International Seismological Centre

University of Minnesota Seismic Station

Minneapolis, Minnesota

SEISMOLOGICAL BULLETIN

by

Brian J. Mitchell

1 January 1963 -- 30 June 1963

OCT 2 9 1963

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Station Constants

Latitude: 44° 54' 52" North

Longitude: 93° 11' 24" West

Elevation: 710 feet

Abbreviations

i = sudden beginning of the motion (impetus)

e = gradual beginning of the motion (emersio)

Instruments

Three component Benioff short-period seismographs,
To = 1 sec., Tg = .76 sec.

Three component Sprengnether long-period seismographs,
To = 30 sec., Tg = 100 sec.

All times are G. C. T.

Minneapolis, Minnesota, 1963

Date	Phase	Time
1 Jan 63	iP	04 13 30
	ipP	04 13 36
	Colombia	
	USCGS	04 05 27.5
	6.8° S 155.9° E	
	Depth: 165 km Dist: 42.0°	
1 Jan 63	eLQ	20 49 45
	eLR (NE)	20 58 28
	Indian Ocean	
	USCGS	19 35 55.1
	40.2° S 81.3° E	
	Depth: 33 km Dist: 173.8°	
	Az: 42.8°	
1 Jan 63	ip (NW)	23 46 45
	eS	23 53 11
	esS	23 53 24
	eLQ	23 55 40
	eLR (NW)	23 58 56
	Alaska Peninsula	
	USCGS	23 39 05.6
	56.6° N 157.7° W	
	Depth: 50km Dist: 41.0°	
	Az: 310.4°	
	Mag: 6	
2 Jan 63	eLR (WNW)	15 52 56
	Near south coast of western New Guinea	
	USCGS	14 56 05.4
	4.1° S 135.2° E	
	Depth: 33 km Dist: 121.4°	
	Az: 299.1°	
3 Jan 63	eLR	03 54 00
	Ryuku Islands	
	USCGS	03 05 03.5
	29.7o N 130.1° E	
	Depth: 33 km Dist: 95.9°	
	Az: 323.1°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
2 Jan 63	eLR	18 56 38
	Santa Cruz Islands USCGS 10.7° S 165.0° E Depth: 39 km Dist: 105.8° Az: 270.6°	18 30 527
2 Jan 63	eLR	01 08 10
	Swan Islands Region USCGS 17.5° N 82.7° W Depth: 33 km Dist: 28.7° Az: 158.8°	00 53 49.1
3 Jan 63	eLR (W)	10 29 14
	New Britain USCGS 5.3° S 151.5° E Depth: 74 km Dist: 111.5° Az: 284.6°	09 39 46.8
4 Jan 63	ePP	12 35 58
	eS	12 41 46
	eSS	12 51 00
	e	12 55 00
	eLQ	13 03 05
	eLR (W)	13 08 16
	Solomon Islands region USCGS 4.7° S 154.0° E Depth: 69 km Dist: 109.4° Az: 283.1°	12 16 38.0
5 Jan 63	eSS	13 39 32
	eLQ	13 49 38
	eLR	13 55 26

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	New Hebrides Islands	
	USCGS	13 04 48.1
	17.8° S 167.9° E	
	Depth: 33 km Dist: 108.6°	
	Az: 263.2°	
5 Jan 63	iPKP	13 35 58
	ePKS	13 39 26
	ePKS	13 39 41
	eLQ	14 12 42
	eLR	14 19 15
	Timor	
	USCGS	13 16 43.0
	10.0° S 124.0° E	
	Depth: 33 km Dist: 132.8°	
	Az: 305.8°	
5 Jan 63	iP (SW)	17 52 16
	i	17 52 45
	iSP	17 59 13
	Western Brazil	
	USCGS	17 43 35.1
	7.0° S 72.1° W	
	Depth: 544 km Dist: 55.0°	
	Az: 154.2°	
6 Jan 63	iP	06 26 01
	ipP	06 26 13
	eS	06 32 54
	eSS	06 36 42
	eSSS	06 37 47
	eLR	06 40 08
	Near coast of Equador	
	USCGS	06 17 28.0
	1.8° S 80.7° W	
	Depth: 51 km Dist: 47.8°	
	Az: 163.0°	

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
6 Jan 63	iP	17 32 54
	iPP	17 33 50
	iPPP	18 34 04
	Central Alaska USCGS	17 25 53.8
	62.7° N 151.1° W Depth: 116 km Dist: 37.0° Az: 319.6°	
7 Jan 63	eLR	07 16 20
	Solomon Islands region USCGS	06 24 49.2
	6.4° S 154.7° E Depth: 80 km Dist: 110.1° Az: 281.3°	
7 Jan 63	iPKP	12 07 14
	eLQ	12 35 40
	eLR (NW)	12 42 24
	Halmahera region USCGS	11 48 22.7
	0.6° N 126.7° E Depth: 42 km Dist: 122.5° Az: 310.5°	
	Mag: 5 3/4	
10 Jan 63	eLR	05 34 00
	Off Coast of Jalisco, Mexico USCGS	05 18 36.9
	18.8° N 106.3° W Depth: 33 km Dist: 28.2° Az: 207.0°	
11 Jan 63	iP	12 25 19
	eLR	12 54 18

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Near coast of Southern Chile	
	USCGS	12 12 16.2
	45.0° S 75.7° W	
	Depth: 33 km Dist: 90.9°	
	Az: 167.7°	
11 Jan 63	iP	14 42 40
	iPP	14 43 19
	iPPP	14 43 49
	eLR	14 52 17
	Off coast of El Salvador	
	USCGS	14 36 11.0
	12.6° N 88.2° W	
	Depth: ee km Dist: 32.5°	
	Az: 107.9°	
12 Jan 63	iP (SSE)	03 57 20
	iPP	03 58 18
	iPPP	03 58 57
	Northern Colombia	
	USCGS	03 40 34.8
	4.8° N 76.7° W	
	Depth: 102 km Dist: 42.5°	
	Az: 155.2°	
14 Jan 63	eLR	01 32 02
	New Hebrides Islands	
	USCGS	00 50 39.1
	17.2° S 168.1° E	
	Depth: 33 km Dist: 108.0°	
	Az: 263.5°	
14 Jan 63	eLQ	02 33 24
	eLR	02 36 22
	Central Alaska	
	USCGS	02 18 02.0
	62.2° N 150.1° W	
	Depth: 91 km Dist: 36.6°	
	Az: 318.7°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
14 Jan 63	eLR	10 02 06
	New Hebrides Islands	
	USCGS	09 50 30.7
	12.2° S 166.6° E	
	Depth: 145 km Dist: 105.7°	
	Az: 268.4°	
14 Jan 63	eLQ	12 06 48
	eLR (WSW)	12 14 12
	Loyalty Islands	
	USCGS	11 19 47.5
	21.2° S 169.3° E	
	Depth: 33 km Dist: 109.9°	
	Az: 259.6°	
15 Jan 63	iP (NE)	01 40 32
	iPP	01 42 43
	iPPP	01 43 17
	eS	01 47 06
	eLQ	01 50 10
	eLR (NE)	01 54 00
	Denmark Strait	
	USCGS	01 32 20.0
	68.9° N 17.1° W	
	Depth: 33 km Dist: 44.1°	
	Az: 30.3°	
15 Jan 63	iP	05 31 22
	eS	05 37 58
	eSS	05 41 06
	eLQ	05 42 08
	eLR(NE)	05 44 02
	Jan Mayen Island Region	
	USCGS	05 23 10.4
	69.0° N 26.6° W	
	Depth: 33 km Dist: 40.7°	
	Az: 30.5	

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
15 Jan 63	iPP	17 57 17
	iPPP	17 59 27
	eSKS	18 03 42
	eS	18 05 38
	eLQ	18 21 08
	eLR	18 26 44
	Fiji Islands	
	USCGS	17 39 19.2
	17.1° S 179.6° W	
	Depth: 276 km Dist: 99.4°	
	Az: 255.3°	
16 Jan 63	iP (SSE)	04 00 33
	iPP	04 02 35
	iPPP	04 03 27
	eLR	04 12 34
	Colombia	
	USCGS	03 52 56.1
	7.5° N 74.5° W	
	Depth: 33 km Dist: 40.7°	
	Az: 150.8°	
16 Jan 63	iP (NW)	05 54 21
	iPP	05 57 29
	eLR	06 10 18
	Andreanof Islands, Aleutian Islands	
	USCGS	05 44 52.3
	51.3° N 179.9° W	
	Depth: 38 km Dist: 55.0°	
	Az: 310.1°	
16 Jan 63	eLR	06 58 00
	1300 km southwest of Iceland	
	USCGS	06 38 40.4
	54.2° N 34.9° W	
	Depth: 33 km Dist: 37.9°	
	Az: 54.4°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
16 Jan 63	eLR	12 50 32
	1300 km southwest of Iceland USCGS 54.4° N 35.0° W Depth: 33 km Dist: 37.8° Az: 54.1°	12 32 37.6
17 Jan 63	eS	03 50 30
	eLQ	04 04 08
	eLR (S)	04 08 50
	600 km west of Chiloe, Chile USCGS 43.6° S 83.6° W Depth: 33 km Dist: 88.5° Az: 173.1°	03 27 02
17 Jan 63	eLQ	21 20 20
	eLR	21 30 38
	Ryuku Islands USCGS 25.6° N 125.2° E Depth: 140 km Dist: 101.6° Az: 325.1°	20 41 14.8
24 Jan 63	eLR	12 52 52
	Tonga Islands Region USCGS 15.2° S 173.6° W Depth: 33 km Dist: 94.0° Az: 252.6°	12 09 01.2
26 Jan 63	eLR	19 56 36
	Tonga Islands Region USCGS 15.7° S 172.9° W Depth: 33 km Dist: 93.8° Az: 251.8°	19 12 02.5

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
27 Jan 63	iP (WSW)	03 05 33
	iPP	03 06 15
	eLR	03 11 26
	Baja, California	
	USCGS	03 00 38.7
	31.6° N 115.7° W	
	Depth: 33 km Dist: 22.0°	
	Az: 240.6°	
	Mag: 4 3/4	
27 Jan 63	iP	11 54 47
	ipP	11 55 07
	iPP	11 55 18
	eLR	12 05 48
	Gulf of Alaska	
	USCGS	11 47 36.3
	59.4° N 153.4° W	
	Depth: 94 km Dist: 38.3°	
	Az: 314.2°	
27 Jan 63	iP (W)	15 28 22
	iPP	15 29 08
	iS	15 30 50
	iLR (W)	15 32 44
	Idaho	
	USCGS	15 24 46.5
	44.3° N 114.5° W	
	Depth: 31 km Dist: 15.2°	
	Az: 275.2°	
27 Jan 63	iP	19 48 04
	eLR	20 15 42
	Caspian Sea	
	USCGS	19 35 14.3
	41.2° N 49.8° W	
	Depth: 33 km Dist: 87.5°	
	Mag: 5½	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
27 Jan 63	eLR	19 38 00
	New Britain USCGS 5.2° S 152.3° E Depth: 72 km Dist: 110.9° Az: 284.1°	18 46 14.6
28 Jan 63	iPP	12 31 29
	iPPP	12 33 34
	ePPS	12 41 00
	eSS	12 47 00
	eLQ	12 58 20
	eLR(W)	13 02 12
	New Britain USCGS 2.6° S 149.9° E Depth: 33 km Dist: 110.7° Az: 287.8° Mag: 6½	12 12 19.8
28 Jan 63	iPP (NW)	13 08 53
	eLQ	13 13 52
	eLR (NW)	13 18 03
	Alaska Peninsula USCGS 54.7° N 161.6° W Depth: 33 km Dist: 43.6° Az: 308.4° Mag: 6	13 00 50.7
29 Jan 63	iP (NW)	09 32 06
	eS	09 40 58
	eSS	09 45 36
	eLQ	09 48 56
	eLR	09 52 28
	Kurile Islands USCGS 49.7° N 154.9° E Depth: 126 km Dist: 68.7° Az: 319.7°	09 21 14.3

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
30 Jan 63	iP (NW)	04 47 59
	eSS	04 57 54
	eLQ	04 59 30
	eLR (NW)	05 01 32
	Alaska Peninsula	
	USCGS	04 39 56.3
	54.8° N 161.6° W	
	Depth: 33 km Dist: 43.5°	
	Az: 308.6°	
30 Jan 63	eP	10 25 04
	iPKP	10 28 48
	iPP (SE)	10 29 38
	ePS	10 37 16
	ePPS	10 39 24
	eLQ	10 56 12
	eLR (SE)	11 00 44
	Sandwich Islands region	
	USCGS	10 10 04.1
	55.6° S 28.3° W	
	Depth: 33 km Dist: 114.1°	
	Az: 145.7°	
	Mag: 6½	
2 Feb 63	eLR	19 45 32
	Cayman Islands	
	USCGS	19 32 15.1
	18.8° N 81.5° W	
	Depth: 71 km Dist: 27.8°	
	Az: 155.7°	
2 Feb 63	iP (S)	21 31 55
	eLR	21 40 28
	Off west coast of Guatemala	
	USCGS	21 25 38
	13.9° N 92.1° W	
	Depth: 33 km Dist: 30.9°	
	Az: 177.9°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
3 Feb 63	iP (S)	04 29 31
	eLR	04 37 56
	Off west coast of Guatemala	
	USCGS	04 23 28
	15.1° N 92.0° W	
	Depth: 166 km Dist: 29.7°	
	Az: 177.7°	
3 Feb 63	iP (SSE)	12 59 59
	eLR	13 12 24
	Venezuela-Colombia border	
	USCGS	12 52 13.8
	7.6° N 72.1° W	
	Depth: 33 km Dist: 41.4°	
	Az: 147.4°	
4 Feb 63	eLR	02 09 54
	New Britain Region	
	USCGS	01 17 03.1
	6.3° S 149.1° E	
	Depth: 36 km Dist: 113.9°	
	Az: 285.7°	
4 Feb 63	eSS	12 45 24
	eLR	12 48 32
	South of Panama	
	USCGS	12 28 38.1
	5.1° N 82.4° W	
	Depth: 45 km Dist: 40.8°	
	Az: 163.4°	
4 Feb 63	eLR	15 59 16
	New Hebrides Islands	
	USCGS	15 04 05.3
	17.3° S 167.9° E	
	Depth: 33 km Dist: 108.3°	
	Az: 263.6°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
4 Feb 63	iP	23 32 11
	ipP	23 32 43
	eLR	23 53 48
	Kurile Islands	
	USCGS	23 21 09.0
	48.5° N 154.9° E	
	Depth: 85 km Dist: 69.6°	
	Az: 318.8°	
5 Feb 63	eLR	05 52 36
	Mariana Islands region	
	USCGS	05 04 03.4
	19.2° N 147.1° E	
	Depth: 38 km Dist: 95.9°	
	Az: 304.4°	
5 Feb 63	eLR	12 30 35
	Fox Islands, Aleutian Islands	
	USCGS	12 08 20.6
	53.7° N 165.4° W	
	Depth: 33 km Dist: 46.0°	
	Az: 308.1°	
5 Feb 63	iP (S)	20 51 52
	ipP	20 52 07
	iPP	20 55 10
	iPPP	20 57 12
	ePS	21 03 15
	ePPS	21 03 24
	eS	21 02 16
	eSS	21 07 52
	eLQ	21 14 54
	eLR	21 19 28
	Near coast of central Chile	
	USCGS	20 39 21.6
	38.4° S 73.2° W	
	Depth: 41 km Dist: 84.9°	
	Az: 164.4°	
	Mag: 6	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
5 Feb 63	eLR	18 03 47
	Off coast of Chiapas, Mexico	
	USCGS	17 49 38
	14.2° N 94.0° W	
	Depth: 33 km Dist: 30.6°	
	Az: 181.5°	
6 Feb 63	iP (SSE)	01 34 04
	eS	01 44 24
	eSS	01 49 59
	eLQ	01 56 10
	eLR (SSE)	02 01 00
	Near coast of central Chile	
	USCGS	01 21 29.0
	38.4° S 73.6° W	
	Depth: 33 km Dist: 84.8°	
	Az: 164.7°	
	Mag: 5½	
6 Feb 63	iP	03 35 36
	Colombia-Venezuela border region	
	USCGS	03 27 55.8
	6.8° N 73.2° W	
	Depth: 108 km Dist: 41.8°	
	Az: 149.4°	
6 Feb 63	iP	07 09 04
	eLQ	07 17 44
	eLR	07 18 42
	Near south coast of Panama	
	USCGS	07 01 47.0
	7.4° N 82.6° W	
	Depth: 61 km Dist: 38.5°	
	Az: 163.0°	
6 Feb 63	eLR	11 12 00
	Bismarck Sea	
	USCGS	10 20 25.5
	3.5° S 146.0° E	
	Depth: 33 km Dist: 114.0°	
	Az: 290.3°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
6 Feb 63	iP	18 27 14
	eLQ	18 41 52
	eLR	18 44 34
	Komandorskie Islands region	
	USCGS	18 17 10.9
	55.6° N 166.1° E	
	Depth: 33 km Dist: 59.7° Az: 319.8°	
11 Feb 63	eLR	13 07 24
	Tonga Islands region	
	USCGS	12 22 26
	15.7° S 174.7° W	
	Depth: 33 km Dist: 95.1° Az: 253.0°	
	Mag: 4.8° S	
12 Feb 63	eLR	08 57 42
	Revilla Gigedo Islands region	
	USCGS	08 43 37.9
	19.0° N 107.4° W	
	Depth: 33 km Dist: 28.4° Az: 209.2°	
	Mag: 4.4	
13 Feb 63	iP (S)	00 29 02
	eLR	00 38 00
	Near south coast of Guatemala	
	USCGS	00 22 51.3
	13.4° N 91.0° W	
	Depth: 116 km Dist: 31.5° Az: 175.9°	
	Mag: 5	
13 Feb 63	iP (NW)	09 04 04
	iPP	09 08 16
	iPPP	09 10 54
	ePKS	09 12 20
	eSKS	09 14 58
	eSS	09 23 44
	eLQ	09 35 07
	eLR	09 38 36

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Northern Formosa USCGS	08 50 02.2
	24.5° N 121.8° E Depth: 33 km Dist: 103.9° Az: 327.4° Mag: 7¼	
13 Feb 63	iP	18 28 16
	iPP	18 32 41
	iPPP	18 34 58
	ePKS	18 36 28
	eSKS	18 39 09
	ePS	18 42 10
	ePPS	18 43 42
	eSS	18 48 00
	eLQ	18 58 48
	eLR	19 04 16
	Solomon Islands USCGS	18 13 55.1
	9.9° S 160.8° E Depth: 29 km Dist: 108.3° Az: 274.2° Mag: 6	
14 Feb 63	iPKP	07 23 36
	iPP	07 25 40
	iPKS	07 26 42
	eSS	07 43 00
	eLQ	07 58 07
	eLR (WNW)	08 04 40
	Banda Sea USCGS	07 04 40.8
	7.2° S 128.2° E Depth: 197 km Dist: 128.1° Az: 274.2° Mag: 5.8	
14 Feb 63	iP	12 20 36
	eS	12 29 40
	eSS	12 34 25
	eLQ	12 38 48
	eLR (SE)	12 42 07

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Mid-Atlantic Ocean	
	USCGS	12 09 11.4
	00.9° N 30.0° W	
	Depth: 33 km Dist: 70.6°	
	Az: 108.9°	
	Mag: 4.6	
14 Feb 63	iPP	22 27 52
	eSKS	22 33 14
	ePS	22 37 22
	eSS	22 43 10
	eLQ	22 57 52
	eLR	23 01 50
	Eastern New Guinea	
	USCGS	22 07 54.3
	5.0° S 144.6° E	
	Depth: 80 km Dist: 116.0°	
	Az: 290.3°	
	Mag: 6.0	
15 Feb 63	eLR	01 39 55
	Kermadec Islands	
	USCGS	00 48 51.9
	33.2° S 179.2° W	
	Depth: 42 km Dist: 110.0°	
	Az: 242.9°	
15 Feb 63	eLR	07 40 50
	Fiji Islands region	
	USCGS	06 54 51.8
	14.9° S 178.7° W	
	Depth: 33 km Dist: 97.2°	
	Az: 256.3°	
	Mag: 5.0	
16 Feb 63	iPKP	11 04 38
	iPP	11 07 10
	Flores Sea	
	USCGS	10 46 22.0
	7.0° S 117.3° E	
	Depth: 561 km Dist: 133.9°	
	Az: 315.7°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
18 Feb 63	eLR	14 54 00
	West of Chile USCGS 36.2° S 90.4° W Depth: 33 km Dist: 80.8° Az: 177.7° Mag: 5.2	14 12 36.0
18 Feb 63	eLR	18 42 36
	North Atlantic Ocean USCGS 58.2° N 32.4° W Depth: 33 km Dist: 38.7° Az: 47.7° Mag: 4.6	18 24 05.5
18 Feb 63	eLR	19 21 24
	North Atlantic Ocean USCGS 57.9° N 32.2° W Depth: 33 km Dist: 38.8° Az: 48.1°	19 03 01
20 Feb 63	eLR	09 39 20
	Loyalty Islands region USCGS 22.3° S 170.5° E Depth: 33 km Dist: 109.7° Az: 258.0° Mag: 5.0	08 44 00.9
20 Feb 63	eLR	17 49 24
	Off coast of southern Chile USCGS 45.7° S 78.7° W Depth: 33 km Dist: 91.1° Az: 169.9° Mag: 4.6	17 07 32.5

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
21 Feb 63	eLR	15 15 00
	Tonga Islands region USCGS 20.5° S 173.9° W Depth: 29 km Dist: 97.9° Az: 249.1° Mag: 5.0	14 28 29
21 Feb 63	iP	17 27 02
	eS	17 37 22
	eSS	17 43 07
	eLQ	17 48 46
	eLR (NE)	17 53 29
	Near coast of Libya USCGS 32.7° N 20.9° E Depth: 33 km Dist: 82.3° Az: 51.0° Mag: 5.0	17 14 35.7
22 Feb 63	iP (N)	07 19 24
	iPcP	07 20 42
	iPP	07 21 27
	ePcS	07 24 28
	eS	07 26 39
	eSS	07 30 08
	eLQ	07 31 24
	eLR (N)	07 33 40
	North Polar region USCGS 85.0° N 98.9° E Depth: 33 km Dist: 50.2° Az: 358.6° Mag: 5.0	07 10 28.0
22 Feb 63	eLR	14 50 08
	Albania-Greece border USCGS 40.6° N 20.5° E Depth: 33 km Dist: 76.2° Az: 45.9° Mag: 4.4	14 12 54.4

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
24 Feb 63	iP	04 48 34
	Near coast of southern Peru USCGS 15.1° S 72.5° W Depth: 105 km Dist: 62.6° Az: 157.4°	05 38 20.6
24 Feb 63	iP (S)	13 40 16
	eS	13 45 05
	ePcS	13 46 28
	eLR (S)	13 48 24
	Central Guatemala USCGS 14.6° N 91.4° W Depth: 135 km Dist: 30.3° Az: 176.6° Mag: 5.7	13 34 15.7
24 Feb 63	iP (E)	22 43 05
	eLQ	22 52 24
	eLR (E)	22 54 34
	North Atlantic Ocean USCGS 26.4° N 44.5° W Depth: 33 km Dist: 43.0° Az: 98.6° Mag: 4.6	22 35 00.0
25 Feb 63	iP	09 05 12
	eLR	09 14 03
	Off coast of El Salvador USCGS 12.2° N 88.2° W Depth: 33 km Dist: 32.9° Az: 171.0° Mag: 4.2	08 58 40.8

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
25 Feb 63	eLQ	17 56 04
	eLR	18 01 48
	Near coast of Formosa	
	USCGS	17 11 01.7
	24.4° N 123.4° E	
	Depth: 33 km Dist: 103.4°	
	Az: 326.0°	
	Mag: 5.3	
26 Feb 63	eP	20 28 54
	iPP (W)	20 33 39
	eSKS	20 39 10
	eSS	20 50 00
	eLQ	21 01 50
	eLR (W)	21 08 36
	Eastern New Guinea	
	USCGS	20 14 08.7
	7.5° S 146.2° E	
	Depth: 171 km Dist: 116.7°	
	Az: 287.1°	
	Mag: 7.1	
27 Feb 63	eP	04 44 52
	iPP (W)	04 49 32
	eSKS	04 55 28
	eSKKS	04 56 50
	ePS	04 59 10
	eSS	05 05 24
	eSSS	05 09 44
	eLQ	05 16 28
	eLR (W)	05 24 00
	New Britain region	
	USCGS	04 30 00.8
	6.0° S 149.4° E	
	Depth: 52 km Dist: 113.5°	
	Az: 285.7°	
	Mag: 5.2	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
27 Feb 63	eLR (W)	21 20 51
	New Britain USCGS 4.6° S 152.9° E Depth: 100 km Dist: 110.1° Az: 284.0° Mag: 5.0	20 28 34.9
28 Feb 63	eLQ	02 32 34
	eLR	02 40 44
	Indian Ocean USCGS 16.3° S 66.0° E Depth: 33 km Dist: 146.5° Az: 38.2°	01 31 13.2
4 Mar 63	iP (NNW)	07 50 07
	iPP	07 51 46
	iPcP	07 51 58
	eS	07 56 52
	eLR (NNW)	08 02 20
	North Polar Region USCGS 82.9° N 7.7° W Depth: 33 km Dist: 45.2° Az: 10.1° Mag: 5.0	07 41 51.0
4 Mar 63	eSS	14 11 56
	eLQ	14 22 06
	eLR	14 27 28
	Formosa USCGS 24.2° N 121.7° E Depth: 33 km Dist: 104.2° Az: 327.4° Mag: 4.8	13 38 41.0

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
4 Mar 63	iP (SSE)	15 51 58
	iPP	15 54 04
	eS	15 59 10
	eSS	16 03 17
	eLQ	16 04 40
	eLR (SSE)	16 06 54
	Off coast of northern Peru	
	USCGS	15 43 04.0
	4.5° S 81.6° W	
	Depth: 33 km Dist: 50.3°	
	Az: 164.9°	
	Mag: 5.4	
5 Mar 63	iP (SSE)	07 13 57
	iPP	07 16 02
	eS	07 21 10
	eScS	07 23 44
	eSS	07 25 14
	eLQ	07 26 37
	eLR (SSE)	07 28 50
	Off coast of northern Peru	
	USCGS	07 05 01.7
	4.5° S 81.5° W	
	Depth: 31 km Dist: 50.3°	
	Az: 164.8°	
	Mag: 5.6	
7 Mar 63	iP (SSW)	05 33 36
	ipP	05 33 46
	iPP	05 36 35
	eS	05 43 17
	ePS	05 43 46
	ePPS	05 44 04
	eSS	05 48 24
	eSSS	05 51 28
	eLQ	05 53 45
	ePKKP	05 53 57
	ePKKS	05 57 00
	eLR (SSW)	05 59 20

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Approximately 500 km west of Easter Island	
	USCGS	05 22 01.1
	27.0° S 113.5° W	
	Depth: 33 km Dist: 73.9°	
	Az: 198.8°	
	Mag: 5.6	
7 Mar 63	iP (S)	12 29 26
	ipP	12 29 35
	iPP	12 33 03
	iPPP	12 34 58
	eS	12 40 32
	ePS	12 41 25
	eSS	12 46 24
	eLQ	12 53 36
	eLR (S)	12 57 05
	Near coast of southern Chile	
	USCGS	12 16 28.5
	44.3° S 75.3° W	
	Depth: 45 km Dist: 90.2°	
	Az: 167.3°	
	Mag: 5.6	
7 Mar 63	iP (W)	23 58 11
	eLR	00 02 18
	Northwestern Oregon	
	USCGS	23 53 25.8
	44.8° N 123.4° W	
	Depth: 33 km Dist: 21.4°	
	Az: 280.5°	
	Mag: 4.6	
8 Mar 63	eLR	03 35 30
	New Hebrides Islands	
	USCGS	02 44 31.5
	19.2° S 169.7° E	
	Depth: 33 km Dist: 108.3°	
	Az: 260.9°	
	Mag: 5.3	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
8 Mar 63	eLR	04 16 00
	New Hebrides Islands USCGS 19.2° S 169.6° E Depth: 49 km Dist: 108.3° Az: 261.0° Mag: 4.8	03 24 57.2
8 Mar 63	iP	15 17 18
	eS	15 26 36
	eSS	15 31 13
	eLQ	15 36 00
	eLR	15 39 14
	Mid-Atlantic Ocean USCGS 1.1° N 29.9° W Depth: 33 km Dist: 70.6° Az: 108.7° Mag: 5.2	15 06 05.3
9 Mar 63	eLR	07 20 32
	Kurile Islands region USCGS 46.1° N 141.0° E Depth: 31 km Dist: 77.5° Az: 324.7° Mag: 4.8	06 44 28.2
9 Mar 63	eLR	17 15 32
	Bismarck Sea USCGS 3.2° S 147.0° E Depth: 33 km Dist: 113.1° Az: 289.7° Mag: 4.8	16 23 44.3
9 Mar 63	ePS	19 25 00
	eLR	19 48 09

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	New Britain region	
	USCGS	18 55 49.0
	3.2° S 147.1° E	
	Depth: 33 km Dist: 113.0°	
	Az: 289.6°	
	Mag: 4.9	
10 Mar 63	iP (NW)	01 33 28
	iPPP	01 35 38
	eS	01 39 25
	eSS	01 42 15
	eLQ	01 42 18
	eLR (NW)	01 44 31
	Kodiak Island, Alaska	
	USCGS	01 26 04.1
	56.2° N 153.8° W	
	Depth: 33 km Dist: 38.9°	
	Az: 309.1°	
	Mag: 5.1	
10 Mar 63	iPP	03 11 52
	eS	03 19 50
	ePS	03 21 04
	ePPS	03 21 57
	eSS	03 27 08
	eLQ	03 38 07
	eLR	03 42 40
	Near east coast of Formosa	
	USCGS	02 53 33.0
	24.7° N 122.1° E	
	Depth: 33 km Dist: 103.6°	
	Az: 327.3°	
	Mag: 4.9	
10 Mar 63	iP	11 03 35
	iPcP	11 03 50
	eS	11 13 21
	ePS	11 13 46
	eSS	11 18 20
	eLQ	11 23 42
	eLR (S)	11 27 02

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Near coast of central Chile	
	USCGS	10 51 48.1
	29.9° S 71.2° W	
	Depth: 70 km Dist: 77.1°	
	Az: 160.5°	
	Mag: 5.5	
10 Mar 63	eLR	14 48 53
	Celebes Sea	
	USCGS	13 51 04.3
	2.4° N 126.6° E	
	Depth: 41 km Dist: 121.1°	
	Az: 311.7°	
11 Mar 63	iP (NE)	07 39 42
	eLR (NE)	08 05 18
	Turkey	
	USCGS	07 27 22.0
	38.1° N 29.3° E	
	Depth: 33 km Dist: 82.5°	
	Az: 42.2°	
	Mag: 5.5	
14 Mar 63	iPP	08 19 24
	ePPS	08 29 50
	eLQ	08 47 10
	eLR	08 53 13
	Off coast of northern Luzon, Philippine Islands	
	USCGS	08 00 15.6
	19.0° N 120.4° E	
	Depth: 51 km Dist: 109.4°	
	Az: 326.3°	
	Mag: 5.0	
15 Mar 63	iPKP	00 34 33
	iPP	00 35 40
	ePS	00 45 30
	eSS	00 52 04
	eLR	01 10 30

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Mindanao, Philippine Islands	
	USCGS	00 16 01.3
	8.4° N 126.4° E	
	Depth: 117 km Dist: 116.1°	
	Az: 315.4°	
	Mag: 5.0	
15 Mar 63	iP	05 54 41
	eS	06 01 37
	eLR	06 06 35
	North Atlantic Ocean	
	USCGS	05 46 32.8
	21.7° N 45.4° W	
	Depth: 33 km Dist: 45.4°	
	Az: 104.5°	
	Mag: 4.9	
16 Mar 63	iP (NW)	08 56 06
	iPP	08 58 52
	ePcS	09 00 27
	eS	09 05 09
	ePS	09 05 18
	eSS	09 09 26
	eLQ	09 13 48
	eLR	09 18 15
	Kurile Islands region	
	USCGS	08 44 48.3
	46.5° N 154.7° E	
	Depth: 26 km Dist: 71.1°	
	Az: 317.4°	
	Mag: 6.2	
17 Mar 63	eLR	06 38 00
	South of Panama	
	USCGS	06 18 52.4
	7.1° N 82.2° W	
	Depth: 53 km Dist: 38.9°	
	Az: 162.5°	
	Mag: 4.6	

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
18 Mar 63	eLR	10 08 02
	North Atlantic Ocean	
	USCGS	09 47 59
	30.7° N 42.1° W	
	Depth: 33 km Dist: 42.1°	
	Az: 91.7°	
	Mag: 4.3	
20 Mar 63	eLQ	17 28 29
	eLR (WNW)	17 33 06
	Western New Guinea	
	USCGS	16 38 55.8
	2.4° S 138.4° E	
	Depth: 40 km Dist: 118.1°	
	Az: 297.5°	
	Mag: 5.5	
22 Mar 63	eLR	04 40 29
	Yellowstone National Park, Wyoming	
	USCGS	04 34 43.3
	44.7° N 110.7° W	
	Depth: 33 km Dist: 12.4°	
	Az: 275.2°	
	Mag: 4.1	
24 Mar 63	iPKP	02 26 40
	iPP	02 29 58
	ePKS	02 30 57
	ePS	02 39 04
	ePPS	02 41 08
	eSS	02 47 08
	eLQ	03 03 26
	eLR (WNW)	03 12 10
	Sumba Island region	
	USCGS	02 07 12.8
	9.7° S 120.4° E	
	Depth: 33 km Dist: 134.5°	
	Az: 310.1°	
	Mag: 5.4	

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
24 Mar 63	eLR	10 38 36
	Mindanao region, Philippine Islands	
	USCGS	09 43 20.2
	9.0° N 125.6° E	
	Depth: 51 km Dist: 116.0°	
	Az: 316.5°	
	Mag: 5.2	
24 Mar 63	iP	12 57 18
	eSKS	13 07 56
	eS	13 08 29
	ePS	13 09 48
	eSS	13 15 10
	eLQ	13 24 00
	eLR (NE)	13 27 28
	Western Iran	
	USCGS	12 44 03.2
	34.4° N 47.9° E	
	Depth: 33 km Dist: 93.5°	
	Az: 31.4°	
	Mag: 5.2	
24 Mar 63	iP (NW)	21 44 43
	eLR (NW)	22 00 32
	Andreanof Islands, Aleutian Islands	
	USCGS	21 35 24.4
	51.8° N 178.1° W	
	Depth: 57 km Dist: 53.8°	
	Az: 310.0°	
	Mag: 5.5	
25 Mar 63	eLR	09 38 00
	Southern Nevada	
	USCGS	09 28 44.1
	36.0° N 114.9°	
	Depth: 17 km Dist: 18.7°	
	Az: 249.2°	
	Mag: 4.3	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
25 Mar 63	eLQ	21 16 00
	eLR	21 22 34
	Macquarie Islands region	
	USCGS	20 17 03.8
	56.3° S 149.9° E	
	Depth: 39 km Dist: 139.8°	
	Az: 230.3°	
25 Mar 63	eLR	23 49 16
	Off southwest coast of Sumatra	
	USCGS	22 46 16.2
	0.7° N 96.5° E	
	Depth: 30 km Dist: 133.8°	
	Az: 346.5°	
	Mag: 5.6	
26 Mar 63	iP (SW)	10 02 37
	iPP	10 07 00
	eSKS	10 13 16
	ePS	10 16 29
	ePPS	10 17 28
	eSS	10 22 06
	eLQ	10 32 44
	eLR (SW)	10 38 00
	Kermadec Islands	
	USCGS	09 48 19.7
	29.7° S 177.8° W	
	Depth: 45 km Dist: 106.8°	
	Az: 244.8°	
	Mag: 7	
26 Mar 63	iP	13 39 19
	iPP	13 43 42
	eSKS	13 49 52
	ePS	13 53 16
	ePPS	13 54 08
	eSS	13 58 47
	eLQ	14 09 40
	eLR (SW)	14 15 00

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Kermadec Islands USCGS 29.8° S 177.9° W Depth: 42 km Dist: 106.9° Az: 244.8° Mag: 5.9	13 25 02.6
26 Mar 63	iP (NW)	21 47 30
	iPP	21 51 00
	iPPP	21 53 16
	eS	21 57 56
	ePS	21 59 24
	ePPS	21 59 41
	eSS	22 04 30
	eLQ	22 11 15
	eLR	22 15 44
	Near east coast of Honshu, Japan USCGS 36.0° N 135.7° E Depth: 33 km Dist: 88.1° Az: 322.3° Mag: 5.9	21 34 41.1
28 Mar 63	iP	00 23 51
	iPP	00 25 44
	eS	00 30 24
	eSS	00 33 40
	eLQ	00 34 22
	eLR	00 36 40
	Iceland USCGS 66.3° N 19.6° W Depth: 15 km Dist: 43.6° Az: 34.3°	00 15 47.5
28 Mar 63	eLQ	11 57 35
	eLR	12 03 00
	Kermadec Islands USCGS 30.2° S 177.8° W Depth: 38 km Dist: 107.1° Az: 244.4°	11 12 31.3

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
28 Mar 63	eLQ	00 13 36
	eLR	00 19 17
	Kermadec Islands	
	USCGS	23 29 14.6
	29.6° S 177.5° W	
	Depth: 54 km Dist: 106.5°	
	Az: 244.7°	
	Mag: 5.1	
30 Mar 63	iPKP	02 12 07
	iPP	02 13 06
	eSKS	02 18 00
	eSKS	02 19 33
	ePS	02 21 34
	ePPS	02 22 27
	eSS	02 26 16
	eLQ	02 39 04
	eLR (W)	02 44 17
	New Hebrides Islands	
	USCGS	01 53 28.8
	19.1° S 169.1° E	
	Depth: 160 km Dist: 108.6°	
	Az: 261.4°	
	Mag: 6.1	
30 Mar 63	iP (NW)	17 03 42
	iPP	17 06 33
	eS	17 13 20
	ePS	17 13 56
	eSS	17 18 22
	eLQ	17 23 51
	eLR (NW)	17 27 46
	Kurile Islands	
	USCGS	16 51 56.6
	44.2° N 148.0° E	
	Depth: 33 km Dist: 76.0°	
	Az: 319.5°	
	Mag: 6.3	

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
31 Mar 63	iP (S)	04 55 10
	eS	05 02 35
	eScS	05 04 56
	eLQ	05 08 44
	eLR	05 11 28
	Near coast of southern Peru	
	USCGS	04 46 00.8
	6.5° S 81.1° W	
	Depth: 33 km Dist: 52.3°	
	Az: 164.8°	
	Mag: 5.2	
31 Mar 63	iPP	05 49 44
	eSKS	05 55 44
	ePS	05 58 56
	ePPS	06 59 52
	eSS	06 04 40
	eLQ	06 15 24
	eLR	06 20 52
	Kermadec Islands	
	USCGS	05 30 49.3
	29.9° S 177.7° W	
	Depth: 48 km Dist: 107.1°	
	Az: 244.7°	
	Mag: 5.7	
31 Mar 63	eSKS	07 32 40
	ePS	07 36 40
	ePPS	07 38 11
	eLQ	07 54 28
	eLR	08 01 26
	New Britain	
	USCGS	07 07 36.3
	6.1° S 149.0° E	
	Depth: 60 km Dist: 113.8°	
	Az: 286.0°	
	Mag: 5.7	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
31 Mar 63	ePS	19 51 00
	ePPS	19 52 00
	eLQ	20 07 30
	eLR	20 13 08
	Kermadec Islands	
	USCGS	19 22 53.3
	30.0° S 178.0° W	
	Depth: 50 km Dist: 107.2°	
	Az: 244.7°	
	Mag: 5.8	
1 Apr 63	eLR	03 13 39
	New Britain	
	USCGS	02 19 56.8
	6.0° S 149.0° E	
	Depth: 64 km Dist: 113.8°	
	Az: 286.0°	
	Mag: 4.8	
1 Apr 63	iP (NW)	04 40 19
	Off west coast of Hokkaido, Japan	
	USCGS	04 28 44.3
	44.8° N 141.1° E	
	Depth: 255 km Dist: 78.5°	
	Az: 325.9°	
	Mag: 5.6	
1 Apr 63	eLR	10 21 25
	Hindu Kush	
	USCGS	09 22 51.8
	35.4° N 69.8° E	
	Depth: 100 km Dist: 98.6°	
	Az: 14.0°	
	Mag: 4.8	

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
2 Apr 63	eLR	05 33 20
	Kermadec Islands	
	USCGS	04 43 30.9
	29.7° S 177.1° W	
	Depth: 51 km Dist: 106.3°	
	Az: 244.4°	
2 Apr 63	iP	16 27 35
	ipP	16 28 06
	iPP	16 29 36
	ePcS	16 32 34
	eS	16 34 29
	eSS	16 38 34
	eLQ	16 40 12
	eLR	16 42 42
	Andeanof Islands, Aleutian Islands	
	USCGS	16 18 55.6
	53.2° N 171.7° W	
	Depth: 142 km Dist: 49.7°	
	Az: 309.3°	
	Mag: 5.7	
3 Apr 63	eLR	02 07 00
	Fiji Islands region	
	USCGS	01 21 54
	14.7° S 176.4° W	
	Depth: 33 km Dist: 95.5°	
	Az: 254.9°	
	Mag: 4.5	
3 Apr 63	eLR	15 38 00
	South Pacific Ocean	
	USCGS	14 47 55.5
	55.4° S 128.2° W	
	Depth: 33 km Dist: 104.2°	
	Az: 199.7°	
	Mag: 5.8	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
6 Apr 63	iP (NW)	11 26 26
	eS	11 32 08
	eSS	11 34 32
	eLQ	11 35 07
	eLR	11 36 25
	Central Alaska USCGS 63.6° N 149.5° W Depth: 55 km Dist: 36.3° Az: 321.1° Mag: 4.5	12 07 09.5
6 Apr 63	eLR	23 53 24
	Off west coast of Mexico USCGS 20.0° N 109.3° W Depth: 44 km Dist: 28.2° Az: 213.5° Mag: 4.3	23 40 20.8
7 Apr 63	eLR	11 37 18
	Jan Mayen Island region USCGS 71.5° N 13.0° W Depth: 33 km Dist: 45.1° Az: 26.4° Mag: 4.6	11 16 03.8
7 Apr 63	iP (NW)	15 36 25
	Fox Islands, Aleutian Islands region USCGS 53.7° N 170.1° W Depth: 202 km Dist: 48.6° Az: 309.5° Mag: 6.0	15 28 01.8

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
7 Apr 63	iPKP	22 55 22
	iPP	22 58 08
	ePKS	22 58 52
	eSSS	23 22 32
	eLQ	23 35 40
	eLR	23 42 10
	Near southwest coast of Sumatra	
	USCGS	22 36 03.4
	4.9° S 103.2° E	
	Depth: 72 km Dist: 137.6°	
	Az: 335.3°	
	Mag: 6.1	
8 Apr 63	eS	14 52 48
	eLQ	14 55 56
	eLR	14 57 52
	North Atlantic Ocean	
	USCGS	14 38 27.0
	27.7° N 44.3° W	
	Depth: 33 km Dist: 42.3°	
	Az: 97.0	
	Mag: 5.0	
10 Apr 63	eLQ	18 52 28
	eLR	18 44 39
	Timor	
	USCGS	07 50 30.2
	9.2° S 125.0° E	
	Depth: 33 km Dist: 131.5°	
	Az: 305.4°	
	Mag: 5.2	
11 Apr 63	eLR	12 23 24
	Off coast of Mexico	
	USCGS	12 10 21.5
	19.7° N 108.9° W	
	Depth: 33 km Dist: 28.3°	
	Az: 212.5°	
	Mag: 4.6	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
11 Apr 63	eSS	17 22 00
	eLQ	17 36 08
	eLR	17 41 28
	Sandwich Islands region	
	USCGS	16 45 25.1
	60.2° S 18.7° W	
	Depth: 33 km Dist: 121.0°	
	Az: 145.9°	
12 Apr 63	eSS	09 17 45
	eLQ	09 31 12
	eLR	09 35 25
	North Island, New Zealand	
	USCGS	08 41 56.7
	39.0° S 176.7° E	
	Depth: 106 km Dist: 116.2°	
	Az: 240.3°	
12 Apr 63	eLR	14 02 16
	Andreanof Islands, Aleutian Islands	
	USCGS	18 38 03.0
	51.6° N 175.0° W	
	Depth: 33 km Dist: 52.2°	
	Az: 308.6°	
	Mag 4.2	
12 Apr 63	eS	20 03 36
	eLR	20 09 35
	Svalbard region	
	USCGS	19 47 54.8
	79.6° N 5.1° E	
	Depth: 33 km Dist: 47.7°	
	Az: 14.1°	
	Mag: 5.2	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
12 Apr 63	eLR	21 32 41
	Tonga Islands region	
	USCGS	20 48 16.7
	16.7° S 173.7° W	
	Depth: 33 km Dist: 95.1°	
	Az: 251.6°	
	Mag: 5.0	
13 Apr 63	iP (SSE)	02 30 03
	iPP	02 32 08
	ePcS	02 35 12
	eS	02 37 21
	eScS	02 39 39
	eSS	02 41 42
	eLQ	02 43 44
	eLR	02 46 18
	Central Peru	
	USCGS	02 20 57.5
	6.2° S 76.5° W	
	Depth: 125 km Dist: 53.0°	
	Az: 159.1°	
	Mag: 6.3	
13 Apr 63	eLQ	15 21 48
	eLR	15 27 26
	Near north coast of New Guinea	
	USCGS	14 31 21.0
	3.4° S 135.4° E	
	Depth: 31 km Dist: 120.7°	
	Az: 299.5°	
	Mag: 5.6	
14 Apr 63	eLR	06 26 56
	Kermadec Islands	
	USCGS	05 32 33.9
	31.4° S 177.8° W	
	Depth: 33 km Dist: 107.9°	
	Az: 243.5°	
	Mag: 5.0	

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
16 Apr 63	eP	01 45 05
	iPKP	01 48 18
	iPP	01 50 08
	ePKS	01 52 02
	eSKS	01 55 45
	ePS	02 00 44
	ePPS	02 01 30
	eSS	02 07 17
	eLQ	02 21 28
	eLR	02 27 00
	Halmahera region	
	USCGS	01 29 19.4
	0.8° S 128.0° E	
	Depth: 33 km Dist: 123.0°	
	Az: 308.3°	
	Mag: 6.1	
16 Apr 63	iPKP	01 55 55
	Halmahera region	
	USCGS	01 36 59.4
	1.2° S 128.4° E	
	Depth: 33 km Dist: 123.1°	
	Mag: 6.3	
16 Apr 63	iPKP	02 14 07
	Halmahera region	
	USCGS	01 55 10.9
	0.7° S 128.0° E	
	Depth: 32 km Dist: 122.9°	
	Az: 308.3°	
	Mag: 6.0	
16 Apr 63	iPKP	02 24 58
	Halmahera region	
	USCGS	02 05 52
	1.3° S 126.9° E	
	Depth: 33 km Dist: 124.0°	
	Az: 309.0°	
	Mag: 5.8	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
16 Apr 63	eLR	10 09 28
	Halmahera region USCGS 0.9° S 128.5° E Depth: 33 km Dist: 122.8° Az: 307.7° Mag: 4.4	09 10 29.0
16 Apr 63	eLR	13 01 12
	Halmahera region USCGS 1.0° S 127.6° E Depth: 33 km Dist: 123.4° Az: 308.5 Mag: 4.7	12 03 42.5
30 Apr 63	eLQ eLR (WNW)	01 50 44 01 55 34
	Halmahera region USCGS 0.7° S 129.0° E Depth: 33km Dist: 122.3° Az: 307.4° Mag: 5.6	00 58 18.3
30 Apr 63	eLR	07 34 06
	Rat Islands, Aleutian Islands USCGS 51.6° N 178.4° E Depth: 64 km Dist: 55.8° Az: 311.1° Mag: 4.9	07 07 55.9

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
30 Apr 63	eLR	19 09 04
	Near coast of Peru	
	USCGS	18 43 14.0
	8.2° S 79.9° W	
	Depth: 60 km Dist: 54.2°	
	Az: 163.7°	
	Mag: 4.8	
1 May 63	eP	10 17 29
	iPKP	10 22 02
	iPP	10 22 49
	eSKS	10 29 00
	ePS	10 29 29
	ePPS	10 32 14
	eSS	10 38 16
	eLQ	10 48 56
	eLR	10 54 20
	New Hebrides Islands	
	USCGS	10 03 20.0
	19.0° S 169.0° E	
	Depth: 140 km Dist: 108.6°	
	Az: 261.5°	
	Mag: 6.2	
3 May 63	eLR	11 28 52
	Iran	
	USCGS	10 44 28.0
	30.7° N 51.7° E	
	Depth: 25 km Dist: 99.2°	
	Az: 30.0°	
	Mag: 5.3	
3 May 63	eLR	11 38 16
	Tonga Islands	
	USCGS	10 54 43.0
	15.0° S 173.3° W	
	Depth: 33 km Dist: 93.6°	
	Az: 252.5°	
	Mag: 5.0	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
4 May 63	eLQ	06 19 20
	eLR	06 23 40
	Andreanof Islands, Aleutian Islands	
	USCGS	05 56 04.1
	51.8° N 175.4° W	
	Depth: 69 km Dist: 52.3°	
	Az: 309.0°	
4 May 63	eLR	16 34 32
	Off coast of Guatemala	
	USCGS	16 19 28.3
	13.2° N 90.8° W	
	Depth: 164 km Dist: 31.7°	
	Az: 175.6°	
	Mag: 5.1	
5 May 63	iP	15 28 25
	eLR	15 51 37
	Northern Chile	
	USCGS	15 17 01.9
	24.7° S 69.5° W	
	Depth: 50 km Dist: 72.6°	
	Az: 157.5°	
	Mag: 5.1	
5 May 63	eLR	17 56 55
	Tonga Islands region	
	USCGS	17 11 47.2
	17.5° S 173.7° W	
	Depth: 33 km Dist: 95.7°	
	Az: 251.1°	
	Mag: 5.0	
6 May 63	eLR	09 44 49
	Near south coast of Java	
	USCGS	08 38 33.3
	9.1° S 112.5° E	
	Depth: 84 km Dist: 138.0°	
	Az: 320.2°	
	Mag: 5.7	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
8 May 63	iP	08 59 02
	eS	09 05 36
	eSS	09 09 26
	eLR	09 12 16
	Unimak Island, Aleutian Islands region	
	USCGS	08 50 56.0
	54.9° N 163.9° W	
	Depth: 89 km Dist: 44.8°	
	Az: 309.3°	
	Mag: 5.6	
8 May 63	iP	10 34 43
	iPP	10 38 15
	eS	10 45 06
	ePS	10 46 02
	ePPS	10 46 40
	eSS	10 51 00
	eLQ	10 57 40
	eLR	11 02 51
	Honshu, Japan	
	USCGS	10 22 11.2
	36.6° N 141.0° E	
	Depth: 53 km Dist: 85.2°	
	Az: 319.1°	
	Mag: 6.1	
8 May 63	eLR	16 20 20
	Off coast of Mindanao, Philippine Islands	
	USCGS	15 24 00.3
	5.3° N 125.7° E	
	Depth: 70 km Dist: 119.1°	
	Az: 314.3°	
	Mag: 5.6	
9 May 63	iP	15 10 16
	iPP	15 11 31
	eS	15 15 44
	eSS	15 17 20
	eLR	15 19 18

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Near west coast of Nicaragua	
	USCGS	15 03 41.0
	12.2° N 86.9° W	
	Depth: 34 km Dist: 33.0°	
	Az: 168.7°	
	Mag: 5.3	
9 May 63	eLR	21 08 30
	Fox Islands, Aleutian Islands	
	USCGS	20 45 13.8
	53.9° N 165.2° W	
	Depth: 33 km Dist: 45.8°	
	Az: 308.3°	
10 May 63	eLR	05 19 44
	Loyalty Islands	
	USCGS	04 28 41.8
	20.0° S 168.1° E	
	Depth: 33 km Dist: 109.9°	
	Az: 261.4°	
	Mag: 4.9	
10 May 63	iP (SSE)	22 31 26
	iPP	22 33 17
	iPPP	22 34 20
	eS	22 38 26
	eSS	22 42 02
	eLQ	22 43 24
	eLR	22 45 35
	Ecquador	
	USCGS	22 42 42.2
	2.2° S 77.6° W	
	Depth: 33 km Dist: 48.9°	
	Az: 159.1°	
	Mag: 5.7	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
11 May 63	eLQ	18 32 21
	eLR	18 37 44
	Off east coast of Formosa	
	USCGS	17 49 43.0
	24.2° N 122.5° E	
	Depth: 33 km Dist: 103.9°	
	Az: 326.7°	
	Mag: 4.5	
12 May 63	eLR	10 46 20
	Macquarie Islands region	
	USCGS	09 42 58.3
	57.5° S 159.4° E	
	Depth: 44 km Dist: 135.0°	
	Az: 226.8°	
	Mag: 6.2	
12 May 63	iP (NW)	20 16 07
	iPP	20 17 47
	eS	20 21 58
	eSS	20 24 53
	eLQ	20 25 20
	eLR	20 28 14
	Kodiak Island, Alaska	
	USCGS	20 08 43.0
	57.4° N 153.9° W	
	Depth: 80 km Dist: 38.8°	
	Az: 311.1°	
	Mag: 5.9	
13 May 63	iP (S)	12 50 07
	iPcP	12 53 51
	eS	12 55 27
	eLR	12 58 29
	Mexico--Guatemala border	
	USCGS	12 44 00.7
	14.5° N 92.9° W	
	Depth: 60 km Dist: 30.3°	
	Az: 179.4°	
	Mag: 5.6	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
13 May 63	eLR	23 42 31
	New Britain region USCGS 6.0° S 150.1° E Depth: 94 km Dist: 113.0° Az: 285.2°	22 48 10.3
14 May 63	eLR	00 07 08
	New Britain USCGS 4.1° S 152.8° E Depth: 58 km Dist: 109.8° Az: 284.5° Mag: 4.8	23 14 47.0
15 May 63	ePS	03 21 47
	eSS	03 27 52
	eLQ	03 39 53
	eLR	03 44 52
	Bismarck Sea USCGS 3.4° S 146.8° E Depth: 33 km Dist: 113.3° Az: 289.7° Mag: 5.7	02 52 39.7
15 May 63	eS	12 24 06
	eSS	12 27 56
	eLQ	12 28 30
	eLR	12 31 00
	Azores region USCGS 38.0° N 26.4° W Depth: 33 km Dist: 49.3° Az: 73.4° Mag: 5.3	12 08 08.8

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
16 May 63	eLQ	16 43 38
	eLR	16 49 45
	Halmahera region	
	USCGS	15 52 18.4
	0.8° S 128.5° E	
	Depth: 50 km Dist: 122.7°	
	Az: 307.8°	
	Mag: 4.4	
17 May 63	iP (NW)	04 18 09
	eLR	04 41 50
	Kurile Islands region	
	USCGS	04 06 36.2
	45.3° N 150.8° E	
	Depth: 33 km Dist: 73.8°	
	Az: 318.7°	
	Mag: 5.9	
17 May 63	ePS	06 38 02
	ePPS	06 39 15
	eSS	06 44 15
	eLQ	06 56 43
	eLR	07 02 48
	Near west coast of Luzon, Philippine Islands	
	USCGS	06 09 18.2
	15.7° N 120.1° E	
	Depth: 80 km Dist: 112.5°	
	Az: 325.1°	
	Mag: 5.5	
17 May 63	ePPS	12 31 56
	eLQ	12 42 20
	eLR	12 47 47
	South of Hokkaido, Japan	
	USCGS	12 09 05.6
	41.7° N 141.9° E	
	Depth: 47 km Dist: 80.7°	
	Az: 321.5°	
	Mag: 4.8	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
18 May 63	iP	05 45 20
	eLR	06 11 24

La Rioja Province, Argentina
USCGS 05 33 25.0
29.6° S 68.5° W
Depth: 29 km Dist: 77.5°
Az: 158.1°

19 May 63	iP (S)	01 16 12
	iPP	01 19 58
	iPPP	01 22 14
	eSKS	01 26 52
	eS	01 27 24
	ePS	01 28 34
	ePPS	01 29 05
	eSS	01 33 52
	eLQ	01 42 49
	eLR	01 44 36

Coast of southern Chile
USCGS 01 03 04.1
46.5° S 75.1° W
Depth: 33 km Dist: 92.4°
Az: 167.6°
Mag: 6.5

19 May 63	iP (ESE)	21 43 54
	ipP	21 44 02
	iPP	21 45 09
	iPPP	21 46 04
	eS	21 50 20
	eSS	21 53 16
	eLQ	21 53 25
	eLR	21 55 36

North Atlantic Ocean
USCGS 21 35 49.6
23.8° N 45.9° W
Depth: 33 km Dist: 43.6°
Az: 102.7°
Mag: 6.0

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
20 May 63	eLR	01 51 24
	Panama-Costa Rica border USCGS 8.3° N 83.0° W Depth: 33 km Dist: 37.5° Az: 163.3°	01 35 32.7
20 May 63	eLR	03 00 56
	Panama-Costa Rica border USCGS 8.3° N 83.0° W Depth: 33 km Dist: 37.5° Az: 163.3° Mag: 4.3	02 43 16.3
20 May 63	iP	11 52 21
	iPP	11 56 48
	iPPP	11 59 11
	ePKS	12 00 28
	eSKS	12 03 02
	ePS	12 06 16
	ePPS	12 07 12
	eSS	12 11 44
	eLQ	12 22 40
	eLR	12 28 00
	Kermadec Islands region USCGS 30.7° S 178.3° W Depth: 34 km Dist: 107.8° Az: 244.3° Mag: 6.2	11 38 00.9
21 May 63	eLR	01 43 52
	South Pacific Ocean USCGS 56.0° S 123.9° W Depth: 33 km Dist: 103.8° Az: 197.2°	00 58 07.4

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
21 May 63	iPP	17 48 58
	ePS	17 58 15
	ePPS	17 59 00
	eSS	18 04 14
	eLR	18 19 51
	Solomon Islands region	
	USCGS	17 30 15.4
	11.1° S 163.3° E	
	Depth: 33 km Dist: 107.3°	
	Az: 271.5°	
	Mag: 5.4	
22 May 63	eLR	03 17 53
	Solomon Islands region	
	USCGS	02 27 56.3
	11.3° S 163.2° E	
	Depth: 60 km Dist: 107.5°	
	Az: 271.5°	
	Mag: 5.1	
22 May 63	eSS	04 35 44
	eLR	04 38 26
	Off west coast of Mexico	
	USCGS	04 24 29.6
	17.7° N 106.0° W	
	Depth: 33 km Dist: 29.2°	
	Az: 205.7°	
22 May 63	iP	14 07 54
	iPP	14 10 27
	iPPP	14 12 22
	ePcS	14 13 03
	eS	14 17 00
	ePS	14 17 12
	ePPS	14 17 24
	eSS	14 21 58
	eLQ	14 27 10
	eLR	14 29 36

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
	Kurile Islands region USCGS 48.6° N 154.7° E Depth: 22 km Dist: 69.6° Az: 319.0° Mag: 6.3	13 56 43.0
23 May 63	eLR	01 50 10
	Molucca Passage USCGS 1.6° N 126.4° E Depth: 33 km Dist: 121.9° Az: 311.4° Mag: 4.8	00 51 40.3
23 May 63	iP	03 46 16
	Fiji Islands region USCGS 15.0° S 176.7° W Depth: 279 km Dist: 95.9° Az: 254.9° Mag: 5.4	03 33 19.1
23 May 63	iPPP ePS ePPS eSS eLQ eLR	03 57 06 04 03 40 04 04 41 04 09 36 04 20 13 04 25 16
	Solomon Islands region USCGS 10.9° S 163.3° E Depth: 33 km Dist: 107.2° Az: 271.7° Mag: 5.5	03 35 34.7
23 May 63	eLR	16 05 05
	Baha California Norte USCGS 32.5° N 115.3° W Depth: 14 km Dist: 21.2° Az: 241.8° Mag: 4.8	15 53 00.2

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
23 May 63	eLR	18 36 08
	Off west coast of Mexico	
	USCGS	18 21 18.3
	14.5° N 105.2° W	
	Depth: 33 km Dist: 32.0°	
	Az: 202.4°	
25 May 63	iPP	16 27 48
	ePS	16 37 36
	eSS	16 43 48
	eLQ	16 57 08
	eLR	17 02 45
	Sandwich Islands region	
	USCGS	16 08 00.8
	56.8° S 25.0° W	
	Depth: 29 km Dist: 116.3°	
	Az: 145.3°	
26 May 63	eLQ	05 20 00
	eLR	05 23 44
	Near east coast of Kamchatka	
	USCGS	04 52 23.4
	51.5° N 159.8° E	
	Depth: 33 km Dist: 65.2°	
	Az: 318.8°	
	Mag: 5.3	
26 May 63	iP	23 17 18
	iPP	23 17 56
	iPPP	23 21 13
	eS	23 25 29
	eLR	23 36 33
	Near east coast of Kamchatka	
	USCGS	23 06 55.0
	55.2° N 159.9° E	
	Depth: 47 km Dist: 62.7°	
	Az: 321.9°	
	Mag: 5.3	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
27 May 63	iP (NW)	04 09 08
	eS	04 17 36
	eLR	04 28 19
	Near east coast of Kamchatka	
	USCGS	03 58 47.9
	55.3° N 160.1° E	
	Depth: 54 km Dist: 62.6°	
	Az: 321.9°	
	Mag: 5.7	
27 May 63	eLR	17 17 48
	Halmahera region	
	USCGS	16 20 09.6
	0.6° S 130.1° E	
	Depth: 33 km Dist: 121.6°	
	Az: 306.4°	
	Mag: 5.0	
29 May 63	eLR	09 21 17
	Southern Iran	
	USCGS	08 35 02.9
	27.2° N 59.3° E	
	Depth: 33 km Dist: 104.0°	
	Az: 25.1°	
	Mag: 5.4	
30 May 63	eSS	07 37 23
	eLQ	07 55 39
	eLR	08 01 29
	South of Australia	
	USCGS	06 56 09.3
	54.2° S 143.7° E	
	Depth: 33 km Dist: 142.9°	
	Az: 234.6°	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
2 June 63	iP (S)	22 28 13
	Near coast of Guatemala USCGS 13.8° N 90.8° W Depth: 68 km Dist: 31.1° Az: 175.5° Mag: 5.1	22 22 00.0
4 June 63	eLR	10 39 30
	Off east coast of Mindanao USCGS 8.1° N 126.8° E Depth: 161 km Dist: 116.1° Az: 314.9°	11 44 12.0
5 June 63	eLR	11 06 24
	New Hebrides Islands USCGS 14.9° S 166.8° E Depth: 37 km Dist: 107.4° Az: 266.2° Mag: 5.0	10 12 09.0
5 June 63	eLQ eLR	14 49 00 14 54 24
	Tonga Islands region USCGS 17.2° S 176.7° W Depth: 33 km Dist: 97.5° Az: 253.3° Mag: 4.8	14 07 38.1
5 June 63	eLR	23 48 00
	Celebes USCGS 2.9° S 119.7° E Depth: 63 km Dist: 129.2° Az: 315.6° Mag: 4.6	22 41 01.8

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
10 June 63	eLQ	05 15 40
	eLR	05 22 48
	800 km. west of Macquarie Islands	
	USCGS	04 16 37.7
	55.4° S 146.4° E	
	Depth: 33 km Dist: 141.5°	
	Az: 232.3°	
	Mag: 6.1	
10 June 63	iPKP	06 58 26
	iPP	07 01 44
	eSS	07 20 44
	eLR	07 44 54
	800 km. west of Macquarie Islands	
	USCGS	06 39 04.0
	55.3° S 146.1° E	
	Depth: 18 km Dist: 141.7°	
	Az: 232.5°	
11 June 63	eLR	13 29 48
	Central Alaska	
	USCGS	13 08 31.4
	63.1° N 151.4° W	
	Depth: 31 km Dist: 37.2°	
	Az: 320.2°	
11 June 63	eLR	15 34 51
	Baja California	
	USCGS	15 23 42.3
	31.8° N 116.2° W	
	Depth: 33 km Dist: 22.2°	
	Az: 241.8°	
	Mag: 5.2	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
13 June 63	eLR	18 20 15
	New Britain USCGS 4.6° S 153.2° E Depth: 54 km Dist: 109.9° Az: 283.8° Mag: 5.0	17 26 41.1
15 June 63	eSS	15 53 12
	eLR	16 06 20
	Off coast of central Chile USCGS 36.3° S 98.9° W Depth: 33 km Dist: 81.0° Az: 184.7° Mag: 4.9	15 30 37.7
17 June 63	iP	18 38 50
	eS	18 43 40
	eLR	18 46 52
	Southwestern Yukon USCGS 60.4° N 140.8° W Depth: 33 km Dist: 31.9° Az: 316.1° Mag: 5.1	18 32 14.5
18 June 63	eLR	00 06 26
	Near south coast of Sumatra USCGS 4.1° S 102.2° E Depth: 73 km Dist: 137.2° Az: 337.1° Mag: 6.1	23 02 06.6

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
18 June 63	eLR	04 51 32
	Ryukyu Islands USCGS 29.0° N 129.9° E Depth: 33 km Dist: 96.6° Az: 323.0° Mag: 5.5	04 02 31.0
18 June 63	eLR	17 12 24
	North of Puerto Rico USCGS 19.6° N 65.6° W Depth: 33 km Dist: 34.1° Az: 128.8° Mag: 4.6	16 54 05.6
19 June 63	eLR	03 05 12
	Tonga Islands region USCGS 23.6° S 174.9° W Depth: 55 km Dist: 100.7° Az: 247.5° Mag: 4.3	02 15 54.1
19 June 63	eSS eLQ eLR	09 45 47 09 59 36 10 05 16
	Talaud Islands region USCGS 4.7° N 126.5° E Depth: 83 km Dist: 119.2° Az: 313.2° Mag: 6.2	09 09 04.0

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
19 June 63	eLR	11 38 52
	Assam, India USCGS 25.0° N 92.1° E Depth: 51 km Dist: 110.3° Az: 354.9° Mag: 5.7	10 47 24.7
19 June 63	eLQ	12 43 55
	eLR	12 48 37
	Solomon Islands USCGS 9.3° S 158.8° E Depth: 33 km Dist: 109.3° Az: 276.1° Mag: 5.5	11 58 55.0
19 June 63	iP	23 14 56
	iPP	23 18 28
	ePS	23 26 49
	ePPS	23 27 32
	eLR	23 44 40
	South of Honshu, Japan USCGS 31.5° N 140.3° E Depth: 38 km Dist: 89.7° Az: 316.6° Mag: 5.0	23 01 51.5
20 June 63	eLR	23 34 56
	Kermadec Islands USCGS 27.9° S 176.6° W Depth: 41 km Dist: 104.8° Az: 245.4° Mag: 5.2	22 46 18.1

International Seismological Centre

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
21 June 63	eLR	22 32 16
	Eastern Manchuria USCGS 47.9° N 130.3° E Depth: 33 km Dist: 80.0° Az: 332.0° Mag: 4.9	13 44 24.6
21 June 63	eLR	16 19 18
	Eastern India USCGS 25.2° N 92.2° E Depth: 56 km Dist: 110.1° Az: 354.8° Mag: 4.9	15 26 31.0
21 June 63	eLR	18 34 26
	Kermadec Islands region USCGS 27.9° S 176.2° W Depth: 33 km Dist: 104.5° Az: 245.2° Mag: 4.7	17 42 35.9
21 June 63	eLR	22 32 16
	Kermadec Islands region USCGS 29.7° S 177.4° W Depth: 43 km Dist: 106.5° Az: 244.6° Mag: 4.8	21 42 01.0
22 June 63	eLR	05 29 53
	Solomon Islands region USCGS 6.1° S 154.4° E Depth: 64 km Dist: 110.1° Az: 281.8° Mag: 4.9	04 37 21.7

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
22 June 63	eLR	09 15 08
	West of Chile USCGS 41.1° S 90.2° W Depth: 33 km Dist: 86.7° Az: 177.7° Mag: 4.6	08 35 14.8
22 June 63	eLR	21 29 00
	Northwestern Manchuria USCGS 52.9° N 121.3° E Depth: 33 km Dist: 78.2° Az: 339.5° Mag: 4.5	20 51 56.8
23 June 63	ePS eLR	04 17 36 04 39 28
	Kermadec Islands region USCGS 29.6° S 177.9° W Depth: 55 km Dist: 106.8° Az: 244.9° Mag: 5.0	03 49 33.9
23 June 63	eLR	09 46 27
	Near east coast of Honshu, Japan USCGS 37.7° N 141.7° E Depth: 39 km Dist: 84.0° Az: 319.3° Mag: 4.5	09 03 49.0
23 June 63	eLR	12 19 00
	Off coast of Central Mexico USCGS 21.0° N 108.2° W Depth: 33 km Dist: 26.9° Az: 212.4°	12 05 19

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
24 June 63	iP (NW)	04 33 49
	iPP	04 35 12
	iPPP	04 35 28
	eS	04 39 37
	eSS	04 41 56
	eLQ	04 42 24
	eLR	04 43 30
	Cook Inlet	
	USCGS	04 26 37.9
	59.5° N 151.7° W	
	Depth: 52 km Dist: 37.4°	
	Az: 314.3°	
	Mag: 5.7	
24 June 63	iP	16 26 07
	eS	16 33 12
	eSS	16 37 14
	eLQ	16 37 25
	eLR	16 40 50
	Fox Islands region, Aleutian Islands	
	USCGS	16 17 15.4
	52.3° N 171.2° W	
	Depth: 33 km Dist: 49.8°	
	Az: 308.1°	
	Mag: 5.4	
25 June 63	eLR	08 38 17
	Off coast of Oregon	
	USCGS	08 26 21.9
	44.3° N 129.1° W	
	Depth: 31 km Dist: 25.5°	
	Az: 281.5°	
	Mag: 4.5	
25 June 63	eLR	09 52 16
	Off coast of Oregon	
	USCGS	09 39 28.4
	44.3° N 129.1° W	
	Depth: 32 km Dist: 25.5°	
	Az: 281.5°	
	Mag: 4.5	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
25 June 63	eLR	15 38 47
	Near south coast of Java	
	USCGS	14 32 14.3
	8.4° S 106.5° E	
	Depth: 78 km Dist: 139.8°	
	Az: 328.9°	
	Mag: 5.4	
26 June 63	eLR	10 37 20
	Off coast of Mindanao, P. I	
	USCGS	09 41 31.2
	4.6° N 126.3° E	
	Depth: 33 km Dist: 119.4	
	Az: 313.3°	
	Mag: 4.9	
26 June 63	iP (SSE)	17 50 04
	iPP	17 51 34
	iPPP	17 51 48
	eS	17 55 52
	eSS	17 58 44
	eLQ	17 59 26
	eLR	18 01 11
	Near south coast of Panama	
	USCGS	17 42 40.6
	7.1° N 82.3° W	
	Depth: 20 km Dist: 38.8°	
	Az: 162.6°	
	Mag: 6.0	
27 June 63	eLR	07 23 36
	Yukon Territory	
	USCGS	07 08 01.7
	60.5° N 140.7° W	
	Depth: 29 km Dist: 31.9°	
	Az: 316.3°	
	Mag: 4.6	

Minneapolis, Minnesota, 1963

Date	Phase	Time h m s
27 June 63	eLR	16 35 39
	Andaman Islands region	
	USCGS	15 32 53.1
	14.4° N 93.7° E	
	Depth: 33 km Dist: 120.6°	
	Az: 352.2°	
	Mag: 5.2	
28 June 63	iPKP	02 49 12
	eLQ	03 34 20
	eLR	03 42 44
	Indian Ocean	
	USCGS	02 28 51.6
	27.5° S 66.1° E	
	Depth: 33 km Dist: 156.0°	
	Az: 50.6°	
	Mag: 6.0	
28 June 63	iPKP	14 09 20
	eLR	14 52 52
	Near coast of Sumatra	
	USCGS	13 47 47.7
	1.3° N 97.4° E	
	Depth: 50 km Dist: 133.0°	
	Az: 345.4°	
	Mag: 5.0	
28 June 63	eS	22 16 20
	ePS	22 16 56
	eSS	22 21 40
	eLQ	22 26 13
	eLR	22 30 15
	Kurile Islands region	
	USCGS	21 55 38.8°
	46.5° N 153.2° E	
	Depth: 33 km Dist: 71.8°	
	Az: 318.2°	
	Mag: 6.1	

Minneapolis, Minnesota, 1963

International Seismological Centre

Date	Phase	Time h m s
29 June 63	eLR	13 33 31
	Mariana Islands region USCGS 11.6° N 142.7° E Depth: 30 km Dist: 104.5° Az: 303.1° Mag: 5.2	12 43 47.5
30 June 63	eLR	02 30 39
	Mariana Islands region USCGS 11.8° N 142.5° E Depth: 33 km Dist: 104.4° Az: 303.4° Mag: 4.6	01 39 05.4
30 June 63	eLR	05 12 19
	Mariana Islands region USCGS 11.7° N 142.6° E Depth: 33 km Dist: 104.5° Az: 303.2° Mag: 4.7	04 19 17.0

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University of Minnesota Seismic Station

Minneapolis, Minnesota

SEISMOLOLOGICAL BULLETIN

by

Brian J. Mitchell

1 July 1963 -- 31 December 1963

APR 6 1964

International Seismological Centre

Station Constants

Latitude: 44° 54' 52" North

Longitude: 93° 11' 24" West

Elevation: 710 feet

Abbreviations

i = sudden beginning of the motion (impetus)

e = gradual beginning of the motion (emersio)

Instruments

Three component Benioff short-period seismographs,
To = 1 sec., Tg = .76 sec.

Three component Sprengnether long-period seismographs,
To = 30 sec., Tg = 100 sec.

All times are G. C. T.

Beginning with this Bulletin, earthquakes are not reported for which only a surface wave was recorded.

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
2 July 63	iP	08 05 18
	Colorado	
	USCGS	08 02 54.1
	39.8° N 107.4° W	
	Depth: 15 km Dist: 11.7°	
	Az: 249.0° Mag: 4.6	
4 July 63	eP (SW)	11 12 01
	ePP	11 16 21
	eSKS	11 23 46
	eS	11 24 56
	ePS	11 26 22
	ePPS	11 27 34
	eSS	11 31 46
	eLQ	11 41 38
	eLR	11 47 08
	Tonga Islands region	
	USCGS	10 58 13.2
	26.3° S 177.7° W	
	Depth: 158 km Dist: 104.4°	
	Az: 247.3° Mag: 5.6	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
4 July 63	eSS	23 27 46
	eLQ	23 36 24
	eLR (ESE)	23 40 48
	St. Helena Island region	
	USCGS	22 56 15.7
	18.5 S 12.6 W	
	Depth: 33 km Dist: 96.4°	
	Az: 109.6° Mag: 5.6	
5 July 63	eP	05 58 01
	eS	06 05 54
	eLQ	06 12 36
	eLR	06 16 14
	Peru	
	USCGS	05 48 13.4
	11.6 S 77.5 W	
	Depth: 55 km Dist: 58.0°	
	Az: 161.8° Mag: 5.8	
7 July 63	eP	19 24 23
	eLR	19 27 12
	Central Utah	
	USCGS	19 20 42.3
	39.6 N 111.9 W	
	Depth: 33 km Dist: 14.8°	
	Az: 255.6° Mag: 4.9	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
8 July 63	eP	04 24 24
	eS	04 28 55
	eLR	04 30 50
	Off coast of Northern California	
	USCGS	04 19 08.4
	40.8 N 125.8 W	
	Depth: 33 km Dist: 24.2°	
	Az: 271.8° Mag: 4.7	
8 July 63	eS	11 27 07
	eSS	11 32 32
	eLQ	11 38 28
	eLR	11 42 04
	Mid Atlantic Ocean	
	USCGS	11 05 07.5
	0.3 N 17.8 W	
	Depth: 33 km Dist: 79.5°	
	Az: 100.2° Mag: 4.9	

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
9 July 63	iP (S)	04 26 54
	eLR	04 35 14
	Mexico-Guatemala border	
	USCGS	04 20 50.6
	15.2 N 94.0 W	
	Depth: 33 km Dist: 29.6°	
	Az: 181.6° Mag: 4.5	
9 July 63	iP (SSE)	09 31 45
	ePP	09 33 05
	ePPP	09 33 20
	eS	09 37 49
	eSS	09 40 08
	eLQ	09 40 31
	eLR (SSE)	09 42 24
	Costa Rica - Panama border	
	USCGS	09 24 33.3
	8.5 N 83.0 W	
	Depth: 31 km Dist: 37.3°	
	Az: 163.2° Mag: 5.1	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
10 July 63	iP (NW)	05 34 20
	eS	05 43 38
	ePS	05 44 21
	eSS	05 49 00
	eLQ	05 53 46
	eLR (NW)	05 51 12

Kurile Islands region

USCGS 05 23 00
46.3 N 153.4 E
Depth: 33 km Dist: 71.9°
Az: 318.0° Mag: 4.8

10 July 63	iP	09 58 33
	eSS	10 05 56
	eLR	10 12 48

North Atlantic Ocean

USCGS 09 49 29.6
13.4 N 44.9 W
Depth: 37 km Dist: 51.5°
Az: 111.9° Mag: 4.9

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
12 July 63	iP	14 09 03
	eS	14 13 32
	eSS	14 13 57
	eLR	14 15 10

Near coast of Vancouver Island

USCGS 14 03 38.3
50.3 N 129.6 W
Depth: 33 km Dist: 25.0°
Az: 295.6° Mag: 4.8

12 July 63	iP	15 39 25
	eS	15 48 46
	eLR	16 02 08

Kurile Islands region

USCGS 15 28 08.5
46.8 N 153.6 E
Depth: 33 km Dist: 71.4°
Az: 318.2° Mag: 4.8

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
14 July 63	iP (SE)	05 49 44
	iPP	05 51 39
	iPPP	05 52 04
	eS	05 56 12
	eSS	05 59 27
	eLQ	06 00 08
	eLR	06 01 44

Off coast of northern Venezuela

USCGS 05 41 43.0
10.4 N 62.6 W
Depth: 24 km Dist: 42.3°
Az: 133.1° Mag: 5.5

16 July 63	iP (NE)	18 39 44
	ePP	18 42 43
	ePPP	18 44 34
	eS	18 50 12
	ePPS	18 51 00
	eSS	18 56 16
	eLQ	19 02 30
	eLR	19 05 44

Georgia S.S.R.

USCGS 18 27 18.4
43.1 N 41.5 E
Depth: 33 km Dist: 83.5°
Az: 31.6° Mag: 5.8

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
18 July 63	iP	00 09 25
	eS	00 14 00
	eSS	00 14 22
	eLR	00 15 38
	Vancouver Island region	
	USCGS	00 04 05.3
	49.1 N 128.9 W	
	Depth: 33 km Dist: 24.6°	
	Az: 292.7° Mag: 4.8	
18 July 63	ePP	05 18 18
	eSKS	05 23 29
	ePS	05 28 10
	eLR	05 54 12
	Sandwich Islands region	
	USCGS	04 58 09.2
	61.0 S 22.3 W	
	Depth: 33 km Dist: 120.1°	
	Az: 147.9° Mag: 6.0	

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
19 July 63	iP (NE)	05 56 24
	iPcP	05 57 04
	eS	06 05 22
	ePPS	06 06 01
	eSS	06 10 13
	eLR	06 17 21
	Ligurian Sea	
	USCGS	05 45 28.0
	43.4 N 8.2 E	
	Depth: 33 km Dist: 67.7°	
	Az: 50.6° Mag: 5.6	
24 July 63	eSKS	11 56 56
	ePPS	12 00 42
	eLQ	12 17 00
	eLR	12 20 24
	Near east coast of Ioemosa	
	USCGS	11 32 17.7
	24.6 N 122.0 E	
	Depth: 33 km Dist: 103.7°	
	Az: 327.3° Mag: 5.3	

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
26 July 63	iP (NE)	04 29 00
	eS	04 38 42
	ePS	04 39 00
	eSS	04 43 52
	eLQ	04 48 32
	eLR	04 52 15
	Southern Yugoslavia	
	USCGS	04 17 16.7
	42.1 N 21.5 E	
	Depth: 33 km Dist: 75.6°	
	Az: 44.3° Mag: 5.4	
29 July 63	eP	20 28 48
	e	20 31 26
	ePPP	20 34 52
	ePKS	20 36 02
	eSKS	20 31 20
	e	20 40 38
	ePS	20 42 04
	ePPS	20 43 08
	eSS	20 47 55
	eLQ	20 58 30
	eLR (SW)	21 04 12
	Kermadec Islands	
	USCGS	20 14 07.3
	30.2 S 177.3 W	
	Depth: 39 km Dist: 106.8°	
	Az: 244.1° Mag: 5.7	

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
30 July 63	eSKS	06 10 44
	eS	06 12 10
	ePS	06 13 50
	ePPS	06 14 52
	eSS	06 19 31
	eLQ	06 30 16
	eLR (SW)	06 35 26

Kermadec Islands region

USCGS 05 45 53.3
29.6 S 177.3 W
Depth: 33 km Dist: 106.4°
Az: 244.6° Mag: 5.3

30 July 63	eS	13 18 58
	eSS	13 24 09
	eLQ	13 28 49
	eLR (S)	13 32 40

Easter Island region

USCGS 12 57 25.3
29.2 S 112.1 W
Depth: 33 km Dist: 75.7°
Az: 197.0° Mag: 4.8

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
30 July 63	ePP	14 11 32
	ePKS	14 14 16
	ePS	14 21 08
	ePPS	14 22 16
	eSS	14 27 12
	eLQ	14 40 20
	eLR (SE)	14 45 03
	Sandwich Islands	
	USCGS	13 51 57.8
	55.9 S 27.5 W	
	Depth: 33 km Dist: 114.6°	
	Az: 145.6° Mag: 6.2	
3 Aug 63	iP (ESE)	10 31 52
	iPP	10 34 12
	iPPP	10 35 27
	eSS	10 43 03
	eLQ	10 47 04
	eLR	10 50 02
	Mid Atlantic Ocean	
	USCGS	10 21 36.6
	7.7 N 35.8 W	
	Depth: 33 km Dist: 61.8°	
	Az: 108.6° Mag: 6.1	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
6 Aug 63	iP (NE)	13 42 55
	ePP	13 45 12
	eS	13 49 44
	eLQ	13 52 12
	eLR (NE)	13 53 50
	North Atlantic Ocean	
	USCGS	13 36 35.6
	57.0 N 33.6 W	
	Depth: 33 km Dist: 38.2°	
	Az: 49.7° Mag: 5.1	
8 Aug 63	iP	02 25 00
	ePPP	02 28 38
	ePcS	02 29 41
	eS	02 33 12
	eScS	02 34 31
	eSS	02 36 30
	eLQ	02 39 14
	eLR	02 43 22
	Fox Islands, Aleutian Islands	
	USCGS	02 14 54.4
	54.2 N 168.1 E	
	Depth: 33 km Dist: 59.6°	
	Az: 317.7° Mag: 5.5	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
8 Aug 63	eP	11 30 45
	ePP	11 35 28
	eSKS	11 41 16
	ePS	11 44 56
	ePPS	11 45 28
	eSS	11 51 13
	eLQ	12 02 00
	eLR (NW)	12 07 26

New Britain

USCGS 11 16 11.2
5.8 S 151.0 E
Depth: 48 km Dist: 112.2°
Az: 284.6° Mag: 5.6°

9 Aug 63	eP	14 50 11
	ePP	14 53 54
	eSKS	15 00 38
	eS	15 01 16
	ePS	15 02 45
	ePPS	15 03 28
	eLQ	15 16 36
	eLR (SW)	15 21 08

Fiji Islands region

USCGS 14 36 45.9
15.3 S 175.7 W
Depth: 33 km Dist: 95.5°
Az: 254.0° Mag: 5.5

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
12 Aug 63	eS	13 21 08
	eSS	13 24 09
	eLR	13 27 30
	Galapagos Islands	
	USCGS	13 06 46.1
	2.1 N 90.4 W	
	Depth: 33 km Dist: 42.7°	
	Az: 175.9° Mag: 4.6	
13 Aug 63	iP	22 06 07
	eS	22 17 32
	ePS	22 19 00
	ePPS	22 19 52
	eSS	22 24 08
	eLQ	22 33 20
	eLR	22 37 43
	Tonga Islands	
	USCGS	21 52 37.4
	19.3 S 173.7 W	
	Depth: 33 km Dist: 96.9°	
	Az: 249.8° Mag: 5.1	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
15 Aug 63	iP (NW)	06 24 00
	ePP	06 27 12
	e	06 33 24
	eS	06 34 18
	ePS	06 35 08
	ePPS	06 35 24
	eSS	06 40 06
	eLQ	06 47 18
	eLR	06 51 17

Near east coast of Honshu, Japan

USCGS 06 11 34.6
37.9 N 141.6 E
Depth: 59 km Dist: 83.9°
Az: 319.5°

15 Aug 63	iP (SSE)	17 34 36
	iPcP	17 34 48
	ipP	17 36 34
	iPP	17 37 14
	iPPP	17 38 52
	iS	17 42 25

Peru-Bolivia border

USCGS 17 25 05.9
13.8 S 69.3 W
Depth: 543 km Dist: 62.3°
Az: 153.6° Mag: 7.8

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
17 Aug 63	eP	11 26 02
	ePP	11 29 52
	ePPP	11 32 00
	eS	11 37 04
	ePS	11 38 30
	ePPS	11 38 40
	eSS	11 43 33
	eLQ	11 52 50
	eLR	11 55 49

Ryukyu Island region
USCGS 11 12 41.2
30.6 N 130.9 E
Depth: 33 km Dist: 94.8°
Az: 323.0° Mag: 5.6

17 Aug 63	iP (S)	11 39 52
	iPP	11 40 29
	iPPP	11 40 54

Veracruz, Mexico
USCGS 11 34 23.4
17.7 N 94.3 W
Depth: 163 Dist: 27.1°
Az: 182.3° Mag: 4.9

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
18 Aug 63	iP (NW)	18 52 37
	ePP	18 54 44
	eS	19 00 16
	eSS	19 04 23
	eLQ	19 05 12
	eLR	19 08 34

Andreanof Islands, Aleutian Islands

USCGS 18 43 16.1
50.3 N 176.9 W
Depth: 33 Dist: 53.9°
Az: 307.9° Mag: 5.5

21 Aug 63	iP (SE)	03 46 16
	ePP	03 47 18
	eS	03 51 46
	eSS	03 54 00
	eLQ	03 54 14
	eLR (SE)	03 55 12

Caribbean Sea

USCGS 03 39 22.6
14.3 N 72.5 W
Depth: 33 km Dist: 35.2°
Az: 143.6° Mag: 5.4

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
22 Aug 63	iP (W)	09 32 24
	eS	09 36 48
	eSS	09 37 12
	eLR	09 38 01
	Off coast of Oregon	
	USCGS	09 27 09.3
	42.0 N 126.2 W	
	Depth: 33 km Dist: 24.0°	
	Az: 274.8° Mag: 5.6	
22 Aug 63	ePP	20 11 21
	ePKS	20 14 39
	eSKS	20 17 40
	eS	20 18 32
	ePS	20 20 50
	ePPS	20 21 40
	eSS	20 27 00
	eLQ	20 37 35
	eLR (W)	20 43 14
	Solomon Islands	
	USCGS	19 52 25.0
	9.4 S 158.0 E	
	Depth: 33 km Dist: 109.9°	
	Az: 276.6° Mag: 6.1	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
25 Aug 63	eP	12 30 54
	epP	12 33 00
	i	12 34 00
	eSKS	12 40 38
	eSKS	12 41 40
	e	12 43 38
	ePS	12 45 26
	eSS	12 48 31
	eSKKS	12 52 32
	eSSS	12 53 56
	e	12 56 08

Fiji Islands region

USCGS 12 18 12.5
17.5 S 178.8 W
Depth: 565 km Dist: 99.1°
Az: 254.5° Mag: 6.1

27 Aug 63	eS	03 47 44
	ePS	03 48 52
	eSS	03 53 52
	eLQ	04 00 40
	eLR	04 05 00

Near coast of southern Chile

USCGS 03 23 32.6
45.9 S 75.3 W
Depth: 33 km Dist: 91.8°
Az: 167.6° Mag: 5.3

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
5 Sept 63	eP	11 41 54
	eS	11 46 26
	eLR	11 48 28
	Vancouver Island region	
	USCGS	11 36 31.6
	50.3 N 129.1 W	
	Depth: 33 km Dist: 24.6°	
	Az: 295.5° Mag: 4.2	
6 Sept 63	eP	06 16 54
	eS	06 27 41
	eSS	06 33 44
	eLQ	06 40 33
	eLR (NW)	06 47 10
	Sea of Japan	
	USCGS	06 03 52.1
	36.4 N 130.6 E	
	Depth: 33 km Dist: 89.9°	
	Az: 326.1° Mag: 5.4	
6 Sept 63	eP	20 37 09
	eS	20 41 47
	eLR	20 43 44
	Vancouver Island	
	USCGS	20 31 46.1
	50.1 N 129.5 W	
	Depth: 31 km Dist: 24.9°	
	Az: 295.1° Mag: 4.4	

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
2 Sept 63	iP	13 33 03
	eS	13 37 33
	eLR	13 39 59
	Vancouver Island region	
	USCGS	13 27 37.4
	50.5 N 129.4 W	
	Depth: 33 km Dist: 24.8°	
	Az: 296.0° Mag: 4.6	
2 Sept 63	eP (SW)	14 15 52
	eS	14 20 08
	eLR (SW)	14 21 27
	Gulf of California	
	USCGS	14 10 44.7
	25.7 N 109.5 W	
	Depth: 33 km Dist: 23.3°	
	Az: 219.9° Mag: 4.8	
4 Sept 63	iP (NNE)	13 38 00
	eS	13 42 43
	Near east coast of Baffin Island	
	USCGS	13 32 12.3
	71.4 N 73.3 W	
	Depth: 33 km Dist: 28.3°	
	Az: 13.3° Mag: 5.9	

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
10 Sept 63	ePP	19 32 51
	eS	19 40 33
	eLQ	19 51 52
	eLR	20 03 44
	Tonga Islands region	
	USCGS	19 14 26.8
	19.0 S 175.8 E	
	Depth: 33 km Dist: 103.9°	
	Az: 257.0° Mag: 5.3	
13 Sept 63	iP	10 56 17
	eS	10 59 48
	eLR	11 01 16
	Chihuahua, Mexico	
	USCGS	10 51 56.6
	29.1 N 105.6 W	
	Depth: 33 km Dist: 18.6°	
	Az: 216.1° Mag: 4.7	
14 Sept 63	ePS	04 20 44
	ePPS	04 21 22
	eSS	04 26 41
	eLQ	04 37 36
	eLR (WSW)	04 42 27
	Kermadec Islands	
	USCGS	03 52 16.9
	31.4 S 179.0 W	
	Depth: 33 km Dist: 108.7°	
	Az: 244.2° Mag: 4.9	

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
15 Sept 63	iP (W)	01 01 00
	iPP	01 05 20
	iPPP	01 07 42
	ePKS	01 09 04
	eSKS	01 11 36
	eS	01 13 04
	ePS	01 14 37
	eSS	01 20 08
	eLQ	01 30 25
	eLR	01 35 00
	Santa Cruz Islands	
	USCGS	00 46 54.1
	10.3 S 165.6 E	
	Depth: 43 km Dist: 105.1°	
	Az: 270.5° Mag: 6.3	
17 Sept 63	iP (SSE)	06 04 14
	ipP	06 04 31
	eS	06 12 00
	ePS	06 12 29
	eScS	06 13 56
	eSS	06 16 48
	eLQ	06 18 36
	eLR	06 21 10
	Central Peru	
	USCGS	05 54 33.7
	10.6 S 78.2 W	
	Depth: 61 km Dist: 56.9°	
	Az: 162.3° Mag: 5.5	

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
17 Sept 63	eP (W)	19 34 19
	ePP	19 38 37
	ePPP	19 41 00
	eSKS	19 44 39
	eS	19 46 08
	ePS	19 47 52
	eSS	19 53 32
	eSSS	19 57 20
	eLQ	20 03 40
	eLR	20 08 33

Santa Cruz Islands

USCGS 19 20 08.2
10.1 S 165.3 E
Depth: 17 km Dist: 105.2°
Az: 270.9° Mag: 6.1

18 Sept 63	eP (NE)	17 10 30
	eS	17 20 29
	ePS	17 21 18
	eSS	17 25 53
	eLQ	17 32 12
	eLR (NE)	17 36 22

Turkey

USCGS 16 58 12.5
40.9 N 29.2 E
Depth: 33 km Dist: 80.2°
Az: 40.5° Mag: 5.2

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
22 Sept 63	ePP	03 14 44
	eSKS	03 21 12
	eS	03 22 24
	ePS	03 24 00
	eSS	03 29 47
	eLR	03 45 44

Fiji Islands region

USCGS 02 56 24.3
19.3 S 175.9 E
Depth: 28 km Dist: 104.0°
Az: 256.7° Mag: 5.8

23 Sept 63	ePP	09 22 52
	ePS	09 32 48
	ePPS	09 34 02
	eSS	09 40 05
	eLQ	09 23 48
	eLR (E)	09 59 49

Northern Rhodesia

USCGS 09 01 56.8
16.6 S 28.8 E
Depth: 33 km Dist: 124.1°
Az: 79.2° Mag: 5.8

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
24 Sept 63	iP (SSE)	16 39 58
	eS	16 47 40
	eScS	16 49 40
	eSS	16 50 56
	eLQ	16 53 54
	eLR	16 56 11
	Near coast of Peru	
	USCGS	16 30 16.0
	10.6 S 78.0 W	
	Depth: 80 km Dist: 56.9°	
	Az: 162.1° Mag: 6.0	
26 Sept 63	eP (WNW)	05 37 30
	ePP	05 39 37
	ePcS	05 42 37
	eS	05 45 00
	eScS	05 47 12
	eSS	05 49 22
	eLQ	05 50 56
	eLR	05 53 40
	Andreanof Islands, Aleutian Islands	
	USCGS	05 28 07.3
	50.4 N 176.9 W	
	Depth: 33 km Dist: 53.8°	
	Az: 308.0° Mag: 5.3	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
29 Sept 63	eP	22 50 12
	ePP	22 51 12
	eS	22 55 13
	eSS	22 57 02
	eLR	22 57 57
	Guatemala	
	USCGS	22 44 02.9
	14.4 N 91.9 W	
	Depth: 61 km Dist: 30.4°	
	Az: 177.5° Mag: 5.1	
3 Oct 63	ePS	16 17 54
	ePPS	16 19 12
	eSS	16 24 11
	eLQ	16 37 16
	eLR (SE)	16 43 44
	Sandwich Islands	
	USCGS	15 48 17.2
	58.5 S 25.1 W	
	Depth: 54 km Dist: 117.4°	
	Az: 146.7°	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
3 Oct 63	iP (NW)	23 37 48
	ePP	23 41 34
	ePPP	23 43 29
	eSKS	23 48 50
	ePS	23 49 40
	ePPS	23 50 11
	eSS	23 55 15
	eLQ	00 01 28
	eLR (NW)	00 04 52

Kyushu, Japan

USCGS 23 24 34.7

32.2 N 131.6 E

Depth: 33 km Dist: 93.1°

Az: 323.3° Mag: 5.7

7 Oct 63	ePP	13 31 55
	ePKS	13 35 39
	eSKS	13 37 18
	eS	13 38 04
	ePS	13 40 20
	ePPS	13 41 12
	ePKKP	13 41 24
	eSS	13 46 06

Fiji Islands region

USCGS 13 14 24.6

23.6 S 179.9 E

Depth: 550 km Dist: 104.2°

Az: 250.9° Mag: 5.7

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
8 Oct 63	eP (W)	00 30 16
	ePP	00 34 10
	eSKS	00 40 57
	eS	00 41 23
	ePS	00 42 44
	ePPS	00 43 28
	eSS	00 48 00
	eLQ	00 56 52
	eLR	01 00 56
	Samoa Islands region	
	USCGS	00 17 01.1
	15.1 S 173.2 W	
	Depth: 33 km Dist: 93.6°	
	Az: 252.4° Mag: 5.7	
11 Oct 63	iPPP	10 25 02
	eS	10 27 55
	eSS	10 29 34
	eLR	10 30 10
	Off coast of Jalisco, Mexico	
	USCGS	10 17 07.6
	17.8 N 105.9 W	
	Depth: 33 km Dist: 29.1°	
	Az: 205.6° Mag: 5.0	

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
12 Oct 63	iP (NW)	11 38 38
	iPcP	11 39 00
	iPP	11 41 28
	ePPP	11 43 01
	eS	11 48 04
	ePPS	11 49 12
	eSS	11 53 27
	eLQ	11 58 20
	eLR	12 01 40

Kurile Islands

USCGS 11 26 57.9
44.8 N 149.0 E
Depth: 40 km Dist: 75.0°
Az: 319.0°

13 Oct 63	iP (NW)	05 29 38

Kurile Islands

USCGS 05 17 57.1
44.8 N 149.5 E
Depth: 60 km Dist: 74.8°
Az: 319.0°

13 Oct 63	iP	09 28 17

Kurile Islands

USCGS 09 16 25.9
44.6 N 149.6 E
Depth: 50 km Dist: 74.9°
Az: 318.9° Mag: 4.9

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
13 Oct 63	iP	09 34 30
	Kurile Islands	
	USCGS	09 22 44.6
	44.9 N 151.0 E	
	Depth: 50 km Dist: 74.0°	
	Az: 318.3° Mag: 5.0	
13 Oct 63	iP	10 22 21
	Kurile Islands	
	USCGS	10 10 28.2
	44.5 N 149.6 E	
	Depth: 45 km Dist: 75.0°	
	Az: 318.8° Mag: 4.7	
13 Oct 63	iP	11 27 19
	Kurile Islands	
	USCGS	11 15 40.4
	44.9 N 151.1 E	
	Depth: 45 Dist: 74.0°	
	Az: 318.2° Mag: 4.9	
13 Oct 63	iP	12 41 08
	Kurile Islands	
	USCGS	12 29 39.2
	45.9 N 151.8 E	
	Depth: 30 km Dist: 72.9°	
	Az: 318.5° Mag: 5.0	

Minneapolis, Minnesota, 1963

International Seismological Centre

DATE	PHASE	TIME h m s
13 Oct 63	iP	12 54 08
	Kurile Islands	
	USCGS	12 42 13.0
	44.4 N 149.4 E	
	Depth: 55 km Dist: 75.2°	
	Az: 318.8° Mag: 5.2	
13 Oct 63	iP	13 09 57
	Kurile Islands	
	USCGS	12 58 21.6
	45.0 N 150.1 E	
	Depth: 50 km Dist: 74.4°	
	Az: 318.9° Mag: 5.4	
13 Oct 63	iP	14 37 50
	Kurile Islands	
	USCGS	14 26 11.9
	44.5 N 149.5 E	
	Depth: 50 km Dist: 75.0°	
	Az: 318.8° Mag: 5.1	
13 Oct 63	iP	16 11 25
	Kurile Islands	
	USCGS	15 59 52.9
	45.6 N 150.5 E	
	Depth: 35 km Dist: 73.7°	
	Az: 319.0° Mag: 6.1	

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DATE	PHASE	TIME h m s
13 Oct 63	iP	16 40 35
	Kurile Islands USCGS 44.9 N 150.3 E Depth: 40 km Dist: 74.4° Az: 318.7° Mag: 5.2	16 28 58.2
13 Oct 63	iP	18 26 30
	Kurile Islands USCGS 45.2 N 150.8 E Depth: 45 km Dist: 73.9° Az: 318.6° Mag: 5.2	18 14 57.5
13 Oct 63	iP	19 39 07
	Kurile Islands USCGS 45.7 N 151.7 E Depth: 45 km Dist: 73.1° Az: 318.5° Mag: 5.5	19 27 38.2
13 Oct 63	iP	22 06 31
	Kurile Islands USCGS 44.7 N 152.1 E Depth: 50 km Dist: 73.7° Az: 317.5° Mag: 5.5	21 55 00.8

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International Seismological Centre

DATE	PHASE	TIME h m s
13 Oct 63	iP	22 14 31

Kurile Islands
USCGS
45.1 N 150.9 E
Depth: 45 km Dist: 73.9°
Az: 318.5° Mag: 4.9

14 Oct 63	iP	00 04 00
	eS	00 13 32
	eSS	00 18 29

Kurile Islands
USCGS 23 52 22.8
44.5 N 150.1 E
Depth: 50 km Dist: 74.8°
Az: 318.5° Mag: 5.5

14 Oct 63	iP	04 17 31
	eSS	04 32 18

Kurile Islands
USCGS 04 06 01.7
44.9 N 150.2 E
Depth: 50 km Dist: 74.4°
Az: 318.7° Mag: 5.3

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DATE	PHASE	TIME h m s
14 Oct 63	iP	04 22 49

Kurile Islands

USCGS 04 11 14.0
44.7 N 150.6 E
Depth: 45 km Dist: 74.4°
Az: 318.4° Mag: 5.3

14 Oct 63	iP	06 34 40
	eS	06 41 45

Fox Islands, Aleutian Islands

USCGS 06 26 11.7
52.8 N 167.1 W
Depth: 80 km Dist: 47.3°
Az: 307.4° Mag: 5.1

14 Oct 63	iP	13 33 17
	eS	13 42 40
	eSS	13 47 40
	eLQ	13 51 26
	eLR	13 53 26

Kurile Islands

USCGS 13 21 45.2
44.8 N 151.0 E
Depth: 60 km Dist: 74.1°
Az: 318.2° Mag: 5.9

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International Seismological Centre

DATE	PHASE	TIME h m s
15 Oct 63	iP	10 07 36
	eS	10 14 12
	eSS	10 17 24
	eLQ	10 18 33
	eLR	10 21 15
	North of Iceland	
	USCGS	09 59 30.1
	67.2 N 18.4 W	
	Depth: 33 km Dist: 43.9°	
	Az: 32.9° Mag: 5.2	
15 Oct 63	iP	09 13 42
	Kurile Islands	
	USCGS	09 02 08.3
	45.3 N 150.2 E	
	Depth: 40 km Dist: 74.1°	
	Az: 319.0° Mag: 5.4	
15 Oct 63	iP	09 43 43
	Kurile Islands	
	USCGS	09 32 08.7
	45.2 N 150.2 E	
	Depth: 40 km Dist: 74.2°	
	Az: 318.9° Mag: 5.5	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
15 Oct 63	iP	10 58 52

Kurile Islands
USCGS
44.6 N 149.0 E
Depth: 50 km Dist: 75.2°
Az: 319.2° Mag: 5.4

16 Oct 63	ePP	16 00 22
	eSKS	16 07 08
	eS	16 07 46
	ePS	16 09 08
	ePPS	16 09 52
	eSS	16 14 28
	eLQ	16 23 19
	eLR	16 28 00

Tadzhik S.S.R.
USCGS
38.6 N 73.4 E
Depth: 33 km Dist: 96.0°
Az: 10.5° Mag: 5.9

15 43 00.8

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DATE	PHASE	TIME h m s
19 Oct 63	eS	02 39 11
	ePS	02 39 52
	eSS	02 43 48
	eLQ	02 49 00
	eLR	02 53 15
	Kurile Islands	
	USCGS	02 18 37.9
	46.8 N 153.7 E	
	Depth: 45 km Dist: 71.4°	
	Az: 318.2° Mag: 5.2	
19 Oct 63	eS	03 54 56
	ePPS	03 55 44
	eSS	03 59 16
	eLQ	04 04 16
	eLR	04 07 20
	Kurile Islands	
	USCGS	03 34 19.6
	46.6 N 153.8 E	
	Depth: 33 km Dist: 71.5°	
	Az: 318.0° Mag: 5.4	

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
20 Oct 63	eP (NW)	01 04 51
	ePS	01 14 10
	Kurile Islands	
	USCGS	00 53 07.2
	44.7 N 150.7 E	
	Depth: 25 km Dist: 74.3°	
	Az: 318.3°	
20 Oct 63	iP	09 22 22
	ePP	09 25 33
	eS	09 31 58
	ePS	09 32 28
	ePPS	09 32 40
	eSS	09 37 00
	eLQ	09 41 49
	eLR	09 46 44
	Kurile Islands	
	USCGS	09 10 43.9
	44.4 N 150.0 E	
	Depth: 40 km Dist: 74.9°	
	Az: 318.5° Mag: 5.5	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
20 Oct 63	eP	12 03 55
	iPcP	12 04 08
	eS	12 13 29
	ePS	12 13 57
	ePPS	12 14 09
	eSS	12 18 20
	eLQ	12 23 56
	eLR	12 26 36

Kurile Islands

USCGS 11 52 20.7
44.7 N 150.2 E
Depth: 45 km Dist: 74.6°
Az: 318.6° Mag: 5.1

23 Oct 63	iP (NW)	09 59 14
	iPcP	09 59 22
	eLR	10 28 26

East of Honshu, Japan

USCGS 09 47 08.1
41.2 N 144.2 E
Depth: 50 km Dist: 80.1°
Az: 319.8° Mag: 5.4

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
24 Oct 63	eP	01 18 08
	epP	01 18 32
	eSS	01 33 17
	eLR	01 43 00
	Kurile Islands	
	USCGS	01 06 25.9
	44.5 N 150.3 E	
	Depth: 45 km Dist: 74.7°	
	Az: 318.4° Mag: 5.0	
24 Oct 63	ePKP	07 45 36
	iPP	07 48 25
	ePKS	07 49 41
	ePPP	07 51 42
	eLR	08 32 32
	Off south coast of Sumatra	
	USCGS	07 26 23.9
	4.9 S 102.9 E	
	Depth: 50 km Dist: 137.7°	
	Az: 335.8° Mag: 4.8	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
27 Oct 63	eP	15 01 30
	ePPP	15 02 40
	eS	15 04 04
	eLR	15 06 53
	Imperial County, California	
	USCGS	14 56 55.0
	33.0 N 115.7 W	
	Depth: 14 km Dist: 21.1°	
	Az: 243.4°	
28 Oct 63	eSKS	08 19 10
	eS	08 20 51
	eSS	08 28 02
	eLQ	08 37 50
	eLR (WSW)	08 42 52
	Tonga Islands region	
	USCGS	07 55 12.3
	24.3 S 176.0 W	
	Depth: 33 km Dist: 101.9°	
	Az: 247.7° Mag: 5.4	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
28 Oct 63	iP (NW)	12 13 54
	eS	12 22 30
	ePPS	12 23 44
	eSS	12 26 17
	eSSS	12 29 14
	eLQ	12 30 43
	eLR (NW)	12 34 32

Off east coast of Kamchatka

USCGS 12 03 19.8
52.8 N 159.8 E
Depth: 33 km Dist: 64.4°
Az: 319.9° Mag: 5.7

31 Oct 63	ePP	03 35 20
	eSKS	03 42 08
	eS	03 43 00
	ePS	03 44 16
	eSS	03 49 44
	eLQ	03 59 13
	eLR (WSW)	04 04 00

Tonga Islands

USCGS 03 17 42.0
21.8 S 175.0 W
Depth: 33 km Dist: 99.5°
Az: 248.9° Mag: 5.4

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
3 Nov 63	iP (SSE)	03 19 05
	ipP	03 19 23
	ePcP	03 20 20
	ePP	03 22 08
	ePcS	03 24 24
	eS	03 26 14
	eS cS	03 28 44
	eSS	03 30 06
	eLQ	03 31 47
	eLR	03 34 33

Peru-Ecua'dor border
USCGS 03 10 12.7
3.5 S 77.8 W
Depth: 33 km Dist: 50.1°
Az: 159.8° Mag: 6.0

4 Nov 63	eP	01 28 36
	ePKP	01 32 52
	ePP	01 34 06
	ePKS	01 36 08
	eSKS	01 39 20

New Hebrides Islands
USCGS 01 14 32.8
15.1 S 167.3 E
Depth: 154 km Dist: 107.2°
Az: 265.7° Mag: 5.8

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
6 Nov 63	ePP	02 33 15
	ePKS	02 35 48
	eSKS	02 39 16
	ePS	02 13 05
	ePPS	02 44 32
	eSS	02 49 52
	eLQ	03 02 11
	eLR (WNW)	03 07 27

Western New Guinea

USCGS 02 13 16.8
2.6 S 138.4 E
Depth: 33 km Dist: 118.2°
Az: 297.3° Mag: 5.7

9 Nov 63	ePP	02 55 24
	eLR (NE)	03 04 00

South of Iceland

USCGS 02 46 44.5
56.8 N 34.6 W
Depth: 33 km Dist: 37.7°
Az: 50.2° Mag: 4.8

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
18 Nov 63	eP (SW)	14 43 29
	ePP	14 44 00
	eSS	14 47 34
	eLR	14 48 30
	Gulf of California	
	USCGS	14 38 28.9
	29.9 N 113.6 W	
	Depth: 14 km Dist: 22.0°	
	Az: 234.0° Mag: 5.6	
19 Nov 63	eSS	08 32 07
	eLR	08 33 08
	Gulf of California	
	USCGS	08 23 11.6
	30.9 N 113.8 W	
	Depth: 14 km Dist: 21.4°	
	Az: 236.1° Mag: 5.0	

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DATE	PHASE	TIME h m s
15 Nov 63	iP (NW)	21 18 16
	ePP	21 21 10
	ePPP	21 22 54
	eS	21 27 52
	ePPS	21 28 36
	eSS	21 32 48
	eLQ	21 38 40
	eLR	21 42 48
	Kurile Islands	
	USCGS	21 06 34.0
	44.3 N 149.0 E	
	Depth: 50 km Dist: 75.4°	
	Az: 319.0° Mag: 6.0	
17 Nov 63	iP (ESE)	00 58 14
	eS	01 06 31
	eSS	01 10 33
	eLQ	01 13 16
	eLR (ESE)	01 16 19
	North Atlantic Ocean	
	USCGS	00 48 02.6
	7.6 N 37.4 W	
	Depth: 33 km Dist: 60.8°	
	Az: 110.0° Mag: 5.9	

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
14 Nov 63	ePP	04 54 49
	eSKS	05 00 56
	ePS	05 04 04
	ePKKS	05 09 41
	eSS	05 10 16
	eSSS	05 14 14
	eLQ	05 20 46
	eLR (W)	05 26 12

New Hebrides Islands

USCGS 04 35 48.5
17.5 S 167.7 E
Depth: 33 km Dist: 108.5°
Az: 263.6° Mag: 4.8

14 Nov 63	iP (S)	09 11 53
	eS	09 17 00
	eSS	09 18 17
	eLR (S)	09 19 52

Off coast of Chiapas Mexico

USCGS 09 05 47.8
15.1 N 93.9 W
Depth: 33 km Dist: 29.7°
Az: 181.4° Mag: 4.9

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
9 Nov 63	iP (SSE)	21 24 22
	iPcP	21 25 20
	iPP	21 26 23
	Western Brazil	
	USCGS	21 15 30.4
	9.0 S 71.5 W	
	Depth: 600 km Dist: 57.1°	
	Az: 154.2° Mag: 5.9	
10 Nov 63	eP (NW)	17 29 26
	iPcP	17 29 30
	ePP	17 32 08
	ePPP	17 34 05
	eS	17 38 57
	ePPS	17 39 33
	eSS	17 43 46
	eLQ	17 49 23
	eLR (NW)	17 54 49
	Kurile Islands	
	USCGS	17 17 42.7
	44.4 N 149.0 E	
	Depth: 40 km Dist: 75.4°	
	Az: 319.1° Mag: 5.5	

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
23 Nov 63	eP	07 55 42
	eLR	07 59 26
	Gulf of California	
	USCGS	07 50 46.3
	30.1 N 11+.0 W	
	Depth: 14 km Dist: 22.1°	
	Az: 235.0° Mag: 5.1	
23 Nov 63	eSS	08 41 40
	eLR	08 42 50
	Gulf of California	
	USCGS	08 32 31
	29.9 N 114.0 W	
	Depth: 14 km Dist: 22.2°	
	Az: 234.7° Mag: 5.3	
26 Nov 63	eSKS	23 14 49
	eS	23 16 00
	ePS	23 17 28
	ePPS	23 18 22
	eSS	23 23 04
	eLR	23 38 16
	Fiji Islands region	
	USCGS	22 50 08.9
	16.6 S 175.2 E	
	Depth: 33 km Dist: 102.7°	
	Az: 259.2° Mag: 5.3	

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
22 Nov 63	eP	14 57 34
	eS	15 07 22
	ePS	15 07 40
	eSS	15 12 08
	eLQ	15 18 12
	eLR	15 20 22
	Kurile Islands	
	USCGS	14 45 51.7
	44.4 N 149.0 E	
	Depth: 33 Dist: 75.4°	
	Az: 319.1° Mag: 5.6	
22 Nov 63	iP	11 19 36
	eL	11 24 08
	eSS	11 25 00
	eLR (S)	11 27 08
	Guerrero, Mexico	
	USCGS	11 14 03.0
	18.5 N 100.3 W	
	Depth: 120 km Dist: 27.0°	
	Az: 195.0° Mag: 4.9	

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Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
2 Dec 63	eP	21 04 26
	eS	21 11 14
	eSS	21 14 38
	eLQ	21 15 37
	eLR	21 17 40
	Svalbard region	
	USCGS	20 55 58.8
	80.1 N 0.6 W	
	Depth: 33 km Dist: 46.6°	
	Az: 13.8° Mag: 5.1	
3 Dec 63	ePS	22 43 08
	ePPS	22 44 04
	eSS	22 49 01
	eLQ	22 59 09
	eLR (W)	23 04 12
	Santa Cruz Islands	
	USCGS	21 15 10.4
	12.2 S 166.0 E	
	Depth: 32 km Dist: 106.1°	
	Az: 268.8° Mag: 5.1	

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DATE	PHASE	TIME h m s
3 Dec 63	iP (SSE)	23 14 56
	iPcP	23 15 09
	ePP	23 17 48
	ePPP	23 19 34
	eS	23 24 06
	ePS	23 24 43
	ePPS	23 25 08
	eSS	23 28 54
	eLQ	23 32 07
	eLR	23 35 22

Northern Chile
USCGS
22.4 S 69.3 W
Depth: 18 km Dist: 70.5°
Az: 156.6° Mag: 6.1

23 03 41.6

4 Dec 63	eS	01 48 18
	ePS	01 48 24
	ePPS	01 49 00
	eSS	01 52 52
	eLQ	01 56 44
	eLR	02 00 38

Kurile Islands
USCGS
46.2 N 153.1 E
Depth: 20 km Dist: 72.1°
Az: 318.1° Mag: 5.2

01 27 34.1

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
4 Dec 63	eP	16 12 05
	eS	16 22 08
	ePS	16 22 36
	eSS	16 27 28
	eLQ	16 33 38
	eLR (S)	16 36 12

Easter Island region

USCGS 15 59 42.1

35.5 S 102.8 W

Depth: 33 Dist: 80.5°

Az: 187.9° Mag: 4.6

11 Dec 63	eSKS	01 11 39
	eS	01 12 07
	ePS	01 13 39
	eSS	01 18 43
	eLR (WSW)	01 31 36

Tonga Islands region

USCGS 00 47 48.3

15.1 S 173.6 W

Depth: 33 km Dist: 93.9°

Az: 252.7° Mag: 5.6

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
11 Dec 63	eS	17 25 22
	eScS	17 27 35
	eLQ	17 31 23
	eLR	17 35 28

Andrea not Islands. Aleutian Islands

USCGS 17 08 12.3
51.2 N 179.3 W
Depth: 32 km Dist: 54.7°
Az: 309.8° Mag: 5.3

15 Dec 63	ePKP	19 52 44
	iPKS	19 56 30
	iPP	19 58 58
	eSKS	20 00 00
	ePPP	20 02 00
	ePPS	20 12 00
	eSS	20 17 20

Java Sea

USCGS 19 34 45.5
4.8 S 108.0E
Depth: 650 km Dist: 136.0°
Az: 328.8° Mag: 6.4

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
18 Dec 63	iP (NW)	00 44 00
	Tonga Islands	
	USCGS	00 30 02.6
	24.8 S 176.6 W	
	Depth: 46 km Dist: 102.7°	
	Az: 247.7° Mag: 6.5	
29 Dec 63	iP (SSE)	17 26 19
	eS	17 35 00
	ePPS	17 35 44
	eLQ	17 43 39
	eLR	17 46 20
	Northern Chile	
	USCGS	17 15 39.2
	18.5 S 69.7 W	
	Depth: 113 km Dist: 66.6°	
	Az: 155.7° Mag: 5.5	

International Seismological Centre

Minneapolis, Minnesota, 1963

DATE	PHASE	TIME h m s
30 Dec 63	iP	13 40 57
	eS	13 50 24
	ePS	13 50 44
	eSS	13 55 18
	eLQ	14 00 09
	eLR (NW)	14 03 10

Kurile Islands

USCGS 13 29 25.3
45.5 N 150.6 E
Depth: 40 km Dist: 73.8°
Az: 318.9° Mag: 5.7

31 Dec 63	eSKS	18 03 16
	ePS	18 07 00
	ePPS	18 08 07
	eSS	18 12 55
	eLQ	18 26 08
	eLR	18 30 33

Sandwich Islands

USCGS 17 37 32.1
56.5 S 26.0 W
Depth: 30 km Dist: 115.6°
Az: 145.5° Mag: 6.3