59 32				
23	eP	Z	08 59 25				
23	eP	Z	12 20 26				
23	iP	ZN	12 53 09dn	1.2 ⅔	2.6 ¾		
	e	Z	56 10				
23	iP	ZN	15 59 08				
24	iP	Z	05 04 05				
24	e(P)	ZN	05 28 14				
24	eP	Z	07 35 42				
24	eP	ZNE	08 32 02				
24	eP	Z	16 44 33				
25	eP	Z	06 24 42				
25	eP	ZNE	21 24 52				
	e(S)		33 55				
26	eP	Z	04 44 09				
26	iP	ZN	09 02 52d	2 1			
26	ePKP	Z	11 15 45				
	i(PKS)	Z	18 55				
26	eP	ZN	17 40 43				
26	eP	ZNE	20 37 40				
			26 10				
			47 45				

Date	Phase		h m s	Az Tz	An Tn	Ae Te	Mag.
MAY 28	eP	Z	12 42 51				
28	eP	ZNE	15 52 29				
29	iP	Z	11 31 18d	2.5 ⅔			
29	eP	Z	15 53 55				
29	eP	Z	16 22 50				
29	iP	Z	19 16 55				
30	eP	Z	05 26 42				
30	eP	Z	06 01 50				
30	ePKP	Z	18 24 06				
	PKS	Z	27 27				
31	eP	Z	14 21 18				
31	iP	ZNE	19 42 57d	2.5 1			
	PP	ZN	45 25				
	eS	NE	51 40				
	ScS	Z	52 12				
	SS	E	56 20				
	P'P'	Z	20 12 00				
31	eP	Z	22 13 32				
JUN 1	eP	Z	10 52 09				
1	eP	Z	12 46 28				
2	eP	ZN	10 01 15				
2	eP	ZN	12 46 12				
2	eP	ZN	13 05 52				
2	eP	ZN	14 09 20				
2	iP	ZN	17 16 11u	2 ⅔			
2	eP	ZN	21 51 22				
3	e	Z	00 43 43				
3	eP	ZN	09 03 25				
3	iP	ZNE	19 42 17d	5 1½			
	(PPP)	Z	45 23				
	eS	N	50 53				
	L	ZN	20 06 00				
4	PKP	Z	14 49 11				
	PKS	Z	52 26				
5	eP	Z	07 25 11				
5	eP	ZN	08 32 05				

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN - 5	iP	ZNE	10 51 53us	5	2	4	2			
	e	N	52 30							
	eS	ZNE	56 36							
-5	e	ZN	17 22 23							
-6	eP	Z	09 29 30							
-6	eP	Z	12 35 29							
-6	eP	ZN	16 42 33							
	e	ZN	42							
-6	e	N	22 10 00							
-7	eP	Z	09 25 08							
-7	eP	ZN	13 00 50							
	PPP	Z	02 08							
	S	ZN	06 18							
	L	ZN	08 13							
	L	ZNE	09 15							
	ScS	N	12 08							
-7	eP	ZN	18 39 10							
-8	PKP	Z	00 58 00							
	PKS	Z	01 01 32							
-8	eP	ZN	19 20 36							
-8	PPP	Z	21 42 56							
-9	eP	ZN	05 06 15							
-9	eP	Z	10 50 11							
-9	eP	ZN	18 26 30							
-10	eP	ZN	04 08 49							
-10	eP	ZN	04 21 41							
	L	N	45 00							
-10	eP	ZN	07 27 15							
-10	eP	ZN	17 00 08							
-11	eP	Z	03 52 03							
-11	eP	Z	06 38 04							
-11	eP	ZN	11 20 05							
	e	ZN	22 43							
-11	eP	Z	13 30 48							
-12	eP	Z	16 56 47							
-12	eP	Z	17 54 20							

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN -13	eP	ZN	11 05 14							
	e(S)	Z	09 05							
-13	eP	Z	11 53 56							
-14	eP	Z	16 39 00							
-15	eP	Z	02 15 17							
-15	eP	Z	11 43 47							
-15	iP	ZNE	15 03 58u	3.2	$2\frac{1}{2}$					
	iPP	ZN	05 48u	6	$2\frac{1}{2}$					
	iS	ZE	11 37n			5.5	5			
-15	eP	Z	17 32 09							
-16	eP	Z	18 57 02							
-16	iP	ZN	01 20 34d	2.5	$\frac{3}{3}$					
-16	e	ZN	03 14 24							
-16	iP	Z	07 24 05.5d	1.5	1					
-16	eP	ZNE	16 54 40							
-17	eP	ZN	10 09 20							
	e	ZN	11 30							
-18	eP	Z	05 49 24							
-18	eP	Z	10 15 15							
-18	e	Z	16 21 05							
-19	ePKP	ZN	05 37 06							
	PP	Z	39 15							
	PKS	Z	40 40							
	(SKKS)	ZN	45 14							
-19	iP	Z	07 56 37u	2	1					
-19	iP	ZN	11 21 46u	3	$\frac{3}{4}$					
-19	eP	Z	13 39 38							
-19	eP	ZN	18 08 03							
	(PcP)	ZN	10 10							
	eS	N	15 22							
	Lr	N	16 55							
-20	eP	Z	00 58 22							
-20	eP	Z	14 10 35							
-20	eP	Z	17 41 35							
-21	eP	Z	14 27 54							
-21	eP	Z	17 08 57							
-22	eP	Z	09 41 54							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 23	eP	ZN	05	08	18							
23	iP	ZN	07	29	27u	2.5	1					
23	iP	ZN	19	02	36u	3.5	2/3					
23	eP	Z	19	26	56							
23	eP	Z	22	39	54							
23	eP	ZN	23	16	46							
24	eP	ZN	00	20	41							
24	eP	ZN	05	22	48							
24	eP	ZN	06	26	12							
24	eP	ZN	06	45	19							
24	eP	ZN	16	08	53							
24	eP	ZN	18	22	53							
24	e	ZN	22	19	25							
24	iP	ZN	22	19	28d	5	3/4					
25	eP	Z	02	23	42d	1.6	1/2					
25	eP	Z	02	34	19							
25	eP	Z	09	37	38							
25	eP	ZN	09	48	17							
	PP	Z		51	26							
	eS	N		58	07							
	SS	N	10	02	26							
	SSS	ZN		06	46							
	L	Z		08	17							
	L	N		15	48							
25	eP	Z	12	55	28							
25	eP	Z	21	05	06							
25	eP	Z	23	10	30							
26	iP	Z	01	27	31u	1	3/4					
26	iP	ZN	04	08	21d	3	1					
26	eP	ZN	04	56	24							
26	ePKP	Z	04	57	24							
	i	Z			56							
	PP	ZN		58	17							
	PKS	ZN	05	00	37							
	PPP	ZN		01	35							
26	eP	ZN	22	37	30							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUN 27	iP	ZN	18	23	06u	2	3/4					
27	eP	ZN	19	54	35							
28	iP	Z	05	21	17u	2.5	1					
28	eP	ZN	08	41	15							
28	eP	ZN	10	07	15							
29	eP	Z	03	37	47							
29	eP	ZN	09	25	02							
29	eP	ZN	11	00	26							
	e	ZN			52							
	e	ZN		12	20							
29	eP	ZN	12	51	08							
29	eP	Z	23	27	42							
30	eP	ZN	04	02	54							
30	eP	ZN	06	57	50							
30	ePKP	Z	09	01	54							
	PP	Z		04	27							
	PKS	Z		05	12							
30	iP	ZN	09	54	45d	4	1/3					
30	eP	Z	20	02	10							
JUL 1	ePKP	ZN	06	12	16							
	ePKS	ZN		15	35							
1	eP	ZN	20	18	28							
2	eP	ZN	04	05	24							
2	iP	ZN	04	57	38d	3.5	3/4					
2	iP	ZN	16	51	40u	2	1					
3	eP	ZN	05	56	58							
3	iP	ZNE	06	36	01d	8	1					
	ePP	ZN		38	54							
	ePPP	ZN		40	33							
	eS	N		42	38							
	iScS	ZN		45	13s			5	3			
3	eP	ZN	10	29	38							
	Lr	N		36	55							
3	eP	Z	16	08	09							
4	eP	ZN	00	29	35							
4	eP	ZN	02	34	33							

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 4	iP	ZNE	13 09 13u	5	¾					
	e(S)	Z	10 52							
	L	N	13 00							
	ePcP	Z	15 11							
4	eP	ZN	18 46 51							
5	eP	ZN	00 45 32							
5	eP	ZN	04 55 10							
5	iP	ZN	14 01 29u	1.5	1					
5	eP	ZN	21 52 00							
6	eP	ZN	08 44 43							
6	eP	ZN	16 22 53							
8	eP	Z	05 22 22							
8	eP	ZN	06 16 22							
8	iP	ZN	12 36 54.5d	1.5	¾					
	e	ZN	37 08							
8	eP	ZN	19 32 11							
	L	N	38 16							
8	e	Z	22 56 18							
8	iP	ZN	22 58 12							
9	iP	ZN	01 17 41u	1.4	1⅓					
9	eP	Z	06 27 45							
9	iP	ZN	14 03 28d	2	¾					
10	ePKP	ZN	06 35 21							
	Lq	NE	07 17 00							
	Lr	ZNE	20 00							
	Lr	Z	22 00							
10	iP	Z	14 59 44							
11	eP	Z	07 18 08							
11	eP	ZN	12 39 23							
11	eP	ZN	18 36 13							
	L	ZNE	42 21							
11	iP	ZN	19 22 12d	2	1¼					
	eS	Z	31 55							
12	eP	ZN	01 01 08							
12	eP	Z	03 43 02							
12	eP	ZN	12 33 55							
			09 10							

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 13	iP	ZN	12 14 43u	1.5	1					
14	eP	Z	14 59 18							
14	eP	ZN	20 25 00							
15	e	Z	09 42 05							
15	eP	Z	12 19 46							
15	eP	Z	14 12 46							
16	eP	ZN	08 02 15							
	eS	ZN	13 31							
16	eP	ZN	13 04 27							
	(SSS)	Z	21 02							
16	iP	ZN	17 05 08d	1.4	1					
16	iP	ZN	18 51 11u	2	1					
17	eP	Z	16 04 09							
17	ePKP	Z	21 18 32							
	ePKS	Z	23 52							
18	ePKP	Z	00 58 40							
	ePKS	Z	01 02 17							
18	eP	Z	02 00 24							
18	eP	ZN	08 01 40							
18	eP	Z	09 45 41							
19	iP	ZN	00 58 27							
19	iP	ZNE	06 41 49							
	iPcP	Z	42 28							
19	e(P)	ZN	09 12 12							
	e	Z	13 04							
19	eP	ZNE	18 29 01							
	eS	NE	39 06							
	L	Z	59 00							
	e(SKKS)	Z	59 14							
19	eP	Z	20 06 39							
19	eP	Z	22 26 13							
20	eP	Z	11 06 34							
20	eP	Z	11 54 29							
20	eP	Z	12 23 12							
21	eP	Z	04 18 31							
21	ePKP	Z	07 43 54							
21	ePKP	Z	14 56 27							
	ePKS	Z	59 45							

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te
JUL 21	e	Z	18 40 50						
21	iP	Z	18 43 32d	3.4	1				
21	e(P)	Z	19 44 29						
22	eP	Z	07 31 56						
22	eP	Z	15 02 49						
23	ePKP	Z	10 46 30						
24	eP	Z	03 03 47						
24	eP	ZN	06 07 36						
25	eP	Z	00 57 29						
26	eP	ZNE	06 22 42						
26	iP	ZN	17 48 39						
	PP	Z	53 29						
	iS	ZN	58 25						
	(PPS)	Z	18 03 13						
	SS	Z	05 47						
	SSS	Z	06 51						
	SKKS	Z	15 00						
	(P'P')	Z	17 20						
27	eP	Z	00 31 32						
	eP	Z	17 29 48						
	eP	Z	20 13 00						
28	eP	Z	04 56 15						
28	iP	ZN	17 33 52d	4	¾				
	PP	Z	35 35						
	(PPP)	Z	40 21						
	eS	ZN	41 25						
	ScS	Z	43 26						
28	iP	Z	18 44 06d	2	1				
28	eP	Z	21 32 25						
29	eP	ZN	00 40 09						
29	eP	ZN	03 28 26						
	e(S)	Z	37 30						
29	eP	ZN	10 59 24						
30	iP	ZNE	05 56 35u						
	e	ZN	58 10						
	PP	Z	59 52						
	eS	ZN	05 06 36						
30	eP	Z	15 17 58						

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te
	eP	ZN	05 47 32						
	ePcP	Z	49 00						
	eS	ZN	55 35						
	L								
	eP	Z	14 36 52						
	PcP	Z	38 34						
	(PP)	Z	39 10						
3	iP	ZNE	01 15 17.5						
	PP	Z	17 11						
	PPP	Z	18 09						
	eS	ZNE	22 33						
	ScS	ZNE	24 10						
	SS	Z	42						
4	eP	ZN	03 33 30						
4	iP	ZN	04 24 44u		2	¾			
	eS	N	34 08						
4	eP	Z	08 54 10						
4	eP	Z	16 15 26						
4	eP	Z	21 05 44						
5	eP	Z	17 31 21						
6	eP	Z	10 02 09						
6	eP	ZN	21 19 35						
	ePP	ZN	22 11						
	eS	ZN	28 05						
	eP'P'	ZN	48						
6	eP	ZN	22 01 33						
8	eP	ZN	12 29 26						
9	eP	ZN	12 57 15						
9	eP	ZN	18 48 55						
9	eP	Z	22 59 49						
10	eP	Z	18 17 32						
10	eP	Z	19 22 52.5d		1	½			
11	eP	Z	08 03 21						
11	eP	Z	09 26 20						
12	eP	ZN	19 37 26.5						
13	eP	Z	04 02 54						
13	iP	Z	08 43 59d		2.2	¾			
13	eP	ZN	14 58 44						
13	iP	Z	17 00 40						

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te
AUG 13	ePKP	Z	20 32 08						
13	eP	Z	22 07 49						
	ePcP	Z	08 32						
14	eP	Z	00 41 52						
14	eP	ZN	09 54 50						
14	iP	ZN	12 54 04u	3	1				
14	ePKP	ZN	15 14 21						
	ePKS	Z	17 41						
	ePKKP	Z	24 11						
15	ePKP	ZN	20 14 49						
	ePPP	Z	19 13						
15	iP	ZNE	22 41 24u	6.5	1¼				
	PPP	Z	48 13						
	iS	ZNE	51 26						
	PS	ZN	52 38						
	Lq	ZE	23 04 28						
	P'P'	Z	07 50						
	Lr	ZNE	13 30						
15	eP	Z	23 28 12						
16	eP	Z	11 23 13						
16	ePKP	ZNE	13 34 31						
	ePKS	Z	37 03						
	eSKS	Z	40 24						
16	ePKP	ZNE	19 32 55						
	ePKS	Z	36 14						
17	eP	Z	02 11 21						
17	ePKP	Z	09 26 50						
	PP	Z	27 46						
	PPP	Z	31 08						
17	eP	Z	12 32 34						
17	iP	Z	16 04 49						
17	eP	ZN	18 12 53						
	ePPP	Z	18 07						
	eS	Z	22 30						
17	eP	ZN	21 19 07						
	ePP	Z	21 58						
	ePPP	Z	22 12						
17	eP	Z	22 24 41						
18	eP	Z	15 53 55						
18	(ScSPKP)	Z	20 40 18						
19	eP	ZN	04 55 49						
19	eP	ZE	11 59 57						

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te
AUG 19	e(SSS)	Z	16 48 49						
19	eP	ZNE	22 00 08						
	eS	ZE	10 05						
19	eP	Z	23 07 09						
20	eP	ZNE	03 50 41						
	eS	ZNE	59 26						
20	e(SS)	Z	09 59 13						
20	eP	ZNE	10 40 56						
20	e	ZN	14 29 20						
20	eP	ZN	17 49 06						
21	eP	ZNE	01 18 32						
	eS	N	26 15						
21	eP	ZN	04 12 59						
21	iP	ZNE	21 08 59u			4	1		
	ePcP	Z	09 51						
	iS	ZNE	17 02						
	eScS	ZN	18 44						
	eSKKS	Z	37 41						
	ePKPPKP	Z	38 14						
22	eP	Z	00 08 08						
22	eP	Z	10 06 59						
22	eP	Z	14 40 13						
22	eP	ZN	22 28 07						
	eS	N	38 05						
22	iP	Z	23 28 55d			2	1		
	e(ScS)	Z	39 06						
23	eP	Z	08 10 01						
23	eScSPKP	Z	22 31 33						
24	eP	Z	04 34 31						
24	e	Z	13 21 20						
24	e	Z	15 25 11						
25	eP	Z	06 36 47						
25	eP	Z	07 21 56						
25	eP	ZN	08 15 45						
25	eP	Z	08 36 15						
25	eP	ZN	18 53 03						
25	eP	ZN	18 53 03						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 26	iP	ZN	12	31	19u	4	1½				
	eS	Z		41	20						
26	eP	ZN	12	55	38						
26	e(P)	ZN	13	34	44						
	e(S)	Z		41	55						
26	eP	Z	14	52	28						
26	iP	Z	15	08	31u	3	1				
26	iP	ZNE	18	06	11u	5.5	1½				
	eS	N		14	15						
26	e	Z	21	38	04						
26	eP	Z	23	33	54						
26	eP	ZN	23	42	14						
	ePcS	ZN		45	48						
	eSS	ZN		55	45						
27	ePKP	ZN	15	36	01						
	ePP	ZN		38	45						
	eSKS	Z		43	20						
28	eP	Z	09	46	40						
28	eP	ZN	17	05	27						
29	eP	ZE	09	47	49						
29	eP	ZNE	12	34	59						
	eS	ZN		45	00						
29	eP	ZNE	13	02	32						
	ePP	ZN		05	10						
	eS	Z		12	17						
29	eP	Z	14	49	47						
30	eP	Z	12	39	10						
	e	Z		41	02						
30	eP	Z	14	42	59						
31	eP	Z	16	30	47						
31	ePKP	ZNE	23	19	48.5						
	eSKKS	ZNE		36	44						
SEP 1	eP	Z	01	06	45						
	ePcS	Z		10	56						
1	eP	Z	14	03	07						
2	iP	ZNE	02	38	39d	2	1				
2	eP	ZN	03	07	51						
2	eP	ZN	12	01	49						
2	eP	ZN	14	37	10						
	eS	N		46	35						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 3	eP	ZN	06	18	43						
3	e	Z	23	00	00						
4	eP	Z	14	03	07						
4	eP	ZNE	22	01	45						
	PP	ZNE	22	01	45						
	PPP	Z		05	45						
	eS	ZNE		10	31						
	ScS	N		11	26						
	SS	E		14	51						
	Lr	ZNE		22	00						
	PKPPKP	ZNE		30	38						
	SKKS	ZNE		34	45						
4	iP	ZN	23	19	44u	4	1				
5	eP	Z	13	13	55						
5	eP	Z	13	20	17						
5	eP	Z	22	46	38						
6	eP	ZN	00	24	30						
6	eP	ZN	03	28	27						
7	eP	ZN	06	54	45						
8	ePKP	Z	05	44	46						
8	eP	Z	22	35	29						
9	eSKS	ZN	22	49	57						
	eSKSP	ZN		54	53						
11	eP	ZN	18	14	38						
11	eP	Z	23	47	23						
12	eP	ZN	00	49	16						
12	eP	Z	05	46	43						
	L	ZE	06	03							
14	ePKP	ZN	14	40	54						
14	eP	ZN	18	07	58						
14	eP	ZN	21	44	33						
15	eP	ZN	16	56	32						
15	eP	Z	18	04	30						
15	eP	Z	18	19	04						
15	iP	ZNE	19	57	12d	8	1				
	e(PP)	Z		59	32						
	eS	ZNE	20	06	37						
	eScS	Z		08	05						
	ePPS	N		11	09						
	ePKKS	Z		15	22						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 15	eSKKS	Z		23	20						
	(L)	Z		25	47						
16	eP	Z	12	55	11						
16	eP	ZN	16	14	11						
17	eP	Z	04	58	54						
	i(S)	ZN		59	28						
17	eP	Z	14	24	31						
17	e	Z	15	17	37						
17	e	Z	15	17	37						
17	eP	Z	16	14	23						
17	eP	Z	17	49	17						
18	eP	ZN	03	43	58						
18	eP	ZN	07	03	00						
18	eP	ZN	14	12	42						
18	eP	ZN	21	37	23						
	ePcP	ZN			32						
18	eP	ZN	23	55	25						
19	eP	ZN	08	24	55						
19	e	Z	23	18	48						
20	eP	ZN	17	20	50						
	ePPP	ZN		25	46						
	1S	ZNE		30	15						
	eSS	N		34	13						
21	eP	Z	13	39	26						
21	eP	ZN	16	22	21						
22	iP	Z	07	11	20d	4	1				
22	iP!	ZNE	19	14	02dn	135	1¾	6.5	2		
	(PcP)	ZE		15	44						
	eS	ZE		20	57						
	(ScS)	N		24	20						
	L	ZE		26	48						
23	eP	Z	16	38	07						
24	eP	Z	12	33	40						
24	eP	Z	15	46	59						
24	eP	ZN	16	39	49						
25	e	Z	07	37	51						
25	e	Z	08	25	59						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
		Z	15	24	00						
SEP 25	eP	Z	20	34	25d	1.3	1				
25	iP	Z	21	04	18						
25	eP	ZN	13	48	42						
26	eP	ZN	17	08	07						
26	e	ZN	07	47	53						
27	eP	ZN	14	05	24d	2.9	1				
27	iP	N		12	23						
	e(S)	ZN	19	50	50	No short period records.					
27	e	ZN	20	37	05						
29	eP	ZN		50	48						
	e(S)	ZN	07	21	09						
30	eP	ZN	08	56	42						
30	eP	ZN	09	30	40						
30	eP	Z	14	37	08						
30	e	ZN	16	14	49						
30	eP	ZN	18	13	06						
30	e	ZN	06	42	29	10	2½				
OCT 1	eP	Z	09	34	40						
1	P	ZNE			59						
	ePP	Z		35	14						
	ePPP	Z		38	47						
	eS	ZNE		41	16	18	14				
	eL	ZNE	18	06	26						
1	ePKP	Z	04	33	37u						
2	P	ZN			40						
	eP	N		34	32½						
	e	N			36						
	e?	N		35	24						
	ePP	Z			26						
	ePP	N			29						
	ePP	N			40						
	e(PP)	ZN		37	02½						
	e	N		40	14½						
	eS	E		43	30						
	eSS	E			40						
	eSS	Z		47.5							
	eL	NE		47.7							
	eL	ZN	05	12	47						
	ePKPSKS	E									
2	P	Z	15	13	50½u						
	eP	N			53½						
2	eP	ZN	17	54	49						
2	eP	ZN	21	05	33						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 3	eP	Z	02	51	33½						
3	eP	Z	04	11	41½						
	e	N			48						
	eS	N		12	02						
	eS	Z			09						
3	P	Z	11	36	58d						
	eP	N		37	02						
	e(pP)	N			23						
3	eP	Z	11	53	20½	Local ?					
	eS	N			54						
	eS	Z			58						
	e?	N		54	06						
	e(S*)	N			15						
	e(S*)	N			23						
3	eP	ZN	17	40	39						
3	e(P)	Z	18	42	10	Local ?					
	e	N			19						
3	e	Z	22	57	12	Local ?					
4	P	Z	01	01	09d						
	eP	N			10½						
	e	N			30½						
	epP	ZN			34						
	e	N		02	04½						
4	P	ZN	04	14	45d						
4	eP	Z	06	03	28½						
	e	N		04	03						
4	e	Z	11	15	07½						
	e	N			18						
4	P	Z	14	30	20u						
	e(PcP)	N			25						
	ei	ZN		32	04½d						
4	e(SKP)	Z	15	30	09						
	e	N			21						
4	ei	ZN	18	30	13d						
6	iP	ZN	00	55	25dn						
	e(pP)	N			48½						
	i(PcP)	Z		56	55½d						
6	iP	ZN	02	17	26u						
	epP?	Z		18	20						
6	e?	Z	06	24	49						
	e?	N			58						
6	e	N	07	22	40½						
	eL	N			24.0						
	eL	Z			27ca						
6	e?	Z	12	36	17						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 6	ePn?	Z	16	15	26						
	ePn	N			30½						
	ePn	Z			34						
	eP	Z			37						
	eP	N		16	02						
	S	Z			03½						
	eS	N									
6	e?	Z	19	07	39½						
6	ePKP	Z	19	12ca							
7	e?	Z	03	16	40						
	e	N			42½						
7	P?	Z	11	25	00½						
7	P	Z	12	44	11½d	1½	1½				
	P	Z			12d	7	4				
	eP	N			14½			1	1½		
	eP	N			20			4	2		
	e?	N		46	03½						
	PP	N		47	34½						
	eS	ZN		53	39½	1	8	3	8		
	eS	N			40			1½	8		
	eSKS?	N		54	15½			1	7		
	SKS	N			16½			1½	8		
	e(PS)	Z			22	18	6				
	SS	N		58	14½						
	e?	N	13	00	27½						
	eLr	Z			08.7	15	25				
	e(PKPPKS)	N	15	42½							
	eL	Z			16.2	1¼	18				
7	eP	ZN	13	58	24						
7	eP	N	16	16	36½						
7	eP	Z	22	43	51						
	e			44	09						
8	eP	ZN	03	22	08						
	e	Z		23	49						
	e?			24	39						
	e			33	29						
8	eP	ZN	04	53	01						
8	e?	Z	10	13	55½						
	e	N		14	02½						
8	eP?	Z	10	56	35½	Local					
	eP	N			42						
	S	ZN		57	08½						
8	eP	Z	11	21	46½						
	e	N			53½						
8	P	ZN	14	12	08d						
	ePcP	Z			21½						
8	eP	Z	15	47	12½						
	P	ZN			13½d						
	e(pP)?	Z			39½						
8	e	N	22	36	41						

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 9	eP	Z	04 18 46			
9	eP?	Z	08 25 15½			
	eP	N	17			
	e	Z	25			
	e	(Z)	30½			
9	P	ZN	11 28 48d	1¼ 2	1½ 1¼	
	iP	ZN	48½u	3½ 2	.4 1½	
	eP	E	52			
	i?	N	29 09½		2 1¼	3 1½
	i?	N	21		2 1¼	
	e	Z	55	1 5		
	ePcP	N	30 21½		1 3½	
	ePP	Z	49	1½ 4		
	eS	Z	35 07	.5 8		
	e(S)	E	38			
	eLq	E	39 31			.5 10
	eLr	E	43.5			.7 18
	eLr	ZN	44.0	1½ 19	¾ 16	.8 20
9	e	N	14 12 11½			
9	eP?	Z	14 23 29			
9	P	Z	14 54 28u			
	i	(Z)	30½			
10	iPKP	Z	08 49 30½d	.8 ¾		
10	eP	Z	11 48 08			
11	e(P)?	Z	01 01 19			
	e(S)		02 53½			
11	eP?	Z	07 29 52			
	e	N	30 04			
11	iP	ZN	14 49 02½u	2 1¼	2 1	
	P	Z	01½u	1 3		
	e(PcP)	NE	07		.3 1	.1 1
11	eP?	ZN	15 03 04			
	e	ZN	09			
11	e?	N	18 34 03			
11	eP	ZN	19 02 35			
11	eP	Z	21 49 22			
11	eP?	Z	22 59 23			
	e?	N	27½			
12	eP?	ZN	00 36 13	Local.		
	e	ZN	28			
	iS	N	34½			
12	P	ZN	09 54 44			
	ePKKP	Z	10 15 05½			
12	iP	ZN	12 59 23u			
	e	N	59			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 12	eP?	N	14 53 00½			
12	ePKP	Z	15 36 46	.2 ½		
	ePKP	N	48½		.4 1	
	ePKP	ZN	37 13½	1 2		
	e(PP)	Z	15	.5 2		
	e(PP)	N	44 02		1 7	
	eSKKS	N	45 29½		.4 7	
	e	N	47 57½	.4 1		
	ePKKP	Z				
12	eP	ZN	17 37 36			
13	eP?	ZN	01 32 23			
13	eP?	Z	04 19 48			
13	P	ZN	05 37 34½d			
	PP	ZN	39 35			
13	e?	N	14 56 51½			
13	e?	N	15 21 26½			
14	eP?	ZN	09 01 10½			
	eS	ZN	19½			
14	ePKP	ZN	09 25 36½			
	e?	Z	54			
	(PP)	ZN	26 10½			
	ePP	N	42			
14	P	ZN	11 29 19			
	iS	ZN	21			
14	e?	N	17 04 28½			
14	eP	ZN	19 40 49			
14	eP?	Z	20 19 54			
	e	N	20 11			
	e	N	27½			
15	P	ZN	02 03 16			
15	eP	ZN	02 30 13½			
15	eP	ZN	03 05 05½			
	e?	ZN	10			
15	eP	Z	06 25 45			
15	e?	ZN	11 35 53			
	e?	ZN	36 27			
15	eiP	ZN	11 40 09u			
	ePcP	Z	41 35½			
15	eP?	ZN	16 54 04	Local.		
	e	N	08			
	S	ZN	10½			
15	eP	ZN	17 13 18½			
	e	ZN	29			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 16	eP?	ZN	01	54	41						
	eS	ZN		55	04½						
	e	ZN			08½						
16	eP	ZN	02	01	45						
16	iP	ZN	18	12	47½d						
	ePcP?	N		13	37						
	ePKKP?			37	54½						
16	P	ZN	23	02	32						
17	iP	ZNE	10	33	19d						
	iPcP?	Z		34	04½						
	e(PS)	E		42.3							
17	P	ZN	12	41	13d						
17	eP	ZN	17	28	38						
	e(S)	ZN		29	13						
	e	N			30½						
	iS	ZN			37½						
18	e?	ZN	01	00	05						
18	eP?	Z	17	38	07						
	P	ZN			08d						
	e	ZN			22						
	e	N		39	33½						
18	P	ZN	10	09	34d						
	e?	ZN		10	07						
	ePP	N		11	30						
	e	Z			37½						
19	eiP	ZN	01	36	00½						
19	eP	ZNE	01	56	41						
	eP	ZN			42						
	e	ZN		57	11						
	e	ZE			29						
	e?	N		58	12						
	e	E		59	04						
	e	NE	02	00	19						
	e?	N			28						
	eL	N			55						
	eL	Z		01	02						
	eL	E			18						
	eL	N			55						
	eL	Z		03	47						
19	eP	Z	02	04	07						
19	iP	ZN	04	43	12us						
	iS	ZN			15½n						
	i	ZN			20						
19	eP	ZN	11	50	53						
	epP	ZN			57						
	isP	ZNE		51	09						
	ePP	N		52	17						
	e(PcP)	Z			40						
	e(PPP)	N		53	31						
	e	N			46						

Local.

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
	(P)	ZN	14	42	24						
19		ZN	21	14	13½						
19	eP	Z		15	04						
	e	N			37						
	e?	Z		19	42½						
	e										
20	PKP	ZN	01	14	44u	.5	1	.2	1		
	ePKP	Z			44	.2	5				
	iPKS	ZN		18	93u	.7	1½	.5	1½		
	PKS	Z			03d	.7	3				
	PKKP	Z		24	39	.3	1½				
	PKKP	NE			44			.5	1½	.2	1½
	i(PcSPKP)	ZN		25	58	2	2	2	1½		
	e(PKPPKP)	N		33	29			¾	4		
20	iP	ZN	01	24	08u	2	1	1¼	1		
	iP	ZNE			08½u	1	5	.2	2½		
	ePP	Z		27	10	.6	4				
	e(S)	N		33	29			¾	4		
	eS	NE			35			.8	6	.5	8
	ePS	NE		34	09			1½	8	.6	7
	ePS	N			10			1	6		
	eLr	E		49.1						.7	22
20	P	ZN	03	07	23u						
21	iP	ZNE	06	26	25dw						
	e	N			50						
	iS	NE		35	42½n						
	eSKS	N		36	09						
21	eP	ZN	11	18	24½						
21	e?	N	12	52	36	Local ?					
	e(P)	ZN			52½						
	e	Z			56½						
	eS	ZN		53	27½						
	e(S)*	N		54	00						
21	eP	ZN	15	52	11½						
	ePcP	ZN			21½						
	e	N			28½						
	e	N			37½						
	e?	N	16	03	50						
21	iP	ZN	17	41	41us						
	epP	N		42	04½						
	eScP	Z			57½						
	e	Z		46	21						
21	eP	Z	21	43	29						
	eS	N		44	04½						
	S	ZN			06						
22	eP	ZN	11	30	52						
	eS	ZN		31	26½						
22	iP	ZN	23	53	17½ds	1	5	.6	5		
	e	N		54	24½			.6	5		
23	iP	ZN	16	55	47½dn						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 23	eP?	Z	17	56	12½						
	eP	ZN			15						
	eS	N		58	42						
23	P?	ZN	19	49	08d						
	e	ZN		51	42						
24	iP	ZN	09	07	59d						
24	eP?	ZN	16	19	13						
	eS				29						
24	eP	ZN	21	25	24½						
	ePcP	ZN			32½						
	e(pP)	N			47						
	e	N		26	25½						
	e	N		27	19						
25	eP?	ZN	06	24	40½	Local ?					
25	eP	Z	06	37	18						
	e	N			22						
25	eP?	ZN	06	54	24½	Local ?					
	eS	ZN			36½						
25	eP?	Z	12	33	33	Local ?					
	e	N			40						
26	eP?	ZN	00	55	09½	Local ?					
26	eP	ZN	02	30	24						
26	eP	ZN	09	22	03						
	e	N			23						
26	eP	ZN	12	52	24½						
	e	Z		54	03½						
	e(S)	ZN			18½						
	e(S)	N			19						
	e	N			50						
26	ePKP	ZN	15	43	56						
26	eP	ZN	19	00	10½						
26	eP	ZN	21	52	24½	Local ?					
	S?	ZN			57½						
27	eP	ZN	15	14	21						
27	eP	ZN	16	10	08	Local ?					
28	eP	N	01	29	19						
28	eP	Z	04	19	24						
	eP	Z			25½						
	e	NE			29						
	e	Z		20	34½						
	e?	Z		21	26½						
	e?	Z		22	57						
	e(S)	NE		23	16½						
	eLg	NE		24.2							
	eLr	E		26.7							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 28	eP	Z	07	09	33						
	e(S)	Z		11	58						
28	eP	N	11	05	45½						
28	eP	N	15	50	41						
28	eP?	N	19	29	41						
	e	N		32	38						
28	eP	N	22	09	04½						
	eS	N			40½						
	e	N		10	42						
29	e?	N	06	01	48½						
	e	NE		02.0							
	e?	N		03	36						
	e	N		05	43						
	e	N		07.4							
	eL	E		07.7							
	eL	N		08.6							
29	e	N	06	25	11						
29	PKP	ZN	08	03	19½	.9	1	.6	1		
	ePKP	Z			19½	.4	2½				
	ePKS	ZN		06	30	.5	3	.5	9		
	ePKS	ZN			38	.8	2	.7	2		
	e(PcPP')	N		11	38			.5	7		
	eSKKS	N		12	23			.6	7		
29	ePKP	Z	08	14	23	.5	1½				
	e	N			39½			.4	1		
	e	ZN		16	04	.4	1	.4	1		
	e(PP)	N			30			.4	1½		
	ePP	Z			40	.7	2				
30	e?	E	04	04	09						
30	e?	Z	06	51	22						
30	eP	ZNE	08	23	47½						
	eP	NE			50½						
	e?	E		26	34						
	e	E		28	04						
	eL	E		29.8							
	eL	E		30.5							
30	e?	ZNE	10	14	27½						
	P	ZNE			59½u						
30	(P)	E	17	51	29						
30	P?	Z	23	10	28½d						
31	eP?	ZNE	04	13	05	Local ?					
	S	ZNE			12						
31	P?	ZNE	14	54	23	Local ?					
31	P?	Z	18	02	48	Local ?					
	e	E			51½						
	eS	ZNE			53½						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 31	eP	ZNE	19	14	45						
	eSKS	NE		24	32						
	e	N		25	26						
	e?	N			49						
	e	E		26	23½						
	e	N			51						
	e	E		27	21						
	e	E		31	00						
	e	E		40	08						
	eL	E		45	.2						
31	PKP	ZN	23	57	42u						
	ePP	E		58	17						
	ePP	E		58	.3						
	ePKS	N	24	01	26						
NOV 1	P?	NE	02	03	19						
1	eP	Z	03	50	23	0.6	1½				
	e	NE			26½			0.4	1½		
	e	NE			30			0.5	6		
	ePcP	ZNE			34	1	3	0.5	1¼	1½	1½
	e	E			41½					4	2
	e	ZN			44	1½	3	1	2		
	e	N		51	10			1½	2		
	e	E		56	45½					2½	6
	e	E		57	33					2	6
	eS	NE	04	00	00			1½	7	2½	10
	e	N			04			2	7		
	e	E			17½					3	6
	e	N			56			1¼	5		
	e	N		01	00			1½	6		
	e	E			52					3	8
	e	N		03	14			1	5		
	e	N		04	08			0.6	7		
	e	N			43			0.9	7		
	e(L)	E		11	.3					1	18
1	eP	Z	06	18	36	0.4	0.6				
1	eP?	Z	06	27	41½						
	P	Z			44½						
1	P	ZNE	12	18	33d						
	epP?	Z			44						
1	P	ZNE	12	25	52½d						
	e	Z		33	49½						
	eS	Z		34	08½						
	ePS	N			21						
	ePS	N			24						
	ePPS	Z			32						
1	eP	ZN	12	26	46	4	¾	0.4	1		
	P	N			46			1	7		
	1(pP)	ZNE			56	14	1	0.7	1	1	1
	ePcP	N		27	17			0.8	1		
	e	N			31½			0.3	1½		
	eiS	ZE		35	01	0.8	5			1¼	6
	eS	N			04			0.6	4		
	eiS	NE			04			1½	6	3	12
	ePPS	Z			43½	0.5	6				
	ScS	E		36	34					0.8	7
	eScS	N			39			1½	6		

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 1	eScS	NE			39½			0.5	5	3	14
	e	Z			56	1	4				
	e	E		37	18					0.6	6
	e	E			56					0.7	6
	eL	NE		49	½			1	13	3½	15
	ePKPPKP	Z		56	10	0.3	1				
1	P	ZNE	12	39	21½						
	epP	Z			32						
	e	N		40	06						
1	eP	Z	12	42	31						
	(pP)	Z			41						
1	eP	Z	12	47	56½						
	e(pP)	Z		48	06						
1	eP?	ZN	13	52	35						
	i	ZE			37						
	i	ZNE			40						
	e	E		53	20½						
1	P	ZNE	16	00	24u					1	¾
	pP?	ZN			33						
	(pP)	ZE			36						
	PcP	NE		01	03						
1	eP	Z	16	07	27						
1	eP?	N	16	23	55						
1	P	Z	17	36	10d						
1	P	Z	18	11	24						
1	P	Z	19	36	19d						
1	P	Z	19	49	50d						
1	eP?	NE	21	25	16						
1	eP	Z	21	39	01½						
	(pP)	Z			10						
1	eP	Z	23	39	04						
2	eP	Z	03	36	06						
	(S)	Z			13u						
2	iP	ZN	08	09	15u						
3	eP	ZE	00	34	22						
	(S)	Z			28u						
3	eP	ZE	03	35	15						
3	iP	ZE	04	49	12u						
	pP	Z			34						
	(S)	N		16	17						
3	eP	E	17	42	40						
4	eP	ZNE	02	27	54						

Date	Phase	h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 7	PKS	10	51	40						
7	PKP	11	43	17						
8	1PKP	09	42	02u						
	PKS		45	22u						
	ePS		54	13						
9	P	07	25	27						
	(S)			33						
9	P	09	59	27						
9	P	15	17	39						
10	P	03	34	22						
	S		35	19						
12	eP?	00	33	08	Local ?					
12	eP?	01	51	00	Local ?					
12	eP	06	47	18½						
12	eP	10	51	02						
	e(S)	11	00	51						
12	eP	18	23	15						
12	ePKP	20	42	25			0.9	1	0.6	1
	e			55			1.5	2½	1.4	1½
	PKS		46	25			0.3	2½	1	2½
	SKS		49	28			1	4½	0.6	3½
	ePKKP		52	34			0.4	1		
	PKKP2			49			0.5	1		
	eScSP?		53	22			0.6	4½	0.5	1½
	ePPS		55	28					0.8	5½
	ePKKS			48			0.3	1½		
	SKKS?		59	42½			0.4	2½		
	e(PcSP')	21	00	38			0.9	2½		
	Lq		16.6						0.9	21
	Lr		27.0				1.5	20	2	20
12	ePKP	21	42	25						
12	P?	22	42	59	Local.					
12	ePKP?	23	51	20						
	e(PcPP')		58	58						
	e(SKKKS)	24	00	07						
	e(SKKKS)		10	43						
12	eP?	23	55	40	Local ?					
13	eP?	00	27	04	Local ?					
13	ePKP	03	15	25						
13	1PKP	04	23	34½u	1.1	1½				
	ePP		25	17	0.4	2				

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 13	1P	ZNE	08	42	08u						
	eS	ZE		50	38						
	ePPS	ZE		51	13						
	eScS	ZE			41						
13	1P	ZNE	16	29	50u						
13	eP	ZNE	17	13	42½						
13	ePP?	ZNE	18	55	39						
14	P	ZNE	00	02	26½						
14	P	Z	01	53	35½						
	eS?			57	55						
14	eP	ZE	05	14	03½	1.5	1				
	ePcP?	E			47					1	1½
14	PKP	Z	05	53	50½						
14	1P	ZE	14	00	01u	0.7	1½				
	(pP)	Z			08½	2.2	1½				
	PcP	ZE			17	4	1½				
	e	ZE			30	4.5	2				
	1PP?	Z		02	52	2	1				
	eS	E		09	28					0.7	6
	eScS	E		10	09					1	3
15	eP	Z	03	00	44						
	S	ZNE		01	19						
15	eP	ZNE	08	28	47						
15	1PKP	ZNE	09	19	42	2	1	0.2	½	0.2	1
	e	ZNE			47	0.4	1	0.4	1	0.2	1
	(pPKP)	ZNE		20	02	1	1	0.4	1	0.3	1
15	eP	ZNE	17	43	12						
	S	ZNE			17						
15	eP	ZNE	19	25	34½						
	1(pP)	Z			54						
16	P	ZNE	02	41	30						
	e	ZNE		42	32						
16	ePKP?	Z	05	06	27						
	e(PKP)	Z			39½						
16	eP?	Z	12	58	26	Local ?					
	(S)	ZNE			39						
16	P	Z	15	24	27½d						
16	eP?	Z	16	30	41						
	e	NE			56						
	(S)	ZE		31	00						
	e	ZNE			08						
16	eP?	Z	17	06	03	Local ?					
	S	ZNE			12						

Date	Phase		h m s	Az Tz	An Tn	Ae Te
NOV ~~OCT~~ 16	eP?	Z	17 23 13	Local ?		
	S	Z	22			
16	iP	ZNE	17 55 18½dnw	3 1	0.9 1	0.5 1
	P	ZN	18½	0.4 2½	0.4 4	
	e	ZE	25		0.7 3½	0.3 3½
	e	Z	28½	1.6 1		
	e(PcP)	ZNE	56 09	0.6 4	0.4 4½	0.6 4
	(PcP)	E	09			1 1
	e	ZNE	13	1 2½	1.2 2	0.8 2
	S	NE	18 03 52½ne		1.1 5	0.7 4
	S	ZNE	53se	0.2 8	1.5 6	1 6
	ePS	E	04 11			0.7 5
	PS	ZE	13	0.1 4½		1.7 6
	ePPS	N	38		0.7 5	
	ePPS	N	38		0.7 5	
	e(ScS)	N	05 14		0.7 5	
	e	E	33½			0.7 5
	e	NE	34		0.7 6	1 6
16	eP	Z	18 12 21	0.3 3½		
	P	ZN	21½d	0.7 1		
	e	ZNE	28½	1.3 2		
	e	NE	38		0.5 2	
	ePcP	ZE	13 22	0.2 4		
	e	ZNE	35	0.5 2½		
	eS	NE	20 24½			0.3 3
	ScS?	E	22 25			
	e(ScS)	E	35			
16	eP	Z	18 24 22			
	e		26½			
16	ePKP?	Z	20 42 57	Local ?		
	e(SKS)	ZN	49 03			
	e(SKS)	NE	09½			
17	iP	ZNE	09 57 30d	2.5 1½		
	ePcP	N	58		0.3 1½	
	e	E	58 23			0.3 1½
	eS	E	10 06 33			0.2 7
	eLr	E	18.7			0.5 14
	eP'P'	Z	25 51	0.6 2½		
17	eP	ZNE	17 04 38½			
17	P	ZNE	18 54 45½			
	e		55 00			
17	eP	Z	19 44 09			
17	eP	ZE	22 08 57½			
	e	NE	09 11½			
	eL	E	23.7			
18	ePKP	Z	08 04 30			
	e		05 18			
18	ePKP?	Z	08 15 13½			
	e		53			
18	eP?	ZNE	13 35 54½			
	e(S)	ZNE	36 30			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
NOV 18	ePKP	Z	18 52 15			
19	iP	ZNE	01 45 28½u			
	i	NE	42			
	ePcP	ZN	46 01			
	e(P'P')	ZN	02 13 09½			
19	P	ZNE	04 02 32½			
	e(PcS)	Z	07 15½			
19	P	ZNE	07 43 20½			
	e	Z	30			
19	eP?	ZNE	09 16 00	Local ?		
19	PKP	ZNE	09 42 44d			
	pPKP	Z	57½u			
	ePP?	Z	44 31			
	e	N	52 25			
	ePKKP	Z	41			
19	PKP	ZNE	15 21 32½			
	epPKP	ZN	43			
	e(PP)	N	24 16			
19	P	ZNE	19 40 33½			
19	P?	ZNE	20 34 05	Local ?		
19	eP?	ZNE	22 06 35			
20	eP?	ZNE	06 46 31			
20	ePKP?	ZNE	14 37 04			
20	ePKP?	ZNE	23 23 17			
22	P	ZNE	00 15 50	1 1		
	(PcP)	Z	53½	1.3 1		
	eS	NE	25 18			1.1 8
	e	N	26 46		0.4 5	
	eL	E	41.5			0.3 19
22	P	ZNE	02 08 45½u	2 2		
	ePcP	ZE	09 00½	3 2		
	ePP	N	11 45		1 2½	
	ePS	N	18 28		0.7 6	
23	ePKP?	Z	22 37 24			
24	iP	ZNE	06 56 45d			
	ePcP?	Z	58 36			
	iPcS	Z	07 02 18			
	eS	NE	57½			
	e	N	03 41			
	e	N	04 41			
	eLq	E	06.3			
	eLr	E	09.8			
	Lr	ZN	10.2			
24	eP	Z	17 55 22			
25	P	ZNE	13 24 39½u			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 25	eP	ZNE	13	26	09½						
	ePcP	ZE			19½						
26	eP	ZN	00	28	40½						
	e	ZNE			49						
26	eP	ZNE	21	32	51½						
	eL	NE			40.2						
	eL	Z			41 55						
	e	N			44 06						
	e	N			44						
26	P	ZNE	21	43	16	Volcanic ?					
	(S)	ZNE			21						
26	P	ZNE	21	58	49½	Volcanic ?					
	e(S)				54½						
26	P	ZNE	22	01	07	Volcanic ?					
	iS				13½						
27	eP	NE	06	45	03						
	e	E			46 17½						
	eL	NE			48.7						
27	eP	NE	07	07	24½						
	e?	E			47 18						
	eL	E			47.8						
27	P	NE	13	45	12			1.5	0.8		
	e(PP)	NE			31			2.5	2		
	e(PPP)	E			57½					1.5	2
	e	N			46 41			1	5		
	iS	E			48 25½					1.7	3
	S	N			29½						
	e(SS)	N			57½			1.3	6		
	eL	NE			49.0			3.5	11		
	e	NE			49 04					1	4
27	eP?	E	15	10	40						
	e	E			11 11½						
26	P	ZNE	10	44	37½	Volcanic ?					
	(S)	ZNE			44						
28	P	ZNE	15	06	25						
	e	ZN			35						
	e	N			07 07½						
	eL	ZN			10.2						
28	P	ZNE	15	20	50						
	e	Z			59						
	e	NE			21 06						
	e(S)	N			24 04½						
	eL	ZN			24.6						
28	eP	ZNE	15	57	16						
28	eP	ZNE	17	12	47½						
	e	ZNE			13 18						
29	P	ZNE	03	34	22	Volcanic ?					

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 29	iP	ZNE	04	55	39½d						
	PcP	Z		56	54						
	eS?	NE	05	02	38						
30	eP	ZNE	01	14	10	Volcanic ?					
30	ePKP	ZE	01	57	17	0.6	-			0.2	3
	ePP?	Z			58	0.9	1½				
	ePP	E		51	03					0.5	1.3
	PKP	Z	02	02	27	0.5	2½				
30	P	ZNE	05	35	10	Volcanic ?					
DEC 1	P	ZNE	04	55	04½u	1.2	1.5				
	ePcS?	E	05	00	40					0.4	3
	eS?	E		02	25½					0.4	1.5
	eS?	N			47						
2	eP?	ZNE	09	56	13						
3	P	ZE	20	44	42						
4	Pn	ZNE	01	20	10d						
	eP*	ZNE			14						
	eSn?	N			30						
	eSn	ZN			31½						
	S*	ZNE			36½						
	e	NE			40½						
	i	ZE			49½						
4	eP	ZNE	12	40	33						
5	eP?	N	07	02	12						
	eP?	ZNE			17½						
	i	N			25½						
6	eP	ZNE	01	11	32½						
7	P	Z	02	53	25						
	e(PcP)	NE			35						
	e(PcP)	ZE			46						
8	P	ZNE	03	20	39u						
9	eP?	Z	08	12	09½	0.5	0.7				
9	eP	Z	12	28	17						
10	iP	ZNE	07	10	24d	9	0.7	7	0.7	5.5	0.7
	eP	ZN			24½	0.4	0.7	2	8		
	i	ZE			26u	6	4			0.6	3
	pP	ZN		11	21u	7	9	5	0.8		
	ipP	ZE			23½	11	2.5			3	0.7
	PcP	ZE		12	14	10	1			4	2
	e	Z			35	2.3	4				
	i(ScP)	Z		15	33	7	2.5				
	iS	ZNE		16	20one	6	4.5	17	4.5	7	4
	iS	ZNE			21½us	4.5	5	20	7	4	8
	(SP)	ZE			42½	4.5	8			0.6	3
	e	E		17	32					2	5
	i	Z			46	4	8				
	e?	N		18	44			5	7		
	iG	NE		19	47			11	9	3	19
	eLr	NE		21	.1			4	13	4	17

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 10	iPP	ZNE	14	51	23d						
13	P	ZNE	09	15	58	3	1.5				
	e?	E		16	24					1.5	2
14	iP	ZE	07	21	02½u	3	1.6			0.5	0.8
	eS	NE		28.7				0.8	5	0.6	10
	e?	N		30.4				0.7	7		
	eLr	ZE		38.0		1.5	20			1	20
15	ePKP?	Z	08	09	03	Local ?					
	i?	Z			06½						
15	P?	Z	12	49	11½						
	eP	Z			14						
	i	ZN			16						
	iPcP	Z		50	39						
	eS	N		55	56						
18	eP	ZE	07	29	28						
18	P	ZN	19	34	21u						
	epP	ZN			34						
	ePcP	Z		35	00						
	eS	NE		43	07½						
	e(PPS)	NE		44	28						
19	P	ZNE	00	49	34						
	e(S)	N		55	21						
19	iP!	ZNE	04	24	28d	Explosion ?					
19	eP	Z	09	59	03	0.8	1				
	eL	NE	10	13.7				0.5	12.5		
19	ePn?	Z	19	31	08						
	eP	ZNE			14						
	eP	ZN			26						
	e(Sn)	NE			34						
	eSn	ZNE			35½						
	eS	ZN			45						
21	eP?	Z	13	13	22½						
	e	ZE			32						
21	eP?	ZNE	15	02	44						
23	eP?	Z	03	40	52						
24	eP?	Z	01	24	39						
	e(P)	Z			49½						
24	P	ZNE	20	45	30d						
24	iP	Z	22	21	07						
25	P	ZNE	08	17	05½	5.5	1.2	1.2	1	0.7	1
	P	Z			05½d	1.3	5				
	ePcP	ZE			16	6	2			0.8	1
	ePcP	Z			17½	1.5	2.5				
	PcP	N			19			1.5	1	2.2	2
	e	Z			30	1.5	3.5				
	e	E			49					2	2
	eS	Z		26	33	1.1	6				

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 25	eS	NE			34			1.2	5	1	5
	ePS	N			45½						
	ePS	Z			48	1	7				
	ePS	N			53			2.5	6		
	ePPS	N		27	10			2	6		
	eLr	Z		37ca		0.8	20				
26	P	ZE	05	59	57						
	e	Z	06	01	53½						
	eS	E		10	10						
26	eP	Z	12	54	54	Local.					
	eS	ZNE		55	32½						
28	iP	ZNE	06	54	14½						
	eS	ZE	07	02	12						
29	P	ZNE	22	51	15u						
	e	Z		52	06½						
	eSKS	N	23	01	44						
	e(PS)	N		02	54						
30	iP	ZN	08	47	33½d	4	1.8			0.7	1
	i	ZNE			42½	4	1.1	1	1.5	1.1	1.2
	e	NE			54						
	ePcP?	N		48	30			1.5	2		
	eS?	N		55	09			0.5	4		
	eLr	Z	09	05.0		0.5	20				
30	P	ZNE	16	17	13½u						
31	eP?	Z	01	44	44						
	e(P)	Z		45	14						
31	iP!	ZNE	01	54	54½d	14	0.6				
	iP	Z			56u	1	2				
	e	N		55	29			2.5	2.5		
	i?	Z			49	3	0.6				
	PcP	ZN		56	14½	6	2.5				
	eS	NE	02	02	16			3.5	3		
	eScS	N		03	52			1.5	5		
	ePKPPKP?	Z		26	44	1.3	4				

HALLETT

The amplitudes given in this section of the report are in millimetres, read directly from the photographic paper records.

JAN 1	eL	Z	10	33±
1	e(SS)	Z	15	41±
2	e(L)	Z	00	56±
2	e	Z	23	28±

Date	Phase		h m s	Az Tz	An Tn	Ae Te
JAN 3	iP	Z	17 58 53u	2 15		
	eS	ZE	18 08 55	1 -		3 -
	e(SS)	ZE	13 28	2 20		4 20
	eLq	N	20		2 25	
	eLr	ZE	22.5	2 35?		3 -
	M	E	27			7 20
	M	Z	29	5 18		
3	eL	Z	22 50±			
4	e	N	07 47 47			
	e?	Z	50			
4	ePKP	Z	08 22 00	1 13		
	e(PKKP)	Z	30 18	2 -		
	eL	ZE	53.0	1 30		2 30
	M	ZE	58	2 17		4 20
4	e	Z	18 40±			
4	eL	Z	23 56±			
5	P	Z	08 16 28	2 2		
	i(PP)	Z	21 53u	1½ 2		
	e(SSS)	Z	38.0	1 -		
	e	Z	50 35	2 15		
5	e(SS)	Z	12 15.5			
	e	Z	19.0			
	eL	Z	35.0			
6	i(PKKP)	Z	02 25 13u			
6	P?	Z	13 17 03	Local ?		
	i	Z	19u			
	(S)	Z	32			
8	e?	Z	08 50			
9	e(L)	Z	11 40±			
9	e(PP)	Z	18 02 01			
	i(PP)	Z	20d			
	eL	Z	50			
10	i	Z	21 56 50u			
11	eL?	Z	06 12±			
11	iP	ZN	13 27 42un	4½ 2	2 -	
	ePP	Z	29 42	3 10		
	iS	ZNE	34 37w	10 13	16? -	29 12
	e	Z	44	2 5		
	iSS	E	38 40e			11 15
	eSSS	Z	39 40	2½ 20		
	i	NE	40 05uw		7 25	17 20
	eLr	Z	43 45	3 20?		
12	e?	Z	14 38±			
12	eL	Z	16 09			
12	e(L)	Z	16 38			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
JAN 13	P	Z	03 04 51(u)	2 5?		
	S	Z	13 03	3 12?		
	Lr	Z	23.5	5 35		
				13d-14d Microseism storm.		
15	iP	ZN	19 27 45½u	25 18	3 -	
	ePPP	Z	33 18	1 5		
	eSKS	N	37 56	8 15		
	e(S)	Z	38 25	16 -		
	e(S)	Z	40	2 -		
	eSS	ZN	43 14	14 40	12 40?	
	eSSS	Z	49 46	22 45?		
	e(PcPP')	N	50 10		19 40	
	e(P'P')	N	52 40		12 35	
	i(Lq)M	ZN	53 23u	80 35	25 33	
15	eP	Z	22 26 45	1 2		
	eP	ZN	46	10 25?	4 -	
	iPP	Z	55	2 -		
	e	Z	27 15	2½ 2		
	eL	N	43 38		3 20	
	eLr	ZN	46	13 25	15?	30?
16	P	Z	00 10 25			
	e(S)	Z	11 30			
	L	ZN	12.0			
16	eP	ZN	11 13 38	2 15?	2 -	
	eS	ZE	21 44	2 -		2? -
	iS	N	48		2 20	
	e(SS)	E	28 35			3 -
	eLr	ZNE	32.8	2 20	2 20	2 20
	M	ZN	36 4	4 20	2 20	
17	e(L)	Z	04 52			
17	iP	ZNE	07 21 00ue	4 10?	3 -	4 10
	i	ZN	22 12u	7 10	3 -	
	eS	Z	25 27		2 12	
	iS	Z	30	3 10		
	iS	E	33			23 15?
	L	ZNE	27.0	10 20?		
	M	ZE	28+	58 -		90+ 10
18	e	ZNE	02 48			
18	eP	Z	15 57 30ca			
	e	Z	28 10ca			
	eLr	ZN	52.6			
19	P	Z	09 20 57			
19	iP	ZE	14 21 07u	7 13		4 -
	iPP	ZE	25 04	7 17		4 20
	(S)	Z	31 27	5 18		
	eS	E	37			15 -
	e	Z	33 30	7 20		
	(SKPP)	Z	49 30	13 25		
	Lr	Z	52 29	65? 30		
	M	Z	56	100+ 25		

Date	Phase		h m s	Az Tz	An Tn	Ae Te
JAN 20	1P	Z	02 31 04d	2 -		
	ePP	Z	34 40	1 5?		
	eS	Z	40 10	2 -		
	eSS	Z	44 40	2 -		
	1(Lr)	Z	52 29	3 25		
×21	eL	Z	10 28			
				25d and 26d all long-period records disturbed by artificial movements.		
				26d strong microseisms.		
				27d no records owing to recorder fault.		
				27d to 30d microseismic storm.		
-31	eS	ZNE	06 44 40	2 -	2 -	1 -
	1SS	NE	46 53		1 -	3 15?
	e(SSS)	N	47 25		2 -	
	eSSS	ZN	43	3? 25	3 25	
-31	1	ZNE	21 15 55			
	1(L)	ZN	22 50			
	e	ZNE	25.2			
	1	ZN	25 30			
FEB 1	eP	ZN	16 23 55	1½ 10	3? -	
	1	E	25 49			2 10
	PP	E	27 51			2 10
	1S	ZNE	34 29ne	3 15	5 15	13 15
	SS	E	41 56			3 15
	Lr	E	54 39			5 20
	M	ZE	59	33 20		40 20
-1	e(PPS)	Z	21 12 26	2 15		
	e	Z	18 00	1½ 25		
	eSS	Z	20 31	1 -		
	eLr	Z	31 26	2 25		
	M	Z	39	11 15		
×2	eL	ZN	09 09±			
×3	e(L)	ZN	08 52±			
×5	e(L)	ZNE	02 54±			
-5	eP	ZE	20 56 22			
	e(S)	ZE	21 02 36			
	e(L)	ZNE	08 52			
	eL	ZE	10 35			
-6	1P	ZN	16 08 15			
	e(PP)	ZNE	09 38			
	e	ZNE	11 18			
	S	ZNE	14 42			
	e	Z	48			
×7	e	Z	01 16			
×8	eL	Z	00 26			
×11	e(L)	Z	01 20			
×12	e	Z	07 09			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
FEB 13	1(SKKS)	ZN	00 11 12u	2 5		
	e(Lr)	ZN	40			
				13d-14d Microseism storm.		
-18	eS	ZE	07 51 02			
	e	ZNE	52.1			
	e	ZE	53.4			
×18	e(Lq)	ZE	55 37			
	e	ZE	56 43			
	e	ZN	57.6			
	e(Lr)	ZN	58.7			
	e(L)	ZNE	08 00.0			
	e	Z	04.75			
	e	ZN	07.6			
-18	1P	ZNE	13 29 19			
	e	NE	30.1			
	ePP	ZNE	31 05			
	1S	ZNE	35 46			
	1	NE	37 09			
	1Lq	ZNE	39 15			
	1Lr	NE	41 32			
×18	eL	ZN	20 42±			
-19	(P)	Z	19 34 47			
	(S)	Z	37 12			
-27	e	ZN	22 38 55			
	e	ZNE	42 29			
	e	ZNE	45 33			
	e	ZNE	56 17			
	e	ZNE	59 24			
	e	ZN	23 04 32			
	e	ZN	12 34			
	eL	Z	15			
MAR 9	eP	ZNE	10 30 02	1½ 3	10? 3	8 3
	1S	ZNE	36 05nw	2 15	8 13	12 12
	1SS	NE	39 21ne		6 17	12 25
	e	Z	41 01	12 25		
×20	eL	Z	02 35±			
√21	e	Z	21 18±			
√22	e?	Z	10 41±			
	eL	Z	11 03±			
×22	eL	Z	12 12±			
×24	eL	NE	01 18±			
×24	e?	Z	04 14±			
×24	e?	Z	17 23			
×25	e	ZE	23 20±			
-28	e	ZNE	05 33 41			
	1L	ZNE	34 35			
	1	E	37 02			

Date	Phase		h m s	Az Tz	An Tn	Ae Te	
MAR 29	1P	Z	06 28 35				
	eS	NE	30 16				
							Note: Frequent periods of microseismic storms interfered with earthquake recording during March, particularly in the first half of the month.
APR							1d and 2d Microseism storm.
-3	e(P)	Z	09 09 56				
	e	E	10 14				
	e	Z	11 26				
	e	Z	12 20				
	1	E	26				
	e	E	47				
	1	E	16 20				
	1	ZE	17 40				
	e	Z	20 30				
-3	1(P)	ZN	21 37 25				
	e?	E	40				
	e	ZNE	38 10				
-4	(P)	Z	05 28 22				Local.
-4	eP	ZNE	07 41 04				
	1S	ZN	49 55				
	(ScS)	N	51 10				
	1SS	ZN	54 28				
	e	ZN	58 39				
	Lr	ZN	08 00.9				
	e?	ZNE	01 50				
	1	Z	03 54				
	e(L)	ZN	06 10				
	1(L)	Z	10 59				
-4	P	Z	10 11 32				Local.
-4	eP	Z	15 49 15				
	1(P)	NE	25(e)				
	e(PPP)	N	53 03				
	e	Z	54 53				
	1S	ZNE	58 03ue	3 15	2 20	3 -	
	(ScS)	ZN	59 07				
	1SS	ZNE	16 02 48ne	2 20?	4 20?	3 15?	
	e	ZN	04.6	2 15			
	eLr	Z	09+	2 30			
	e	Z	13 54	3 20			
	eL	N	16		5 20		
	M	ZN	18	6 20	6 17		
X5		Z	17 54				
-6	eSS	ZE	11 04 57				
	e	Z	06 45				
	(SSS)	ZNE	08				
X6	e	Z	14 09±				
-7	1(PKP)	Z	15 48 45(u)				
	1(PKP2)	ZNE	49 05				
	1(PPS)	ZN	16 03 01				
							Period of heavy microseisms.

Date	Phase		h m s	Az Tz	An Tn	Ae Te	
APR 10	1P	Z	13 30 25u	5 3			
	epP	Z	31 24	2 2			
	e	Z	31 24	1½ 3			
	e(PP)	Z	32 59	4 3			
10	1P	ZNE	17 08 47				
	1	ZNE	09 02				
	1	ZNE	08u				
	e	ZE	57				
	e	ZNE	10 21				
	1(S)	E	55w				
	1S	ZN	11 03d				
	e	N	13 05				
	ePcP	ZNE	17				
	eScP	ZNE	14 47				
	1PcS	Z	16 17d				
10	e?	N	23 48 33		2 6		
	e(Lq)	ZNE	47	3 5	3 30?	1 -	
	e	ZNE	50 07	2 -	3 5	5 5	
	e	NE	51 16		3 7	3 7	
	e(SKKS)	ZN	28	2 5	2 -		
	e	Z	54 45				
	e	Z	55 18				
	e	ZNE	59.4			3 8	
	1	ZNE	11 02 16s		3 5		
	e	ZE	04 16	2 10?		4 15?	
11	e(PPP)	Z	23 35 58	2 7			
	eSKS	NE	38 31		2½ 15	2 10	
	(PS)	ZNE	42.0		4 30	3 -	
	eSS	ZN	47 56		3 15		
	(Lr)	N	24 12		3 20		
							Interpretation doubtful. May be two shocks.
12	P	Z	03 30 25				Local.
12	P	Z	10 54 24				Local.
12	e(Ir)	ZE	12 40.0	3 20		5 20	
	e	Z	43 06	5 15?			
	1	E	22w			10 10?	
	e	E	44 44			4 15	
	M	ZE	49	7 20		8 15	
X12	eL	Z	14 01±				
13	1SKSP	ZN	13 00 07d	5 -	4 15		
	e(PKKS)	Z	01 06	2 10			
	e	N	02 32		7 30?		
	e(SKKS)	ZN	05 01	2 -	4 20		
	1SS	ZNE	07 12	3 20	15 25	9 20	
	e	E	08 18				
	e	E	11 15				
	e	ZNE	15 43	4 15	7 15		
	eL	ZE	25 02	3 15?		2 -	
	M	ZN	33	12 25	15 27		
X13	e(L)	Z	17 39±				

Date	Phase		h m s	Az Tz	An Tn	Ae Te
APR 14	eP	ZNE	21 45 25			4 5
	e	ZNE	46 04	2½ 15	2½ 5?	
	e(PP)	ZN	49 30		1½ 6	
	e(PP)	ZNE	50 07	5 20?		
	i	Z	52 44			
	iS	ZNE	56 52	4 -	6 25?	5 20
	iPS	NE	57 31s		10 23	15 20
	iPPS	ZNE	58 52de	10 15	8 15	6 -
	i(PSPS)	ZNE	22 04 03	4 25?	6 23?	7 12?
	(L)	ZNE	11 02	4 15	12 20	
	eL	ZE	13.5	5 30?		3 20
	M	ZNE	19	35 25	16 30	30 25
	M	ZNE	44	20 18	24 20	13 15
15	SKS	NE	01 55 12			
	ePPS	Z	57 11	3 20?		
	iSS	N	02 01 26n		5 20	
	eLq	N	11 13		4 30	
	eLr	ZNE	15	3 30	4 25	3 30
	M	ZE	19	12 20		12 20
15	e(PPS)	N	04 21 38		4 30	
	eSS	ZN	25 28	2 -	6 20	
	eLq	N	35.0		10 35	
	e(Lq)	ZE	36½	2 20		3 -
	e	ZE	38.4	3 25		3 -
	e(Lr)	ZNE	40.5	7 25	6 25	7 30
	M	ZE	43	13 20		12 20
	M	ZE	49	12 15		13 15
				15d-17d Microseism storm.		
17	eP	Z	15 30 01	Local.		
17	iP	Z	18 15 25	Local.		
18	eP	ZNE	08 52 13			
	e	ZNE	54.3			
	e	ZE	56 15			
	e	ZN	09 01 06			
19	iP	ZNE	11 00 12			
	e	Z	01 12			
	e(ScS)	ZN	10 32			
	eLr	ZNE	20.7			
	e?	Z	27 03			
				20d-21d Microseism storm.		
21	P?	Z	08 48 44	Local.		
21	eP	Z	20 24 51	Local.		
21	eP	Z	22 49 44	Local.		
22	iP	Z	00 08 19	Local.		
23	i(P)	Z	07 06 15d			
23	e	ZN	15 36±			
23	eP	Z	19 23 36			
23	e(P)	Z	23 44 03	Local.		

Date	Phase		h m s	Az Tz	An Tn	Ae Te
APR 24	eP?	Z	00 44 19	Local ?		
24	eP?	Z	01 18 02	Local ?		
24	eP	ZNE	13 18 42			
	e(PcP)	N	19 24			
	ePP	Z	20 40			
	iS	ZNE	25 57e			
	e?	N	27 41			
	iSS	ZNE	29 41			
	i	E	31 02			
	i(Lq)	N	34			
	i(Lr)	ZNE	34.3			
24	eP	ZE	17 30 10			
	e(PcP)	ZE	26			
	e(PP)	Z	32 30			
	iS	E	38 44			
	e	Z	39 09			
	i(pS)	E	44			
	e(SSS)	ZE	46 34			
	e?	Z	48 40			
				26d-27d Microseism storm.		
26	iP	Z	09 35 38d			
26	eP	Z	23 33 02			
27	eP	Z	18 56 02	Local.		
27	eL	ZNE	20 01 05			
27	e(P)	Z	22 57 16	Local ?		
28	e(P)	Z	06 14 24			
	iP	Z	38			
	iS	ZNE	17 26			
	Lq	ZE	18 17			
	eL	Z	21 20			
28	e	Z	07 04 41			
	e	Z	57			
28	eP	ZE	12 00 26	5 18		2 18
	e	Z	01 40	2 -		
	e	E	03 05			2 15
	e(PP)	Z	46	2 -		
	e	N	05 20		2 -	
	iS	ZNE	10 55e	3 17		7 15
	e(PS)	N	12 07		2 12	
	e	E	14 00			4 25
	e(SS)	NE	16 47		2 12	4 -
	e	Z	17 28	3 15		
	e	ZN	23.8	5 -	3 35	
	e(Lr)	ZNE	26.8			
	eL	NE			3 20	4 20
	M	ZE		13 20		15 20
30	eP?	Z	12 16 56			
30	eP	Z	14 26 37			
30	eP	Z	18 14 35			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
APR 30	eP	Z	19	21	00	Local ?					
30	iP	Z	19	39	26d	2	3				
MAY 1	iP	ZN	00	38	56u	4(z)	-	1½	?		
	i	Z		39	25	10	2				
	e(PP)	E		40	29					2½	15
	ePcS	E		43	10					3	10
	iS	NE		46	44s			8½	25	4½	15
	i(ScS)	NE		48	11s			5½	25	5½	15
	i(SS)	N		50	28			7	40		
	Lr	ZE		56	28	6	-			5	25?
	(SKKS)	ZN	01	14		6	50?	7	-		
1	eP	Z	01	08	02	Local					
1	eP	Z	06	21	26	Local ?					
1	eP	Z	22	14	36	Local					
3	(P)	Z	00	43	20						
3	(P)?	Z	04	09	10						
3	eP	Z	09	38	27						
3	e(P)	Z	12	28	37						
3	(P)	Z	15	14	24						
	i	Z			40						
4	e?	Z	13	26	53						
5	(P)	Z	10	56	58	Local					
5	(P)	Z	11	01	28	Local					
5	e	E	16	40	21						
	e	E		42	46						
	i	E	17	02	47						
6	e(P)	Z	02	16	14						
7	eP?	Z	01	58	48						
7	eP?	Z	06	07	10						
8	e(P)	Z	01	43	27						
	i	Z		49	24						
8	eiP	Z	04	52	53						
8	eP	Z	12	46	23						
8	iP	ZNE	12	52	19dse	9	10	5	10	5½	10
	i	Z		53	03u	6	2				
	e	E			14					3	10
	e?	Z			17	3	-				
	e(pP)	Z		54	22	3	-				
	e(sP)	E		55	03					3	10
	e(sP)	ZN			11	2½	2				
	i	N		56	37s			3	-		
	e(sPP)	NE		58	11			5	35?	4	10
	e	E		59	55						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
MAY 8	e?	Z	13	00	53						
	e(S)	ZNE		01	51w				3 -		6 -
	e(SP)	Z		02	26	4	20				
	e(SP)	E			46						5 10
	e	N		03	31				7	15	
	e(SS)	E		07	15				4	10	
	e(SS)	N			47				5	-	
	(L)	NE		12	.5				6	40?	5 -
9	iP	Z	04	51	29d	2½	2				
	i(sP)	Z		52	13	3½	2				
	i(PP)	Z		53	23	2	2				
	L	E	05	05	.2						6 ?
9	eiP?	Z	05	19	18						
	(P)	E			23						
9	eP?	Z	07	16	05						
9	eP	Z	07	32	23						
	(S)	Z			39						
9	eP	Z	08	21	38						
	(S)	Z		22	02						
13	eP	Z	14	34	59						
14		Z	22	12	ca						
15	eP?	Z	05	55	38						
15	eP?	Z	06	08	32						
	e(S)	ZE		12	31						
	e(SS)	N		13	10						
15	eP?	Z	07	12	17						
15	iP	Z	09	23	54d						
15	e(S)	Z	18	59	03						
15	eP	Z	20	40	54						
16	eP	Z	13	00	10						
16	eP	Z	13	30	44						
	iS	NE		33	13s						
	i(S)	Z			18u						
16	eP	Z	21	21	04						
16	iP?	Z	22	41	25	Small.					
17	eP	Z	07	13	44						
	e(L)	Z		40	35						
	e?	E		41	04						
17	(P)	Z	17	53	15						
18	P	ZNE	02	42	57	2	?	2½	15	2?	-

Date	Phase		h m s	Az Tz	An Tn	Ae Te
MAY 18	1	Z	43 12u	5 2		
	ePP	Z	45 27			
	e	E	45			2½
	e	N	55			
	1S	NE	51 06se		6 17	8 16
	1SS	N	54 55s		7 12	
	e(Lq)	E	58 10			10 ?
	eLq	N	36		4 -	
	Lr	N	03 01.2		8 20	
	M	N	05		25 20	
18	1P	Z	03 41 22d			
18	1P	Z	05 36 44d			
18	1P	Z	12 31 21u	3½ 3?		
	eS	NE	39 33			4 18
	e(ScS)	NE	41 06			3 15
	e	N	42.6		11 60?	
	eSS	E	43 45			9 20
	Lq	E	46 31			8 40?
	(PKKP)	N	52.2		9 22	
	M	N	54		18 18	
18		Z	21 51±	Local ?		
19	1P	Z	00 16 05d			
21	eP	Z	13 29 15			
22	eP	Z	15 18 20			
	(L)?	N	45			
23	e(SKSP)	Z	22 40 15			
23	P?	Z	23 01 35	Local ?		
24	e(L)	NE	07 42			
25	eP	Z	21 24 59	2 2		
	e(sP)	Z	26 02	1 2		
	ePP	Z	28 54	1 -		
	eS	Z	36 23	½ -		
	eLr	ZNE	56	1 -		
	M	NE	22 00		14 22?	15 25
					20 18	17 22
26	e(P)	Z	11 49 18			
27	eP?	Z	00 55 34			
27	eP?	Z	23 19 43			
27	1P	Z	23 43 47u			
	1(PcP)	Z	44 07d			
28	e(P)	Z	07 56 32			
28	eP?	Z	08 09 55			
28	eP?	Z	12 37 39			
28	eP	Z	16 13 48			
28	e	Z	17 48 03			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
MAY 30	e(P)	Z	02 46.0			
30	eP	Z	06 01 18			
30	e?	N	18 15.2		4 15	
	ePKP	ZN	23 58	½ 1	7 15?	
31	1P	ZE	19 42 18u	11 8		2 -
	1	Z	30d	18 1		
	e	Z	43 50	4½ -		
	1PP	Z	44 29u	19 ?		
	1	Z	46 02d	2 10?		
	eS	ZE	50 26	1½ 5		14 15
	M	E	58			65 25?
	e(Lr)	N	20 01.0		7? 15	
	M	ZN	03	55 20	50? 22	
	M	N	17		40? 15	
JUN 1	PKP	Z	04 18 55			
1	1P	Z	10 52 25u			
	ePKKP	Z	11 11 01			
2	e(P)	Z	02 14 10			
	1	Z	15 08			
2	e?	Z	05 27 19			
2	e(P)	Z	09 36 51			
2	e(P)	Z	11 45 20			
	1	Z	38			
3	e(P)	Z	02 06.4			
3	e?	Z	05 06 57			
3	e(P)	Z	08 01 54			
	1	Z	02 10u			
3	e?	Z	15 26 31			
3	1P	ZN	19 41 40us	8 10	6 12	
	1	Z	51(d)	6 2		
	1?	Z	46 53(u)	7 13?		
	eS	N	49.6		15 13	
	Lq	E	56.5			7½ 20?
	(Lr)?	ZN	58.5	12 30	22? 30	
	(Lr)	Z	20 00.5	8 23		
	M	E	02			31 17
	M	Z	08	23 15		
4	eP	Z	00 02 07			
4	e(P)	Z	05 15 50ca			
	1	Z	16 32			
4	e	Z	05 32ca			
4	e(P)	Z	06 19 40ca			
4	e(SKKS)	Z	14 57 11	1 1?		
	(Lr)	ZN	15 37ca	8 ?	5 25	

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 5	P?	Z	07	21	50						
5	iP?	Z	07	32	58u						
5	eP	Z	10	50	38						
	i(P)	Z			43d						
	i	Z		51	09u						
	i	Z			23						
	i	Z			37						
	i	Z		52	03d						
	e(L)	E			40						
	e(L)	Z			55						
	e(L)	N		53	10						
6	eP	ZN	09	29	30	1	?	9	?		
	PP	N		34	00			6½	20?		
	iPP	E			10					8	?
	i	N		37	20			10	23?		
	iS	N		40	55n			10	30		
	e(PKKP)	E		45	30					7	15
	e	E		46	50					10	?
	(P'P')	NE		54	10n			30	35	11	30
	e(SKKS)	E		56	15					9	?
	Lq	E		59	.3					25	25
	M	E	10	02						33	20
6	iP	Z	12	35	42u						
6	(P)	Z	13	16	02						
6	e?	Z	19	26	52	½					
	P	E		29	44					8	?
	ePP	Z		33	26	½	2				
	PPP	E		34	26					7	-
	e(SKS)	Z		39	37	1	1				
	L	E	20	05	.1					7	20
6	e	Z	22	42	33						
	e	Z		43	18						
7	i(P)	Z	09	20	48d						
7	(P)	Z	12	01	30						
7	eP	Z	13	00	18						
	i	Z			40d						
	iS	ZNE		04	35sw						
	iSS	E		05	38(e)						
	eLq	Z		07	.0						
7	(P)	Z	18	39	42						
7	e	Z	19	09	13						
7	e(P)	Z	19	47	56						
8	ePKP	Z	00	57	54	½	1½				
	i(SKKS)	N	01	06	50s			11	?		
8	e(P)	Z	03	39	08						
8	e(P)	Z	07	39	12						
	i	Z			25d						
	i	Z			30u						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 8	e?	Z	17	54	09						
	i	Z			12d						
8	eP?	Z	18	32	40						
8	e(P)	Z	18	54	56						
9	P?	Z	04	32	05						
9	e(PKPPKS)	Z	22	00	21						
10	iP	Z	04	08	06d						
10	(P'P')	Z	07	37	03						
10	e	Z	09	37	55						
	e	Z		38	24						
10	(P)	Z	09	55	13						
	i	Z			21						
11	e	Z	03	51	13						
	i	Z			21						
11	e	Z	03	51	15						
11	e(P)	Z	13	46	05						
11	P?	Z	17	13	00						
12	P?	Z	04	39	00						
12	e(P)	Z	07	26	05						
12	P	ZE	21	19	30dw	3½	?			8	?
	ePP	N		24	06			3	?		
	ePPP	E		25	38					3	?
	e(SKS)	N		30	10			2	15		
	S	ZN		31	10	6	15	10	20		
	eS	E			16					6	18
	e(PKKP)	E		35	49					7	25
	iSS	N		37	29			8	?		
	e	Z		43	58	3½	15				
	i(Lq)	Z		46	10	6	3				
	e(SKPP)	E		47	58					4	15
	eLr	ZNE		51	.5	6	20	2	25?	2	17?
	e	ZNE		54	.1	7½	?	2½	18	5	?
12	eL	ZNE	22	51	±						
13	(P)	Z	03	03	01						
13	iP	Z	11	04	56(d)						
	e(PP)	Z		06	04						
	e(ScP)	NE		09	59						
	e	N		10	33						
	e(S)	ZNE		11	13						
	e	N			30						
	e	ZE			45						
	e	ZN			57						
	e	N		12	09						
	e	ZE		13	14						
	e	N		15	44						
	e	Z		16	56						
13	e(P)	Z	12	48	15						

Date	Phase		h m s	Az Tz	An Tn	Ae Te	
JUN 13	i(P)	Z	19 28 20u				
14	e?	Z	15 26.5				
14	e(P)	Z	20 52 20				
	i	Z	30d				
15	iP	Z	02 49 40				
15	eP	Z	11 43 17(u)				
15	iP	Z	15 03 20d	4			
	iPcP	Z	04 14u	3 2			
	ipP	Z	05 07u	3 12			
	esP	ZE	06 09u	5 13		2 ?	
	iPcS	ZE	08 13	6 12		3 ?	
	iS	ZE	10 27de	4½ 12		14 12	
	isS	E	13 34e			6 ?	
	e	E	17 19			9 20	
	(PKKP)	E	22 37			7 ?	
15	P?	Z	16 22 11				
15	eP	ZE	17 31 29				
	ePP	Z	34 15				
	eSS	ZE	44.2				
	eLq	Z	48 41				
	eLr	ZE	51.6				
15	iP?	Z	18 18 42u				
16	e(P)	Z	00 06 50				
16	e	Z	01 42 56				
	i	Z	43 09d				
16	iP	Z	07 04 28d				
16	iP	Z	07 23 28d				
16	eP	Z	08 23 05				
	eS	ZNE	31 13				
	eScS	N	33 20				
	e	Z	34 02				
	eSS	Z	35 16				
	eSSS	N	36 31				
	eLq	E	37 40				
	e(Lr)	N	40 30				
	eLr	ZN	41 04				
16	i(P)	Z	19 01 06u?				
17	e?	Z	02 00 08				
17	P?	Z	19 53 53				
	i	Z	20 02 50d	Prominent.			
17	e(P)	Z	21 49 25				
18	eP?	Z	06 32 45				
18	i(P)	Z	08 07 31d				

Date	Phase		h m s	Az Tz	An Tn	Ae Te
JUN 18	e(P)	Z	16 21 07			
	(L)	Z	31.5			
19	eP	Z	01 27 32			
	iP	ZN	34dn			
	e(S)	Z	32 04			
19	i(P)	Z	02 17 03			
19	e(P)	Z	03 37 42			
19	ePKP	Z	07 36 56	½ 1½		
19	iP	Z	07 56 03d			
	e(SS)	Z	08 09 02			
	e(SSS)	Z	11 42			
	(Lr)	Z	16.0			
19	eP	Z	11 21 08			
19	e?	Z	13 30 10			
	i(P)	Z	39 06u?			
19	iP	Z	18 07 33u?			
	i	Z	46u			
	iPP	Z	08 23d			
	iS	E	12 00w?			
	eSS	ZNE	13.9ca			
	M	NE	16			
20	eP	Z	00 57 45			
	ePKP	Z	01 19 02			
	eSKKS	Z	26 13			
	e(SKKS)	N	33			
20	P	Z	17 41 40			
20	e	Z	21 20 22			
21	e	Z	02 54 57			
21	e	Z	16 46 29			
22	e	Z	13 21 50			
23	e	Z	05 59 15			
	e	Z	06 09 20			
	i	Z	23u			
	i	Z	28d			
23	iP	Z	07 28 44d			
23	iP	Z	19 02 00d			
23	P	Z	19 26 20			
24	eP	Z	00 20 30			
24	e(PKKP)	Z	05 07 29			
24	eP	ZN	06 45 39d?			
	e(PcP)	N	46 29			
	e(PP)?	E	47 20			
	e(PPP)	NE	48.6			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 24	1S	ZNE		53	15sw						
	(SS)	N		56	14						
	eLq?	N		58	22						
	e(lr)	NE	07	00	14						
	e(Lr)	Z			36						
	M	ZE		07							
25	e(P)	Z	02	33	38						
25	iP	ZN	09	47	52d	3	?	3	?		
	ePP	ZE		50	34	1	?			4	10
	e	ZE		51.7		1	?			5	10
	ePP	Z		52	20	1	2				
	e	Z		53	44	12	15				
	iS	ZNE		57	08dne	10?	13	17	22	21	13?
	e	Z		59	45	1½	10?				
	eSS	Z	10	02	11	21	?				
	eL	ZNE		07½		22	?	40	35	60	25
	eL	Z		10	50	70	30				
	M	N		13				50	15		
	eP'P'	Z		15	55	1	4?				
	M	Z		16		105	20				
25	iP	Z	12	54	52d						
25	eP?	Z	21	05	51						
25	i(P)	Z	23	10	49d						
26	P?	Z	03	29	54						
26	e(P)	Z	04	07	38						
26	ePKP	Z	04	57	09	<½	1				
	e	Z			40	½	2				
27	(P)	Z	04	03	03						
27	(PKP)	Z	05	00	25	1	1				
27	e?	Z	16	02.8							
28	eP	ZE	08	42	59						
	iS	NE		47	25						
	e	E		49	10						
	i	E		51	07						
	e?	N		58	01						
29	P	Z	03	37	59	1½	1				
29	iP	Z	09	24	28u						
	i	Z			45u						
	eS	E		32	25						
	eSS	E		38.0							
	eLr	E		41.0							
29	iP	Z	12	50	30d						
	i	Z			52u						
30	eP	Z	04	01	55						
	e(L)	E		04	35						
30	e(P)	Z	06	57	01						
	e(L)	ZE	07	00.0							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 30	eP?	Z	08	14	28						
30	e	Z	13	59	20						
30	e	Z	18	44	45	½	?				
JUL 1	ePKP	Z	06	12	06d	1	1				
1	e(P)	Z	13	07	23						
1	iP	Z	20	10	13d?						
	e	E		12	15						
1	eP?	Z	23	45	24						
	e	Z			30						
2	iP	Z	04	57	00u						
	ipP	Z		58	18d						
	e?(PP)	Z			40						
2	eP	Z	16	51	05						
2	e(P)	Z	21	50	00±						
3	eP	Z	05	57	16						
3	iP	Z	06	35	17u	3½	1?				
	ePcP	Z		36	07	1½	?				
	iPP	Z		37	14u	3	?				
	ePPP	Z		38	28	1	?				
	i	Z		40	14d	3½	3				
	eS	Z		43	00	½	4				
	(L)	E	07	07						3	?
	(L)	E		12						5	23
	M	E		36						12	20
3	eP	Z	10	29	32						
	eSS	Z		37.5							
	e(Lr)	E		42.0							
	e	E		49.0							
	e	E		52	30						
	i	E	11	05	00w?						
	M	E		20							
3	ePP	Z	19	20	02						
	e(SKKS)	Z		26	04						
3	e(P)	Z	23	55	03						
	e	Z			38						
4	e?	Z	00	24	53						
	(P)	Z		28	56						
4	eP	Z	02	34	43						
4	e(P)	Z	04	31	31						
4	iP	ZNE	13	07	56u						
	i	Z		08	08u						
	iS	ZNE		09	40						
	iLr	ZN		10	08						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 4	iP	Z	18	46	35u						
5	e(P)	E	23	36	15						
	eL	E	24	03							
6	e	Z	18	46	37						
	e	Z		48	48						
7	SKKS?	Z	00	11	16	Possibly artificial.					
7	e(P)	Z	11	56	06						
7	eP?	Z	14	31	07						
	i	Z			18d						
8	e	Z	06	02	37						
8	eP	Z	06	15	40						
	ePP	Z		17	16						
8	eP	Z	19	31	11						
	i	Z			25d						
	i	Z			30d?						
	i	Z			43d						
	(L)	ZNE		34.2							
8	iP	Z	22	58	43u	1	3				
	e(PPP)	Z	23	02	30	½	5				
9	e(P)	Z	01	18	12						
9	eP	Z	14	02	50						
	iP	Z			52d						
9	e(PKPPKP)	Z	15	56	24						
	i	Z			33u						
10	ePKP	Z	06	35	11	<½	1				
	ePKP	Z			20	1	3				
	iPKP	Z			25d	15½	5				
	e	Z			39	1½	3?				
	i	Z		37	56d?	18	6				
	e	Z		38	01	2½	2				
	ePKS	Z			40	2½	3				
	iPKS	Z			50u?	45+	?				
	i(PKS)	Z			58	3	5				
	i	Z		39	04	5	?				
	iPPP	Z			32	4½	5				
	ePS	Z		47.0		2	12				
	eSS	Z		53.0		1	12				
	eLg	Z	07	18		1	11				
	M	Z		35		10	18				
11	iP	Z	06	25	31d						
11	eP	Z	18	35	24						
	e	Z			30						
	iS	ZNE		38	28ne						
	iL	ZE		39	15						
	e(L)	Z			50						
	M	ZNE		40							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 11	iP	Z	19	22	29	3	1				
	i(PcP)	Z			33u	4½	1				
	i(PcP)	Z			43d	3½	2				
11	e(P)	Z	20	16	27						
11	e(P)	Z	20	43	38						
12	eP	ZE	01	01	03	½	1			7	?
	e	E		03	00					6	25?
	ePP	ZE		05	14	5	?			4½	?
	e(PPP)	E		07	07					4	25
	i	E		10	13					10	?
	e(SKS)	E		11	23					6	?
	eS	ZE		12	19	5	?			3½	?
	e	Z		15	45	3½	?			9½	35
	(Lq)	E		28	15						
	eLr	ZE		30.5		5	15?			3ca	?
12	iP	Z	03	42	33u						
12	eP?	Z	17	51	51						
13	e(P)	Z	02	47	00						
13	e	Z	07	42	30						
13	iP	Z	12	14	07d						
	i	Z			30d?						
	ipP	Z			41u						
13	e(L)	NE	23	04±							
14	e(P)	Z	07	07	30						
15	P	Z	15	57	05						
	S	Z			17						
16	eP	Z	13	04	20	1	2				
	iP	Z			25u	4	?				
	i	Z			29d	1½	2				
	e(Lq)	Z		19	44	5½	?				
	iLr	Z		21	23						
	(L)	Z		24.4		8	17				
16	e(P)	Z	13	20	53						
16	iP	Z	17	04	31u						
	i	Z			43						
	eL	Z		21	09						
	e	Z		27	05						
16	iP	Z	18	50	34d						
	i	Z			47						
16	P	Z	20	50	33						
17	P	Z	03	07	25	Local ?					
17	iPKP	Z	05	57	44u						
17	eP	Z	10	13	34	Local ?					

Date	Phase		h m s	Az Tz	An Tn	Ae Te
JUL 17	ePKP	Z	21 18 21	½ ?		
	e	Z	36	1 1		
18	ePKP	Z	00 58 22			
	e	Z	59 00			
18	eP	Z	02 00 30			
18	e(P)	Z	02 40 28			
18	iP	Z	05 32 05d			
	i(S)	Z	15			
19	eP	Z	00 57 10u			
	iP!	Z	12u			
	eS	ZNE	58 57			
	e(PcP)	ZN	01 02 41			
19	iP	ZE	06 41 25ue	1½ 2		12 ?
	i	Z	42 02	4 2		
	epP	Z	43 20	2 ?		
	ePP	E	44 41			7 ?
	epPP	ZN	46 31	10 ?	7 ?	
	esPP	Z	47 49			
	e(S)	ZNE	51 15	1 5	4 ?	small
	eSP	NE	52 47		7 20	10 -
	esPS	ZNE	56 02			9 ?
	e	Z	57 20	10 25		
	e(sSS)	ZE	07 08.2			
	e	ZE	13+	7 ?		6 20
19	e?	Z	13 58 30			
19	i?	Z	17 33 02u			
19	e(PKP)	Z	17 41 30			
19	iP	ZN	18 28 41u?	4½ 7	10 ?	
	i	Z	48d	3½ 2		
	i	Z	56u	4 2		
	e	Z	30 15	6 25		
	ePP	Z	31 32	4 ?		
	iPPP	ZN	33 31	5 ?	5 20?	
	e	Z	34 16	½ ?		
	iS	ZNE	38 30	4½ 20	8 20	10 17
	e	ZN	39 15	8 20	11 12	
	eSS	Z	43 15	6 ?		
	eSSS	ZN	46 20		12½ 20	
	M	E	59			30 20
	M	ZN	19 03	46 18	45 18	
19	e(P)	Z	20 06 20			
19	eP	Z	22 25 55			
	e	Z	32 42			
20	i(PcP)	Z	11 55 45u			
	i	Z	56 02			
	i	Z	30			
20	e?	Z	18 12			
21	eP?	Z	03 11 50			
21	eiP?	Z	06 11 17	Local ?		

Date	Phase		h m s	Az Tz	An Tn	Ae Te
JUL 21	ePKP	Z	07 44.0			
21	iPKP	Z	14 55 16d	1½ 1		
21	iP	Z	18 42 54u			
22	e?	Z	12 29 15			
23	e	Z	14 35 42			
24	eP	Z	03 03 10			
24		Z	03 50±			
25		Z	12 41±			
26	eP	Z	06 24 11			
	i	Z	23d			
	ePcP	N	36			
	(PP)	Z	26 07			
	e	N	27 16			
	(PPP)	Z	50			
	iS	ZNE	32 42w			
	iScS	E	34 10w			
	SS	ZE	36 40			
	i	N	37 47s			
	i(SSS)	N	39 25s			
	i(SSS)	ZE	38w			
	e(Lq)	Z	40 40			
	e(Lq)	E	41.1			
	e(Lr)	Z	42 40			
	M	Z	49			
26	eP	Z	08 38 50			
	iPP	Z	55u			
	iPPP	Z	39 07d			
	eS	ZNE	41.4			
	eLr	Z	43 20			
26	e(P)	Z	11 54 16			
	(P)	Z	33			
26	eiP	ZNE	17 48 51d?w	10½ 7	3 10	9 ?
	i	ZNE	49 05un	10½ 10	11 -	4 ?
	ipP	ZNE	51 05u	24½ 8	6 10	6½ 10
	ePP	N	52 28		3 12	
	e?	E	45			17 10?
	e?	N	53 11		9 ?	
	iSKS	ZNE	58 25dnw	80 10		
	iS	Z	37	5 ?		
	i	Z	48	6 3		
	i(SP)	Z	59 13u	7 ?		
	e?	Z	18 00.7	21 ?		
	e	E	02 50			20½ 8
	i(SS)	Z	04 00u	31 8		
	e	Z	05.9	2 ?		
	i(SSS)	ZE	08 50dw	41 ?		40 9
	e(PKPPKP)	Z	14 30	1 2		
	i	E	16 03w			22 ?
	i	Z	17 18d	3½ 2		
26	e(P)	Z	18 35 06			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 27	eP	Z	17	30	10						
	i	Z			14u						
	i(PcP)	Z			25u						
	eS	E		39	.2						
	eSS	ZNE		43	55						
	e(SSS)	N		47	.0						
	eLr	ZNE		51	.3						
28	eP	Z	09	21	37						
28	iP	Z	17	33	14u						
	eS	N		40	10						
	e?	N		42	16						
28	iP	Z	18	43	56u						
	eS	N		52	19						
	eLr	Z	19	03	.0						
28	P	Z	21	31	42						
29	eP?	Z	09	12	00						
	e	Z		14	14						
29	iP	Z	10	58	47d	1	3(z)				
	e(PPP)	ZN	11	02	18	1	7	½	?		
	S	ZNE		06	21n	1½	20	2½	17	2	15
	e(SS)	ZE		10	40	1	12			1½	15
	e(Lq)	ZN		12	26	1	12	1	12		
	e(Lq)	E			51					2	15
	eLr	ZNE		14	.0	5	27	3	25	3	22
	M	Z		14½	ca	7	30				
	M	N		18				5	20		
29	e(SKS)	Z	22	01	44						
	e(SKSP)	ZN		06	06						
	eSS	ZN		12	30						
	eLq	ZN		24	50						
	eLr	ZN		30½							
29	e(P)	Z	22	25	00						
	e	Z			10						
30	iP	Z	04	56	20d	1½	2				
	iPcP	ZN			53	1	2	2	?		
	e	N		57	39			1½	16		
	e	Z		58	08	1	2				
	iS	E	05	05	45e					3	?
	eS	N			50			1½	10?		
	eSS	NE		10	30			1	?	1	?
	iSSS	E		13	40w?					1½	?
	e	N		14	05			1½	15		
	eLq	E		15	05					2	20
	eLr	NE		18	.0			2½	30		
	M	E		20						5	25
	M	N		24	+			6½	20		
30	i(P)	Z	09	43	51d						
30	eP	ZE	15	17	50	½	?				
	i	Z			55u?	1	2				
	i	Z		18	08d?	1	2				
	iS	NE		24	00ne			3½	14	3	13
	eSS M	N		26	50			10	22		

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUL 30	e(SSS)	E		27	05					3	13
	L	E		28	32					1½	?
	M	E		30						5½	17
31	iP	Z	12	11	51u						
31	eP	Z	18	30	31						
	e(S)	ZN		32	31						
AUG 1	iP	ZN	05	46	55u						
	i	Z		47	02						
	epP	ZN		48	23						
	iPP	N		49	21						
	esPP?	N		51	20						
	iS	ZNE		54	27s						
	e(ScS)	N		55	57						
	esS	NE		56	56						
	eSS?	N		58	38						
	esSS	NE	16	00	48						
3	iP	ZNE	01	14	38us	5	10?(z)	1½	11	1	?
	i	Z			52u	4	2				
	i	Z			58u	4	2				
	ePcP	Z		15	47	1	2				
	ePP	ZN		16	21	1	10(z)	1	8		
	e	ZN		17	24	2	10	1½	8		
	e(pPcP)	Z			42	½	?				
	e(pPcP)	N		18	13			1	7		
	iS	ZNE		21	17	1	?	2	10	13½	10?
	esScP	NE		23	16			1½	10	2	10
	i	ZNE		27	25e	2	10	2	15	5½	?
	e	ZN		33	15	3	?	1	12		
	e	E		37	35					3	15
	e	E		41	41					1½	?
4	eP?	Z	04	09	38						
	eS	Z		11	55						
4	iP	ZNE	04	24	24d						
	esP	ZNE		25	01u						
	esPP	Z		27	47						
	ePPP	NE		28	49						
	iS	ZNE		33	25						
	e	Z		35	33						
	e?	N		36	33						
	e(SS)	E		37	51						
	e(sSS)	N		38	22						
	e	ZN		39	.2						
	e	ZE		41	28						
	eSSS	ZNE		42	17						
	e(PKKS)	ZE		47	.2						
4	eP	Z	08	53	20						
4	e?	Z	17	05	±						
4	eP	Z	21	04	31						
	e(S)	ZNE		06	44						
5	eP	Z	15	56	47						
	eS	NE	16	00	51						
	eLr	ZN		02	17						
	e	N		04	03						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 5	eP	Z	17	30	40						
	ePP	Z		32	21						
	eSS	ZNE		40	45						
	eLr	Z		44	24						
6	eP?	Z	02	34	13						
6	eP	Z	03	01	18						
6	iP	Z	10	02	25u						
	epP	Z		04	28						
6	eP	Z	14	34	01						
6	iP	ZNE	21	18	57u	2½	5	1½	?	1	?
	i	Z		19	08d	3	1				
	i	ZN			21u	3	?	2	13		
	ePcP	Z			53	2½	2				
	e	Z		20	23						
	e(PP)	ZN		21	21	1	?				
	ePPP	ZN		22	29	2	?	2	14		
	iS	ZNE		26	49dsw	4	10?	5½	10?	6	?
	e(ScS)	NE		29	16w?			1½	15	4	?
	SS	ZN		30	.5	2	25	2	?		
	eLq	ZNE		33	05	2½	25	2	17	2½	15
	eLr	ZNE		35	.0	4	27	2	?	3	23
	M	ZN		37		12	22	5	23		
	M	ZNE		42		9	17	6	17	4½	17
	M	ZN		49		12	17	9	17		
6	e	Z	21	49	14						
6	iP	Z	22	00	51u						
	e	Z		01	09						
	e(pP)	Z			26						
6	eL	ZN	23	51±							
7	iP?	Z	13	31	21d						
7	e(L)	ZN	19	12±							
7	eP?	Z	22	03	05						
8	eSKKS	Z	01	04	23						
	e?	Z			29						
8	e?	Z	05	42	26						
	e	Z		46	58						
8	eSKKS	Z	13	20	44						
8	eP?	Z	17	12	44						
8	e(PKP)	Z	20	57	12						
9	eL	NE	02	28±							
9	eP	Z	12	57	54						
	i(PcP)	Z		58	14u						
	i(PcP)	Z			28u						
	ePPP	Z	13	01	55						
	eS	ZNE		06	26						
	ePS	N		07	00						
	eScS?	Z			44						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 9	eSS	ZN		10	.4						
	eL	ZNE		17	.0						
10	e(P)	Z	18	16	24						
	e(P)	Z		17	12						
	ePcS	N		20	30						
	e	N		22	10						
	e	N		28	33						
	eLq	ZNE		36							
	eLr	ZN		40							
11	eP	Z	08	02	42						
	i	Z			45u						
	i	Z			48u						
11	e?	Z	21	06							
	e(L)	ZN		09							
11	eP?	Z	23	10	53						
12	eP	Z	17	05	17						
12	e(P)	Z	19	15	29						
	i	Z			36d						
	e	Z		20	07						
12	iP	Z	19	37	06u	2½	?				
	iPcP	Z			15u	2	2				
	i(PcP)	ZNE			25us	8	?	2	?	2	?
	i	Z			30u	4½	? 2				
	i	Z			37u	1½	2				
	i	Z		38	07	4	17				
	i	Z			24d	3	2				
	i(PP)	Z		40	01u?	1	2				
	iPP	ZN			11un	3½	?	2	?		
	i(PP)	E			25e					2	?
	ePPP	Z		42	02	2	17				
	i(PPP)	N			16s			2	12?		
	iS	ZNE		47	04use	5	15	7	4	4	15
	e(PPS)	N		48	05						
	i	E		49	02e					10	?
	e(SS)	E		51	12					6½	?
	e(SS)	ZN		52	.2	12	35	5	35	7½	30
	i(SS)	E		53	11w						
	iSSS	ZE		55	34d	3	?			5	20
	e(SSS)	N			49			6	15		
	e	NE		57	.3			5	25	7	?
	eLq	N		58	52			7	?		
	e	Z	20	00	10	8	25				
	e(Lr)	Z		02	36	11	45				
	M	Z		05		26	37				
	M	ZNE		08		40	30	15	25	18	30
12	eiP	Z	20	09	21						
	e(SS)	Z		24	10						
12	e?	Z	21	26	.2						
12	eL	ZNE	22	01±							
12	e	Z	23	27	38						
13	iP	Z	00	22	23u						
	e	Z		23	05						

Date	Phase		h m s	Az Tz	An Tn	Ae Te
AUG 13	iP	Z	04 02 36d			
	ePP	Z	05 25			
	e(Lr)	NE	24.4			
	e(Lr)	N	27.4			
	i(SKKS)	N	32 36			
	e(SKKS)	E	33 20			
	e	N	35.4			
13	e	NE	13 34 35			
	i	E	39e			
	i	N	55n			
13	eL	N	20 51 10			
13	e(P)	N	22 06±			
	e(Lr)	N	29 10			
14	e	N	03 23			
	e	E	46.5			
14	e(P)	Z	03 46 31			
	i	Z	49			
14	eP	Z	09 54 09			
	i	Z	23d?			
	eS	N	10 01 27			
	e(PPS)	E	46			
	eLr	N	09 36			
	e	E	12 02			
14	eL	N	12 29.0			
	eL	E	30½			
14	iP	Z	12 53 27d			
	i	Z	35u			
	e(S)	N	13 00 58			
14	ePKP	Z	15 14 10	½ 2		
	e	Z	26	1 2		
	e	Z	33	1 2		
	e	Z	43	½ 2		
	e	Z	50	1 3		
	iPP	ZN	16 09u	2½ 20?	1½ ?	
	eSKS	ZN	21 11	1½ 17	1½ 15	
	eSKKS	N	22 48		2½ 20	
	ePKKP	Z	24 16	2 12		
	ePS	N	25.6		1 ?	
	eSS	E	32.6			2 25
	iSSP	ZN	33 30ds	3½ 30	9 20	
	eSSS	E	36 25			2½ -
	e	Z	39 55	2½ 15		
	e	Z	44 37	2 -		
	eLq	E	47.4			2 50?
	e(Lr)	N	52.4		1½ 30	
	eL	Z	53 25	3 30		
	eL	E	54.4			1½ 23
	M	N	16 02		5½ 18	
	M	Z	07	8½ 18		
14	e	Z	17 10 28			
14	e(P)	Z	17 34 57			
	e	Z	35 04			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
AUG 14	e(P)	Z	22 21007			
15	eP	Z	02 06 22u?			
15	eP	Z	02 37 50			
	eS	ZNE	46 50			
	eSS	Z	51 14			
	eLr	Z	59 15			
	e(Lr)	N	03 00 15			
15	e	Z	03 28 42			
15	e	N	05 55±			
15	eP?	Z	20 11 30	1½ -		
	ePKP	Z	14 36	½ -		
	e(PKP)	Z	41	1 1		
	e(PKP)	Z	44	1 -		
	i(PKP)	Z	47u	1½ -		
	ePP	Z	16 30	1 2		
	ePP	ZN	16.7	2½ 18	1½ 18	
	e(PP)	E	16 55			1½ 18
	ePKS	ZN	18.1	6½ -	3 -	
	eSKS	ZN	21 55	2½ 23?	2 -	
	iPKKP	E	24 47e			2 -
	eSKSP	ZN	26 16	2½ 22	2 -	
	iPKKS	E	27 00w			3 23
	ePP	Z	28 07	1 3		
	ePP	Z	09	7½ 25		
	iSKKS	Z	31 58d	7 -		
	iSS	ZE	33 38de	8 30		12 30?
	i(SKKS)	NE	34 09ne		18 -	6 20?
	iPKPPKP	E	36 26e			10 -
	eSSS	E	38 10			4 30
	iSSS	N	25e		16 22	
	e	NE	42.0	14 -	9 32	5 -
	i	Z	45 25u	12 36		
	iLq	E	48 00e			11 -
	eLq	Z	20	10½ 30		
	i	N	48.9n		10½ 40	
	M	E	49½			40 40
	eLr	Z	52 40	7½ 23		
	eLr	N	53.1		3 33	
	e	ZN	55.8	20 -	26 34	
	M?	N	58		49 23	
	M	Z	59	71 23		
15	iP!	Z	22 41 06d	9 2		
	iP	ZNE	06dnw	17 3	4½ -	3½ -
	iPP	Z	50	10 15?		
	i(pPcP)	E	58			3 12
	isP	ZN	42 04		6 12	
	i(SPcP)	Z	42 41d?			
	i(pPP)	E	45 00e			11½ 13
	i(sPP)	Z	20d	21 -		
	pPPP	E	46 42			10½ -
	i	ZN	47 00n	17 13		11½ 13
	i(ScS)	Z	50 52u	1½ 5		
	i(ScS)	ZNE	54uw	18½ 20	7 -	>50 -
	esScS	Z	52 17	2½ 10		
	SS	E	55.5			24 18
	i(SS)	Z	56 00u	25½ 25		

Date	Phase		h m s	Az Tz	An Tn	Ae Te
AUG 15	esSS	N	57		13 10	
	(SSS)	Z	57.5	32 13		
	e	N	23 01.4		20 27	
	e	N	03.6		40 -	
	e	E	04.7			40 -
	e(PKPPKP)	Z	07 54	1½ 2		
	e	Z	11 10	1 -		
	e	Z	12 39	2½ -		
	e	N	13.7		10 13	
	e	Z	14	1 18		
	e	Z	27 52			
16	iP	Z	11 22 33d	1 4		
	iP	Z	34d	2 10		
	e	N	23 07		1 10	
	e(PP)	E	24 48			½ 9
	ePPP	ZE	25 38	1½ 10		½ 8
	S	ZNE	29 44w	1½ ?	1 9	4 18
	1	N	30 00s		4½ 15	
	eScS	E	32 18			1½ 15
	SS	NE	33 20w		1½ 15	4½ 15
	eSSS	ZN	34.5	1 12	2 12	
	e(Lr)	E	38 50			5 20
	M	ZN	40	7 20	6 20	
	e?	E	41 57			4½ 18
	M	Z	43	8½ 18		
	M	N	44		5½ 18	
16	i	Z	13 34 12d	1 1		
	ePKP	Z	36 52	½ 2		
	e?	Z	37 07	½ 2		
	ePP	Z	56	1 2		
	e?	Z	39 40	1 17?		
	eSKS	N	43 58		1 1	
	eSKKS	N	45 34		1 ?	
	ePKKP	Z	47 05	1 8		
	e(PKKS)	N	49 50		1 20	
	e(PcPP')	Z	50 17	1 ?		
	e(SS)	E	55 27			1½ ?
	e	N	47		1½ ?	
	e	ZN	56.2			
	e	E	14 10.2			1 -
	e(Lq)	Z	16 58	2 25		
	e(Lr)	N	18 03		1½ 13	
	e	E	19 13			½ -
16	ePKP	Z	19 33 01	- 2		
	e(PKP)	Z	08	1 1		
	ePP	ZNE	35 20	1½ 20	½ -	1 20
	ePKS	Z	36 24	1 10?		
	PKS	ZN	27u	6 15	1 -	
	i(PKS)	E	34w			3 -
	iPPP	Z	27u	1½ ?		
	ePPP	Z	37 28	1 6		
	eSKKS	NE	42 15		1½ -	3 -
	ePKKP	Z	43 08	1½ 10		
	ePKKS	Z	45 18	3 17		
	iPKKS	E	29e			3½ 15
	eScSP'	Z	47 18	2 15		
	iScSP'	E	27e?			4 18
	e(SSP)	Z	52 08	3 22		
	e(SKKS)	NE	53.1		3½ 25	4½ 20
	e(SSS)	E	57 33			6 -
	i(SSS)	N	58 09n		5½ -	
	i	Z	20 01 42u	6 30		

Date	Phase		h m s	Az Tz	An Tn	Ae Te
AUG	i	N	02 07s		6½ 25?	
	e(Lq)	E	04 14			5 -
	eL	N	10 33		5 -	2 -
	eL	E	11 09			
	eLr	N	15 05		4 27	
	e(Lr)	Z	15 26	10 50		
	e(Lr)	E	52			10 28
	M	N	26		36 23	
	M	ZE	27	60 25?		40 18
16	e	Z	21 46 05			
16	e	Z	22 36.2			
	e	Z	38 57			
17	eP	Z	02 10 40			
	eS	NE	21 35			
	e	ZN	24.8			
	SS	ZN	26 50			
	eSS	E	27 01			
	eSSS	Z	30 28			
17	e(P)	Z	07 30 02			
	e	Z	35 55			
	e	Z	39 28			
	i	Z	37u			
17	e(PKP)	Z	09 26 08			
	ePKP	Z	27			
	ePPP	N	30 30			
	e(PPP)	Z	36			
	ePKKS	N	39.4			
	e(ScSP')	Z	41 15			
	e(SS)	E	43 42			
	e(P'P')	ZN	44.7			
	SKKS	N	47 00			
	e(Lr)	Z	10 07 44			
	e(L)	N	08.7			
	e	E	10 30			
17	e(P)	Z	12 31 52			
	e(L)	N	47 37			
	e(L)	Z	57			
	e(L)	E	50.4			
17	iP	ZN	18 12 25d			
	i(P)	Z	35d			
	iPcP	Z	47u?			
	i(P	Z	58d?			
	i	Z	13 21			
	i	Z	14 28			
	ePP	Z	15 13			
	ePcS	Z	42			
	ePPP	Z	16 38			
	e	E	18 37			
	S	ZNE	21 43n			
	i	E	23 16w			
	e	E	23.7			
	eSS	E	26 04			
	e(SS)	Z	17			
	e'SS)	N	26.5			
	eSSS	E	29.7			
	e(SSS)	ZN	30.0			
	eLq	E	31.0			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 17	i(PKKP)	N		31	34						
	PKKP	E		32	3						
	e(PKKP)	N		32	33						
	eLr	ZNE		34	9						
	i(PKKS)	N		35	23n						
	M	Z		36							
	(PcPP')	E		36	8						
	e(PcPP')	N		37	28						
	i	N		40	23n						
17	iP	Z	21	18	18d	2	4?				
	iP	Z			20d	1½	9?				
	i(P)	Z			28u	2	2				
	i	Z		19	07u?	1½	2				
	ePP	Z		24	→	1	22				
	i(PPP)	ZN		57	→	1	-	1	10		
	ePPP	E		20	05					1	10
	i(PPP)	Z			21d	1	-				
	ePcP	Z		21	07	1½	2				
	e(PcS)	Z		23	48	1½	-				
	S	ZNE		24	1	1½	17	4½	13	1	10
	eSS	E		26	47					5?	15
	iLr	Z		29	25d	6	20				
	i(Lr)	N		30	s			6½	15		
	M	Z		31		14½	18				
	M	N		32				15	15		
	M	E		34						12	13
17	eP?	Z	23	35	07						
	e	Z			30						
	i	Z			36(u)						
18	e(PKP)	Z	07	01	42						
	e(PKP)	Z			45						
18	e	Z	15	53	27						
	e	Z			45						
19	eP	Z	04	55	10						
	ePP	Z		57	08						
	eS	NE	05	02	50						
	e	Z		04	21						
	eSS	NE		06	30						
	eSSS	Z		07	05						
	eLq	ZE		08	38						
	eLr	ZN		10	25						
	e(Lr)	Z		11	25						
	e(Lr)	N			32						
19	e(pPKP)	Z	16	50	12						
	i(pPKP)	Z			17u?						
	e	N		54	20						
19	e?	Z	21	37	19						
	i	Z			24u						
19	eP	ZN	21	59	37						
	ePP	N	22	02	45						
	e(PP)	Z		03	24						
	ePPP	ZN		04	25						
	eS	ZE		09	06						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 19	ePPS	N			56						
	SS	Z		13	51						
	e(SS)	N		14	07						
	e(SSS)	E		17	51						
	Lq	N		18	47						
	eLr	E		23	15						
	e(Lr)	N			51						
	(P'P')	Z		27	34						
19	e(P)	Z	23	06	41						
20	eP?	Z	03	16	03						
	e(S)	Z		17	13						
	i	Z			18u						
20	eP	ZN	03	50	04	1½	10?	½	15		
	i	Z			13d?	2½	1				
	ePP	Z		52	09	1	14?				
	e	Z		53	20	1	7?				
	ePcS	ZN		54	20	3	10	2½	11		
	S	ZNE		58	10	3½	13	5	25?	6	18
	e	E	04	01	35					1?	10
	eSS	ZE		02	07	5	27?				
	e(Lq)	N		04	37			3	13		
	eLq	ZE		04	9			4	20	8	30
	eLr	ZN		07	52	7	31	5	30		
	e(PKKP)	E		10	42					4½	20
20	e(L)	ZN	09	41							
20	eP	Z	17	48	24						
	ePPP	Z		51	03						
	ePcS	N		52	7						
	eS	N		55	45						
	e(PPS)?	Z		56	43						
	eLr	Z	18	03	5						
	e(Lr)	N		03	7						
	e(Lr)	E		04	5						
	(PKKP)	Z		09	0						
	e(PKKP)	Z		09	22						
21	eiP	Z	00	24	36(u)						
	i(pP)	Z		25	57d						
21	eP	ZN	01	17	52						
	(P)	Z		18	03						
	i	Z			30(u)						
	ePPP	Z		20	32						
	iS	E		25	02w						
	ePS	N			11						
	eSS	N		28	23						
	eSS	E			36						
	eSS	Z			48						
	eSSS	NE		29	9						
	eLr	Z		32	3						
	e(Lr)	N		32	8						
	e?	N		35	58						
21	iP	Z	04	12	18d						
	i(P)	Z			31d						
	eS	N		19	44						
	eSS	Z		20	2						
	eLq	E		26	2						

Date	Phase		h m s	Az Tz	An Tn	Ae Te
AUG 21	e	N	30 09			
	e	ZN	23			
	(PKKS)	Z	38 01			
	e	N	40 35			
21	eP	Z	08 37 48			
	(sP)	Z	40 22			
21	e?	Z	12 28 32			
	eP?	Z	33 21			
	(PKP)	N	37 35			
	e(PP)	Z	39 11			
21	iP!	ZN	21 08 21d			
	i(P)	Z	24u			
	i(P)	Z	36d			
	iPcP	Z	09 11(d)			
	ipP	NE	29			
	i(pP)	Z	37(u)			
	e(pPP)	N	11 17			
	e(ScP)	E	12 39			
	i(PcS)	Z	55			
	epPcS	N	14 25			
	iS	NE	15 56se			
	e(sS)	N	17 12			
	e(sS)	E	20			
	esScS	E	19 30(e)			
	esSS	E	21 55			
	eSSS	N	22 40			
22	eP	Z	00 08.0			
	i(P)	Z	08 07d			
	e	Z	12.0			
	eLr	N	16 38			
22		Z	01 33.3			
22		Z	02 22.7			
22	e(P)	Z	10 06 20			
	i	Z	23d?			
	i(pP)	Z	46u?			
22	e?	Z	16 52 25			
22	i(SKS)	Z	21 21 48d?			
22	eP	Z	22 27 35			
	iPcP	Z	28 00±			
	e	Z	33 43			
22	iP	Z	23 28 45u			
	e(PcP)	Z	29 12			
23	e	Z	01 42 40			
23	iP	Z	08 09 24d			
	e	Z	38			
23	e	ZN	16 36			
24	eiP	Z	04 34 51u?			
	i	Z	58u			
	eL	Z	55			
	eL	E	56			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
AUG 24	eL	N	05 00			
24	eL	Z	10 45			
24	iP	Z	17 07 19d			
25	e(L)	N	08 51ca			
26	eP?	Z	05 13 22			
26	iP	Z	12 30 41d			
	eS	E	38 56			
	eLr	N	50.0			
	e(Lr)	Z	50 35			
	e	ZN	53 02			
	e(PKKS)	E	55.0			
26	eP	ZE	12 55 01			
	e(PP)	N	57 32			
	e(Lr)	E	11			
	e(Lr)	ZN	14			
26	eP	Z	13 34 35			
	e(L)	Z	14 14.1			
	eL	N	14 42			
26	iP	Z	16 07 56d			
26	eiP	ZN	18 05 34d?			
	i	Z	39			
	ePcS	N	10 00			
	eS	NE	13 44			
	e	Z	14 54			
	eScS	E	15 36			
	e	N	16 10			
	eLq	E	20 27			
	e(Lr)	N	22			
	e	N	25 12			
26	eP	Z	23 33 16			
26	eP	ZN	23 41 33			
	ePPP	Z	45 12			
	e(PPP)	Z	20			
	eS	NE	49 40			
	eL	E	56 34			
	e	N	24 01.0			
26	eP	Z	23 55 07			
	e	Z	16			
27	e?	Z	00 59 40			
27	eP	Z	02 38 15			
	eS	N	48 47			
	eSS	NE	54.5			
	eLq	N	03 01.5			
	eLr	E	05.7			
27	e(P)	Z	13 25 50			
	i	Z	26 04			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
AUG 27	ePKP	Z	15	35	04	1½	2				
	ePKS	ZN		39	25	1½	18	1	-		
	e	Z		40	43	1	3				
	eSKKS	N		45	2			1½	-		
	e	Z		51	42			2	20		
	eP'P'	ZN		53	20	2	?	2	17		
	eSKKS	Z		55	00	2	15				
	eP'PKS	NE		57	55			1½	-	1	15
	e	E	16	03	35					1	-
	eLq	E		13	11					2	?
	e(L)	ZE		16	27	1	38			1	-
	e(L)	N			38			2	20		
	M	Z		42		14	20				
	M	N		45				9	20		
	M	Z		46		11	17				
28	eP	Z	05	11	42						
	e(L)	N		13	40						
	e(L)	ZE		14	3						
28	eP	Z	12	34	22d	1	2				
	i	ZN			33d	1½	-				
	i	Z			51u	2	5				
	ePcP	Z		35	13	1	?				
	ePcS	ZN		38	30	1½	9	1	10		
	S	NE		42	30e			1½	?	3½	11
	e(PS)	Z		43	10	2½	?				
	eSS	N		47	0			2½	12		
	eLq	ZE									
	eLr	ZN		52	1						
29	eP	Z	13	01	53						
	i(PPP)	Z		04	33d						
30	e(L)	N	10	36							
30	P	Z	14	42	28						
30	e(PPS)	ZN	19	07	35						
	eLr	Z		30	½						
	eL	E		33							
	eL	N		34							
30	eL	NE	20	54	±						
31	iP	Z	16	30	11d						
31	e(SKKS)	Z	23	36	02	1½	?				
	i(SKKS)	Z			10u	3	2				
SEP 1	eP	Z	01	06	03						
1	e	N	22	10							
2	iP!	Z	02	38	03u						
	i	Z			07d						
	eLr?	Z		57	4						
	e(PKKP)	ZN		59	½						
2	eP	Z	03	07	19						
	e(PcP)	Z			28						
	e(Lr)	N		28							
	e	Z		33							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 2	e?	Z	05	48	±						
2	e?	Z	06	50	6						
2	iP?	Z	07	12	38d	Local?					
2	P	Z	14	36	41						
	iPcP	Z		37	11d						
	i	Z			21u						
	e	Z		39	55						
	ePcS	Z		40	10						
2	e(Lr)	Z	20	56							
2	eP	Z	22	18	06						
2	eP?	Z	23	47	05						
3	ePP	Z	04	03	18	Two superimposed shocks					
	eSKS	N		09	43						
	e(S)	N		11	0						
	ePS	NE		12	35						
	eSS	E		18	30						
	eSS	ZN		18	8						
	e(Lq)	E		29	10						
	e(Lq)	Z		31	3						
	eLr	ZNE		35	0						
3	e(P)	Z	08	29	½						
	e(Lr)	Z	09	06							
4	e?	Z	06	58	03						
4	eP	Z	17	16	15						
	e(PPP)	Z		17	31						
	e(S)	N		21	20						
	e(PcS)	N		22	3						
	e(SS)	Z		23	00						
	M	N		24						10	13
4	e	Z	17	33	05						
	e	N		35	0						
4	eP	Z	22	02	01	1½	2?				
	i(P)	ZN			08d	7	8	2½	10		
	ePcP	N		03	18						
	i	Z		03	18						
	e	N			43			2½	12		
	iPPP	Z		06	04u	3½	2				
	i(PPP)	Z			20u	2½	2				
	i	Z			55u	2½	2				
	iS	ZN		10	58s	8	13	6	18		
	i(PPS)	ZN		11	58s	7	13	12	20		
	i(SS)	Z		15	20u	10½	25?				
	SS	ZN		16	1	9	20	11	13		
	eSSS	ZN		18	7	5½	30	5½	18		
	iLq	N		19	50n			9	28?		
	i(PKKP)	Z		22	17d	15	38				
	M	ZN		29		40	18	45	17		
	eP'P'	Z		30	35	1	?				
	e	Z		30	35	1	?				
	e(SKKS)	Z		34	33	1	?				

Date	Phase		h m s	Az Tz	An Tn	Ae Te
SEP 4	iP	Z	23 19 05u?			
5	eP	Z	03 52 12			
5	iP	Z	06 23 50d?			
5	e?	Z	08 20			
5	e(SKS)	Z	11 24.5			
5	eP	Z	13 14 10			
5	eP	Z	13 20 15			
5	e(P)	Z	14 23 20			
	e	Z	45			
6	e?	Z	13 35 42			
7	e(P)	Z	03 03 29			
7	e?	Z	04 37 25			
7	eP	Z	04 54 15			
	eLr	ZNE	05 12			
8	iPKP	Z	05 44 36d			
	ePP	Z	46 20			
	e(SSP)	N	06 03 55	May be ScS		
	eLq	E	19 20			
	eLr	ZN	23			
	M	Z	34		5 25	
8	e(PP)	Z	15 12 08			
8	e(P)					
8	eP	Z	22 35 45			
	eLr	ZE	56			
	e(L)	N	23 01			
10	e(P)	Z	00 53 05			
	e(L)	NE	01 20			
11	e	ZNE	04 44 22			
11	e(P)	Z	04 49 25			
11	iP	ZNE	18 14 20d			
	e(PcP)	Z	38			
	eS	ZN	24 43			
	eScS	E	25 05			
	ePS	ZNE	25 40			
	eSS	N	30 37			
	e	Z	34 40			
	eLq	ZNE	37.1			
	e	E	38 08			
	e(Lr)	N	39½			
	e	ZE	43.4			
	e	E	45.7			
	M	Z	50		3 20	
11	eP	Z	23 46 40			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
SEP 12	eP	Z	05 46 58			
	i	Z	47 12d?			
	S	ZNE	54 25n			
	eSS	N	58 00			
	eSSS	N	59+			
	eLr	ZE	06 02.2			
	M	N	04		8 18	
	M	Z	08	10 15		
	M	E	09			7 15
13	i(P)	Z	03 44 38			
14	ePKP	Z	14 40 51	½ 2		
	PKS	ZN	44 24d?	1 2	1½ 10	
	e	ZE	55 26	1½ ?		
	e	ZNE	56 35	1½ ?	1½ 15?	2 17
	e	ZN	15 06 40	3 ?	1½ 26	
	e	Z	10.3	2 30		
	eLr	Z	23 45	1½ 25		
	e(L)	NE	25+		1 ?	1 ?
	e(L)	Z	26.8	2 40		
14	iP	Z	18 07 18d			
14	eP	Z	21 44 43			
	e(PcP)	Z	53			
	eS	N	55 26			
	e	N	22 08 15			
	e(SKKS)	N	13.0			
	eLr	ZE	13.8			
	e(L)	N	16 35			
	M	ZE	22	6 17		4 15
15	e(P)	Z	05 47 30			
	e(SKS)	Z	56 45			
	ePKP	Z	06 02 41			
	e(L)	ZE	22			
15	iP	Z	16 55 47u	1½ 2		
	e(PcP)	Z	57 57	1 2		
	eS	N	17 01 53		1½ 10?	
	eSS	NE	05 10		1½ ?	2½ 17
	eLr	N	06.7		1 ?	
15	iP	ZNE	19 56 58us	15? -	3? 12	2½? -
	i(PcP)	Z	57 09d	9 2		
	i	Z	25d	6 2		
	epPcP	E	59 21			2 -
	iPP	Z	20 00 13d	2½ 2		
	iS!	ZNE	06 14ne	1 4	20 12	21½ ?
	i(SKS)	Z	27d?	3 3		
	iSP	ZE	49	2 3	4 12	
	i	N	07			
	isSP	NE	10 18s			
	eSS	NE	14.8			
	eSSS	N	15 10			
	e	E	18 45			
	e	NE	25.4		2 -	4 -
	i	E	27 42e			5 20
	i	N	32 35n		6¼ 15	
	e	N	34.8		3½ 15	
16	iP	Z	07 35 18d			
	iPcP	Z	24u			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 16	e(P'PKS)	Z	13	28	58	Possibly artificial					
17	e	Z	09	59	10						
17	iP	ZN	15	16	18u						
	(S)	ZNE		18	20						
	e	Z			44						
17	eiP	ZN	16	13	04						
	i	Z			09u						
	i	Z			15u						
	(S)	ZNE		15	05u						
18	P	Z	02	02	00						
18	eP?	Z	03	19	23						
18	iP	Z	03	44	41						
	e	E		57	20						
	e	Z	04	01	05						
	e	E		02½							
	e	N		05							
	e	Z		06½							
18	eP	Z	07	02	38						
	ePKKP	Z		22	31						
	e	NE		24							
	eLr	Z		27							
	e(L)	NE		28							
18	ePKKP	Z	15	13	14						
	eLq	ZNE		26	30						
	e(Lr)	Z		32							
18	e(L)	E	22	06							
19	e	NE	00	38	15						
19	e(L)	N	09	00							
19	iSKKS?	Z	17	47	18d						
20	eP?	Z	02	42	10						
20	e(P)	Z	05	42	10						
20	eL	Z	11	38							
	eL	NE		42							
20	iP	ZNE	17	20	18us	3½	2	2½	15	1	?
	i	Z			28d?	4	2				
	iPcP	E			37e					3½	-
	iPcP	Z			45u	4	2				
	iPP	Z		22	33d	1	2				
	e(PP)	N		23.0							
	i	E		26	07					3	8
	S	NE		29	08e			2	15	10	?
	ScS	NE		30	13n			12	?	4	?
	e(SS)	N		32	55			2	15		
	iSS	NE		33	45se			7½	20	6	15
	Lq	NE		37	10e			2	17	5	15?
	iLq	E			48w					9½	?
	eLr	NE		40.5				4½	28		
	M	N		43				9	20		
	M	N		48				10	16		

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
SEP 20	iP	Z	17	27	40d						
	e	Z		28	05						
	e(PP)	Z		29	12						
21	e(P)	Z	05	55	44						
	e	Z		56	22						
	e	Z			44						
	e	Z		57	00						
	e(S)	N	06	01	04						
	L	ZN		02.6							
	L	E		03.0							
	M	NE		04				21	12	10	12
21	eP	Z	13	38	55						
	iPcP	Z		39	30u						
	ePP	Z		41	10						
	eS	ZNE		46	50						
	e(SSS)	E		53	15						
21	e(ScSP)	Z	16	49	04						
	e(SS)	E		57							
22	iP	ZNE	19	13	18usw	16	?	8	10	3½	-
	i	Z			28u?						
	e	ZE		14.0		7	?			3½	7
	ePP	ZN		14	55	5	?	3½	8		
	i(PcP)	E		15	27w					6	8
	i(PPP)	Z			43d	2½	2				
	e(PcS)	Z		18	11	1	5				
	e	E		55	55					5	?
	iS	ZNE		19	23s	1	?	10	12	8	?
	iS	Z			31u	19	?				
	SS	ZNE		22	25w	6	17	12	10	43	13
	(Lq)	Z		23.7		11	?				
	M	ZN		24		55	20?	32	17		
22	iP	Z	22	56	43u	1½	?				
	ePP	ZN		58	40	2	18	1	25?		
	eLr	E	23	16						1	?
	e(L)	ZN		18		2	27	1	25?		
23	i(PKP)	Z	04	10	19u						
23	e?	Z	07	19	37						
23	i(P)	Z	16	19	04d						
	i	Z			08d						
23	e	Z	16	38							
	e	Z	17	03	45						
23	e?	Z	17	52±							
23	eP?	Z	19	45	40						
24	ePKP	Z	04	03	25	½	1				
	e	Z			40	½	5				
	ePKS	Z		06	40	½	4				
	ePPP	ZN		07	35	3½	12	1	10		
	e(P'PKS)	ZNE		25.5		1½	?	2	?	1½	?
	e(SSS)	ZN		29.5		1	-	2	-		
	eLr	ZN		46		2	30	2	25		
	eLr	E		47						1	-
24	e?	Z	13	34	10						

Date	Phase		h m s	Az Tz	An Tn	Ae Te
SEP 24	P	Z	14 03 56			
25	PKP	Z	07 12 43d?			
	eSKS	Z	19 30			
25	e(PKP)	Z	07 38 10			
	ePKP	Z	50	½ 5		
	e	ZN	39.4	½ 5		
	eSKKS	NE	46 30		2 ?	2½ ?
	PPS	NE	49 24s		3½ 17	2 ?
	1(SS)	NE	55 24sw		4 ?	8½ ?
	eLq	NE	08 06.3		3½ 30	7 30
25	eP	Z	15 23 16			
	e(PcP)	Z	25.4			
	eS	ZE	29 29			
	eS	N	50			
	eSSS	E	32 40			
	eLr	Z	35.2			
25	1P	Z	20 34 28u			
	1PcP	Z	36d			
	eS	NE	43 25			
	e	N	49.2			
	eLq	ZE	50.6			
25	e	ZNE	21 02.7			
	eP	Z	03 30			
	eS	ZE	09 20			
	1(Lq)	NE	13 00e			
	eLr	Z	15+			
25	eP	Z	22 48 08			
	e	Z	52 25			
	eLr	ZN	23 00			
26	1P?	Z	04 28 28d			
26	e?	Z	05 22 32			
27	1P	Z	07 47 46u			
27	1P	Z	14 04 48u			
	1(pP)	Z	05 25d?			
28	e?	Z	02 02½			
29	eP	Z	00 13 37			
	eLr	ZN	30±			
29	P?	Z	10 03 40			
29	e	Z	16 31 50			
30	1P	Z	07 20 50u			
	e	Z	21 40			
	e(S)	N	30 50			
	eL	Z	47			
	e(L)	N	51			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
SEP 30	eP	Z	08 56 01			
	eL	ZE	09 12			
	eL	N	14			
30	eP	Z	09 30 22			
30	e(PcS)	Z	18 52 20			
OCT 1	e(P)	Z	06 41 52			
1	eP	Z	09 33 52	2 ?		
	P	ZNE	52d	5	3	3
	1	E	55e			9 10
	1(PP)	ZN	34 00us	16½	10 8	
	1(PP)	Z	04u?	5 2		
	1PPP	Z	50u	5½		
	1S	ZNE	37 22sw	8	15 10?	23 8?
	1(S)	Z	32u	21		
	(Lr)	Z	40 20	5 12		
	M	ZN	40	110	110	
	M	E	41			98
	1	E	47 33			13 9
1	e(L)	Z	12 20 ca			
1	e(PKP)	Z	18 05 20			
	e	Z	06 20			
	e(L)	ZN	53			
2	1P	Z	04 34 22u			
	1	Z	37(u)			
	e(PcP)	Z	55			
	(S)	ZE	41 35w			
	eS	Z	42 08			
	1ScS	E	44 15			
	SS	ZNE	45 25w			
	eSSS	E	48.0			
	eSSS	Z	48 35			
	eLr	Z	51.0			
	e(Lr)	N	52.0			
	M	ZNE	53	22½ 14	18 15	14 15
2	e(P)	Z	06 52 46			
2	e(L)	Z	15 48±			
3	P	Z	02 51 50			
3	eP	Z	11 37 23			
	e(S)	E	46 34			
	e(Lr)	ZN	58ca			
	e	E	12 00 ca			
3	e(P)	Z	16 44 06			
3	1P	Z	17 39 24d			
	e(S)	ZNE	41.3			
3	e(P)	Z	18 56 16			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT -4	eP	Z	01 00 42			
	i(PcP)	Z	01 07u			
	eS	NE	09 48			
	e(ScS)	Z	10 48			
-4	iP	Z	04 14 08d			
	eL	ZNE	32			
-4	eP	Z	04 38 57			
-4	eP	Z	04 54 57			
	e	ZN	05 16			
-4	eP	Z	05 27 17			
-4	eP	Z	06 56 41			
-4	e(L)	Z	10 45±			
-4	eP	Z	11 46 41			
	e(L)	ZN	12 18			
-4	e(P)	Z	13 14 07			
	i	Z	31d			
-4	P	Z	14 30 30			
-4	e1P	Z	18 19 39			
-5	P	Z	03 29 49			
	e(S)	ZNE	30.5			
-5	P	Z	09 51 04			
	e(S)	ZNE	53.0			
-5	eP	Z	16 10 59			
	e(S)	ZNE	17 12+			
-5	e(P)	Z	21 20 29			
-6	iP	Z	00 54 41u			
	eS	ZN	01 00 37			
	e(SS)	Z	03 50			
-6	eP	Z	02 16 16			
	e	Z	43			
	e	ZN	38			
-6	eP	Z	04 39 35			
	e	N	47.5			
	e(L)	ZE	48.5			
-6	eP	Z	07 14 56			
	S	NE	20 25			
	eL	N	22 20			
	M	N	23			
-6	e(P)	Z	10 21 33			9 15
	e(L)?	E	40			
-6	eP	Z	19 11 51			
	e(L)	Z	55			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT -7	e(P)	Z	01 01 10			
-7	eP	Z	03 23 08			
-7	e(P)	Z	03 36 28			
	e	Z	37 18			
-7	eP	Z	09 24 30			
	e	Z	30 02			
-7	iP	Z	11 24 23u			
-7	iP	ZNE	12 43 42d	1½ 2	1 10?	1 -
	iPcP	Z	55d	1½ 2?		
	iS	NE	52 40sw		7 13?	4 12
	iScS	N	53 57s		6 ?	
	eSS	NE	56 30		1½ 15	1½ 15
	eLq	N	13 01.0		1½ ?	
	eLqM	E	01 20			6 25
	eLr	N	05 30		4 20	
	M	N	07		7 14	
	M	N	16		7 17	
-7	e(P)	Z	13 12 00			
-7	e(P)	Z	15 37 38			
-7	eP	Z	18 57 17			
	e S)	ZNE	58 56			
-8	e(P)	Z	02 19 12			
	e	Z	27 01			
-8	iP	Z	03 21 25u			
-8	e(P)	Z	03 32 47			
	e	E	32			
	e	N	34			
-8	iP	Z	04 52 17			
	e	NE	05 03			
-8	e	Z	07 47 33			
-8	eP	Z	10 25 21			
	e	E	37			
-8	e(P)	Z	11 21 02			
	e(S)	E	31			
	e	N	33			
-8	e	Z	12 55 43			
-8	e	Z	13 34 05			
-8	i	Z	14 11 35d			
	e(PcP)	Z	48			
	e(L)	Z	32			
-8	e(P)	Z	14 35 35			
-8	iP	Z	15 46 29u			
	e(S)	N	53½			
	e(ScS)	E	56.6			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 8	e	NE	18 20			
8	e	E	22 43 05			
	e	NE	47			
9	e(P)	Z	10 13 35			
9	eiP	Z	11 29 28d?	2 2		
	P	ZNE	28d	1½ -	1 -	1 -
	i	Z	36d	2½ 2		
	i	Z	30 05u	3 2		
	i	Z	22d	2½ 2		
	iPcP	Z	37u	2 2		
	e	Z	31 06	1½ 2		
	PP	ZNE	35u	4 -	1 -	1½ 7
	S	ZE	36 55w	2½ -		9 20?
	ePS	N	37 20		6 20	
	eSS	E	40 18			3 15
	(SS)	ZN	40d	4 17	2½ 15	
	eSSS	E	41 42			3 20
	eLr	ZE	45 2	4 -		4 25
	eLr	ZN	46.2	5 -	1½ 25	
	e(Lr)	E	46 48			5 20
	i	E	49 52w			10 20
	e(PKKP)	ZN	50 32	9½ 15	5 15	
	M	Z	53	23 18		
	M	E	54			16 17
	M	ZN	56	23 15	20 15	
	M	E	57			17 15
9	e(P)	Z	14 41 38			
	e	Z	53 20			
9	e(L)	ZN	17 27±			
9	e	ZN	21 30±			
10	eP?	Z	01 46 15			
	e	NE	56			
10	iPKP	Z	08 49 21d			
	eLr	ZN	09 30			
10	e	N	10 10±			
10	e?	Z	11 44 41			
	eP	Z	47 37			
	e(S)	N	58 05			
	e(SKKS)	N	12 22.7			
10	e	NE	20 19ca			
11	e(L)	NE	01 25ca			
11	e(P)	Z	02 09 11			
	i(P)	Z	51d			
	e	NE	17			
	e(L)	E	22			
11	eP?	Z	12 08 15			
	i	Z	22u			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 11	iP!	Z	14 49 18d	7 -		
	iPcP	Z	23d	2½ 1		
	e	Z	37	2 1		
	eS	N	58 48		1 8	
	e(PPS)	NE	15 00 20		1 15	1 -
	e(PKKS)	Z	10 46	½ 2		
11	e?	Z	18 36 45	Possibly artificial		
11	e?	Z	19 17 20	Possibly artificial		
11	e	NE	23 12±			
12	e(P)	Z	07 50 50			
	e(S)	N	52 50			
	e	E	53.0			
12	e(P)	Z	09 54 05			
12	P	Z	12 58 55			
	eLr	N	13 21½			
12	eP	Z	15 32 25	½ 1		
	esP	Z	33 28	½ 2		
	iPP	Z	36 40d	1 2		
	ePP	Z	40	1 8		
	esPP	Z	37 38	1½		
	SKKS	ZNE	42 43e	1	1½ 12	2½ -
	e(pPS)	ZNE	45.6	1½	2	1 16
	esSS	ZNE	51.1	1	1½ 15	1 22?
12	e(P)	Z	16 16 26			
12	eP	Z	17 37 00			
12	eP?	Z	18 55 47			
13	iP	Z	05 36 58d			
13	ePKP	Z	09 17 24			
	e(PKS)	Z	21 25			
14	iP	Z	23 34 33u			
15	iP	Z	11 39 24u			
15	eP	Z	17 12 46			
	e(L)	NE	27			
16	eP?	Z	12 02 15			
16	iP	ZN	18 12 11u			
	eS	N	20 20			
17	iP	Z	10 32 41u			
	i	Z	45			
	i	Z	33 02u			
17	eP?	Z	15 12 08	Local?		
	i	Z	32 52			
18	eL	ZNE	07 25			
18	e(L)	Z	11 17			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 18	eP?	Z	16 28 39			
18	P	Z	17 38 49			
	e	Z	39 06			
	eL?	Z	54			
	e(L)	NE	57			
	e	ZNE	18 04			
18	e(P)	Z	17 58 27			
18	eP	Z	19 10 08			
	e(L)	ZN	31			
18	eP	Z	19 33 17			
	e(S)	NE	35 06			
19	eP	ZNE	01 55 52			
	ePP	Z	57			
	eS	NE	57 45			
	eLq	ZE	58 20			
	e(Lr)	NE	50			
	e(Lr)	Z	59.1			
	M	NE	59±		32 -	27 18
	M	Z	02.00	26 15		
19	P	Z	02 03 37			
	i(PKKS)	E	23 55			
19	e(P)	Z	02 24 56			
19	eP	ZN	11 50 08			
	i	Z	15u			
	i	Z	24d			
	e(PP)	ZN	56			
	S	ZNE	56 12n			
	SS	E	59.1			
	Lq	ZN	12 00.0			
	(Lr)	Z	02.8			
	M	ZN	07	15 17	10 16	
19	eP	Z	15 27 17			
	e(PcS)	N	32 10			
	e(S)	Z	35.1			
	e(Lq)	ZNE	47+			
19	eP	Z	21 14 53			
	e(L)	ZN	34			
20	iPKP	Z	01 14 32d			
	i	Z	51d			
20	iP	Z	01 23 55d	2 3?		
	iP	ZNE	55u?	2 8?	½ 12?	1 -
	i(PcP)	ZE	24 15d	3½ 20		2 15?
	i	Z	53u	3½ 2		
	(PP)	ZNE	27 05	3 13	1 12	2½ 15
	iS	ZNE	33 16dne	4 -	5 14	5½ -
	i(PS)	NE	50ne		9 -	9 15?
	i	Z	34 47	3 -		
	eSS	E	37 50			3½ -
	SS	ZN	38 20s	1½ 10	5½ -	
	i	Z	39 47u	4 20		

Date	Phase		h m s	Az Tz	An Tn	Ae Te	
OCT 20	eSS	N	41 20		2 17		
	eSSS	Z	42 10	2 -			
	eLr	ZN	46½	6 40			
	eLr	E	47.1			5 37	
	M	ZE	48	15 25		13 25	
20	iP	Z	03 09 05u				
20	e	Z	06 41 14				
	e?	Z	48 44				
21	eL	ZE	01 39±				
21	iP	ZE	06 25 56u				
	iPcP	Z	26 00u				
	i	Z	27 17				
	e(S)	Z	34 40				
	S	ZNE	50e				
	ePS	ZNE	35 35				
	eSS	N	39 05				
	eSS	Z	27				
	e(SSS)	ZE	42.9				
	eLq	E	44 10				
21	P	Z	15 52 00				
	ePcP	Z	09				
	eS	ZN	16 01 20				
	e(PS)	E	02.0				
	eSS	NE	06.0				
	e(Lq)	Z	09.6				
	eLr	ZE	14				
21	P	Z	17 40 40				
21	eP	Z	18 59 32				
21	e	N	19 56.5				
22	eL	Z	09 47±				
22	e(L)	N	14 54±				
22	P	ZNE	23 52 38u				
	i(pP)	Z	47u				
	PcP	Z	53 17				
	eS	ZE	24 00 40				
	eLq	E	07 22				
	e(Lr)	Z	10				
23	PKP?	Z	02 48 05				Possibly artificial
23	iP	Z	16 55 10u				
	e(PP)	Z	57				
	e	Z	17 01 07				
	e(Lq)	Z	10				
23	eP	ZE	17 55 41				
	e(S)	ZNE	18 00 04				
	eL	ZE	01 07				
	eL	N	25				
24	e(P)	Z	09 07 13				

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 24	e	N	16 18 40			
	e	ZE	19.0			
24	e	N	18 13 15			
	e	E	42			
	e(L)	Z	14 45			
24	eL	N	18 28 12			
	eL	Z	29.0			
	eL	E	29 45			
X 24	e(L)	N	21 45			
	e(L)	E	52			
X 25	e(L)	N	07 10±			
				25d records disturbed by high wind		
25	eL	N	12 17.0			
25	eL	NE	18 51.0			
26	P	Z	02 30 10			
	ePP	Z	33 20			
	eS	E	40 35			
	e(L)	NE	59			
26	eP	Z	09 21 18			
	e(L)	NE	2 +			
26	e(P)	Z	12 53 09			
	e(S)	N	13 00 47			
	e	E	04.7			
	e(L)	NE	10			
27	eP	Z	15 13 40			
	eS	E	20 54			
	eS	N	21 20			
27	eP	Z	16 11 11			
	eS	N	18 34			
	eL?	N	23			
28	eL	NE	01 59 50			
28	P	ZNE	04 18 47			
	e	NE	20 30			
	e(S)	E	21 28			
	iLM	ANE	22 02	2 10	29 15	18 15
28	e(L)	NE	05 22 37			
28	eP	Z	07 08 24			
	e(S)	NE	11 06			
X 28	e(S)	NE	44 30			
28	ePKP	Z	11 05 21			
	ePP	ZNE	06 32			
	ePS	N	15 23			
	e(PPS)	E	16 15			
	e(SKKS)	E	23 10			
	e(P'PKS)	NE	28 10			
	e(P'PKS)	N	29 13			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
OCT 28	eLr	E	44			
	e(Lr)	N	46			
	M	N	57		7 16	
	M	E	59			6 17
	M	E	12 05			7 15
28	eP	Z	18 29 08			
	i(PcP)	Z	25d?			
X 29	e(L)	N	00 23±			
29	eP	Z	05 55 19			
	e(S)	NE	06 00 15			
	L	ZN	45			
	M	N	02		13 17	
29	eP	Z	06 01 07			
	e(S)	N	05 46			
	L	ZNE	06 20			
	M	N	07		21 16	
29	eP	Z	08 03 10	1 2		
	eP	Z	10	1 10?		
	ePP	ZN	05 05	3 -	1 -	
	i	Z	06 06	3½ 23?		
	eSKS	ZN	10.3	2 18?	3 20	
	iSKKS	N	11 47n		3 20	
	e	Z	12 40	1 20?		
	i(PS)	ZNE	14 55dn	6 -	3 -	1 -
	iPKKS	Z	16 25d	8 22		
	e(SS)	Z	20 35	4 -		
	e(SSP)	NE	21 35		4 30	4 30
	eSSS	Z	26 40	4 30		
	i	E	27 18			4 18
	eLq	E	36 00			7 30
	eLr	N	40.6		4 20	
	eL	ZNE	42	8 25?	5 35	3 25?
	M	Z	48	23 23		
	M	N	52		12 20	
	M	E	53			7 20
X 30	e	ZNE	03 30±			
30	eP	ZN	08 22 48			
	i	Z	53u?			
	eS	ZNE	25 54			
	L	Z	26 37			
31	eP	Z	06 15 43			
	e(L)	ZNE	20			
X 31	eL	ZE	08 02±			
X 31	eL	ZNE	08 53±			
X 31	e	ZNE	13 00±			
31	eP	ZN	19 14 15			
	e(PPP)	Z	19 07			
	eS	ZNE	23 35			
	e(ScS)	ZN	24.4			
	e	E	25 35			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
OCT 31	eSS	ZN		28	30						
	eLq	E		33	15						
	e	N		34	35						
	Lr	ZNE		36.5							
31	e(P)	Z	23	57	20						
NOV 1	iP	Z	03	49	53d	1½	2				
	P	ZNE			53d	2½	7	1	-	½	-
	e	Z		50	00						
	i(PcP)	Z		15u		3	2				
	ePP	Z		52	23	1	6				
	ePP	ZN			23	1	8?	1	8		
	e	E		53	28					2	10
	e(S)	ZN		58	52	2	17	2½	14		
	S	NE		59	07n			7	23	3	-
	ScS	ZE			42d	5	?			5	-
	e	E	04	03	13					2½	15?
	iSS	ZN			32ds	7½	25	5	14		
	e	Z		06	02	3½	30?				
	eSSS	E			44						
	eLq	ZE		07	9	4	?			5	-
	(Lq)	Z		09	18	7½	?				
	Lr	ZNE		11	0	6½	32	7	25	4	-
	M	ZN		15		22	20	13	20		
1	eP	Z	04	13	45						
	e(S)	Z		17	54						
1	eP	Z	06	18	06	1	-				
	e(S)	E		37	10					2½	25?
	e(S)	Z		37	50	2	-				
	eL	ZNE		40		4	40	2	35?	3	25
1	eP	Z	06	27	12						
1	eP	Z	12	17	54						
1	eP	Z	12	25	14						
	i(PcP)	Z			40d						
1	eP	Z	12	26	06	1	-				
	eP	ZNE			06	2½	-	1	-	½	-
	iP	Z			15d	4½	1				
	iP	ZN			15d	7	-	3½	-		
	i	Z		31	17u	4	12				
	iS	ZNE		33	47dse	7½	13	4½	15	11½	13
	eS	Z		50		1	5				
	ScS	NE		35	55e?			4	13	15	15
	eSS	ZE		37	6	2	14?			6	15
	SSS	E		40	0					6	30
	eLq	N		40	45			4½	15		
	Lr	Z		42	15	2½	25				
	Lr	N		43	10			5	-		
	M	ZN		50		33	15	25	15		
1	i(P)	Z	12	38	42d						
1	P	Z	15	59	44	1	-				
	P	ZN			44	1	7	1	8		
	e	Z			56	2	2				
	i	Z	16	00	02d	3½	-				
	e	Z			12	2	11				
	iS	ZNE		07	28e	3	11	2	15	4	14

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 1	iScS	E		09	30w					9½	15
	(SS)	Z		10	30	1½	10				
	eSS	NE		11	4			2	12	3½	15
	eLq	E		13	28					4	?
	e	E		14	35					3	15
	Lr	Z		15	18	2½	15				
	i	Z		16	38	4	?				
	e	N		20	40			2	20		
	(PKKP)	Z		21	25	3½	16				
	M	ZN		27		15	16	12	15		
1	e(P)	Z	17	38	37						
1	P	Z	19	35	40						
1	eP	Z	21	38	20						
	e	Z			30						
2	i(P)	Z	00	24	20u	Possibly artificial					
2	iP	Z	08	08	34d						
2	ePKP	Z	11	03	53						
	e(P'P')	Z		23	07						
	eLr	N		44							
	e(L)	Z		50							
3	P	Z	04	08	28						
	e	Z			34						
	eS	NE		14	55						
	eS	Z		15	05						
	eSS	NE		17	5						
	eLr	Z		20	5						
3	P?	Z	07	43	8	Possibly artificial					
3	e(PS)	Z									
3	e	Z	15	37							
3	e(P)	Z	20	25	26						
3	eP	Z	20	39	09						
	e(S)	ZNE		40	55						
4	e(SSS)	NE	09	04	2						
4	e(P)	Z	17	09	58						
	i	Z		10	12u?						
	e(L)	ZN		19							
4	P	Z	20	05	28						
	i(PcP	Z			41d						
	eS	N		14	14						
	eSS	Z		18	4						
	eSSS	E		20	½						
	e(L)	N		23							
	eLr	Z		24							
4	eP	Z	23	02	18	½	2				
	eP	ZE			18	1	-			1	7
	i	Z			24d	2	2				
	i	Z			29d	2	2				

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 4	ePP	Z		03	20	1	9				
	e?	Z		05	10	1	-				
	S	ZNE		08	23s	2½	18	6	15	3	15
	SS	N		11	10			30	24		
	SSS	Z			40	4	27?				
	M	ZE		13		21	22			13½	22
4	i(P)	Z	23	13	45d						
4	P?	Z	23	20	05	Possibly artificial					
4	iP	Z	23	44	25d						
	i	Z			34u						
	e(SS)	Z		55	06						
5	eP	Z	04	37	25						
	eS	E		45	10						
	eScS	NE		47	10						
	eLr	Z		53	.3						
	e?	N		56	15						
	e	Z	09	00							
5	e(P)	Z	06	41	25						
	e(L)	E	07	00							
	e(L)	ZN		03							
5	iP	Z	08	12	15u						
5	P	Z	13	09	38						
6	P	Z	10	07	12						
	e(S)	Z			15.4						
	e(L)	N			21.2						
	e(L)	E			22.2						
	eL	Z			23½						
6	P	Z	15	41	01						
	eL	ZNE		57							
6	iP	Z	21	32	25d						
	eL	ZN		54							
6	ePKP	Z	23	13	11	1	-				
	iPKP	ZNE			11ds	13	27	3½	25	2	26
	i(PKS)	Z		16	51u	2½	2				
	i(PKS)	Z		51u		23	30?				
	i	Z		18	07u	7	2				
	i	ZNE			07unw	77?	-	45	-	24	25
	i	ZN		20	22us	7	-	34	-		
	e	Z		22	01	3	-				
	i	Z			25d?	3½	-				
	(PKKP)	ZN		24	09s	2	-	30	-		
	i	Z		25	37d?	3	-				
	i(PKKS)	Z		27	16d	3½	2				
	e(L)	Z		45	13						
	eL	Z		50	51	1½	15				
	M?	N		50				50	-		
	M?	Z		52		150	-				
	M?	E		55						110	-
	M	Z		57		15	25				
7	eP?	Z	00	46	10						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 7	ePKP	Z	02	01	45						
7	e(P)	Z	06	04	56						
	e	ZN		09							
7	iP	Z	07	55	51u						
	eS?	NE	08	03	00						
7	e	NE	09	44	50						
7	e(P)	ZNE	11	54	05						
	e	NE	12	00	50						
	e(L)	ZNE		25							
7	e(PKP)	Z	17	53	05						
	e(L)	ZNE	18	30							
7	eP?	Z	20	28	27						
	eP	Z		34	16						
	eL	ZNE		51							
8	iP	Z	07	54	17d						
	S	Z			28						
8	eP	Z	09	41	51						
	iPP	Z		43	50d	1	5?				
	e(SSP)	ZN	10	01	05	19	14				
	eSSS	NE		05	.7						
	e(Lr)	ZN		22							
8	eL	ZE	20	25±							
9	eP?	Z	10	33	42						
	i(P)	Z			47u						
9	P?	Z	14	51	12						
10	eP	Z	07	10	04						
	e	Z		25	12						
	eLr	NE		30							
10	eP	Z	07	32	22						
10	e(P)	Z	11	19	17						
10	P	ZNE	11	25	10	1	2	<½	-	½	-
	e?	Z		31	34	½	1				
	eS	NE		35	15			1	-	1½	-
	eSS	NE		40	16			1	15	1½	17
	eLq	N		46	.5			1	-		
	Lr	E		51	.0					3	22
	M	E		54						4	15
10	eP	Z	12	12	23						
11	e	Z	13	12	15						
11	e	Z	13	39	45						
11	P	Z	16	16	33						
	e(L)	E		18	10						
	e(L)	N			33						

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te
NOV 11	e(L)	NE	18 25±						
11	eP	Z	19 47 49						
	e(S)	E	55 52						
	eL	NE	20 04						
11	iP	Z	22 49 46u						
	e(L)	NE	23 15						
12	iP	Z	03 59 04u						
	i	Z	11d						
	e	ZNE	04 04 37						
	e(L)	NE	07.5						
	eL	Z	08.5						
12	i(PKKP)	Z	06 38 44u?						
	e(L)	ZE	07 03						
12	iP	ZN	10 50 29d?						
	e(PcP)	Z	42						
	eS	ZN	59 06						
	eS	E	20						
	eSS	ZN	11 03.7						
	eLq	ZE	07						
	eLq	N	08						
12	e(P)	Z	17 58 30						
12	e(P'P')	Z	18 22 32						
	eLq	N	29 09						
12	eP	NE	20 38 36			2	20	1	17
	ePKP	ZE	42 15	½	2			1	18
	iPP	ZNE	43 29s	1½	-	8½	17	5	18
	ePKS	Z	46 07	1	3				
	i	N	47 16s			3½	15		
	e	Z	36	1	-				
	eSKS	E	49 15					2	15?
	i	E	51 29w					9	15
	i(PKKP)	N	53 10s			14	-		
	(PKKP)	ZE	24w					21	20
	i(SSP)	NE	59 34sw			12	-	11	20?
	i(SKKS)	NE	21 04 00se			11	27	19	35?
	eLq	E	11.3					11	-
	eLq	N	12.0			10	24		
	i(L)	E	12 47w					20	-
	Lr	E	18½					8	22
	Lr	N	19½			6	20		
	M	NE	23			43	26	29	24
13	iP	Z	00 25 38d						
13	ePKP	Z	03 15 15						
	e(PPS)	NE	26 15						
	e	N	29.4						
	eSKKS	NE	33.1						
	e(SKKS)	E	37.2						
13	iPKP	Z	04 23 26d?	½	2				
	ePP	Z	24 39	½	4				
	e	NE	32 32			½	15?	1	12?
	ePPS	NE	34 28			2	-	1½	20
	e(SS)	NE	40 49			1	-	1½	-
	e(SKKS)	N	41 15			3	25		

Date	Phase		h m s	Az	Tz	An	Tn	Ae	Te
NOV 13	eSKKS	NE	44.9			½	25	1	-
	(Lr)	NE	05 01			1	25	1	-
13	P?	Z	08 40 45						
	iP	Z	41 32d						
13	eL	NE	10 01						
13	eP	Z	16 20 49						
	i	Z	30 22d						
13	e(PP)	Z	23 28 27						
	eL	ZNE	24 15						
14	iP	Z	05 14 02d						
	eP	ZNE	02	1	10	½	-	½	12
	i	Z	17u						
	e(PcP)	Z	15 22						
	S	ZNE	21 53n	½	-	2½	14	1½	22
	eSS	ZN	25.2	1	-	1	12		
	eSSS	NE	27.5			1½	25	½	-
	eLq	ZE	28.6	1½	-			2	18
	M	N	29			8½	13		
	eLr	Z	30.1	3	25?				
	M	Z	30+	5	22				
	M	E	35					6	15
14	eP	Z	13 59 40	½	3				
	eP	ZNE	40	½	-	<½	-	½	-
	i(PcP)	Z	57	½	-				
	iPcP	Z	14 00 05d	2½	2				
	ePcP	ZNE	05	1	17	1½	17	2	15
	i	Z	40d	2½	2				
	e	ZNE	01 18	1	-	½	-	<½	-
	ePPP	ZE	04.3	1	12			1	12
	iS	ZNE	08 46se	1½	-	4	19	4½	17
	iPS	ZNE	09 30use	1½	18	6	-	6½	17
	eSS	NE	13.3			1½	-	2	12
	e	ZE	14 35	2½	-			2	-
	eLq	ZNE	17.5	2	18?	6	45?	3?	20
	eLr	Z	22.3	2½	17				
	iP'P'	Z	27 34d	1	3				
14	e(SKS)	Z	15 47 55						
	e(L)	ZNE	16 10						
14	eL	E	23 12±						
15	eL	ZNE	04 50±						
15	eSKS	Z	09 26 23	1	8				
	eSKKS	N	27 01			1	?		
	e	E	29 20					1	?
	ePKKP	ZNE	30 28	2½	16	1½	16	1	18
	ePPS	NE	31 13					1½	-
	e	Z	32 23	1	?				
	e(PKKS)	E	34 42					½	15
	e(SKKS)	ZNE	37 22	1	?	1	?	1	15
	eLq	E	49.7					1	?
	Lr	Z	54.5	1	35				
	Lr	NE	55.3			1	40		

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 15	eP	Z	19	24	58						
	ePcP	E		25	35						
	ePP	Z		26	56						
	eS	ZNE		33	02						
	eSS	NE		35	.1						
	eLq	E		39	33						
	eLq	N		40	08						
	e(Lq)	E			28						
	eLr	N		41	40						
	eLr	Z		42	.6						
16	1P	ZN	09	56	55u						
	1PcP	Z		57	14u						
	ePP	Z		59	26						
	eS	N	10	05	08						
	1(PS)	E			24						
	eScS	N		06	38						
	e	Z		10	39						
	eSSS	N		11	23						
	eLq	ZNE		13	00						
16	P	Z	17	03	57						
	e(S)	N		11	43						
	eL	ZNE		21							
16	P	Z	(18)	54	04						
	eS	NE	(19)	01	30						
	eLq	E		07½							
	eLr	ZN		10							
16	e(P)	Z	21	19	30						
	e	Z			57						
16	eP	Z	22	09	02						
	e	NE		15	36						
	e	N		18	48						
	L	N		20							
	L	ZE		21							
17	e	ZN	10	34±							
17	PKP	Z	15	53	38						
17	P	ZNE	(17)	54	41e						
	i	Z			51						
	e(PcP)	Z		55	23						
	ePP	Z		56	49						
	1S	ZNE	(18)	02	38se						
	eScS	Z		04	53						
	eSS	N		06	03						
	eSS	Z			37						
	eLq	E		08	25						
17	e(P)	Z	18	11	40						
17	i(P)	Z	19	35	35d						
17	iP?	Z	22	45	40d						
	e	ZE	23	30							
18	e(P)	Z	05	57	42						
18	eL	ZN	08	44±							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 19	iP	Z	01	45	47d						
	e	Z		47	45						
	S	ZNE		54	36						
	eSP	N		55	02						
19	iP	Z	04	01	05d						
	eS	ZNE		07	40						
	e(SSS)	ZNE		11	.2						
	eLr	ZN		14	.1						
19	iP?	Z	04	16	23u						
19	eP?	Z	07	47	39						
19	ePKP	Z	09	42	35						
	e(SKKS)	E		51	32						
	e(PS)	NE		53	36						
	eSS	ZNE	10	00	.2						
	e(PKPPKP)	N		02	12						
	eSKKS	N		04	56						
	eLq	Z		20							
	eLq	NE		23							
19	ePKP	Z	15	21	28						
19	eP?	Z	18	42	00						
19	iP	ZNE	22	05	18d						
	eS	ZNE		07	05						
20	eP	Z	01	49	23						
20	e?	Z	05	53	32						Two overlapping shocks
	ePKP	Z		55	20						
	e(PKKS)	ZN	06	07	.5						
	eSKKS	ZN		14	57						
	e(SSS)	Z		17	.0						
	eLr	ZN		36							
20	eP	Z	06	16	03						
	eS	N		19	10						
	eLq	E		20	38						
	eLr	ZN		21	.6						
20	ePKP	Z	14	36	48						
	ePS	ZN		47	46						
	ePPS	ZN		52	33						
	eLr	ZN	15	12							
20	P	Z	22	09	43						
20	e	Z	23	26	10						
21	eP	Z	03	12	45						
21	eP	Z	09	51	46						
21	eP	Z	11	51	46						
21	eP	Z	13	49	04						
21	eP	Z	23	44	30						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 22	eP	ZE	00	15	39						
	e	E		16	36						
	ePP	ZN		18	4						
	e	ZN		22	52						
	S	ZNE		24	55w						
	e(ScS)	Z		25	46						
	i	N		26	19						
	e	Z		28	39						
	iSS	ZNE		29	29e						
	eSSS	NE		32	49						
	eLq	Z		34	09						
	(Lr)	ZNE		36							
	M	ZE		44		6	18			6	18
22	iP	Z	02	08	24d	1	1				
	eP	ZNE			24	1	?	½	?	1	12
	iPcP	Z			39d	3½	2				
	e	Z			54	1	2				
	ePPP	Z		12	42	1	7				
	S	ZNE		17	42	1	?	1½	?	2	?
	e	Z		19	53	1	10				
	e(SS)	Z		26	12	1½	?				
	eLr	Z		31½		1	40?				
	e(L)	NE		33				1	?	2	?
	M	ZN		38		7	23	4	23		
23	e	ZE	21	34±							
23	ePKP	Z	23	46	44						
24	P	ZNE	06	57	15						
	e	NE		58	26						
	ePP	NE		59	05						
	ePPP	NE			46						
	S	NE	07	03	58						
	e	NE		06	06						
	eSS	NE		07	04						
	Lr	NE		10	42						
24	eP	Z	17	55	03						
25	ePKP	Z	02	43	48						
25	eP?	Z	03	39	25						
25	P?	Z	08	22	43						
25	eP	Z	13	24	02	Two overlapping shocks					
	eP	Z		25	58						
	e	Z		27	20						
	e	NE		40	06						
	eL	E		49	35						
26	e	Z	11	44±							
26	eP	ZNE	21	37	40						
	e(L)	ZNE		38	50						
	M	N		39+				18	16		
27	e	ZNE	04	58±							
27	iP	ZNE	06	43	40u						
	i(PP)	Z		44	05d						

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
NOV 27	eLr	ZNE		45	33						
	M	ZNE		46		10	13	8	13	7	14
27	iP	ZNE	07	42	10u						
	i(PP)	Z			27u						
	eLr	ZNE		44	03						
	M	ZNE		44+		8	15	5	16	4	15
27	eiP	Z	13	43	52d	3½	-				
	P	ZNE			52s	2	16	5	20	1	18
	e(S)	N		45	00			2	15		
	Lr	ZNE			49	18	?	15	22?	6	?
	M	ZNE		46		67	11	43	15	34	11
28	e(P)	ZNE	15	04	06						
	i(P)	Z		05	07u						
	L	ZNE		07	03						
	M	ZNE		07+		13	15	9	12	7	12
28	iP	ZNE	15	19	31u						
	Lr	ZNE		21	17						
	M	ZNE		22		15	15	12	12	10	12
29	e	ZNE	01	46±							
29	P?	Z	04	54(57)		In time mark					
29	i(P)	Z	10	48	34u						
29	eP?	Z	16	04	59						
29	e	NE	17	05							
30	eP	Z	01	46	00	<½	?				
	e(PP)	Z		51	20	1	8				
	e(S)	ZNE		57	40	½	-	1	11	½	10
	ePKKP	ZNE	02	01	40	1½	-	1½	-	½	-
	ePKKS	Z		04	27	½	13				
	e	ZNE		06	40	1½	10	2	20	1	20
	eLr	ZN		23		1	25?	1	?	1	?
30	e	ZE	08	11±							
30	eL	ZE	12	45±							
30	e	NE	19	32±							
30	e(L)	NE	21	11±							
DEC 1	eL	ZNE	01	52±							
1	P?	Z	03	43	39						
	e?	Z		44	03						
	e(L)	ZE	04	15							
1	eP	Z	04	55	03						
	eL	ZNE	05	10							
1	e(L)	NE	08	10±							
1	eP	Z	09	58	50						
	e(L)	NE	10	01							
1	eP	Z	10	41	06						
	eL	NE		43.1							

Date	Phase		h m s	Az Tz	An Tn	Ae Te
DEC 1	iP	ZN	13 09 43u			
	e(PP)	Z	57			
	e(L)	NE	11.7			
1	e	Z	14 32±			
	i?	Z	37 13u			
	e?	Z	42 28			
1	e	Z	19 39			
1	iP	ZNE	22 25 12d			
	S	ZNE	26 41			
	eL	ZN	55			
2	eP	Z	07 21 17			
	e	NE	30 33			
	eL	E	35			
	eL	N	37			
2	eL	ZNE	23 46±			
3	eP	Z	10 02 03			
	ePP	Z	06.0			
	e(SSS)	ZNE	23.3			
	eLr	ZNE	33			
3	e	ZE	12 08			
4	e	Z	05 10±			
4	eL	ZNE	11 20±			
4	e(P)	Z	12 40 04			
	e(L)	Z	13 15			
4	e?	Z	13 28 46			
4	e?	Z	19 16 08			
4	e(PPS)	Z	19 47.2			
	e	ZE	53.4			
	eLr	ZNE	20 08			
4	eL	Z	21 27±			
4	P?	Z	22 28 57			
4	e(P)	Z	23 00 34			
5	iP	Z	04 16 19u			
6	e(SKKS)	E	09 58 28			1 -
	ePPS	E	10 01.0			2 17
	ePKKS	N	06.2		1 25?	
6	e	Z	21 08±			
6	e?	Z	22 43 05			
7	eP	Z	02 58 10			
	eS	NE	03 08			
7	e	NE	06 45±			
	e(L)	NE	50			

Date	Phase		h m s	Az Tz	An Tn	Ae Te
DEC 7	e(L)	E	18 48			
	e(L)	ZE	54.4			
8	iP	Z	03 20 03u			
	i	Z	07u			
8	e	ZNE	12 38 16	1 -	1½ -	1 ?
	ePKP	ZN	45.1	½ -	1½ 25	
	e(P'P')	Z	13 03 45	1 -		
	e	E	05.5			½ -
	e	Z	10	1 25?		
	e(L)	N	12		1 -	
9	e	N	01 27			
9	eSS	E	02 53 14			
	eLr	NE	56 27			
9	eP	Z	08 12 02			
	e(P'P')	NE	40			
9	iP	Z	12 27 41u			
	i	Z	47u			
	eS	NE	35 44			
	eLr	N	44½			
9	eL	ZN	23 08±			
10	iP	ZNE	07 09 38dn	6 10	4 10	1¼ 7
	iPP	ZNE	10 34dnw	16 12	9 15	4¼ 7
	ePPP	E	11 26			2½ 12
	iPcP	E	12 13w			5 8
	i	E	13 18e			6 8?
	iS	ZNE	14 59w	28 ?	35 ?	47 ?
	iSS	Z	17 00d?	10 14		
	i(SSS)	NE	18 00n		17 ?	V. large
	M	ZNE	18+			
10	e(SSS)	NE	22 31 30			
	eLr	E	41			
11	e	NE	03 02±			
11	eL?	N	12 55±			
13	iP	ZN	09 16 40d			
	ePcP	Z	50			
	ePP	ZN	18 35			
	e(ScS)	E	26 35			
	e	Z	28 18			
	e(SSS)	ZNE	32			
13	i(PKP)	Z	14 48 09d			
14	iP	ZE	07 20 58d	1 2		1 -
	S	ZNE	28 48e	3 22	2 30	4 27
	iSS	Z	32 45	5 ?		
	e(SSS)	E	33 50			4 ?
	SSS	NE	34.7		4 35	2 22
	Lq	ZE	36.7	5 2		7 ?
	M	ZN	37	33 25	26 28	
14	e(P)	Z	23 01 26			

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
DEC 15	1PKKP	Z	08	16	04							
	i	Z			08							
16	e?	Z	02	28	19							
17	eL	ZN	03	25±								
17	eL	ZNE	16	24±								
17	e	Z	17	45±								
17	P	ZN	20	44	45							
	ePcP	Z		45	24							
	ePPP	ZE		49	30							
	S	ZNE		53	40							
	1PS	ZNE		54	24w							
	eLq	ZNE	21	03								L-waves poorly defined
18	e(SSS)	Z	01	59	40							
	e(Lq)	Z	02	02	30							
	i(Lr)	Z		04	04d							
18	eL	ZNE	05	48±								
18	iP	Z	07	39	45d							
	e(L)	Z		53								
	e(L)	Z	08	16								
18	e(P)	Z	08	49	23							
	e	Z		54	45							
	e	Z	09	09								
	eL	ZNE		12								
18	eP	Z	12	34	12							
	e(L)	ZNE		55								
18	eL	Z	18	32±								
18	iP	ZN	19	33	45u							
	e(PcP)	Z		34	03							
	ePP	Z		35	52							
	ePPP	Z		37	00							
	eS	ZNE		41	50							
	1ScS	E		43	40							
	eSSS	NE		47.7								
	eL	Z		49	46							
19	eP	Z	00	48	23							
	i	Z			38d							
	e(S)	ZNE		50								
19	eP	Z	09	59	05							
	eS	NE	10	06	51							
	eSS	E		09	10							
	eLq	N		12	35							
	eLr	E		13	41							
19	iP	Z	11	26	57u							
	i(PcP)	Z		27	14u?							
	e	ZNE			21							
	ePP	ZN		30.5								
	e	Z		36	02							
	eS	ZNE		37	10							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 19	e	Z		39	55						
	SS	ZNE		52.1							
19	eL	ZNE	15	30±							
19	e	Z	18	57±							
19	eL	ZNE	19	32±							
20	e	ZNE	00	40±							
20	e(P)	Z	09	30	33						
20	e?	Z	18	55±							
20	e	E	19	48½							
	eL	ZNE	20	08±							
20	eL	ZNE	21	30±							
21	1PKP	Z	06	05	46u	1	-				
	1PKS	ZE		09	06d	1½	-			½	-
	ePPS	ZE		18	05	1½	-			1	15
	ePPS	ZE		21	03	1½	-			1	12
	e(SS)	Z		23	31	1	-				
	e(SKKS)	ZE		25.2		1	13			1	15
	i(SS)	Z		27	35	1½	-				
	e	E		31	20			2	20		
	eLr	Z		45		1	-				
	eLr	N		47				1	-		
	M	ZE		56		5½	23			4	20
22	eP	Z	02	28	15						
	eS	ZE		37	03						
	eLq	Z		45	00						
	Lr	ZN		47							
22	eP	Z	19	28	27						
	e(S)	ZE		34.5							
	e(S)	N		35	02						
	i	NE		37	41e?						
	eL	ZNE		40							
23	P	Z	03	40	19						
	e(L)	ZE		55							
23	eL	ZE	07	13±							
23	eL	Z	10	30±							
23	eP	Z	19	23	34						
	e(L)	ZNE		35							
	e(L)	ZN		54							
24	e	ZE	00	26±							
24	eL	Z	01	45±							
24	e	Z	20	34							
24	eP	Z	20	44	50						
	i	Z			55u						
	eL	ZN	21	01							

Date	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
DEC 24	iP	Z	22	20	27d						
	i	Z			32u						
	eL	ZN		33							
25	iP	ZNE	08	16	36u	2½	2	1	-	1	20?
	ePP	NE		19	05						
	S	ZNE		25	30s	1	-	7	-	3	-
	iSS	NE		30	05			8	-	4	-
	eLq	E		33	30					3½	27
	eLr	NE		37				4	35	3½	22
	M	N		45				11	17		
26	eP	Z	22	43	57						
	e(L)	ZNE		50							
28	e(P)	Z	05	53	28						
	e	Z		54	42						
	SKS	ZE	06	04	26						
	ePS	ZE		05	.7						
	e	Z		06	34						
	ePKKS	E		11	09						
	eSKKS	E		15	47						
	eL	ZE		31							
	eLr	E		33							
	M	ZE		42		7	18			6	18
29	eP	Z	22	51	10						
	e(PPS)	ZNE	21	03							
30	eP	Z	08	47	26	1	?				
	iPcP	Z		48	35						
	S	ZNE		55	17n						
	eScS	ZN		57	27	1	?	1½	12		
	eScS	Z			46	1	?				
	eSS	E		58	50					1	15?
	eSS	N		59	23			2	?		
	SSS	N	09	01				2½	?		
	eL	ZE		02	½	2	?			2½	?
	M	N		03				8	22		
	M	ZE		04		8	22			2½	25
31	iP	Z	01	54	11u?	2	2				
	eP	ZNE			11	1	8				
	ePcP	ZN		55	28	3	?	1½	6		
	S	NE	02	00	55e			2½	15	8½	12
	e(PPS)	Z		01	31	2	-				
	e	NE		02	26			1	-	6	-
	e(ScS)	ZN		03	19	2	6	3	15		
	eSSS	E		05	12					2	-
	(Lq)	ZNE		06	14e?	1	?	1½	?	2	?
	e(PKKP)	ZN		17		2	40?	2	-		

INSTRUMENTALLY DETERMINED EPICENTRES

The following list gives the epicentres of earthquakes reported felt, and of all instrumentally recorded earthquakes of magnitude 4 and above for which there is sufficient data. Reported earthquakes that cannot be confirmed instrumentally are listed separately, following the list of places reporting felt earthquakes. An explanation of the notation will be found at the beginning of the section 'Station Readings'. These epicentres have been plotted on Maps 1 and 2, to be found inside the back cover of this report.

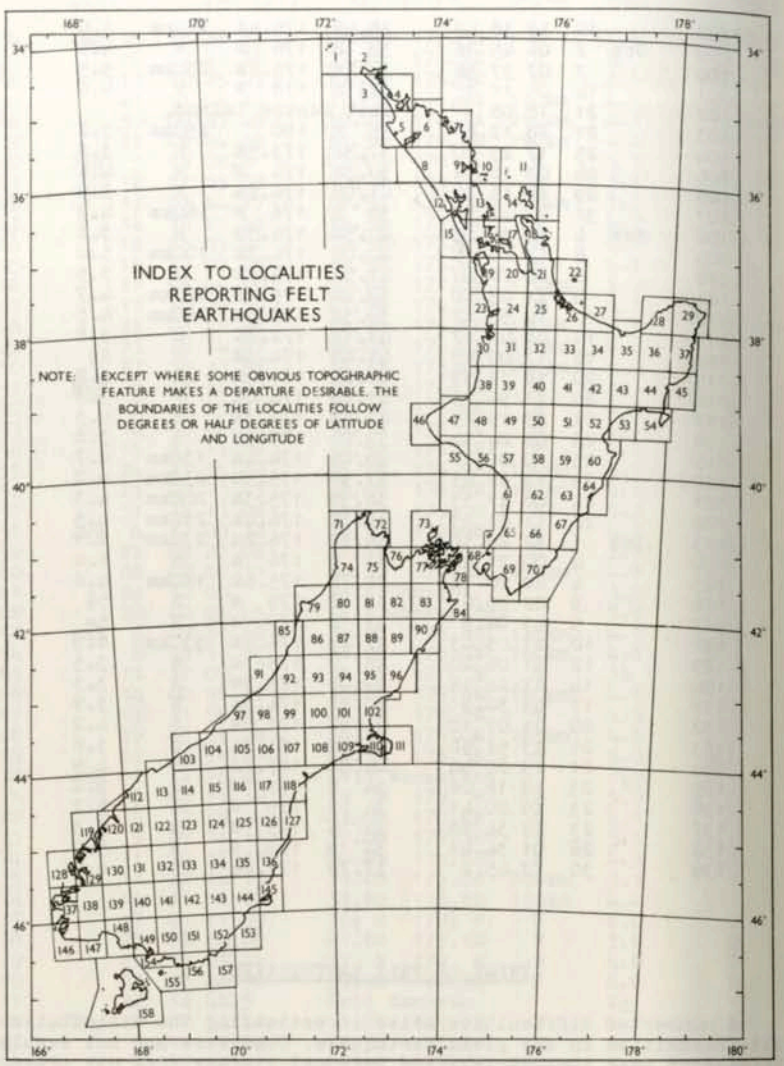
No	Date	Time (UT)	Epicentre		Depth	Mag.	Class
58/1	Jan 7	12 19 17	38.9S	174.9E	210km	4.4	C
2	8	13 02 34	41.0S	174.3E	S	4.4	C
3	9	15 10 27	37½ S	176¾ E	S	3¾	D
4	10	01 30 36	38.5S	176.0E	190km	4.4	D
5	12	00 25 40	41.8S	173.6E	S	4.1	B
6	12	17 43.5	34 S	179 W	N	5.3	D
7	17	10 36 59	40.7S	174.0E	S	4.4	C
8	27	02 01 37	39.6S	175.9E	S	4.3	D
9	28	22 50 29	40.1S	176.4E	S	4.3	C
10	30	01 25 43	45.9S	167.1E	S	5.0	C
11	31	06 32 44	39.9S	176.2E	S	5.9	C
12	31	09 27 26	42.1S	174.0E	N	4.0	B
13	31	11 28 49	39.9S	175.4E	S	3.9	C
14	Feb 6	14 46.1	40 S	175½ E	N	3¾	D
15	6	18 08 49	39.2S	175.3E	N	3¾	D
16	8	16 06 10	38 S	179 E	N	5.0	D
17	10	11 01 50	38.4S	177 E	N	4.1	C
18	13	23 27 22	37½ S	177 E	300km	5.2	D
19	16	02 02 40	37 S	176 E	N	3½	D
20	22	23 32 03	41.3S	174.5E	N	3.9	C
21	24	01 50 45	40.4S	176.3E	S	3.7	B
22	24	10 06 10	37½ S	176¾ E	200km	5.0	D
23	25	12 45 13	37¾ S	177½ E	200km	5.0	D
24	27	08 40 22	37½ S	176½E	150km	4.1	D
25	27	17 43 16	38.9S	173.8E	N	4.4	D
26	Mar 2	15 42 06	40.7S	172.9E	S	3.3	C
27	2	22 29 09	40.7S	172.9E	S	3.7	B
28	3	08 02 49	40.7S	172.9E	S	3.1	D
29	5	05 36 58	35.3S	178.9E	260km	5.9	C
30	5	23 31 52	38.3S	176.2E	160km	5.2	B
31	6	16 33 56	38.1S	177.0E	S	3	D
32	9	10 22 32	33¾ S	179 W	50km	6.5	D
33	15	09 54 45	38.4S	176.1E	180km	4.7	C

No	Date	Time (UT)	Epicentre	Depth	Mag.	Class
58/34	Mar 16	16 38 53	41.8S 177.3E	N	4.5	C
35	16	22 22 38	39.3S 174.9E	N	4.1	C
36	19	16 25 05	39.2S 175.3E	S	3.6	C
37	21	11 01 19	37.7S 176.9E	170km	4.4	B
38	30	09 53 45	39.2S 174.7E	210km	4.7	C
39	31	05 44 38	38.5S 175.6E	190km	4.4	C
40	Apr 3	16 02.8	41.4S 176 E	N	4.5	D
41	12	11 05 09	40½ S 173 E	N	3.8	D
42	13	01 44 17	38.5S 175.9E	170km	5.2	C
43	14	15 25 59	39.3S 173.1E	N	4.7	D
44	15	15 53 40	39.3S 173.2E	N	4.4	C
45	15	17 07 03	39.5S 173.4E	N	4.8	C
46	17	03 46 50	37.8S 177.0E	170km	5.7	C
47	17	14 23 14	41.9S 174.2E	N	4.1	C
48	22	03 52 26	38.6S 175.5E	190km	4.6	D
49	23	18 14 47	38.0S 176.0E	190km	4.7	D
50	27	15 33 56	38.7S 175.2E	250km	4.9	D
51	May 3	18 18.2	38¼ S 176¼ E	N	<3	D
52	7	19 25 27	38.1S 177.6E	S	4.1	D
53	14	12 04 30	38¾ S 176 E	S	2½	D
54	16	21 18 58	39.5S 176.2E	N	4.2	B
55	24	21 56 26	38.9S 175.9E	100km	4.1	C
56	25	09 13 53	38.0S 176.4E	190km	4.4	C
57	31	14 13 06	34¾ S 179½ W	N?	5.3	D
58	Jun 4	17 09 34	40.9S 176.0E	N	4.1	D
59	22	09 27 08	41.7S 174.5E	N	3.9	D
60	28	02 02 39	38.1S 176.5E	150km	4.8	C
61	28	10 09	Felt Cheviot.		3.0	-
62	29	02 45 45	Felt Whakatane.		3.0	-
63	Jul 5	09 31 10	38.5S 176.8E	115km	4.1	C
64	8	15 33 54	38.9S 175.4E	160km	4.6	C
65	11	17 09.3	38 S 177 E	N	3¼	D
66	14	00 56 52	38.6S 175.8E	160km	4.6	C
67	15	11 58 59	42.0S 172.8E	S	4.5	B
68	29	08 55 49	38.4S 176.0E	165km	4.5	B
69	29	22 21 21	40.5S 176.3E	S	5.0	B
70	Aug 2	12 18.4	Felt Whakatane.		2½±	-
71	5	09 11 39	33 S 179 W	N	5.9	D
72	5	12 38 34	43.0S 170.6E	N	4.1	C
73	9	02 11 11	37.0S 177.3E	N	5.1	D
74	11	14 35 37	40.2S 174.0E	N	4.3	D
75	11	22 16 15	39.0S 175.0E	200km	5.1	D
76	15	12 11 18	38.8S 175.8E	150km	4.4	D
77	17	21 11 09	35½ S 179½ W	N	6.0	D
78	23	16 14 00	41.6S 173.1E	N	3.6	D
79	25	17 03 44	37 S 178 W	N	4.8	D
80	27	07 48 10	39.2S 174.3E	N	4.0	D
81	27	18 44.5	Felt Kawerau.		2±	-
82	Sep 2	02 55 41	41.6S 171.9E	N	4.2	B
83	2	11 18 03	41.3S 175.7E	N	3.1	C
84	2	22 11 02	45¼ S 178½ E	350km	5.6	D
85	5	10 58 06	40.1S 176.2E	N	3.5	C
86	8	08 04 29	41.2S 174.9E	S	2¼	C
87	8	19 24 25	38.2S 177.7E	S	4.4	C
88	10	16 07 22	38.2S 177.7E	S	3.0	D
89	12	01 04 30	37.9S 177.1E	S	3½	D
90	15	16 48 10	33 S 180	N	6.0	D
91	17	14 11 00	41.3S 173.1E	90km	4.4	B
92	18	05 12 41	38.1S 176.2E	185km	5.3	B
93	22	05 37 28	40.8S 174.4E	S	4.2	C
94	22	19 05 50	33.3S 177.7W	50km	7.0	C
95	25	11 56 32	40.6S 173.4E	180km	4.5	B
96	26	12 25 50	39.0S 176.2E	130km	4.5	C
97	27	00 33 23	41.7S 174.0E	N	4.1	B

No	Date	Time(UT)	Epicentre	Depth	Mag.	Class
58/98	30	18 38 49	38.4S 176.4E	160km	5.0	C
99	Oct 2	06 45 36	39 S 178 E	N	4.1	D
100	7	07 37 56	39.1S 175.1E	230km	5.5	C
101	14	01 11 15	37½ S 178 W	N	4.6	D
102	21	18 08	Felt Centre Island.			-
103	21	18 12.6	35 S 180	250km	5.2	D
104	23	17 23 20	37.3S 173.5E	N	3.8	D
105	26	03 18 56	39.3S 174 E	N	4.1	D
106	29	15 13 30	41.0S 176.5E	N	3.6	D
107	31	23 42 55	38 S 176 W	160km	4.5	D
108	Nov 6	14 36 42	40.5S 176.3E	S	3.8	C
109	8	13 20 15	40.0S 174.3E	100km	5.0	B
110	8	20 21 44	41.5S 174.8E	N	3.5	C
111	8	21 05 10	39.2S 175.2E	120km	4.7	B
112	10	14 55 17	39.3S 175.3E	280km	4.5	C
113	14	21 44 17	41.1S 172.8E	S	3.8	C
114	18	17 00 55	41.4S 174.8E	S	2½	C
115	20	16 22 59	42.6S 171.2E	S	3.2	C
116	20	21 56 13	41.6S 174.0E	N	3.8	B
117	21	23 19 23	41.8S 171.3E	S	4.5	B
118	23	09 24 14	39.2S 175.5E	S	3.8	C
119	23	10 00 11	40.0S 174.4E	130km	4.7	B
120	23	12 56 43	37.9S 175.9E	230km	4.8	B
121	24	08 47 33	38.9S 175.3E	200km	4.3	C
122	28	11 01 53	38.1S 176.4E	210km	4.5	C
123	Dec 1	12 26 10	38.2S 176.2E	270km	4.1	D
124	4	00 21 20	31 S 176 E	N	5.4	D
125	4	20 20 26	38.7S 175.6E	160km	4.6	D
126	9	02 39.6	33 S 179 W	N	5½	D
127	9	03 04.5	33 S 179 W	N	5±	D
128	10	07 03 03	37.2S 176.9E	330km	6.9	B
129	12	21 06 40	38 S 175½ E	N	3.5	D
130	14	13 24 16	39.0S 175.3W	N	3.3	D
131	17	03 30.3	40.8S 176.3E	N	3.9	D
132	20	21 07 10	41.4S 173.0E	S	4.2	D
133	21	13 51 50	44.0S 171.3E	S	3.8	B
134	21	19 20 44	44.8S 167.7E	N	4.9	B
135	23	19 16 08	34 S 179 W	N	5.4	D
136	23	19 20 41	34 S 179 W	N	5.2	D
137	23	19 34 58	34 S 179 W	N	5.3	D
138	26	01 34 46	34 S 179 W	N	5.0	D
139	30	17 45.2	37.7S 177.0E	N	4.0	D

INDEX OF FELT EARTHQUAKES

A number of difficulties arise in estimating the distribution of felt intensities in any given earthquake. Observers are not evenly distributed over the country, and personal circumstance may prevent them from noticing the shock. Similar shortcomings affect the list of earthquakes felt at any given place. It may reasonably be assumed that a strong earthquake reported from one township will be felt in a 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 land 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 number and name, usually that of the principal centre of population within it. These areas are termed 'localities', and the names are as follows:

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

The first section of the index gives the names of places from which each earthquake has been reported felt, classified according to intensity on the Modified Mercalli scale. A ? indicates that no information is available beyond the fact that the shock was felt, or that the description is 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 on Raoul Island are reported with the instrumental readings for Apia and Raoul respectively.

PLACES REPORTING FELT EARTHQUAKES

58/2	Jan	8d	13h 02m	
		MM3-4		Wellington
		MM3		Paraparaumu (65)
58/3	Jan	9d	15h 10m	
		MM4		Whakatane
58/9	Jan	28d	22h 50m	
		MM2		Dannevirke
		MM1		Waipawa (60)
58/10	Jan	30d	01h 25m	
		MM3		Nightcaps (140)
58/11	Jan	31d	06h 32m	(See Isoseismal Map)
		MM6-7		Dannevirke
		MM6		Ohakune
		MM4-5		Tarawera (52), Ohakune
		MM4		Tokaanu (40), Waipawa (60), Napier, Pongaroa (67), Wanganui, Palmerston North, Porangahau, Bunnythorpe (62)
		MM3-4		Paraparaumu (65)
		MM3		Taihape, Awakino (38), New Plymouth Taumarunui, Hawera, Ohakea (61) Hunterville (58), Foxton (61) Wellington, Nelson, Taupo
		MM2		Stratford (47)
		MM1		Eketahuna (66)
58/13	Jan	31d	11h 28m	
		MM1		Hunterville (58)
58/14	Feb	6d	14h 46m	
		MM3		Wanganui
		MM2		Wellington, Dannevirke, Ohakune, Raetihi (49)
		MM1		Palmerston North
		?		Foxton (61)

58/15	Feb	6d	18h 09m	
		MM2		Ohakune
58/20	Feb	22d	23h 32m	
		MM2		Karori (68)
58/21	Feb	24d	01h 52m	
		MM2		Dannevirke
58/26	Mar	2d	15h 42m	
		MM2		Collingwood (72)
58/27	Mar	2d	22h 29m	
		MM4		Collingwood (72)
		MM3-4		Farewell Spit (72)
58/28	Mar	3d	08h 02m	
		MM3-4		Farewell Spit (72)
58/31	Mar	6d	16h 33m	
		MM4		Whakatane
58/36	Mar	19d	16h 25m	
		MM2		Raetihi (49)
58/43	Apr	14d	15h 25m	
		MM4-5		Collingwood (72)
		MM3		New Plymouth
58/44	Apr	15d	15h 53m	
		MM3		New Plymouth, Hawera
		MM2		Stratford (47)
58/45	Apr	15d	17h 07m	
		MM4-5		Farewell Spit (72)
		MM3		New Plymouth, Hawera, Gisborne
		MM2		Stratford (47)
		MM1		Dannevirke
58/46	Apr	17d	03h 46m	
		MM3		Tolaga Bay, Gisborne
		?		Dannevirke
58/47	Apr	17d	14h 23m	
		MM3		Blenheim
58/51	May	3d	18h 18m	
		MM4		Rotorua
58/52	May	7d	19h 25m	
		MM3		Opotiki
58/53	May	14d	12h 04m	
		MM4		Wairakei (41)
58/54	May	16d	21h 18m	
		MM1		Dannevirke
58/58	Jun	4d	17h 09m	
		MM3-4		Eketahuna (66)
		MM3		Foxton (61), Masterton
58/59	Jun	22d	09h 27m	
		MM2		Cape Campbell
58/61	Jun	28d	10h 09m	
		MM1		Cheviot
58/62	Jun	29d	02h 45m	
		MM4		Whakatane
58/67	Jul	15d	11h 58m	
		MM2		Tadmor (75), Westport

58/69	Jul	29d	22h 21m	
		MM4		Pongaroa (67)
		MM3		Porangahau, Dannevirke
		MM2		Castlepoint
		MM1		Eketahuna (66)
58/70	Aug	2d	12h 18m	
		MM4		Whakatane
58/74	Aug	11d	14h 35m	
		MM3		Blenheim
		MM2		Nelson
58/75	Aug	11d	22h 16m	
		MM2		Dannevirke
58/79	Aug	27d	07h 48m	
		MM1		Whangamomona
58/81	Aug	27d	18h 45m	
		MM1		Kawerau (34)
58/83	Sep	2d	11h 18m	
		MM1		Masterton
58/85	Sep	5d	10h 58m	
		MM3		Dannevirke
58/86	Sep	8d	08h 04m	
		?		Lower Hutt (68)
58/87	Sep	8d	18h 25m	
		MM4		Motu
		MM3		Opotiki
		MM2		Waikaremoana (43)
		MM1		Whakatane
58/88	Sep	10d	16h 07m	
		MM3		Motu
58/89	Sep	12d	01h 04m	
		MM4		Whakatane
58/91	Sep	17d	14h 11m	
		MM4		Nelson
		MM2		Blenheim
58/93	Sep	22d	05h 37m	
		MM4		Wellington
58/94	Sep	22d	19h 05m	
		MM1-2		Wellington
58/99	Oct	2d	06h 45m	
		MM3-4		Gisborne
58/100	Oct	7d	07h 37m	
		MM2		Karori (68), Dannevirke, Nelson
58/106	Oct	29d	15h 13m	
		MM2		Eketahuna (66)
58/108	Nov	6d	14h 36m	
		MM2		Dannevirke
58/109	Nov	8d	13h 20m	
		MM3		Ohakune, New Plymouth
		MM2		Nelson, Levin (65)
58/111	Nov	8d	20h 21m	
		MM3-4		Karori (68)
58/113	Nov	14d	21h 44m	
		MM2		Nelson

58/114	Nov	18d	17h 00m	
		MM2		Seatoun (68)
58/115	Nov	20d	16h 22m	
		MM2		Hokitika
58/117	Nov	21d	23h 19m	
		MM4		Westport
58/118	Nov	23d	09h 24m	
		MM3		Ohakune
58/119	Nov	23d	10h 00m	
		MM4		Farewell Spit (72)
		MM3		New Plymouth
		MM1		Eketahuna (66), Wellington
58/128	Dec	10d	07h 03m	(See Isoseismal Map)
		MM6-7		East Cape, Farewell Spit (?) (72)
		MM6		Eketahuna (66)
		MM5-6		Te Araroa (29)
		MM5		Tolaga Bay, Tokomaru Bay (37)
				Opotiki, Blenheim
		MM4-5		Napier, Titahi Bay (68), Wellington
				Nelson
		MM4		Gisborne, Wairoa, Motu
				Waipawa (60), Whakatane, Ohakune
				Hunterville (58), New Plymouth,
				Wanganui, Bunnythorpe (62)
				Dannevirke, Foxton (61), Otaki
				Paraparaumu (65), Porangahau
				Tadmor (75), Greymouth, Akaroa,
				Christchurch.
		MM3-4		Palmerston North, Gebbies Pass (110)
				Raetihi (49)
		MM3		Waihi (21), Tauranga, Awakino (38),
				Taumarunui, Taihape, Levin (65)
				Martinborough, Masterton, Karamea
				Westport, Murchison, Hokitika,
				Queenstown (132)
		MM2		Thames, Hawera, Hanmer, Cheviot
58/129	Dec	12d	21h 06m	
		MM2		Tokomaru Bay (37)
58/130	Dec	14d	13h 24m	
		MM2		Ohakune
58/131	Dec	17d	03h 30m	
		?		Masterton
58/133	Dec	21d	13h 51m	
		?		Ashburton area
58/139	Dec	30d	17h 45m	
		MM4		Tauranga

The following earthquakes reported to the observatory cannot be confirmed either by instrumental recordings or by an independent observer:

Jan	17d	08h	20m	Rotorua	MM4(?)
Jan	17d	11h		Kawerau (34)	?
Jan	27d	18h	20m	New Plymouth	MM3
Feb	6d	18h	12m	Ohakune	MM2
May	4d	17h	10m	Eketahuna (66)	MM3-4
May	14d	11h	15m	Wairakei (41)	MM1
May	30d	13h	50m	Whakatane	MM2
May	31d	03h	04m	Whakatane	MM2
June	27d	18h	50m	Whakatane	MM3
July	29d	11h	50m	Waipawa (60)	MM1
Sep	2d	17h		Masterton	MM1
Sep	11d	16h	02m	Kawerau (34)	MM2
Oct	21d	18h	08m	Centre Is. (148)	MM3

EARTHQUAKES FELT NEAR STATED LOCALITIES

The first figure following the name of the locality is the number of the epicentre, followed by the maximum intensity (in brackets) reported within 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(4)

108 Ashburton 133(?)

77 Blenheim 47(3) 74(3) 91(2) 128(5)

61 Bulls 11(3) 14(?) 58(3) 128(4)

84 Cape Campbell 59(2)

67 Castlepoint 11(4) 69(4)

96 Cheviot 61(1) 128(2)

110 Christchurch 128(4)

63 Dannevirke 9(2) 11(6-7) 14(2) 21(2) 45(1) 46(?) 54(1) 69(3) 75(2) 85(3) 100(2) 108(2) 108(2) 128(4)

29 East Cape 128(6-7)

45 Gisborne 45(3) 46(3) 99(3-4) 128(4)

85 Greymouth 128(4)

88 Hanmer 128(2)

60 Hastings 9(1) 11(4) 128(4)

55 Hawera 11(3) 44(3) 45(3) 128(2)

91 Hokitika 115(2) 128(3)

74 Karamea 128(3)

132 Kingston 128(3)

70 Martinborough 128(3)

66 Masterton 11(1) 58(3-4) 69(1) 100(2) 119(1) 128(6) 131(?)

38 Mokau 11(3) 128(3)

140 Mossburn 10(3)

36 Motu 87(4) 88(3) 128(4)

75 Motueka 67(2) 128(4)

80 Murchison 128(3)

34 Murupara 81(1)

52 Napier 11(4-5) 128(4-5)

76 Nelson 11(3) 75(2) 91(4) 100(2) 109(2) 113(2) 128(4-5)

47 New Plymouth 11(3) 43(3) 44(3) 45(3) 109(3) 119(3) 128(4)

49 Ohakune 11(6) 14(2) 15(2) 36(2) 109(3) 118(3) 128(4) 130(2)

35 Opotiki 52(3) 87(3) 128(5)

65 Otaki 2(3) 11(3-4) 109(2) 128(4)

62 Palmerston N. 11(4) 13(1) 128(4)

64 Porangahau 11(4) 69(3) 128(4)

33 Rotorua 51(4)

58 Taihape 128(4)

72 Takaka 26(2) 27(4) 28(4) 43(4-5) 45(4-5) 119(4) 128(?)

39 Taumarunui 11(3) 128(3)

41 Taupo 11(3) 53(4)

26 Tauranga 128(3) 139(4)

58 Taihape 11(3) 13(1)

21 Thames 128(3)

40 Tokaanu 11(4)

37 Tolaga Bay 46(3) 128(5) 129(2)

43 Tuai 87(2)

53 Wairoa 128(4)

57 Wanganui 11(4) 14(3) 128(4)

68 Wellington 2(3-4) 11(3) 14(2) 20(1) 86(?) 93(4) 94(1-2)
100(2) 110(3-4) 114(2) 119(1) 12 (4 5)

79 Westport 67(2) 117(4) 128(3)

27 Whakatane 3(4) 31(4) 62(4) 65(4) 70(4) 87(1) 89(4)

48 Whangamomona 79(1)

PUBLICATIONS BY STAFF MEMBERS DURING 1958

EIBY, G.A. "This Earth of Ours" (Parts I and II)
N.Z. Education Dept. Post-Primary School Bulletins,
Vol. 11, Nos 9 and 10. (36 + 36pp)

Bulletin S-104,
EIBY, G.A. "The Structure of N.Z. from Seismic Evidence".
Geologische Rundschau, Vol. 47, pp. 647-661.

The N.Z. Region is characterized by a zone of sub-crustal seismicity extending to a depth of at least 370 km., and separated from the crust by a transition zone extending from the Mohorovičić discontinuity to a depth of about 100 km. The region is bounded by the Pacific Basin to the east, and the Tasman Basin to the west, both of which have oceanic crusts about 5 km. thick. The sub-crust is traversed by a major wedge-shaped structure within which the deep-focus seismicity is confined. This has been named the "Sub-Crustal Rift", and its activity is apparently an extension of that associated with the Kermadec Trench. There is no evidence of arcuate structure All crustal and sub-crustal features appear to follow linear trends.

LIST OF MAPS

(in pocket inside back cover)

1. Epicentres of Normal Focus Earthquakes in 1958
2. Epicentres of Deep Focus Earthquakes in 1958
3. Isoseismals for the Earthquake of 1958 Jan. 31
4. Isoseismals for the Earthquake of 1958 Dec. 10