

SEISMOLOGICAL BULLETIN

1957

INSTITUTE OF SEISMOLOGY
UNIVERSITY OF HELSINKI

Registration
of earthquakes at Helsinki and Sodankylä

By
M. T. Porkka, E. Penttilä
and Lea Laakkonen



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Introduction

Helsinki, the first seismograph station in Finland, was established in 1923. Since that time, most of the interpretations of results have been sent to the ISS. The seismograms were analysed under the supervision of Prof. Henrik Renqvist, the founder and first director of the station. There were no possibilities for publishing the data and therefore the bulletin remained in manuscript form. These manuscripts are stored at the Institute of Seismology. Unfortunately, some of them were destroyed during World War II. On account of lack of assistant personnel analyses of seismograms remained defective during some periods in the latter part of the 1930's.

A second station was established in 1956 for the IGY at Sodankylä, in northern Finland. The station is operating in the Geophysical Observatory of the Finnish Academy of Sciences. The Director of the Observatory, Mr. Eero Kataja, M.A., has been taking care of the seismic observations.

Except the preliminary seismological bulletins, issued in the years 1927 - 1929, from October of 1946 to March 1952 and since the beginning of 1961, this is the first number of the Finnish Seismological Bulletin to be published. It includes the time readings of phases from seismograms of both the above-mentioned stations. The material is uneven. There are breaks in recording because of experimental and construction work and the instrumental constants are only approximately known.

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Most of the analysis work on the distant earthquakes has been done by Mrs. Lea Laakkonen. The near shocks have been interpreted by Mr. E. Penttilä, M. A. Very many near shocks have been recorded at Sodankylä station. Perhaps many of them are not of seismic origin. In this bulletin are included only the near shocks also observed in neighbouring countries.

Stations and seismographs

Helsinki (HEL)

Location: = 60°10'32.3"N
= 24°57'25.2"E
h = 19.9 m

Ground: Migmatite

Sodankylä (SOD)

Location: = 67°22'16.2"N
= 26°37'44.7"E
h = 181 m

Ground: About 20 m gravel overlying the Precambrian metamorphic shists

Approximate instrumental constants:

Seismometer	Period		Damp.		
	Seism.	Galv.	ratio	Max.magn.	Recording
HEL					
Mainka N	10	-	3:1	150	Mechanical on
" E	10	-	3:1	150	smoked paper
Nurmia Z	0.7	1)	3:1	50 000	Photographic
" N	0.5	1)	3:1	35 000	"
" E	0.5	1)	3:1	35 000	"
SOD					
Benioff Z	1	0.2	17:1	70 000	Photographic
Galitzin N ²⁾					"
Nurmia N ³⁾	0.5	1.5	3:1	35 000	"
Nurmia E ³⁾	0.5	1.5	3:1	35 000	"

1) Various short-period galvanometers in trial use

2) January to June

3) From the beginning of July

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January

1 SOD iP 01 05 56
ipP 06 26
iPcP 07 01
Kamchatka

1 SOD iP 03 35 04
ePcP 49
Unimak Island

2 HEL eP 00 50 23
eS 59 21
SOD iP 00 49 31
i 35
iPcP 50 15
ePP 51 34
iScS 59 23
Fox Islands

2 SOD iP 02 25 41
Fox Islands

2 HEL eP 02 28 33
ePPP 32 40
eS 37 32
ePPS 38 03
SOD iP 02 27 45
ePcP 28 30
i 53
iPa 31 02
ePPP 28
iPcS 32 53
ePS 36 16
iScS 37 28
eP'P' 57 19
Fox Islands

2 SOD iP 03 23 00
Fox Islands

2 SOD iP 03 40 42
Fox Islands

2 SOD iP 03 51 17
iPP 53 30
Fox Islands

2 HEL eP 03 59 45
SOD iP 03 58 53
cont.

January

ePPP 04 02 32
iPcS 03 44
ePS 07 16
eScS 08 40
eP'P' 28 33
Fox Islands

2 SOD iP 04 10 47
Fox Islands

2 SOD iP 04 13 38
iPcP 14 23
ePP 15 52
ePPP 17 20
eScS 23 22
Fox Islands

2 SOD iP 10 59 39
i 11 00 03
Fox Islands

2 SOD iP 12 57 15
Fox Islands

2 SOD iP 14 26 41
Fox Islands

2 SOD iP 18 02 05
Fox Islands

3 SOD iP 00 51 10
Fox Islands

3 SOD iP 07 42 35
Greece

3 HEL iP 12 57 38
epP 59 29
iS 13 05 02
eScS 06 21
eSS 09 11
eSSS 12 37
SOD iP 12 57 08
iPcP 58
ipP 59 00
iPP 31
isP 48
cont.

January

ipPcP 13 00 05
iScP 01 01
iS 04 07
iSP 43
iScS 05 50
isS 07 33
iSS 57
iScS 09 42
i(G) 10 56
eP'P' 26 50
Manchuria

3 SOD iP 13 52 11
Manchuria

4 SOD e(P) 12 49 22
i 25
Colombia

4 SOD iP 18 26 59
French Guinea

6 SOD eP 05 25 10
Hokkaido, Japan

6 SOD eP 20 36 16
Philippine Islands

7 SOD iP 02 34 34
Kurile Islands

7 SOD iP 16 57 19
Philippine Islands

8 SOD iP 01 32 55
i 33 01
Sumatra

8 SOD iP 03 47 24
Philippine Islands

8 SOD iP 05 35 03
i 10
Sumatra

8 SOD iP 17 39 46
Fox Islands

January

9 SOD eP 01 48 27
Komandorskie Islands

9 SOD iP 08 03 04
i 38
Fox Islands

9 SOD iP 10 38 36
i 41
Honshu, Japan

13 SOD iP 11 45 31
ePP 47 59
Tadzhik, USSR

13 SOD iP 12 31 10
i 16
Honshu, Japan

14 SOD iSKP 14 40 59
Fiji Islands

17 SOD iP 16 32 40
i 53
Batan Islands

17 SOD iP 22 37 09
Honshu, Japan

22 SOD iP 11 29 51
iPcP 30 02
Belgian Congo

23 SOD iP 17 33 09
W coast of Greece

23 SOD iP 22 10 33
Caucasus, USSR

24 SOD ePKP 01 29 44
New Guinea

24 SOD eP 15 12 00
California

24 SOD iP 16 01 38
Sumatra

24 SOD eP 16 43 07
California

24 SOD iP 17 12 13
California

January

25 SOD iP 03 46 57
iPcP 47 43
iScP 51 40
iP'P' 04 16 20
Andreanof Islands

25 SOD eP 13 21 11

25 SOD eP 23 29 46
NE of Greenland

26 SOD iP 09 10 16
i 29
Philippine Islands

26 SOD iP 16 36 26
i(Pa) 41
iPP 37 04
eLg 44 39
Caucasus

28 SOD iP 05 34 42
Ryukyu Islands

28 SOD eP 23 28 44
Kurile Islands

29 SOD iP 15 23 24
i(Pa) 45
Caucasus

29 SOD iP 15 27 03
i(Pa1) 18
i(Pa2) 24
ePP 44
eLg 35 33
Caucasus

30 SOD iP 12 16 58
Yokon

February

4 SOD iP 10 38 14
Kamchatka

5 SOD iP 05 01 30
ePcP 02 20
Mid-Atlantic Ocean

5 SOD ePKP 16 16 13
Santa Cruz Islands

February

6 SOD iP 20 42 43
iPP 44 20
Lake of Baikal

7 SOD iP 01 46 43
Sumatra

7 SOD eP 16 27 10
Andreanof Islands

7 SOD iP 21 52 39
iPcP 58
Sea of Japan

8 SOD iP 10 06 19

9 SOD eP 02 06 55
New Guinea

9 SOD iP 08 20 06
Caroline Islands

9 SOD iPKP 13 48 37
iPKS 52 24
New Zealand

9 SOD iP 16 49 19
ePcP 44
California

9 SOD eP 17 49 37
California

10 SOD iP 05 56 30
Azores

10 HEL eSKS 22 55 21
SOD iP 22 44 50
i 55
i 45 30
i 50
ePP 48 03
iSKS 55 09
eS 22
Philippine Islands

10 HEL eSKS 23 14 09
SOD iP 23 03 27
i 39
eSKS 13 46
eS 14 00
e 30
Philippine Islands

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February	February	February
11 SOD iP 01 27 16 ePP 30 29 eSKS 37 39 iS 53 i 38 17 Philippine Islands	12 SOD eP 21 19 41 Philippine Islands	18 SOD ePKP 16 21 56 ePP 25 22 Sandwich Islands
11 SOD iP 03 48 50 Philippine Islands	13 SOD iP 00 42 26 ePP 45 39 eSKS 52 34 iS 50 i 53 16 Philippine Islands	19 HEL eP 07 49 05 SOD iP 07 50 17 i 42 iPP 51 11 iPPP 25 iPcP 53 26 iS 55 21 Greece
11 SOD iP 03 57 08 Philippine Islands	13 SOD iP 04 56 05	19 SOD iP 20 08 21 iPcP 09 30 Kamchatka
11 SOD iP 04 16 44 Philippine Islands	13 SOD ePKP 12 55 50 New Hebrides	20 SOD iP 04 47 34 Tunisia
11 SOD iP 07 00 11 Philippine Islands	13 SOD iP 14 51 35 Kurile Islands	20 SOD iP 13 09 09 ipP 30 iPcP 10 11 Kamchatka
11 SOD eP 12 09 51 Philippine Islands	14 SOD iP 12 16 36	20 SOD iP 22 10 38 ePP 13 43 iS 20 39 Sumatra
11 SOD eP 12 33 10 Philippine Islands	14 SOD iP 23 12 44 Formosa	21 SOD iP 01 20 58 Mid-Atlantic Ocean
11 SOD iP 14 38 14 iSKS 48 28 iS 44 e 49 11 Philippine Islands	16 SOD eP 13 49 13	21 SOD iP 14 40 01 ipP 28 isP 42 epPcP 41 16 i(PP) 42 11 ipPP 44 ePPP 43 42 Aleutian Islands
11 SOD iP 15 47 25 iS 51 10 England	16 SOD iP 14 24 45 Java Sea	21 SOD iP 19 55 32 i 42 Kermadec Islands
11 SOD iP 16 36 03 Aleutian Islands	17 SOD eP 03 58 49 Philippine Islands	22 SOD iP 05 04 56 Lake of Issyk-Kul
11 SOD iP 19 09 24 Philippine Islands	17 SOD iP 04 45 29 Kamchatka	
11 SOD iP 19 36 01 Philippine Islands	17 SOD iP 10 03 33 Philippine Islands	
12 SOD eP 09 02 46 Kurile Islands	17 SOD iP 15 59 29 Oaxaca, Mexico	
12 SOD eP 17 26 59 Philippine Islands	18 SOD eP 00 28 33 Kurile Islands	
	18 SOD iP 14 59 37 Mid-Atlantic Ocean	

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February			March			March		
23	SOD iP	03 44 41	2	SOD iP	07 20 16	9	SOD iP	16 42 46
	Kurile Islands			iPP	22 03		Andreanof Islands	
				South of Iran				
23	SOD eP	05 07 39	4	SOD eP	03 36 03	9	SOD iP	16 49 26
	Kurile Islands			Kirghiz			Fox Islands	
23	SOD iP	05 11 18	5	SOD iP	12 33 41	9	SOD iP	16 51 59
	Kurile Islands			N Atlantic Ocean		9	SOD iP	16 55 57
23	SOD eP	13 27 19	6	SOD iP	11 36 39		i	56 09
	Vancouver Island			Kurile Islands		9	SOD iP	17 20 24
23	HEL eP	20 37 42	7	SOD iP	21 59 56		iPcP	21 09
	eS	46 52		Arctic Ocean			Andreanof Islands	
	SOD iP	20 37 22	8	HEL eP	12 18 59	9	SOD iP	18 02 09
	iPP	39 55		eS	22 51		Andreanof Islands	
	iPPP	41 37		eLi	24 56	9	SOD iP	18 04 25
	iPcS	58		eLg ¹	25 59		Aleutian Islands	
	iS	46 26		SOD iP	12 20 15	9	SOD iP	18 07 28
	iPS	50		Greece			i	56
	iPPS	47 04	8	SOD iP	12 27 07		Unimak Island	
	iScS	19		iLi	35 43	9	SOD iP	18 42 51
	eLg ¹	21 02 28		iLg ¹	36 39			
	Formosa			Greece		9	SOD iP	19 23 39
23	SOD i(PKP)	22 56 25	8	SOD eP	20 43 51		Fox Islands	
24	SOD iP	21 58 36	8	SOD iP	23 41 04	9	SOD eP	19 29 24
	i	48		eS	45 53		Aleutian Islands	
	Formosa			Greece		9	SOD iP	19 44 58
26	SOD iP	03 07 14	9	SOD iP	14 15 35		Andreanof Islands	
	i	22		Alaska		9	SOD iP	19 47 41
	epP	39	9	HEL eP	14 33 25		iPcP	48 25
	Philippine Islands			ePS	42 46		Andreanof Islands	
27	SOD iP	15 12 36		SOD iP	14 32 39	9	SOD iP	19 52 20
	i	48		iPS	41 15		Andreanof Islands	
	Formosa			Andreanof Islands		9	SOD iP	20 11 12
28	SOD iP	11 11 54	9	SOD iP	15 52 06		Fox Islands	
	i	12 14		Andreanof Islands		9	SOD iP	20 17 14
	Andreanof Islands		9	SOD iP	16 16 22		Fox Islands	
March				Fox Islands		9	SOD iP	20 32 12
2	SOD iP	00 39 39	9	SOD iP	16 31 54		Fox Islands	
	i	40 15		Andreanof Islands		9	SOD iP	20 38 15
	Jamaica							

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March	March	March
9 SOD iP 20 42 10 Fox Islands	10 SOD iP 02 32 38 Fox Islands	10 SOD iP 12 55 48 Andreanof Islands
9 SOD iP 20 43 20 Andreanof Islands	10 SOD iP 03 05 20 Hokkaido, Japan	10 SOD iP 13 20 24 Andreanof Islands
9 HEL eP 20 50 12 eS 59 03 eSS 21 03 12 SOD iP 20 49 23 eS 57 38 eScS 59 11 eSS 21 01 22 Fox Islands	10 SOD iP 03 16 21 iPcP 17 08 Andreanof Islands	10 SOD iP 13 38 41 Andreanof Islands
9 SOD iP 22 06 30 Fox Islands	10 SOD iP 03 19 10 i 56 Andreanof Islands	10 SOD iP 14 56 02 Aleutian Islands
9 SOD iP 22 47 05 Fox Islands	10 SOD iP 03 37 40	10 SOD iP 15 36 35 iPcP 37 18 ePP 38 54 Andreanof Islands
9 SOD iP 23 09 43 Fox Islands	10 SOD eP 04 04 30 Fox Islands	10 SOD iP 15 58 45 Fox Islands
9 SOD iP 23 19 33 i 20 56 Fox Islands	10 SOD iP 04 47 15 Aleutian Islands	10 SOD iP 16 47 57 iPcP 48 43 Andreanof Islands
9 SOD iP 23 31 02 Andreanof Islands	10 SOD iP 04 51 13 Fox Islands	10 SOD iP 16 49 59 Andreanof Islands
10 SOD iP 00 16 42 Fox Islands	10 SOD iP 06 33 56 Andreanof Islands	10 SOD iP 19 28 44 Andreanof Islands
10 SOD iP 00 36 18 Aleutian Islands	10 SOD iP 07 33 29 Andreanof Islands	10 SOD eP 19 51 08 Andreanof Islands
10 SOD iP 01 10 38 Aleutian Islands	10 SOD iP 07 41 39 iPcP 42 26 Fox Islands	10 SOD iP 20 43 56 ePcP 44 43 Unimak Island
10 SOD iP 01 27 04 Andreanof Islands	10 SOD eP 09 33 51 Andreanof Islands	10 SOD iP 21 07 06 Fox Islands
10 SOD iP 01 32 14 ePcP 33 00 Fox Islands	10 SOD iP 10 00 54	10 SOD iP 21 20 23 Unimak Island
10 SOD eP 01 53 43 Andreanof Islands	10 SOD iP 11 30 57 Fox Islands	10 SOD iP 21 42 38 Andreanof Islands
10 SOD iP 01 56 05	10 SOD eP 11 45 43 Aleutian Island	10 SOD iP 21 46 56 Andreanof Islands
	10 SOD iP 12 22 56 ePcP 23 41 Andreanof Islands	
	10 SOD iP 12 46 21 Fox Islands	

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March

11 SOD iP 00 06 58
i 07 09
iPcP 44
Fox Islands

11 SOD iP 00 18 21
iPcP 19 05
Fox Islands

11 SOD eP 02 01 17
Fox Islands

11 SOD eP 02 55 13
Fox Islands

11 SOD iP 03 22 59
iPcP 23 39
ePcS 27 43
Andreanof Islands

11 SOD iP 03 45 15
Andreanof Islands

11 SOD iP 04 05 39
Andreanof Islands

11 SOD eP 04 15 26
Andreanof Islands

11 SOD iP 05 38 02
Fox Islands

11 SOD iP 06 47 26

11 SOD iP 06 53 02
ePcP 46
Fox Islands

11 SOD iP 07 02 09
Fox Islands

11 SOD iP 07 18 13
Andreanof Islands

11 SOD iP 07 49 15
iPcP 50 01
Andreanof Islands

11 SOD iP 08 38 00
Andreanof Islands

March

11 SOD iP 08 47 24
Fox Islands

11 SOD iP 08 53 12
i 26
Andreanof Islands

11 SOD iP 08 57 44

11 HEL eP 10 09 38
eS 18 26
ePS 49
eScS 19 25
eSS 22 59
SOD iP 10 08 51
ePP 11 08
iPcS 13 39
eS 17 01
eP'P' 38 27
Fox Islands

11 SOD iP 10 29 01

11 SOD iP 12 21 27
i 35
Sumatra

11 HEL eP 15 06 15
ePPP 10 24
eS 15 06
eScS 16 06
eSS 19 17
SOD iP 15 05 28
iPcP 06 13
ePP 07 46
iPcS 10 14
iS 13 40
iP'P' 34 54
Andreanof Islands

11 SOD iP 15 46 04
i 46
iPcP 51
iPcS 50 48
eS 54 14
eP'P' 18 15 26
Andreanof Islands

11 SOD iP 20 06 08
i 19
Fox Islands

March

11 SOD eP 21 27 16
Andreanof Islands

11 SOD eP 21 50 29
Aleutian Islands

11 SOD eP 23 42 32
Andreanof Islands

11 SOD iP 23 52 28
Fox Islands

12 SOD iP 00 01 54
Fox Islands

12 SOD iP 00 28 11
Fox Islands

12 SOD iP 01 12 43
Andreanof Islands

12 SOD iP 01 14 42
Andreanof Islands

12 SOD iP 02 33 04
ePcP 51
Fox Islands

12 SOD iP 04 59 36
Unimak Island

12 SOD iP 05 22 16
Fox Islands

12 SOD iP 07 38 58
iPcP 39 43
iPcS 43 45
Andreanof Islands

12 SOD iP 07 49 27
iPcP 50 13
iP'P' 08 18 48
Andreanof Islands

12 SOD iP 08 13 23
Andreanof Islands

12 SOD iP 10 48 42
iPcP 28
Andreanof Islands

March

12 HEL iP 11 55 49
i 56
eS 12 04 38
SOD iP 11 55 03
i 10
iPP 56 44
iScP 59 56
iS 12 03 20
iP'P' 24 18
i 29
Andreanof Islands

12 SOD iP 12 56 18
iPcP 57 05
iScP 13 01 07
eS 04 33
Fox Islands

12 SOD eP 15 51 01
Fox Islands

12 SOD iP 17 10 34
ePcP 11 18
Andreanof Islands

12 SOD ePKP 17 39 49
iSKP 42 16
Fiji Islands

12 SOD iP 19 26 05

12 SOD iPKP 19 29 37
Fiji Islands

12 SOD iP 20 10 33
i 43
Unimak Island

12 SOD iP 23 55 37
iPcP 56 22
Andreanof Islands

13 SOD iP 02 58 33
Andreanof Islands

13 SOD iP 03 17 27
Fox Islands

13 SOD iP 03 43 08
iScP 47 54
Andreanof Islands

March

13 SOD iP 09 19 43
iPcP 20 29
Fox Islands

13 SOD iPKP 09 30 34
iPKP 31 46
New Zealand

13 SOD iP 15 52 16
iPcP 59
iPP 54 35
iScP 57 00
iS 16 00 27
iP'P' 21 37
Andreanof Islands

13 SOD iP 17 53 58
iPcP 54 42
Andreanof Islands

13 SOD iP 19 06 39
Fox Islands

13 SOD iP 20 09 25
i 10 06
i 13 57
Fox Islands

14 SOD eP 00 37 47
Fox Islands

14 SOD iP 02 02 26
Fox Islands

14 SOD iP 02 57 01
i 13
Unimak Island

14 HEL eP 14 58 41
eS 15 07 26
eScS 08 26
SOD iP 14 57 56
iPP 15 00 17
iPPP 01 54
iScP 02 41
iS 06 07
iPS 25
iP'P' 27 22
Andreanof Islands

14 SOD iP 15 15 18
Andreanof Islands

March

14 SOD eP 16 01 12
iPcP 58
Andreanof Islands

15 SOD iP 03 02 16
iPcP 03 03
i 51
Fox Islands

15 SOD iP 03 08 20

15 SOD iP 04 23 07
iPcP 53
Andreanof Islands

15 SOD iP 12 07 46
Andreanof Islands

15 SOD iP 16 48 07
Fox Islands

16 SOD iP 00 50 44
iPa 51 43
iPcP 53 11
North of Iran

16 SOD eP 02 23 34
Andreanof Islands

16 HEL eP 02 45 00
eS 54 00
SOD iP 02 44 20
iScP 49 13
i 51 39
iS 52 30
iPS 45
iP'P' 03 13 44
Andreanof Islands

16 SOD iP 12 29 52
Hindu Kush

17 SOD eP 01 57 21
Andreanof Islands

17 HEL iP 02 59 38
i 50
SOD eP 02 58 52
i 59 04
Andreanof Islands

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March				March				March			
17	HEL iP	07 15 36		18	HEL iP	05 19 28			i	13 02 20	
	SOD iP	07 14 49			SOD eP	05 18 44			iScP	05 53	
	Fox Islands				i	52			i	06 23	
					Andreanof Islands				iS	09 19	
17	HEL iP	08 04 47		18	SOD iSKP	19 51 23			iScS	10 59	
	i	59			Fiji Islands				iP'P'	30 17	
	SOD iP	08 40 00							Andreanof Islands		
	ePcP	42		18	HEL iP	20 14 43		19	SOD i	13 46 34	
	Andreanof Islands				SOD eP	20 13 55		19	HEL iP	15 58 24	
17	HEL iP	15 22 36			Andreanof Islands				SOD iP	15 57 37	
	SOD iP	15 21 49		18	HEL iP	23 21 18			Fox Islands		
	i	22 00			iS	24 09		19	HEL iP	17 15 20	
	Fox Islands				eLg	26 04			ePcP	54	
17	SOD iP	16 27 27			SOD iP	23 22 36			SOD iP	17 14 35	
	i	30			iS	26 46			i	42	
	i	38			iLg	29 52			Fox Islands		
	i	46			Crimea			20	HEL iP	00 11 49	
	iPcP	28 07		19	HEL iP	03 50 32			ePcP	12 17	
	ePP	29 46			SOD iP	03 49 43			SOD eP	00 11 02	
	Fox Islands				i	56			i	13	
17	SOD iP	18 39 24			ePcP	50 28			Andreanof Islands		
	i	32			Andreanof Islands			20	SOD iP	00 29 11	
	Aleutian Islands			19	HEL iP	08 23 41			ePcP	57	
17	SOD iP	18 43 27			SOD iP	08 22 54			Aleutian Islands		
	Aleutian Islands			19	HEL iP	08 25 05		20	HEL iP	00 33 20	
17	HEL iP	22 55 33			i	33			i	32	
	ePS	23 04 37			SOD iP	08 24 18			iScP	37 46	
	SOD iP	22 54 47			i	27			SOD iP	00 32 31	
	iPcP	35 37			i	25 20			Fox Islands		
	iScP	59 40			Fox Islands			20	HEL iP	00 53 48	
	eP'P'	24 21		19	HEL iP	11 39 48			SOD iP	00 52 59	
	Fox Islands				iPcP	40 16			ePcP	53 47	
18	HEL iP	00 23 09			SOD iP	11 39 02			Fox Islands		
	SOD eP	00 22 23			iPcP	47		20	HEL eP	02 54 06	
	Andreanof Islands				i	40 43			SOD iP	02 53 19	
18	SOD eP	02 34 47			iScP	43 46			Andreanof Islands		
	Fox Islands				Andreanof Islands			20	HEL iP	03 35 59	
18	HEL iP	02 36 22		19	HEL iP	13 01 50			iPcP	36 26	
	iPcP	50			i	56			SOD iP	03 35 12	
	SOD iP	02 35 36			iPcP	02 18			Andreanof Islands		
	ePP	37 49			eS	10 46		20	HEL iP	06 23 16	
	iScP	40 21			SOD iP	13 01 00			iPKKP	41 45	
	Fox Islands				i	33			Philippine Islands		
					iPcP	48					
					cont.						

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March	March	March
20 SOD iP 09 44 25 i 38	23 SOD iP 05 26 14 i 20 ipP 55 i 27 00 isP 12 iPP 30 26 i 43 isPP 31 16 ePPP 32 39 iSKS 36 38 iS 38 32 iSS 44 39 Banda Sea	24 HEL iP 12 12 13 ipP 55 isP 13 17 SOD iP 12 12 31 epP 13 12 iPP 14 05 Hindu Kush
20 HEL iP 11 12 41 SOD iP 11 11 53 i 57 Andreanof Islands	23 SOD iP 13 34 46 Andreanof Islands	24 HEL iP 16 43 27 SOD iP 16 42 39 Fox Islands
20 SOD iP 19 01 27 Andreanof Islands	23 HEL iP 19 27 15 Ionian Islands	25 HEL iP 00 50 23 SOD iP 00 49 35 ePcP 50 21 Fox Islands
21 SOD iP 08 57 35 i 48 Mexico	24 HEL eP 02 14 48 SOD iP 02 13 43	25 HEL iP 01 14 54 Andreanof Islands
21 SOD iP 12 41 41 i 56 iPcP 42 25 Fox Islands	24 HEL iP 04 47 15 iPcP 46 SOD iP 04 46 27 iPcP 47 17 Rat Islands	26 SOD iP 02 20 18 Fox Islands
21 SOD iP 14 22 19	24 HEL iP 07 40 15 SOD eP 07 39 31 Andreanof Islands	26 SOD iP 03 15 11 Fox Islands
21 SOD eP 17 49 23 i 42 Andreanof Islands	24 HEL iP 08 33 19 i 23 iPcP 47 SOD iP 08 32 36 i 39 Vancouver	26 SOD iP 04 57 22 Iran
22 HEL eP 14 31 56 ePPP 36 01 e 40 00 eS 35 eScS 41 34 SOD iP 14 31 09 ePP 33 14 iS 39 12 iPS 32 iSS 43 00 eP'P' 15 00 44 Fox Islands	24 HEL eP 11 17 07 SOD iP 11 16 20 i 30 Fox Islands	27 SOD iP 04 24 04 Fox Islands
22 HEL iP 14 43 13 iPcP 44 03 Fox Islands	24 HEL iP 11 47 45 ePcP 48 13 SOD iP 11 46 58 Fox Islands	27 SOD iP 16 56 45 i 57 ePcP 57 30 Unimak Islands
22 SOD iP 17 19 59 i 20 19 iPcP 46 Fox Islands		28 SOD iP 13 01 45 Unimak Islands
22 SOD iP 19 55 50 California		28 HEL eP 20 19 20 ePcP 47 SOD eP 20 18 36 Fox Islands
		28 HEL iP 22 30 45 SOD iP 22 31 59 Greece

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March

29 HEL iP 05 21 21
SOD iP 05 20 32
i 43
iPcP 21 20
i 29
i 22 07
ePP 48
iScP 25 26
eP'P' 50 09
Fox Islands

29 HEL iP 05 51 47
SOD iP 05 51 17
Talaud Islands

29 SOD iP 22 59 59
Fox Islands

30 SOD iP 00 52 49
Andreanof Islands

30 SOD eP 02 00 45
Andreanof Islands

30 SOD iP 09 27 10
i 22
Andreanof Islands

31 HEL iP 21 38 09

April

1 HEL iP 07 43 15
Philippine Islands

1 HEL eP 08 07 26
Molucca Passage

1 SOD ePn 09 33 37
eSb 35 11
eSg 30

1 HEL iP 11 46 35
i 44
ePcP 47 07
SOD iP 11 45 47
i 46 01
Andreanof Islands

April

2 HEL iP 00 50 44
i 57
iPcP 51 11
SOD iP 00 49 57
i 50 11
Andreanof Islands
2 HEL iP 08 43 55
iPcP 44 07
SOD iP 08 43 32
Honshu, Japan

2 HEL iP 09 02 27
iPcP 40
SOD iP 09 02 01
Honshu, Japan

2 SOD iP 12 01 59
Andreanof Islands

2 HEL iP 20 27 59
SOD iP 20 27 12
ePcP 58
Andreanof Islands

2 HEL eP 20 50 06
i 19
iPcP 33
SOD iP 20 49 20
Andreanof Islands

2 HEL iP 21 38 59
SOD iP 21 38 11
i 25
Andreanof Islands

3 HEL iP 00 41 25
Near S coast of Iran

3 HEL iP 17 00 42
Aleutian Islands

3 HEL iP 20 34 19
iPP 31
W coast of Cyprus

3 HEL eP 23 20 12
iPcP 41
Aleutian Islands

April

4 HEL iP 00 23 15
iPcP 24 43
iScP 27 50
eS 31 24
iP'P' 52 25
SOD iP 00 22 28
iPcP 23 31
eScP 27 22
Alaska Peninsula

4 HEL iP 01 01 43
i 52
SOD iP 01 00 55
Fox Islands

4 HEL iP 01 40 41
i 52
SOD iP 01 39 54
Fox Islands

4 HEL iPKP 11 19 28
i 55
SOD iPKP 11 19 34
Argentina

4 HEL iP 11 43 35
SOD eP 11 43 56
Hindu Kush

4 HEL iP 12 36 45
SOD eP 12 37 43
W coast of Greece

4 HEL iP 14 54 41
iPcP 55 10
SOD iP 14 53 54
i 04
i 28
ePcP 40
Fox Islands

4 HEL iP 16 16 22
iPP 36
iPPP 52
SOD eP 16 17 37
Northern Iran

April

5 HEL iP 03 00 36
iPcP 01 06
SOD iP 02 59 50
iPcP 03 00 37
Fox Islands

5 SOD iPKP 07 49 38
ipPKP 50 05
ePP 52 20
iSKP 53 04
ipSKP 48
Kermadec Islands

5 SOD iP 16 46 29
iPcP 47 14
Andreanof Islands

5 HEL iP 23 27 10
SOD iP 23 26 54
Formosa

7 SOD iP 08 13 52
Fox Islands

7 SOD eP 10 27 48
i 56
New Guinea

7 SOD eSg 14 51 44

7 SOD iP 22 48 55
Fox Islands

9 HEL iP 00 35 35
ipP 37 19
iS 44 31
SOD iP 00 35 08
i 13
iPcP 28
ipP 36 51
isP 37 48
iS 43 43
iScS 44 23
Honshu, Japan

9 HEL iP 02 29 36
SOD iP 02 29 15
iPcP 34
Mariana Islands

April

9 HEL eP 10 10 23
Andreanof Islands

9 HEL eP 10 46 22
SOD iP 10 45 57
S of Honshu, Japan

9 HEL eP 11 13 09
SOD iP 11 12 27
iPcP 13 12
Andreanof Islands

9 HEL iP 20 34 51
i 35 05
ePcP 19
SOD iP 20 34 04
i(pP) 15
i 21
Fox Islands

10 HEL iP 03 36 11
i 23
iPcP 41
SOD iP 03 35 25
i 35
iPcP 36 13
iScP 40 11
iP'P' 04 04 57
Fox Islands

10 HEL eP 05 25 15
SOD iP 05 24 58
iPP 28 28
eSKS 35 28
Oaxaca, Mexico

10 HEL iP 09 20 22
ipP 33
iPcP 50
SOD iP 09 19 36
ipP 47
i 20 03
ePcP 19
Andreanof Islands

10 HEL iP 11 40 34
iS 49 17
iScS 50 30
SOD iP 11 39 44
cont.

April

iS 11 47 40
iPS 57
iScS 49 23
eP'P' 12 09 09
Kodiak Islands

10 HEL iP 12 13 03
SOD iP 12 12 14
Aleutian Islands

10 HEL iP 13 05 43
i 49
SOD eP 13 04 55
Kodiak Islands region

10 HEL iP 13 31 11
Andreanof Islands

10 HEL eSb 20 05 46
SOD iPn 20 04 47
eSn 05 30
iSg 54

11 HEL eSg 08 07 33
SOD eSg 08 07 36

11 HEL iP 17 51 34
i 46
iPcP 52 07
SOD eP 17 50 51
Fox Islands

12 HEL iP 04 28 41
i 49
iPcP 29 07
Andreanof Islands

12 HEL iP 21 09 49
ePcP 10 17
Aleutian Islands

13 HEL iP 05 24 28
SOD iP 05 23 42
Fox Islands

13 HEL iP 06 43 11
i 28
SOD iP 06 43 02
i 15
eS 53 26
Mindanao

1957

April

13 HEL iP 08 10 17
i 30
SOD iP 08 09 29
Fox Islands

13 HEL iP 10 23 53
i 24 06
SOD iP 10 23 43
epP 24 14
isP 21
esS 34 54
S coast of Mindanao

13 SOD iP 16 28 05
Hokkaido, Japan

14 HEL iP 07 20 41
iS 27 45
SOD iP 07 20 49
iPcP 22 11
iPP 46
iPPP 23 35
iScP 26 05
iS 28 00
eLg 39 03
Southern Tibet

14 HEL iP 08 36 47
SOD iP 08 36 38
Windward Passage

14 HEL iP 16 45 40
i 43
SOD iP 16 45 47
ePcP 46 09
Southern Tibet

14 HEL iPKP 19 37 05
iPKP 16
iPP 39 38
iSKP 40 44
iSKSP 49 38
ePPP 53 14
SOD iPKP 19 37 04
iPP 38 59
ePKS 40 27
eSKS 44 08
i 50 14
eSS 55 50
Samoa Islands

April

14 HEL iP 21 10 03
i(pP) 13
i(sP) 20
iPcP 32
iS 19 02
eP'P' 38 14
SOD iP 21 09 17
i(pP) 27
iPcP 10 01
ePP 11 33
iS 17 35
eP'P' 38 26

Andreanof Islands

15 HEL iP 10 49 31
i 40
i 46
iPcP 50 04
SOD iP 10 48 47
i 55
ePcP 49 30

Andreanof Islands

15 HEL iP 18 23 27
SOD iP 18 22 41
Andreanof Islands

15 HEL iP 21 44 05
i 15
iPcP 36
iS 53 00
SOD iP 21 43 18
i 21
ePcP 44 02
ePP 45 36
eS 51 31
eScS 52 07
iP'P' 22 12 41

Fox Islands

16 HEL iP 04 16 06
ipP 18 11
iSKS 25 38
iS 26 07
iSS 32 19
i 33 31
SOD iP 04 16 09
ipP 18 14
isP 19 10

cont.

April

iPP 04 19 52
ipPP 21 43
iPPP 59
iSKS 25 42
iS 26 10
iSP 27 28
iSPP 28 24
isSKS 29 42
isS 51
isSP 31 04
eSS 32 20

Java Sea

16 SOD eP 08 50 26

17 HEL iP 02 26 47
Italy

17 HEL iP 04 46 24
SOD iP 04 45 36
Kodiak Island

17 HEL ePKP 08 26 55
i 27 07
Tonga Islands

17 HEL iP 08 44 50
Italy

17 HEL iP 09 38 50
iPcP 39 19
Fox Islands

17 HEL iP 13 35 54
i 36 09
iPcP 30
SOD eP 13 35 08
Fox Islands

17 HEL iP 15 18 15
SOD iP 15 17 27
S of Unimak Island

17 HEL iP 19 08 14
Hokkaido, Japan

17 HEL iP 21 18 03
i 20 03
i 22 51

April	April	April
18 HEL iP 00 27 13 i 27 SOD iP 00 26 28 Fox Islands	21 HEL iP 21 25 14 iPP 28 44 eSKS 35 53 iS 58 SOD iP 21 25 12 iPP 28 45 iSKS 35 39 Columbia- Venezuela	iLg2 02 38 44 SOD iP 02 31 56 i 32 16 iPPP 33 10 i 36 24 i 44 iSS 38 42 E of Rhodes Island
18 HEL iP 05 30 13 Turkey		
18 HEL iP 05 42 24 i 42	21 HEL eP 23 28 54 Andreanof Islands	25 HEL iP 04 42 14 i 39 E of Rhodes Island
18 HEL eP 07 11 17 Andreanof Islands	22 HEL iP 00 27 04 SOD iP 00 27 12 Tibet	25 HEL iP 07 05 49
18 SOD iP 22 24 28 i 34 S of Honshu, Japan	22 HEL iP 00 49 24 Crete	25 HEL iP 05 30 36 E of Rhodes Island
19 SOD iP 07 14 52 Unimak Island	22 HEL iP 01 50 09 SOD iP 01 51 13	25 HEL iP 07 17 40 iPcP 19 22 iPP 27 SOD iP 07 17 24 iPP 19 00 iPcP 09 Mongolia
19 HEL iP 15 55 56 i 56 04 iPcP 25 iS 16 04 58 iP'P' 24 09 SOD iP 15 55 09 iS 16 03 26 iPS 41 Fox Islands	22 HEL iP 05 38 15 Tibet	25 HEL iP 07 26 12 iPcP 40 SOD iP 07 25 26 iPcP 26 14 eScP 30 16 Andreanof Islands
19 HEL iP 22 30 28 i 40 iPcP 56 iS 39 23 eScS 40 18 eSS 43 52 iP'P' 58 44 SOD iP 22 29 39 iPP 31 58 iS 38 51 eScS 40 33 iP'P' 58 56 Fox Islands	22 SOD iP 13 55 59 Colombia-Venezuela	25 HEL iP 07 57 20 SOD eP 07 58 27 Rhodes Island
20 HEL iP 02 09 44 SOD iP 02 09 02	24 HEL iP 02 12 41 SOD iP 02 12 46 Sumatra	25 HEL iP 11 19 26 i 30 SOD iP 11 19 16 ePP 23 05 Molucca Passage
20 SOD iP 18 04 33 Fox Islands	24 HEL iP 19 15 23 iS 19 39 SOD iP 19 16 28 i 50 iPP 17 23 iPPP 39 eS 21 29 i 22 33 East Rhodes Island	25 HEL iP 14 18 04 iPcP 53 SOD iP 14 17 11 i 35 ePcP 18 22 Alaska
	25 HEL iP 02 30 52 iS 35 02 iLg1 38 16 cont.	25 SOD iP 15 48 28

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April	April	April
25 HEL iP 17 56 07 iPcP 36 SOD iP 17 55 22 ePcP 56 06 Andreanof Islands	28 HEL iP 01 36 42 eS 47 28 SOD iP 01 36 30 Philippine Islands	30 SOD eP 15 29 47 Aleutian Islands
26 HEL iP 02 18 50 iP 19 30 isP 52 i(PP) 20 08 SOD iP 02 19 08 epP 48 i(PP) 20 38 iPcP 21 16 Hindu Kush	28 HEL iP 19 07 02 SOD iP 19 07 10 Sumatra	May 1 HEL iP 00 52 18 i 23 ePP 53 46 SOD iP 00 52 22 iLg2 01 05 16 Kirghiz-China border
26 HEL iP 02 42 12	28 HEL iP 23 50 14 i 25 SOD iP 23 49 17 Fox Islands	1 HEL iP 20 08 37 SOD iP 20 08 53 Sinkiang Province
26 HEL iP 06 38 50 eS 43 10 SOD eP 06 39 54 i 40 09 iPP 56 iSP 46 39 iLi 48 11 iLg1 49 34	29 HEL iP 04 41 03 SOD iP 04 40 12 iP 33 isP 42 iPcP 56 Fox Islands	1 HEL iP 23 39 04 iPcP 33 iPP 41 32 SOD iP 23 38 17 ePcP 39 03 Fox Islands
26 SOD iP 10 32 37 Alaska	29 HEL iP 04 48 10 SOD iP 04 47 22 Fox Islands	2 HEL iP 02 33 07 iPcP 36 SOD iP 02 32 19 iPcP 33 08 Fox Islands
26 HEL iP 15 19 08 iPcP 39 SOD iP 15 18 30 isP 58 Kurile Islands	29 HEL iP 04 55 31 SOD iP 04 54 42 Fox Islands	2 HEL iP 04 02 30 SOD iP 04 01 43 iS 06 38 Baffin Bay
26 HEL iP 16 14 20 Rhodes Island	29 SOD iP 09 32 25 Kurile Islands	2 HEL ePKP2 10 55 16 South Pacific Ocean
27 HEL eP 00 23 12 SOD eP 00 23 14 Celebes	29 HEL iP 19 35 28 SOD iP 19 35 15 Philippine Islands	2 HEL iP 11 40 10 ePcP 39 SOD iP 11 39 21 ePcP 40 06 Fox Islands
27 HEL iP 02 50 18 iP 30 iPcP 46 SOD iP 02 49 32 iP 42 Fox Islands	29 SOD iP 21 09 18 SOD iP 21 09 20 Off S coast of Java	2 HEL iP 11 49 50 SOD iP 11 49 02 iPcP 49 Fox Islands
	30 HEL iP 03 45 36 i 47 Philippine Islands	
	30 SOD i(P) 04 00 50	

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1957

May

2 HEL iP 21 49 08
iPP 53 16
iSKS 58 49
i 59 22
iSP 22 01 16
SOD iP 21 49 03
ipP 51 12
isP 52 16
i 30
iPP 53 04
Flores Sea

3 HEL iP 05 51 03
Kamchatka

3 HEL iP 07 21 19
SOD iP 07 20 34
ePcP 21 21
Andreanof Islands

3 HEL iP 14 55 37
Philippine Islands

3 HEL iP 16 25 59
iPcP 26 28
Andreanof Islands

4 HEL iP 15 01 16
i 20
SOD iP 15 01 09
i 13
Chinghai Province

5 HEL iP 19 32 22
Iran

6 HEL iP 11 30 45
Andreanof Islands

6 SOD iP 15 13 36
i 14 39
Iran

6 HEL iP 21 54 19
i 30
SOD iP 21 54 06
i 18
Philippine Islands

6 HEL iP 22 55 03
i 37
SOD iP 22 54 46
i 55 22

May

7 HEL eP 05 47 29
SOD iP 05 46 42
Andreanof Islands

7 HEL eP 09 20 56
SOD iP 09 20 07
i 21
Fox Islands

7 HEL iP 22 30 56
SOD iP 22 30 28
S of Honshu, Japan

9 HEL eP 08 51 28
Turkestan, USSR

10 HEL iPKP 16 43 24
Kermadec Islands

11 HEL eP 00 42 52
Greece

11 HEL eP 07 41 18
Andreanof Islands

11 HEL iP 15 06 52
i 07 05
SOD iP 15 06 06
Kamchatka

11 SOD iP 18 54 13
Honshu, Japan

11 SOD iP 19 55 39
Mongolia

12 SOD eP 02 05 29
Greece

12 SOD iPKP 05 07 01
iPP 09 32
iPKS 10 42
Sandwich Islands

12 SOD iP 06 57 27
i 32
ePcP 58 46
Northern Sakhalin

12 SOD eP 07 58 26
Greece

May

12 SOD iP 11 42 28
ePP 46 11
eSKS 53 04
iS 32
ePS 55 04
S coast of Java

12 HEL iP 22 17 51
i 55
i 18 08

12 HEL iPKP 23 48 52
Samoa Islands

13 HEL iP 02 30 44
iPcP 31 21
i(pP) 46
SOD iP 02 30 11
iPcP 31 02
Siberia

13 HEL iP 04 39 07
iPP 44
E of Rhodes Island

13 HEL iP 06 39 18
Greece

13 HEL iP 13 29 44
SOD iP 13 29 33
Philippine Islands

14 HEL iP 03 10 10
Honshu, Japan

14 HEL iP 18 54 57
Andreanof Islands

15 HEL iP 01 27 24
i 47
iPP 28 56
SOD iP 01 27 45
iPP 29 21
Northern Afghanistan

15 HEL iP 01 54 03
iPcP 30
Andreanof Islands

15 HEL iP 02 23 48
SOD iP 02 23 33
Chiapas, Mexico

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May	May	May
17 HEL iPKP 03 01 13 Fiji Islands	20 HEL iP 20 02 37 SOD iP 20 03 42 N coast of Sicily	SOD iP 13 40 02 i 41 18 iPP 42 30 ePPP 44 54 iS 48 29 ePS 38 eScS 49 52 iP'P' 14 09 21 Andreanof Islands
17 HEL iP 06 06 31 SOD iP 06 05 43 Fox Islands	21 HEL iP 01 24 25 ipP 51 i(sp) 25 07 iPP 27 46 i 29 23 eSKS 34 34 iS 39 isS 35 23 iSP 37 iPS 49 SOD iP 01 24 02 ipP 26 iPP 27 14 iS 33 53 iScS 34 02 iSKS 09 isS 37	24 HEL iP 02 50 56 i(pP) 51 15 iPP 54 40 iSKS 03 01 22 Colombia
17 HEL iP 23 13 47		24 HEL iP 03 08 24
18 HEL iP 05 35 06 i 20 iPcP 34 SOD iP 05 34 20 i 49 iPcP 35 06 Fox Islands		24 HEL iP 03 47 26 iPcP 54 Fox Islands
19 HEL iP 03 25 33 SOD iP 03 26 33 Greece		25 HEL iP 00 41 04 i 14 SOD iP 00 40 16 Kamchatka
19 HEL iP 13 48 02 Greece	21 HEL iP 09 26 13 Aleutian Islands	26 SOD iP 04 27 05 Fox Islands
19 HEL iP 20 56 39 iPcP 53 i 57 06 SOD iP 20 56 21 i 47 iPP 53 53 Ryukyu Islands	21 HEL iP 11 47 22 iPcP 45 SOD iP 11 46 50 i 47 01 ePP 49 21 Honshu, Japan	26 HEL iP 06 38 02 i 16 iPPP 33 iS 41 27 iLi 43 24 iLg1 44 02 SOD iP 06 39 15 i 46 iS 43 52 Turkey
19 HEL iP 21 05 22 iPcP 52 SOD iP 21 04 34 ePcP 05 22 Aleutian Islands	21 HEL iP 11 49 08 SOD iP 11 50 13 eLg1 12 00 32 N coast of Sicily	26 HEL iP 08 59 18 eS 09 02 48 SOD iP 09 00 28 eS 05 10 iLg1 08 31 Turkey
19 SOD eP 22 10 06 Iran	21 HEL iP 13 29 02 SOD iP 13 30 13 e 35 11 iLg1 39 27 iLg2 59 E coast of Greece	
20 HEL iP 02 01 49 iPcP 02 18 i 27 Andreanof Islands	21 SOD iP 15 11 53 Unimak Island	
20 HEL iP 03 53 17 iPcP 46 Fox Islands	22 HEL iP 13 40 49 iPcP 41 22 cont.	26 HEL eP 09 18 14 SOD iP 09 19 26 Turkey

May				May				May			
26	SOD iP	09 22 17		28	HEL iPKP	23 38 16			iPP	02 35 11	
	i	34			ipPKP	39 26			ipPKP	36 09	
	Turkey				iSKP	41 10			Argentina		
26	HEL iP	09 41 06			SOD iPKP	23 38 03					
	iSr2	44 30			New Hebrides Islands	31		31	HEL iP	03 21 09	
	SOD iP	09 42 17		28	HEL iP	23 57 48			iPcP	42	
	iS	46 56			iPcP	58 08			SOD iP	03 20 20	
	i	47 20			SOD iP	23 57 33			i	30	
	iPcS	49 22			iPcP	49			ePcP	21 01	
	iLi	50 17			Formosa				Unimak Island		
	Turkey			29	HEL iP	08 52 21					
26	SOD i(P)	11 10 15			iSr1	11 59			HEL iP	22 28 07	
27	HEL iP	06 24 57			SOD iP	08 53 55			iPcP	35	
	SOD iP	06 26 09			Turkey				SOD iP	22 27 20	
	Turkey			29	HEL iP	10 08 21			ePcP	28 09	
27	HEL iP	07 09 37			Iran				eScP	32 06	
	iS	13 07		29	HEL iP	10 22 14		June	iP'P'	56 40	
	SOD iP	07 10 50			iS	25 47		1	HEL iP	05 31 24	
	Turkey				SOD iP	10 23 27			iS	34 57	
27	HEL iP	08 28 45		29	HEL iP	16 23 15			SOD iP	05 32 38	
	Turkey				Turkey				Turkey		
27	HEL iP	11 06 05		29	HEL iP	18 44 15		1	HEL iP	16 14 04	
	iS	09 28			i	24			iPcP	48	
	SOD iP	11 07 09			eS	48 16			SOD iP	16 13 13	
	i(S)	11 59			SOD iP	18 45 22			i	27	
	eLg1	16 07			i(Pa)	46 13			Alaska		
	Turkey				Greece			1	HEL iP	21 12 47	
27	SOD iP	20 08 07		30	HEL iP	13 12 30			iS	16 19	
	Fox Islands				SOD eP	13 30 40			SOD iP	21 13 57	
28	HEL eP	00 14 21			Turkey				iPP	14 56	
	SOD iP	00 15 31		30	SOD eP	14 35 46			Turkey		
	Turkey				Turkey			1	HEL iP	22 41 18	
28	SOD iP	01 29 34		30	HEL iP	20 00 20			SOD eP	22 41 18	
	i	46			SOD iP	19 59 45		2	HEL iP	01 16 30	
	Fox Islands				Hokkaido, Japan				iSr2	19 57	
28	HEL eP	05 38 17		30	HEL iPKP	21 16 31			iSr1	20 02	
	SOD iP	05 39 26			iSKP	19 20			iPcP	36	
	Turkey				SOD iSKP	21 19 07			SOD iP	01 17 41	
					Fiji Islands				eLi	25 42	
28	HEL eP	06 01 29		31	HEL ePKP	02 34 00		2	HEL iP	21 32 10	
	SOD iP	06 01 26			i	36 14			ePcP	50	
	i	49			SOD iPKP	02 34 06			SOD iP	21 31 23	
	iPcP	02 13							i	35	
	Pakistan-Burma border						cont.		Kamchatka		

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June	June	June
3 HEL iP 00 59 18	6 SOD iP 05 48 37	ipP 03 26 23
4 HEL iP 00 51 31	i 54	i 33
iPcP 52 02	Fox Islands	Mariana Islands
SOD iP 00 50 44	6 HEL iP 20 03 01	10 SOD iP 04 54 29
Unimak Island	i 10	Balutchistan
4 HEL iPKP 11 33 48	SOD iP 20 02 53	
Santa Cruz Islands	i 03 05	11 HEL iP 04 15 22
4 HEL iPKP 17 23 13	iPP 06 31	i(pP) 35
iSKP 26 02	eS 13 42	iPcP 53
SOD iPKP 17 23 11	Molucca Passage	SOD iP 04 14 34
iSKP 25 39	7 HEL eP 00 10 26	i(pP) 48
Fiji Islands	i 44	i 15 06
4 HEL iP 20 30 46	SOD iP 00 10 34	Unimak Island
i 56	eLg1 22 35	
iPP 34 06	China	11 HEL iP 05 04 21
SOD iP 20 30 50	7 HEL iP 01 38 42	i 53
i 31 09	SOD iP 01 38 20	SOD iP 05 04 40
Sumatra	Mariana Islands	ePP 06 20
5 HEL iP 06 40 53	7 HEL iP 02 58 05	e 42
i 41 13	SOD iP 02 56 52	eS 10 29
SOD iP 06 42 06	Andreanof Islands	eSS 13 25
Caucasus	8 HEL iP 16 50 46	Hindu Kush
5 HEL iP 07 23 02	SOD eP 16 51 29	11 SOD iPKP 15 09 01
SOD iP 07 22 48	Caspian Sea	i 11
i 56	9 HEL eP 04 17 30	iSKP 12 34
eS 28 13	SOD eP 04 17 04	ePKS 45
North Atlantic Ocean	i 15	Kermadec Islands
5 HEL iP 08 36 45	Honshu, Japan	11 SOD iP 19 01 07
Southern Alaska	9 SOD iP 21 01 32	iPcP 21
5 HEL iP 14 08 07	i 41	iS 10 41
i 21	Fox Islands	i(SKS) 56
SOD iP 14 07 21	10 HEL iP 01 13 39	iPS 11 17
i 34	i 15 08	Philippine Islands
E coast of Kamchatka	ePP 17 48	
5 SOD iPn 21 13 04	iSKS 24 06	12 SOD iP 00 04 06
iPg 20	SOD iP 01 13 37	iPcP 52
iSb 14 21	iPP 17 38	iScP 08 55
6 HEL iP 03 41 16	iSKS 24 03	Andreanof Islands
iPcP 44	Sumbava Island	12 SOD iP 00 09 20
SOD iP 03 40 30	10 HEL iP 03 26 08	ePcP 10 53
i 57	ipP 42	Andreanof Islands
iPcP 41 15	SOD iP 03 25 49	12 SOD iP 08 38 50
Andreanof Islands	i 59	i 39 17
	cont.	Hokkaido, Japan

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June	June	June
13 HEL eP 10 51 29 eS 11 00 29 SOD iP 10 50 52 iPcP 51 36 iScP 55 40 i(PcS) 51 iS 59 00 eScS 11 11 39 iP'P' 20 17 Andreanof Islands	SOD iP 02 23 21 iPcP 40 i 24 04 Burma	iSP 06 32 18 iSKS 42 06 iS 27 Chiapas, Mexico
13 SOD iP 20 34 09 ipP 49 i(sP) 35 03 Sumatra	18 HEL iP 11 30 47 epP 31 08 i 33 20 iPP 39 SOD iP 11 30 34 Philippine Islands	22 HEL iP 09 02 14 iS 03 55 SOD iP 09 01 05 Off coast of Norway
13 SOD iP 21 40 30 Northern Celebes	18 HEL iP 14 59 23 i 44 iPcP 50 SOD iP 14 59 27 i 43 iPcP 52 iS 15 08 37 Burma	23 HEL iP 00 04 24 iPP 08 38 eSKS 15 00 eS 15 59 ePPS 18 36 eSS 23 14 SOD iP 00 04 07 ePP 08 10 iS 15 34 e 22 02 N coast of New Guinea
14 SOD eP 06 34 29 i 46 Andreanof Islands	18 SOD eP 21 33 26 Rat Islands	23 HEL iP 03 37 19 i 36 iPP 39 38 SOD iP 03 36 30 i 37 21 Coast of SE Alaska
14 HEL iP 11 44 28 i(PP) 46 12 iPcP 38 Southern Afghanistan	19 HEL iPKP 01 49 14 iPKS 53 09 SOD ePKP 01 49 08 Tonga Islands	23 SOD eP 20 28 33 Iran
15 SOD iP 18 28 29 iPcP 29 15 Fox Islands	19 HEL iP 23 42 26 i 38 iPcP 53 Alaska	25 SOD iP 10 22 43 i 51 Andaman Islands
15 SOD iP 20 14 10 ipP 21 E coast of Honshu	20 HEL iP 00 44 35 Philippine Islands	25 SOD iP 16 16 19 W coast of Sumatra
16 SOD iP 00 20 00 i 39	20 HEL iP 01 19 14 ipP 45 Mariana Islands	26 HEL eP 02 59 57 SOD iP 03 00 15 i 32 Indian Ocean
16 SOD iP 02 27 31 Fox Islands	22 HEL iP 06 32 07 ipP 27 i 52 ePP 35 43 eSKS 42 29 iS 55 SOD iP 06 31 49 ipP 32 09 cont.	27 HEL iP 00 17 43 iPP 19 33 iScP 23 13 cont.
16 SOD iP 12 16 18		
18 HEL iP 02 23 16 i 22 iPcP 35 iPP 25 23 iSZ 32 29 cont.		

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June

iS 00 24 30
eSS 27 26
iSS 35
i(Sa) 28 05
iLi 31 19
iLg1 33 10
iLg2 34 10
SOD iP 00 17 05
iPP 18 41
iS 23 12
Lake Baikal, USSR

27 HEL iP 01 47 36
SOD iP 01 46 59

27 HEL eP 04 16 10
SOD iP 04 16 00
Philippine Islands

27 HEL iP 07 15 43
iPP 16 02
Greece

28 HEL iP 18 00 25
Philippine Islands

29 SOD iP 22 41 30
ePP 43 09
Lake Baikal

29 SOD iP 23 40 52

29 SOD iP 23 53 36
SE coast of Spain

30 SOD iP 03 06 31
Northern Iran

July

1 SOD ePKP 02 41 36
iSKP 45 02
Tonga Islands

1 SOD iP 06 36 43
i 37 08

1 SOD eP 13 16 50
i 58
Mid-Atlantic Ridge

July

1 SOD iP 13 29 50
Mid-Atlantic Ridge

1 SOD iP 16 26 41
Kamchatka

1 HEL iP 19 40 15
eS 48 09
i 49 15
SOD iP 19 40 17
iS 48 18
iPS 44
isS 49 02
India-Burma border

1 SOD iP 23 52 40
iPcP 53 21
Kamchatka

2 HEL iP 00 48 33
iS 53 30
SOD iP 00 49 14
iL 01 01 54
Northern Iran

2 HEL iP 01 23 01
SOD eP 01 23 43
Iran

2 SOD eP 05 02 59
Iran

2 SOD iP 05 16 09
i 15
Iran

2 SOD iP 07 43 26
Indian Ocean

2 SOD iP 14 29 32
i 30 37
Iran

2 SOD iP 15 08 49

2 SOD eP 22 37 43
Fox Islands

3 SOD iP 01 57 19
i 33
Kamchatka

July

3 SOD ePKP 06 20 42
i 54
iSKP 23 35

Fiji Islands

3 SOD iP 12 34 54
i 56
iS 43 12
eP'P' 13 04 07
Andreanof Islands

3 SOD iP 15 21 48
Andreanof Islands

3 SOD iP 17 14 27
Fox Islands

3 SOD eP 21 46 41

4 HEL iP 02 56 22
SOD iP 02 56 14
USSR

4 HEL iP 08 41 39
i 45
i 51
iPP 42 07
iPP 45 05
Sumatra

4 HEL iP 08 53 44
Kamchatka

4 HEL iP 19 32 18
Mariana Islands

5 HEL iP 01 10 15
Arizona-Mexico border

5 HEL iP 12 26 13
Andreanof Islands

5 HEL iPKP 12 53 31
Kermadec Islands

5 HEL iP 15 42 27
i 31
iPcP 54
Congo

7 HEL iP 06 03 58
SOD iP 06 04 53
eS 09 48
Turkey

July	July	July
7 SOD iP 06 27 43 Kamchatka	10 SOD eP 04 02 41	14 HEL iPKP 06 43 11 iSKP 46 34 SOD ePKP 06 42 36 i 43 i 58 iPP 45 43 iSKP 46 14 Kermadec Islands
7 HEL iPKP 16 29 58 SOD iPKP 16 29 39 iPKKP 40 39 Solomon Islands	10 SOD iP 04 52 38 i 53 11 Fox Islands	14 HEL iPKP 08 30 29 ePKS 34 10 SOD ePKP 08 30 07 i 20 Kermadec Islands
7 SOD e(P) 18 19 45 Iran	10 HEL eP 23 42 33 i 40 SOD iP 23 43 41 Greece	14 SOD ePKP 10 01 38 Tonga Islands
8 HEL iP 00 43 09 i 24 i 29 SOD iP 00 43 09 i 25 India-Burma border	11 HEL iP 08 21 56 iPcP 22 25 SOD iP 08 21 17 Kurile Islands	15 SOD iP 09 43 38 W of Gibraltar
8 SOD iSb 00 50 34 iSg 51 05	12 SOD iP 02 16 29	15 HEL iP 23 16 16 SOD eP 23 16 33 Western Pakistan
8 SOD iP 14 57 01	12 HEL iP 22 24 38 SOD iP 22 24 16 i 28 E coast of Formosa	16 SOD iPn 12 15 06 iPb 12 iPg 22 iSn 46 iSb 56 iSg 16 03
8 HEL iP 15 42 46 SOD iP 15 43 07 iPP 44 Guatemala	13 HEL iP 01 10 31 i 43 SOD iP 01 09 39 i 50 Fox Islands	16 SOD eP 17 10 10 E coast of Borneo
9 SOD eP 06 06 32 Fox Islands	13 HEL iP 01 59 16 SOD iP 01 58 26 Fox Islands	16 SOD iP 19 33 39 iPcP 34 29 Unimak Island
9 HEL iP 10 11 05 iPP 16 i 21 SOD iP 10 11 10 iPP 24 i 43 ePP 14 44 S coast of Sumatra	13 HEL iP 03 36 31 Greece	16 SOD eP 21 16 12
9 SOD iP 20 24 38 N of Iceland	13 SOD iPg 12 06 54 iSg 07 27	17 SOD iP 09 04 18 Fox Islands
9 SOD iP 20 39 03 N of Iceland	13 SOD e(P) 16 22 29	17 HEL iPKP 11 29 11 SOD iPKP 11 28 56 ePP 30 13 ePKKP 39 17 Santa Cruz Islands
9 SOD iP 21 08 46 N of Iceland	14 HEL iP 02 37 41 iPcP 38 10 SOD iP 02 36 56 iPcP 37 44 Kurile Islands	17 SOD iP 16 58 44
9 SOD iP 21 24 23 N of Iceland		
9 SOD iP 22 35 41 Congo		

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July	July	July
17 SOD iP 18 51 32 Mid-Atlantic Ridge	20 HEL iP 14 19 05 i 25 ePP 21 34 eS 27 53 SOD iP 14 18 27 i 37 eS 26 42 E coast of Hokkaido	iPP 00 58 34 iS 01 05 01 iPPS 39 iScS 06 04 SOD iP 00 55 21 iPcP 56 03 iScP 01 00 09 eS 03 23 eP'P' 24 43 Andreanof Islands
17 SOD e(P) 20 10 29 e 13 45	20 SOD ePKP 15 58 00 ePP 16 00 18 eSKP 01 20 Tonga Islands	24 HEL iPKP 06 25 20 New Zealand
18 HEL iP 01 25 49 i 26 03 iPcP 13 SOD iP 01 24 59 Fox Islands	20 HEL iP 19 18 41 i 44 SOD iP 19 19 53 Greece	24 HEL iSKS 11 12 35 Argentina
18 HEL iP 01 30 47 i 58 SOD iP 01 29 59 Fox Islands	20 SOD iP 19 44 50 Fox Islands	24 HEL iSKP 11 25 08 New Hebrides
18 SOD iP 08 40 29 Israel	21 SOD iP 06 16 51 Coast of Guatemala	25 HEL iP 07 53 23 iPcP 50 Andreanof Islands
18 HEL iP 12 17 46 i 57 i 18 06 SOD iP 12 17 17 i 53 iS 25 57 S coast of Honshu	21 HEL iPKP1 19 56 36 iPKP2 48 Kermadec Islands	25 HEL iP 18 42 21 i 35 iP 41 SOD iP 18 41 48 iP 42 08 i 11 Hokkaido, Japan
19 HEL iP 03 31 47 i 32 29 ePP 33 24 SOD iP 03 32 02 Hindu Kush	22 HEL iP 04 00 34 SOD eP 04 00 22 Philippine Islands	25 SOD iP 22 28 07 Philippine Islands
19 HEL iP 12 09 31 SOD iP 12 08 40 Fox Islands	22 HEL iPKP 06 36 45 i 37 01 SOD iPKP 06 36 27 i 51 eSKP 40 02 Kermadec Islands	25 SOD iP 23 02 23
19 HEL iP 13 13 36 iPcP 49 SOD iP 13 13 13 i 16 i 54 iS 22 14 N coast of Formosa	22 HEL iP 14 08 37 SOD iP 14 07 48 Fox Islands	26 SOD iPKP 07 09 17 New Zealand
20 SOD iP 10 52 21 Alaska	23 HEL iP 00 56 07 i 31 iPcP 37 cont.	26 SOD iP 13 47 25 Hokkaido, Japan
20 SOD iP 11 22 31 Kamchatka		27 SOD iP 07 01 42 Guatemala
		27 HEL iP 14 30 52 SOD iP 14 30 28 i 31
		27 SOD iP 15 50 27 Philippine Islands

July	August	August
27 SOD eP 21 09 29 Andreanof Islands	1 HEL iP 11 06 30 SOD iP 11 06 47 Hindu Kush	4 SOD eP 14 29 04 Mexico
28 HEL iSb 06 21 15 iSg 42 SOD iPn 06 18 05 iPg 09 iSn 38 iSb 41 iSg 43	1 HEL iP 16 29 45 SOD iP 16 28 56 Fox Islands	4 SOD eP 19 54 08
28 HEL iP 08 53 06 iPP 56 47 iPPP 58 59 eSKS 09 03 39 iS 53 iPPS 05 06 SOD iP 08 52 50 iPP 56 15 eSKS 09 03 17 eS 29 Mexico	1 HEL iP 18 04 16 SOD iP 18 03 48 Honshu, Japan	4 SOD e(PKP) 21 27 39 ePP 28 28 Prince Edward Island
	1 HEL iPKP 17 17 13 Kermadec Islands	5 HEL iP 02 44 23 SOD iP 02 43 57 i 44 09 i 16
	1 SOD ePn 21 43 59 ePb 44 01 ePg 04 iSn 27 i 30 iSg 32 i 44	5 SOD iP 10 14 15 Kamchatka
28 SOD iP 10 11 16 Mexico	1 SOD e(P) 22 26 35 Mexico	5 SOD iP 14 00 54 Kamchatka
28 SOD iP 13 34 11	2 HEL iPKP 02 32 26 SOD ePKP 02 32 15 New Zealand	5 SOD iP 14 21 43 Kamchatka
28 SOD iP 13 47 03 Mexico	2 HEL iPb 09 17 03 iPg 13 i 37 iSn 43 iSb 59 iSg 18 13	5 SOD eP 17 47 36 Mexico
29 SOD iP 00 24 07 Mexico	SOD iPg 09 17 05 iSg 59	5 SOD eP 20 10 40
29 HEL iP 02 59 17	2 SOD iP 12 31 47 Andreanof Islands	5 HEL iPKP 21 50 09 i 33 Kermadec Islands
29 HEL iPKP 10 17 06 Kermadec Islands	3 SOD iP 06 56 47 Sumatra	5 SOD iP 23 14 58 Kyushu, Japan
29 HEL iPKP 17 33 56 SOD iPKP 17 33 58 iPKKP 44 39 Coast of Chile	3 SOD iP 11 57 08 Mariana Islands	6 SOD iP 00 13 32 Kamchatka
30 HEL iP 01 49 35 SOD iP 01 50 22 iPcP 52 43 Iran	4 SOD eP 06 19 24 ePP 22 53 Mexico	6 SOD iP 03 46 53 Philippine Islands
31 SOD iP 07 45 43 Sunda Strait		7 HEL iP 06 00 07 SOD iP 05 59 20 Kamchatka
		7 HEL iP 06 02 01 i 32 Kamchatka

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August	August	August
7 SOD iP 15 35 51 Hindu Kush	10 HEL iP 19 25 24 SOD iP 19 25 17 Celebes Sea	13 HEL iP 16 02 31 SOD iP 16 02 16 E coast of Formosa
7 SOD iPKP 19 58 55 iSKP 20 01 28 Fiji Islands	10 HEL iP 20 36 04 SOD iP 20 37 08 i 28 Greece	14 HEL iP 02 49 48 i 57 SOD iP 02 50 51 S of Rhodes Island
8 HEL iP 01 18 06 SOD iP 01 19 08 i 15 Coast of Egypt	10 SOD iP 21 17 09	14 SOD ePKP 18 45 49 iSKP 48 51 Tonga Islands
8 HEL iP 19 52 50 iPcP 53 40 SOD iP 19 53 32 i 47 Sinkiang Province	11 HEL iPKP 05 32 37 SOD iPKP 05 32 21 New Zealand	15 HEL eP 06 30 33 Ionian Islands
8 HEL iP 22 44 42 i 55 SOD iP 22 45 18 i 23 Ascension Island	11 HEL iPKP 14 00 07 Kermadec Islands	15 SOD iP 08 45 41 N coast of Panama
8 SOD eP 23 10 42 Ascension Island	11 SOD iPKP 21 57 08 New Hebrides	15 SOD ePb 14 28 51 iPg 53 i 58 eSb 29 23 iSg 26
9 HEL iP 00 07 42 SOD e(P) 00 08 59 Caspian Sea	12 SOD iP 07 21 24 iPP 24 54 Philippine Islands	15 SOD ePKKP 21 14 05 e 21 Solomon Islands
9 HEL iP 02 43 23 SOD iP 02 43 04 i 37 New Guinea	12 SOD iP 08 07 41 i 51 iPcP 08 46 Kamchatka	16 SOD iP 01 40 05 Aleutian Islands
9 SOD iP 07 53 02 Andreanof Islands	12 SOD iP 11 30 10 S coast of Honshu	16 HEL iP 08 37 51 SOD iP 08 37 10 Kurile Islands
9 SOD iP 11 09 39 Kurile Islands	12 HEL iP 21 49 22 Afghanistan	16 HEL iP 21 06 41 SOD iP 21 06 16 i 35 Volcano Islands
10 HEL iP 00 12 11 iPcP 43 SOD iP 00 11 31 Kurile Islands	13 SOD iP 01 21 57 i 22 04 Mid-Atlantic Ridge	16 SOD iP 23 45 16 iPP 49 06 Pacific Ocean
10 HEL ePKP 02 36 51 i 59 i 37 03 eSKP 39 40 SOD ePKP 02 36 48 iSKP 39 21 Fiji Islands	13 HEL iP 12 10 05 SOD iP 12 09 11 i 22 Southern Alaska	16 SOD iP 08 33 07 i 39
	13 HEL iP 14 55 18 SOD iP 14 55 06 Philippine Islands	17 SOD iP 08 59 43 Aleutian Islands

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August	August	August
17 HEL iP 12 51 19 i(pP) 40 SOD iP 12 50 49 i 51 04 iPcP 11 Bonin Islands	19 HEL iP 21 42 58 i 43 13 iPcP 30 SOD iP 21 42 09 Fox Islands	23 HEL eP 11 54 08 i 17 SOD iP 11 53 46 i 58 ePcP 54 06 E coast of Formosa
17 HEL iP 19 11 21 SOD iP 19 11 19 Philippine Islands	20 SOD iP 15 28 21 ipP 29 08 Hindu Kush	23 HEL ePKP 20 30 56 e 31 11 Kermadec Islands
17 SOD iP 23 04 30 Honshu, Japan	20 SOD iP 22 27 13 i 28 Andreanof Islands	23 HEL iP 23 04 24 Java
18 HEL iP 08 49 29 i 40 SOD iP 08 49 15 i 18 iS 59 34 Philippine Islands	20 SOD iP 22 39 23 i 29 Outer Mongolia	24 SOD e(P) 03 06 06
18 SOD eP 09 15 03	21 SOD iPKP 06 07 48 New Zealand	25 SOD eP 10 15 22 Rat Islands
18 SOD iP 21 24 18 Mexico	21 SOD iP 12 01 20 i 30 Fox Islands	25 SOD iP 16 54 24 Philippine Islands
18 HEL iP 21 52 59 iPcP 53 36 iPP 55 21 iS 22 01 26 iScS 02 46 SOD iP 21 52 16 i 18 iPPP 56 01 iPc3 57 14 eS 22 00 11 iPPS 29 Kurile Islands	21 SOD iP 15 44 02 i 20 e(pP) 29 Kurile Islands	26 SOD iP 07 03 57 i 04 10 iPcP 41 Andreanof Islands
19 SOD iP 06 20 34 Fox Islands	21 SOD iP 19 41 23 i 36 Fox Islands	26 SOD eP 14 12 27 Coast of Ecuador
19 HEL iP 07 28 12 e 47 iS 32 57 SOD iP 07 28 53 e 29 51 i 35 02 Caspian Sea	22 SOD iP 03 48 10 iPcP 54 Hokkaido, Japan	27 HEL iP 11 58 50 SOD eP 11 59 58 Italy
	22 SOD iP 08 08 19 Molucca Passage	27 HEL ePKP 21 14 47 SOD ePKP 21 14 38 iSKP 17 15 South of Fiji Islands
	22 SOD iPg 12 52 06 iSg 44	28 HEL iPKP 08 38 48 SOD ePKP 08 38 42 Kermadec Islands
	22 SOD iPKP 17 02 31 New Hebrides	28 HEL iP 23 24 59 S of Honshu
	22 SOD eP 18 35 28 i 31 Sinkiang Province	

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August	August	September
28 HEL eP 23 29 48 SOD iP 23 29 27 i 33 Mariana Islands	30 SOD iP 20 57 29 Mariana Islands 30 SOD e(P) 21 07 39	2 HEL iP 03 45 56 SOD iP 03 45 55 i 46 06 India-Burma border
28 HEL iP 23 35 02 SOD iP 23 34 39 i 45 Mariana Islands	30 SOD iP 21 23 37 31 SOD iP 00 17 13	2 SOD iP 07 04 43 Jan Mayen Island
29 HEL iP 00 02 54 SOD iP 00 02 32 i 40 Mariana Islands	31 HEL iP 01 54 26 SOD eP 01 54 21 i 55 13 Pamir region	2 SOD iP 10 29 02 Rumania
29 HEL iP 01 10 28 SOD iP 01 10 05 Mariana Islands	31 HEL iP 12 02 01 iPP 29 SOD iP 12 03 03 i 29 Greece	2 HEL iP 14 31 13 i 23 iPcP 44 iPP 33 41 iS 40 12 SOD iP 14 30 26 i 36 iS 38 41 eP'P' 59 46 Fox Islands
29 SOD eSKP 14 23 33 S of Fiji Islands	31 SOD iP 12 08 42 iPP 10 19 iPPP 45 iLg2 23 13 Outer Mongolia	2 SOD iP 18 15 08 Aleutian Islands
30 HEL iPKP 04 10 16 Kermadec Islands		2 SOD i(P) 18 16 24
30 HEL iP 16 25 01 i(Pa1) 26 14 iPP 22 ePPP 44 iPcP 27 34 iS 30 22 iPcS 31 16 iScS 35 20 SOD iP 16 25 14 i 20 e 34 iPP 49 iS 31 11 iLg1 37 44 Tadzhik, USSR	September 1 HEL iP 12 57 07 i 16 SOD iP 12 57 18 i 23 iPP 58 53 iS 13 03 15 iLg1 10 15 Sinkiang Province	2 HEL iP 21 34 33 i 35 26 iPP 36 08 iPcP 48 i 37 02 eS 40 14 SOD iP 21 34 51 i 36 03 ePP 24 iS 40 41 Hindu Kush
30 HEL iP 17 05 05 SOD iP 17 04 19 i 32 E coast of Honshu	2 HEL iP 00 12 52 iS 23 36 SOD iP 00 12 29 iSKS 22 46 Mariana Islands	3 SOD iP 05 34 44
30 HEL iP 20 15 50 i 16 03 SOD iP 20 15 34 Batan Islands	2 HEL iP 00 40 13 SOD iP 00 39 50 epP 40 15 Mariana Islands 2 SOD iP 01 53 56	3 SOD iP 05 39 38 3 SOD iP 07 59 59 Fox Islands 3 SOD iP 14 40 14 Mariana Islands

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September

3 SOD iPKP 14 58 32
iSKP 15 01 04
Fiji Islands

4 HEL iP 08 15 10
i 24
i 40
SOD iP 08 15 39
West Pakistan

4 SOD iP 20 13 13
Fox Islands

5 SOD iP 04 11 39
Alaska

5 SOD iP 04 15 16
Mid-Atlantic Ridge

5 SOD iP 04 26 03

5 HEL iP 07 35 37
SOD iP 07 34 49
E coast of Kamchatka

5 HEL iP 11 43 17
i 23
SOD iP 11 43 59
i 44 05
ePP 45 34
Southern Iran

5 SOD iP 14 03 46
Java

6 HEL iP 01 27 39
SOD iP 01 27 16
i 28 06
Mariana Islands

6 HEL iP 05 05 40
i 53
i 06 03
SOD iP 05 04 51
i 05 04
Andreanof Islands

6 SOD iP 16 17 13

September

6 HEL iP 20 26 34
SOD iP 20 27 48
Albania-Greece border

6 HEL iP 20 28 30
SOD iP 20 29 48
Albania-Greece border

7 HEL eP 01 23 15
i 20
SOD iP 01 23 13
Western Venezuela

7 HEL iP 06 59 04
i 26
iPcP 41
SOD iP 06 58 20
Kurile Islands

7 SOD ePb 08 36 31
iPg 34
i 35
i 38
iSb 37 01
iSg 06

7 HEL iP 10 17 41
iPcP 18 09
SOD iP 10 16 53
iPP 19 11
iScP 21 37
iS 25 14
iP'P' 46 16
Andreanof Islands

7 SOD iPn 11 02 27
iSn 04 20

7 SOD iP 20 03 05
8 HEL iP 10 30 47
SOD iP 10 29 58
Fox Islands

10 HEL eP 00 25 20
SOD iP 00 25 57
Atlantic Ocean

September

10 HEL iP 06 23 30
iPP 25 31
SOD iP 06 23 34
India-Burma border

10 HEL iP 20 08 22
SOD iP 20 08 44
Mid-Atlantic Ridge

11 SOD ePg 12 35 41
eSg 36 23

11 SOD iSKP 14 02 29
Fiji Islands

11 SOD iPKP 23 41 15
i 26
Samoa Islands

12 HEL iP 00 40 40
i 54
SOD iP 00 40 26
i 37
ePP 43 43
iS 50 45
North of Honduras

13 SOD iP 06 40 12

15 HEL iP 04 35 09
SOD iP 04 35 11
iPP 39 01
N coast of Java

15 HEL iP 22 18 25
SOD iP 22 17 38
Andreanof Islands

16 SOD iP 00 18 24
iPP 45

S coast of Honshu

16 SOD iP 01 39 57
eS 44 19
Arctic Ocean

16 SOD eP 14 25 46
Mid-Atlantic Ridge

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September	September	September
16 SOD iP 15 05 31 Andaman Sea	20 HEL iP 08 35 57 SOD iP 08 35 23 Kurile Islands	27 HEL iP 05 08 21 SOD iP 05 07 26 iPcP 08 56 Eastern Siberia
16 SOD iP 18 43 36 i 49	20 SOD iP 10 09 15 Hindu Kush	27 HEL eP 11 27 49 SOD eP 11 26 56 Fox Islands
16 HEL iP 20 03 12 SOD iP 20 02 34 Unimak Islands	20 SOD iP 15 57 28	27 HEL eP 14 33 41 Philippine Islands
17 SOD iP 15 57 01 i 18	20 HEL iP 23 18 20 SOD iP 23 17 31 i 38 Fox Islands	28 HEL iP 00 38 21 iPcP 38 i 39 17 i 24 iS 47 12 SOD iP 00 37 54 iS 46 21 S coast of Honshu
17 HEL iP 18 55 46 SOD iP 18 55 19 S coast of Honshu	21 SOD i(P) 10 00 35	28 HEL iPcP 14 38 09 iSKP 41 00 iPKS 53 ipPKS 44 12 isPKS 45 06 iSKKP 49 49 i 56 09 eSS 58 23 eSSS 15 03 46 SOD ePKP 14 37 54 i 38 08 Fiji Islands
17 HEL iP 21 15 16 Greece	21 HEL iP 20 21 29 iS 24 53 i 25 06 SOD iP 20 22 37 i 42 iPcP 25 51 eS 27 33 Northern Turkey	
18 HEL iP 01 09 42 i 53 iPcP 10 21 SOD iP 01 08 56 i 09 05 E coast of Kamchatka	23 SOD iP 09 23 00 Fox Islands	
18 SOD iP 18 25 19 i 29 Fox Islands	24 HEL iP 08 34 13 eSKS 44 45 iS 45 07 SOD iP 08 34 02 iPP 37 41 iS 44 47 eP'P' 59 49 Philippine Islands	
18 SOD iP 23 12 27 Andreanof Islands	24 HEL iP 09 23 36 SOD iP 09 23 19 Philippine Islands	28 HEL ePKP 15 02 17 i 27 SOD iPKP 15 02 16 Fiji Islands
19 HEL iP 13 53 06 SOD iP 13 52 17 i 36 Fox Islands	25 HEL iP 16 49 45 Philippine Islands	
19 HEL iP 17 33 50 eS 37 44 iSS 38 10 SOD iP 17 32 22 iS 34 46 NW of Spitsbergen	26 SOD ePKP 12 22 30 New Zealand	28 SOD iPb 16 05 34 iPg 37 iSb 06 09 iSg 14 i 22
20 HEL iP 02 24 10 Greece	26 HEL iP 18 59 49 SOD iP 18 59 34 iS 19 10 20 Philippine Islands	29 HEL eP 06 50 33 Celebes
20 HEL eP 06 33 54 SOD iP 06 32 41 Arctic Ocean		

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September	October	October
29 HEL iPKP 08 31 43 i 32 33 iSKP 34 33 iPKS 35 26 ipPKS 37 35 iSKKP 43 02 i 49 16 SOD iPKP 08 31 34 iSKP 34 15 S of Fiji Islands	3 SOD iP 01 44 48 Hokkaido, Japan 4 SOD iPKP 01 19 32 iSKP 22 24 Fiji Islands 4 HEL iP 05 38 06 i(pP) 24 eS 48 02 SOD iP 05 38 13 i(sP) 35 Coast of Venezuela	6 SOD iP 09 01 28 iS 03 28 W of Novaya Zemlya 6 HEL iP 21 38 20 iPcP 57 SOD iP 21 37 37 Kurile Islands 6 HEL iP 23 37 56 SOD eP 23 37 09 Andreanof Islands
29 HEL iP 13 40 59 E coast of Kamchatka	4 SOD iPb 12 20 45 iPg 50 iSb 21 25 iSg 32	7 HEL iP 13 30 16 i 28 SOD iP 13 29 31 SE coast of Kamchatka
29 HEL iP 17 47 26 Philippine Islands	4 SOD iPg 12 24 35 iSg 25 13	8 HEL iP 07 05 36 SOD eP 07 06 44 Greece
30 SOD iP 09 10 59 i 11 08	4 SOD iP 23 07 13 i 25	10 HEL iP 01 53 57 i 54 12 iPcP 27 SOD iP 01 53 10 Fox Islands
30 SOD iP 11 14 13 i 28 S coast of Honshu	4 SOD iP 00 06 28 iPcP 07 00 SOD iP 00 05 41 iPcP 06 31 Rat Islands	10 HEL iP 03 50 10 i 23 iPcP 36 SOD iP 03 49 22 i 34 Fox Islands
30 SOD iP 20 33 23 Volcano Islands	5 SOD iPg 02 57 47 iSg 58 20	10 HEL ePKP 04 05 06 i 10 iSKP 07 46 SOD iSKP 04 07 24 Fiji Islands
October	5 SOD iP 05 29 26 E coast of Honshu	10 HEL iP 05 55 30 iPcP 56 SOD iP 05 54 42 i 55 iPcP 55 27 Andreanof Islands
1 SOD eP 03 13 13 Jan Mayen Island	5 HEL iP 11 42 17 SOD iP 11 43 20 SE of Crete	10 HEL iP 06 58 21 iS 07 01 08 SOD iP 06 57 07 iS 58 59 Novaya Zemlya
1 SOD eP 08 16 39 West Pakistan	5 HEL iP 15 57 19 SOD iP 15 58 22 SE of Crete	
2 SOD e 01 13 49	5 HEL iP 22 47 47 i 58 i 51 28 SOD iP 22 48 05 i 21 iPPP 49 53 Tadzhik-Afghanistan	
2 SOD iP 11 37 56 i 38 17 Philippine Islands		
2 HEL iP 12 40 02 SOD iP 12 40 04 Coast of Venezuela		
2 SOD iP 13 17 14 S coast of Iran		
2 HEL eP 21 10 29 SOD iP 21 10 52 i 11 00 Chagos Islands		

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October				October				October			
10	HEL iP	07 49 15		19	HEL iP	18 40 22		24	HEL iP	02 37 54	
	iPcP	43			eS	49 44			eSr2	41 14	
	SOD iP	07 48 27			iPS	50 23			eSr1	26	
	iPcP	49 12			SOD iP	18 40 06			SOD eP	02 38 58	
	Andreanof Islands				iS	49 11			i	39 02	
					iPS	37			eS	43 36	
10	HEL ePKP	19 03 16			i(Lg)	19 04 51			NW Turkey		
	Fiji Islands				E coast of Formosa						
10	HEL iP	19 04 49		19	HEL iP	21 52 28		24	SOD iPKP	09 25 44	
	i	05 10			iS	22 00 57			iSKP	28 17	
	iPcP	20			SOD iP	21 51 48			Fiji Islands		
	SOD iP	19 03 58			iScP	56 23		24	SOD iP	21 56 54	
	iPcP	04 48			iS	59 47			i	57 00	
	Fox Islands				NE coast of Hokkaido				Gulf of California		
11	HEL eP	00 32 46		20	HEL iP	12 15 32		25	HEL eP	01 54 34	
	SOD iP	00 31 59			SOD iP	12 15 47			SOD iP	01 54 17	
	Fox Islands				i	51			Coast of Formosa		
					iPcP	16 15					
11	HEL iP	03 00 38			Mid-Atlantic Ridge			25	HEL eP	03 27 52	
12	SOD iP	19 10 27		20	SOD i(PKP)	16 16 19			SOD iP	03 27 29	
	i	30			i	41			i	39	
	S coast of Java				e	19 31			Batan Islands		
					(Indian Ocean)			25	SOD iP	04 47 43	
13	SOD iP	04 28 52		21	SOD iP	14 34 38			Fox Islands		
	Kamchatka				Mid-Atlantic Ridge			25	HEL eP	06 30 46	
14	SOD iP	01 29 40							SOD iP	06 30 32	
15	HEL iPKP	06 14 46		21	SOD iP	17 54 34			i	42	
	i	59							Coast of Formosa		
	SOD iPKP	06 14 24		22	HEL iP	20 55 26					
	Kermadec Islands				i	42		25	SOD e(P)	07 48 03	
					SOD iP	20 54 50					
17	SOD iP	14 33 04			Coast of Hokkaido			25	HEL iP	10 13 54	
	S coast of Honshu			22	HEL ePKP	22 25 45			iPcP	14 32	
18	HEL eP	01 55 41			S of Kermadec Islands				ePPS	22 55	
	SOD iP	01 56 52		23	HEL iP	04 50 08			SOD iP	10 13 14	
	Greece				SOD iP	04 50 05			i	16	
					Puerto Rico				iPcP	14 14	
18	SOD iPn	00 02 25							eS	20 58	
	iPb	28							S coast of Kamchatka		
	iPg	31		23	HEL iP	06 07 47		25	SOD iP	11 50 05	
	i	33			i	08 59			Fox Islands		
	iSn	57			SOD iP	06 06 59					
	iSb	03 00			i	07 09					
	iSg	07			iPcP	44		25	SOD iP	22 56 37	
					Fox Islands				Philippine Islands		
18	SOD iP	21 56 21		24	SOD iPKP	00 10 32		26	SOD iP	04 44 21	
	Oaxaca, Mexico				Argentina				Molucca Passage		

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October				October				November				
26	HEL	iPKP	08 44 27	31	SOD	ePKP	15 49 04	5	SOD	iPn	10 26 16	
	i		35		i		14		iPb		20	
	iSKP		47 15		S of Tasmania				iSn		55	
	SOD	iPKP	08 44 22						iSb		27 00	
	iSKP		46 54									
	Fiji Islands							5	SOD	iP	20 01 26	
									Andreanof Islands			
26	SOD	iP	14 30 05	November				6	SOD	iP	13 23 03	
	Borneo			1	SOD	iP	14 29 24		iPcP		50	
					Turkestan				Kurile Islands			
27	HEL	iP	22 42 26									
	iPcP		43 14	1	SOD	ePg	20 09 01	8	HEL	iP	09 14 24	
	iPP		44 40			eSg	33		SOD	iP	09 13 49	
	SOD	iP	22 41 39						E coast of Hokkaido			
	i		50	2	HEL	iP	01 29 15	9	SOD	iP	05 14 40	
	iPcP		42 55			i	29					
	iScP		46 32		Fox Islands			9	SOD	eP	06 27 00	
	Kamchatka								Unimak Island			
29	HEL	iP	02 34 45	2	HEL	iP	07 33 53	9	HEL	iP	22 16 50	
	SOD	iP	02 34 41			SOD	iP		iS		19 37	
	Borneo					Mexico	07 33 36		SOD	iP	22 15 46	
30	HEL	iP	01 48 25	2	SOD	iPn	14 17 00		iS		17 44	
	eS		52 43			iPb	02		Jan Mayen			
	SOD	iP	01 49 29			iPg	05					
	Dodecanese Islands					i	07	10	HEL	iP	00 00 28	
30	SOD	iP	02 23 13			iSn	32		Greece			
	iPcP		24 03			iSb	36					
	Fox Islands					iSg	41	10	HEL	iP	08 37 31	
						i	47		iPcP		55	
30	SOD	eP	03 00 39	2	SOD	iP	16 29 50		SOD	iP	08 36 58	
	Andreanof Islands				Philippine Islands				S coast of Honshu			
30	HEL	iP	07 35 44	2	SOD	iPKP	18 49 17	10	HEL	iP	09 52 03	
	SOD	iP	07 36 45			i	34		SOD	iP	09 51 32	
	iS		42 01		New Hebrides				S coast of Honshu			
	Dodecanese Islands			3	SOD	iP	12 55 46	10	HEL	iP	10 34 05	
31	SOD	iP	02 47 25						i(pP)		27	
	Honshu, Japan			4	SOD	eP	02 40 39		SOD	iP	10 33 59	
31	SOD	iP	02 59 07		Andreanof Islands				i		34 17	
	California			5	SOD	iP	00 46 23		i(pP)		21	
					Philippine Islands				Northern Colombia			
31	SOD	iP	10 21 02	5	HEL	iPKP	10 12 26	10	SOD	iP	12 03 29	
	ePP		24 37			SOD	iPKP	10 12 13	10	HEL	iP	12 34 28
	Off coast of Panama				New Hebrides				SOD	iP	12 34 03	

November	November	November
10 HEL iP 18 14 49 E coast of Borneo	15 SOD iP 08 05 04 Philippine Islands	20 HEL iP 12 51 14 eS 13 00 01 SOD iP 12 50 24 i 43 iPcP 51 14 Unimak Islands
10 HEL iP 19 31 30 i 39 SOD iP 19 31 01 Honshu, Japan	15 SOD iP 12 12 33 S coast of Honshu	20 SOD iP 16 25 24 i 32
10 SOD iP 19 41 22 Honshu, Japan	15 SOD iP 16 40 09 E coast of Kamchatka	22 SOD iP 18 13 45 Bonin Islands
10 SOD iP 20 04 01 Honshu, Japan	17 HEL iP 06 07 37 i 54 iS 15 39 iScS 16 49 SOD iP 06 06 58 Sea of Okhotsk	22 SOD iPb 18 16 11 iPg 17 iSb 49 iSg 57
10 HEL iP 22 24 09 SOD iP 22 23 17 i 26 Kenai Peninsula	17 SOD iP 18 05 33 S of Honshu	23 SOD iP 01 05 19 Near Islands
11 HEL iP KP 06 43 41 Kermadec Islands	18 SOD iP 03 08 55 Southern Iran	23 HEL iP 01 09 30 SOD iP 01 08 41 i 54 iPcP 09 29 Fox Islands
11 SOD iP 11 56 53	18 SOD iP 10 22 09 Andreanof Islands	23 SOD iP 18 50 48 Rat Islands
11 SOD iP 18 33 31 Guerrero, Mexico	18 SOD iP 15 04 08 Andreanof Islands	24 HEL iP 09 48 42 SOD iP 09 47 31 i 37 Coast of Greenland
12 HEL eP 00 15 21 Caymen Islands	18 HEL iP 15 23 44 SOD iP 15 23 06 Kurile Islands	25 HEL iP 04 20 46 SOD iP 04 19 52 Alaska
12 HEL ePKP 00 39 28 Tonga Islands	19 SOD iP 01 55 45 Ryukyu Islands	25 SOD eP 20 43 24 Oregon, USA
13 HEL iP KP 17 42 31 SOD iP KP 17 42 11 i 16 iSKP 45 45 Kermadec Islands	19 SOD iP 11 33 09 Bonin Islands	25 SOD eP 22 27 58 Oregon, USA
14 HEL iP 04 45 40 SOD iP 04 44 52 iPcP 45 36 Andreanof Islands	19 HEL iP 16 23 59 SOD iP 16 23 18 iP 41 iPcP 24 08 Kurile Islands	25 HEL iP 22 48 14 SOD iP 22 48 09 i 15 E coast of Borneo
14 SOD iP 05 30 27 Andreanof Islands	19 SOD iP 19 38 55 Philippine Islands	26 SOD eP 00 49 06 Pamir
14 SOD eP 14 22 29 NW coast of Corfu	19 SOD iP 23 25 58 S coast of Honshu	
15 SOD iP 06 17 08 Fox Islands	20 SOD iP 02 47 31 Volcano Islands	

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26 HEL iP 01 55 40
SOD iP 01 55 46
iPcP 52
i(pP) 56 19
i 30
NE coast of Sumatra

26 HEL iP 05 23 14
SOD iP 05 23 13
i 23
E coast of Borneo

26 HEL iP 08 20 08
SOD iP 08 21 18
i 21
Greece

26 SOD iP 10 55 48

26 HEL iP 11 46 46
iPcP 47 10
SOD iP 11 45 56
i 46 10
iPcP 38
Andreanof Islands

26 HEL iP 11 54 49
SOD iP 11 56 02
Greece

26 SOD iP 19 18 42
i 48
Philippine Islands

27 HEL iP 03 12 49
eS 16 40
SOD iP 03 13 58
iPPP 14 59
Greece

27 SOD iP 03 33 53
Philippine Islands

29 HEL iP 22 33 54
iPKP 37 51
iPP 38 19
iPPP 39 12
i 41 36
iSKS 44 00
iSKKS 58
iS 45 30
esS 47 09
iSP 21

cont.

November

ePS 22 48 15
iSP 43
i(PKKP) 59
iPKKP 49 17
i 52 30
iP'P' 57 29
SOD i(P) 22 34 08
iPP 38 00
i(sPP) 39 30
iSKS 44 12
ipSKS 45 08
i 48 55
iSS 53 38
Southern Bolivia

30 HEL iP 02 10 55
SOD iP 02 11 31
Amirante Islands

30 HEL eP 17 47 33
SOD iP 17 46 28
i 31
Arctic Ocean

30 HEL iP 20 38 55
Kurile Islands

30 HEL iP 21 47 58
SOD iP 21 47 16
i 23
Kurile Islands

30 HEL iP 22 04 55
iPcP 05 24
SOD iP 22 04 13
Kurile Islands

30 HEL iP 23 12 23
SOD iP 23 11 58

December

1 HEL iP 01 11 10
SOD iP 01 10 28
Kurile Islands

1 HEL iP 01 19 44
SOD iP 01 19 02
i 13
i 20 32
Kurile Islands

1 SOD iP 01 48 23
Fox Islands

December

1 SOD iP 02 22 36
Kurile Islands

1 HEL iP 03 20 02
SOD iP 03 29 20
Kurile Islands

1 SOD i(P) 04 44 05
1 HEL iP 05 21 20
SOD iP 05 20 39
Kurile Islands

1 HEL iP 10 10 50
SOD iP 10 10 07
Kurile Islands

1 HEL iP 10 11 16
SOD iP 10 10 33
Kurile Islands

1 HEL iP 19 16 29
SOD iP 19 15 42
Fox Islands

2 SOD iP 04 26 40
Rumania

2 SOD iP 12 55 37
Coast of Algeria

3 HEL iP 00 04 29
SOD iP 00 03 20
NE coast of Greenland

3 SOD eP 01 56 13
Andreanof Islands

3 SOD iP 21 50 51

3 HEL iP 21 57 13
SOD iP 21 56 24
Fox Islands

3 SOD iP 23 41 23
iPcP 42 09
Andreanof Islands

4 HEL eP 00 40 25
SOD iP 00 40 16
ePP 43 56
Molucca Passage

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December

4 HEL iP 03 46 03
iS 52 43
iSS 55 51
SOD iP 03 45 45
Outer Mongolia

4 SOD eP 04 26 57

4 HEL iP 04 37 16
SOD eP 04 36 55

4 SOD iP 05 08 54
Outer Mongolia

4 SOD iP 05 24 33

4 HEL iP 08 01 35
Outer Mongolia

4 HEL eP 09 17 36
i 41
SOD iP 09 17 19
i 24
Outer Mongolia

4 SOD iP 10 50 49
Outer Mongolia

4 HEL iP 11 27 51
SOD iP 11 27 38
Outer Mongolia

4 SOD iP 12 43 09

4 HEL iP 13 28 35
ePcP 30 13
iPP 21
SOD iP 13 28 16
iPP 30 02
iPcP 06
Outer Mongolia

4 HEL iP 22 25 16
SOD iP 22 25 00
Outer Mongolia

4 HEL iP 23 50 13
SOD iP 23 49 56
Outer Mongolia

5 SOD iP 07 50 22
Hokkaido, Japan

December

5 HEL iP 14 07 54
iS 10 32
SOD iP 14 06 41
eS 08 10
iT(Pg) 11 19
iT(Sg) 12 13

5 HEL iP 18 17 52
i 56
SOD iP 18 17 35
Outer Mongolia

6 SOD eP 02 29 05
Kurile Islands

6 SOD iP 02 41 44
Kurile Islands

6 HEL iP 04 00 16
SOD iP 03 59 36
Kurile Islands

6 HEL iP 08 47 10
SOD iP 08 46 29
iPcP 47 15
Kurile Islands

6 HEL iPKP 10 00 18
SOD iPKP 10 00 29
iSKP 03 39
Sandwich Islands

6 SOD ePKP 21 32 33
Tonga Islands

6 SOD eP 23 05 47
Philippine Islands

7 SOD i(P) 06 14 40

7 SOD i(P) 13 21 28

7 HEL iP 14 19 46
i 54
SOD iP 14 19 30
iPcP 21 09
iPP 26
Outer Mongolia

7 SOD iP 22 31 25
Nicaragua

December

8 HEL iP 06 21 24
i 30
SOD iP 06 21 06
Outer Mongolia

8 SOD iP 12 27 26
i 38
Honshu, Japan

8 HEL iP 15 37 31
SOD iP 15 37 15
Outer Mongolia

8 HEL iP 16 35 20
SOD iP 16 34 48
Outer Mongolia

8 HEL iP 21 37 12
SOD iP 21 36 51
Outer Mongolia

9 HEL eP 01 28 12
SOD iP 01 27 54
Philippine Islands

9 SOD iPKP 16 08 08
New Hebrides

9 HEL iP 22 17 05
SOD iP 22 16 16
i 27
Yokon

10 HEL ePKP 14 54 41
Solomon Islands

11 HEL iP 18 22 56
SOD iP 18 22 28
S coast of Honshu

11 HEL iP 22 03 38
iPcP 05 14
SOD iP 22 03 23
i 28
ePcP 05 04
ePP 10
Outer Mongolia

12 HEL iPKP 10 06 13
SOD iPKP 10 06 01
New Hebrides

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December				December				December			
12	SOD	iPn	11 54 14	17	HEL	iP	05 20 31	25	HEL	iP	16 38 11
		iPb	17			i(pP)	42		SOD	iP	16 38 12
		iPg	29			i	56		Venezuela		
		iSn	55 12		SOD	iP	05 19 43	26	HEL	iPKP	12 28 56
		iSb	23			i(pP)	56		i		29 00
		iSg	34		Kamchatka				SOD	iPKP	12 28 41
12	HEL	iPKP	18 57 24	17	HEL	iPKP	14 09 04		i		44
	New Hebrides					i	39	Kermadec Islands			
						iPP	11 00				
12	HEL	eP	20 14 51			eSKS	16 04	26	HEL	iP	15 06 13
	SOD	iP	20 14 54			iPKKP	18 50		eS		09 54
	Manipur-Burma				SOD	iPKP	14 08 54		SOD	iP	15 07 22
						ePP	10 23		e		12 34
						iPPP	12 43	Turkey			
						iPKKP	19 08				
13	HEL	iP	01 44 51			iPcPPKP	22 46	27	SOD	iP	01 38 48
		ipP	45 07		Santa Cruz				E coast of Honshu		
	SOD	iP	01 44 47	19	SOD	eP	12 13 29	27	HEL	iP	05 12 23
		ipP	45 01		Kamchatka				SOD	iP	05 11 18
	Colombia								i		26
13	HEL	iP	01 51 08	19	SOD	eP	19 12 33	28	SOD	iP	05 44 08
		iPP	52 05		Honshu, Japan				Outer Mongolia		
		iS	56 04	21	SOD	iP	16 11 24	30	HEL	iP	12 56 56
		iSS	57 41		Algeria				SOD	iP	12 56 06
		iLi	58 02	21	SOD	iP	19 00 15		iPcP		55
	SOD	iP	01 51 56		i		18	Fox Islands			
	Iran				Algeria						
13	HEL	iP	09 14 58	23	SOD	iP	12 42 37	30	SOD	iP	14 10 11
		i(pP)	15 37		Atlantic Ocean				i		22
	N Afghanistan							Philippine Islands			
13	HEL	iP	20 37 19	23	HEL	iP	23 41 50	30	SOD	iP	18 48 06
	Fox Islands					i(S)	44 25		i		23
					SOD	iP	23 43 19	S of Unimak Island			
						i(S)	47 15				
14	SOD	iP	16 13 48		Rumania			31	SOD	iP	00 26 50
	Fox Islands							31	SOD	eP	10 27 24
16	HEL	eP	17 38 56	24	SOD	iP	18 09 41		North Atlantic Ocean		
	SOD	iP	17 38 05		(Arctic Ocean)						
		i	12	25	HEL	iP	02 19 41	31	SOD	iP	13 12 33
		iPcP	45			i(pP)	52		North Atlantic Ocean		
		i	54		SOD	iP	02 18 53	31	HEL	iPKP	14 48 06
	Vancouver Island					i(pP)	19 05		i		13
					Coast of Kamchatka				i		25
16	SOD	iP	23 12 26	25	SOD	iP	13 51 34		SOD	i(PKP)	14 47 54
	Iran				i		42	New Zealand			
					Kamchatka						

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HELSINKI
FINLAND

Arctic Bulletin No. 2

Dec. 1957 - Feb. 1958

Helsinki: $60^{\circ}10'N$, $29^{\circ}58'E$
Sodankylä: $67^{\circ}22'N$, $26^{\circ}39'E$

P

Additional data for Bulletin No. 1:

July 09	Hel	-	Sod	eP	20-24-18
Sept 20	Hel	e 06-33-48	Sod	i	06-32-20
Sept 20	Hel	-	Sod	ePg	09-33-21
				iSg	56
Nov 01	Hel	-	Sod	ePg	20-09-01
				eSg	33
Nov 05	Hel	-	Sod	iPb	10-26-16
				iPg	20
				iSb	55
				iSg	27-00
Nov 24	Hel	iP 09-48-41	Sod	iP	09-47-32
		iPP 49-07		iPP	46
		eS 52-51		iS	50-49
Nov 30	Hel	eP 17-47-33	Sod	iP	17-46-28
Dec 03	Hel	iP 00-04-28	Sod	iP	00-03-20
				i	25
Dec 05	Hel	iP 14-07-54	Sod	iP	14-06-37
		iS 08-00		iT	11-24
		iS 10-31			
Dec 09	Hel	iP 22-17-04	Sod	iP	22-16-13
		i 07			
Dec 12	Hel	-	Sod	ePn	11-54-11
				ePb	20
				ePg	29
				e	54
				iSb	55-21
				eSg	30