



PANAMA CANAL COMPANY  
Engineering and Construction Bureau  
Meteorological and Hydrographic Branch

Lat. 8° 57' 39" N  
Long. 79° 33' 29" W

Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - JANUARY 1966

-----Standard Seismograph System USC&GS: Sprengnether LP (Z.N.E); Benioff SP (s.n.e)-----

No.	Date	Phase	Time		Amplitude mm	Remarks
			G.C.T.	Period		
1	3	iP <sub>ZZ</sub>	18 17 24.3 <sup>D</sup>	0.3	16.0	USCGS: 4.7 N 76.0 W Colombia △ = 375 miles
2	4	eP <sub>Z</sub> iS <sub>n</sub>	15 22 08.6 22 45			△ = 175 miles
3	6	iP <sub>ZZ</sub> iS <sub>n</sub>	04 21 39 <sup>D</sup> 22 43.6	0.2	8.0	USCGS: 6.8 N 73.1 W Northern Colombia △ = 310 miles
4	6	iP <sub>Z</sub> iS <sub>e</sub>	13 15 18.7 <sup>D</sup> 15 26.8	0.1	4.0	△ = 38 miles
5	6	iP <sub>Z</sub> iS <sub>e</sub>	14 06 45 <sup>D</sup> 06 53	0.1	4.5	△ = 38 miles
6	9	iP <sub>Z</sub>	09 15 23.7 <sup>C</sup>			USCGS: 11.5 N 62.3 W Windward Islands
7	10	iP <sub>Z</sub> iS <sub>e</sub>	11 14 49.5 16 15.3			USCGS: 7.4 N 72.4 W Northern Colombia △ = 500 miles
8	13	iP <sub>ZZ</sub>	10 34 54.5			USCGS: 19.1 N 64.7 W Virgin Islands
9	19	iP <sub>ZZ</sub> iS <sub>n</sub>	07 36 01.5 <sup>C</sup> 36 20.7	0.2	6.0	△ = 95 miles
10	21	iP <sub>ZZ</sub>	18 21 23.3 <sup>D</sup>	0.3	5.5	USCGS: 5.6 N 77.6 W Near Coast of Colombia
11	22	eP <sub>Z</sub>	14 38 41			USCGS: 56.0 N 153.7 W South of Alaska △ = 5000 miles

Seismological Bulletin - JANUARY 1966

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
12	23	eP <sub>Z</sub>	01 01 12			USCGS: 16.3 N 94.9 W Oaxaca, Mexico
13	25	iP <sub>Z</sub>	17 00 42 <sup>D</sup>	0.1	12.5	USCGS: 8.8 N 82.8 W Panama-Costa Rican Border
14	26	iP <sub>Z</sub>	00 03 12 <sup>D</sup>	0.1	10.0	
15	28	e <sub>Z</sub>	05 59 56			USCGS: 17.1 S 168.4 E New Hebrides Islands
16	28	iP <sub>ZZ</sub> iS <sub>N</sub>	08 03 54 <sup>C</sup> 07 18			USCGS: 2.7 N 95.3 W Galapagos, Islands △=1300 miles

Harold J. Million  
Chief Hydrographer



PANAMA CANAL COMPANY  
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Meteorological and Hydrographic Branch

Lat. 8° 57' 39" N  
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Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - FEBRUARY 1966

Standard Seismograph System USC&GS: Sprengnether LP (Z,N,E); Benioff SP (z,n,e)

No.	Date	Phase	G.C.T.	Period	Amplitude mm	Remarks
1	4	iP <sub>zZ</sub> iS <sub>n</sub>	16 16 51 <sup>D</sup> 17 34.5			USCGS: 6.6 N 82.2 W South of Panama Δ = 208 miles
2	5	iP <sub>z</sub>	15 20 06.8 <sup>D</sup>	0.2	21.0	
3	7	e <sub>zZ</sub>	04 48 58			USCGS: 29.8 N 69.7 E West Pakistan Extensive damage, 12 dead
4	8	iP <sub>z</sub> iS <sub>n</sub>	19 04 58.8 <sup>D</sup> 05 21			Δ = 105 miles
5	9	iP <sub>zZ</sub> iS <sub>N</sub>	00 58 40 01 03 10			USCGS: 14.3 N 93.0 W Near Coast of Chiapas, Mexico Δ = 1800 miles
6	9	iP <sub>zZ</sub>	04 52 30			
7	9	eP <sub>zR</sub> <sup>0</sup>	14 14 00			USCGS: 35.3 S 106 W Easter Islands
8	9	iP <sub>zZ</sub>	15 18 57.7			USCGS: 15.2 S 75.2 W Near Coast of Peru
9	10	eP <sub>z</sub>	14 42 00			USCGS: 20.8 N 146.3 E Mariana Island Region
10	13	e <sub>z</sub>	10 11 00			USCGS: 26.1 N 103.2 E Yunnan Province, China
11	14	iP <sub>z</sub> iS <sub>n</sub>	15 42 22 <sup>C</sup> 43 16			Δ = 258 miles
12	16	iPS	03 47 42			USCGS: 17.7 S 167.9 E New Hebrides

Seismological Bulletin - February 1966

<u>No.</u>	<u>Date</u>	<u>Phase</u>	<u>Time</u> <u>G.C.T.</u>	<u>Period</u>	<u>Ampli-</u> <u>tude</u> <u>mm</u>	<u>Remarks</u>
13	17	iP <sub>zZ</sub>	12 07 45.5 <sup>D</sup>			USCGS: 32.2 S 78.9 E Mid-Indian Rise
14	19	iP <sub>z</sub>	18 29 12 <sup>D</sup>			
15	21	iP <sub>z</sub>	00 34 25 <sup>C</sup>			USCGS: 55.6 S 26.9 W South Sandwich Island Region
16	22	iP <sub>z</sub>	05 23 54 <sup>C</sup>			
		iS <sub>N</sub>	41 18			
17	26	iP <sub>z</sub>	00 31 35 <sup>C</sup>			USCGS: 6.3 N 77.5 W Near West Coast of Colombia
18	26	iP <sub>z</sub>	06 49 29 <sup>C</sup>			
		iS <sub>n</sub>	48			Δ = 80 miles

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Lat. 8° 57' 39" N  
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Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - MARCH 1966

----- Standard Seismograph System USC&GS: Sprengnether I.P. (Z.N.E): Benioff (z.n.e) -----

No.	Date	Phase	Time		Period	Amplitude mm	Remarks
			G.C.T.				
1	1	iP <sub>z</sub>	23 18	59.5 <sup>C</sup>			Felt at Bambito, R.P.
		iS <sub>n</sub>	19 45				△ = 217 miles
2	5	eP <sub>z</sub>	00 33	16 <sup>D</sup>			
		eS <sub>N</sub>	50 27				△ = 253 miles
3	5	iP <sub>z</sub>	14 34	34 <sup>C</sup>		USCGS: 8.2 N 74.7 W	Northern Colombia
		iS <sub>n</sub>	35 29				
4	6	eP <sub>z</sub>	02 34	14 <sup>D</sup>		USCGS: 31.6 N 80.5 E	
5	7	eP <sub>z</sub>	23 57	46			
		eS <sub>n</sub>	58 39				△ = 260 miles
6	7	iP <sub>z</sub>	21 52	00 <sup>D</sup>		USCGS: 21.6 S 69.2 W	Northern Chile
7	10	iP <sub>z</sub>	19 59	15 <sup>D</sup>			
		S <sub>n</sub>		56.5			△ = 199 miles
8	11	eP <sub>z</sub>	08 29	50			
9	12	iP <sub>z</sub>	16 18	11 <sup>C</sup>			
		iS <sub>N</sub>	20 47				
10	12	iP <sub>z</sub>	16 50	40 <sup>C</sup>			
11	13	eP <sub>z</sub>	18 34	08 <sup>C</sup>			
12	14	iP <sub>z</sub>	15 56	03 <sup>D</sup>	0.2	8.0	
		iS <sub>n</sub>	24				△ = 95 miles

## Seismological Bulletin - MARCH 1966

No.	Date	Phase	Time	Period	Ampli-	Remarks
			G.C.T.		tude	
				mm		
13	20	eP <sub>Z</sub>	01 57 20			USCGS: 0.6 N 30.2 E Uganda
14	21	eP <sub>Z</sub>	14 29 58 <sup>C</sup>			USCGS: 3.3 N 84.1 W Off Coast of Central America △ = 400 miles
15	22	eP <sub>Z</sub> eS <sub>N</sub>	08 41 02 <sup>D</sup> 42 14			
16	23	iP <sub>Z</sub> iS <sub>n</sub>	05 13 52.5 <sup>D</sup> 15 39			USCGS: 16.8 N 85.9 W Caribbean Sea △ = 500 miles
17	23	eP <sub>Z</sub>	00 23 52			USCGS: 23.8 N 122.8 E Taiwan Region
18	23	eP <sub>Z</sub>	05 16 13			USCGS: 16.8 N 85.9 W Caribbean Sea △ = 500 miles
19	23	iP <sub>ZZ</sub>	19 01 45.5 <sup>D</sup>			USCGS: 8.6 N 82.5 W Panama-Costa Rica △ = 225 miles
20	26	iP <sub>Z</sub> S <sub>n</sub>	02 15 45.5 <sup>D</sup> 17 01.5			USCGS: 6.9 N 73.0 W Northern Colombia △ = 400 miles
21	27	iP <sub>ZZ</sub>	18 54 38.6 <sup>C</sup>			USCGS: 8.9 N 83.4 W Costa Rica
22	27	iP <sub>ZZ</sub>	00 13 40 <sup>D</sup>			
23	28	iP <sub>Z</sub>	00 05 14.5 <sup>D</sup>			USCGS: 9.0 N 83.3 W Costa Rica
24	28	iP <sub>Z</sub> S <sub>n</sub>	00 34 24.5 <sup>C</sup> 35 10			USCGS: 10.1 N 82.9 W North of Panama △ = 215 miles
25	28	iP <sub>ZZ</sub>	15 32 26 <sup>D</sup>			USCGS: 3.9 S 80.9 W Peru-Ecuador Border
26	28	iP <sub>ZZ</sub>	17 45 53 <sup>C</sup>			USCGS: 4.0 S 80.8 W Peru-Ecuador Border

Seismological Bulletin - MARCH 1966

<u>No.</u>	<u>Date</u>	<u>Phase</u>	<u>Time</u> <u>G.C.T.</u>	<u>Period</u>	<u>Ampli-</u> <u>tude</u> <u>mm</u>	<u>Remarks</u>
27	28	eP <sub>Z</sub>	20 32 38			USCGS: 3.9 S 80.9 W Peru-Ecuador Border
28	29	eP <sub>Z</sub>	09 59 39.5			
29	29	eP <sub>Z</sub>	19 38 17.5			
30	30	eP <sub>Z</sub>	13 09 09 <sup>C</sup>			USCGS: 49.8 N 129.7 W Vancouver Island Region
31	30	iP <sub>ZZ</sub>	22 18 47 <sup>D</sup>			
		S <sub>n</sub>	19 05			△ = 85 miles
32	31	iP <sub>Z</sub>	00 57 03 <sup>C</sup>			USCGS: 5.4 N 76.2 W Colombia
		S <sub>n</sub>	58			△ = 265 miles

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Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - April 1966

-----Standard Seismograph System USC&GS: Sprengnether LP (Z.N.E): Benioff (z.n.e)-----

No.	Date	Phase	Time	Period	Ampli-	Remarks
			G.C.T.		tude	
					mm	
1	1	eP <sub>Z</sub> S <sub>N</sub>	03 46 16 57 18			USCGS: 53.5 S 3.1 W South Atlantic Ridge
2	1	iP <sub>zZ</sub>	15 21 04.5 <sup>D</sup>			USCGS: 5.1 N 82.5 W South of Panama △ = 150 miles
3	2	eP <sub>zZ</sub>	01 57 05 <sup>C</sup>			USCGS: 16.5 N 97.4 W Oaxaca, Mexico △ = 1500 miles
4	2	iP <sub>zZ</sub>	08 35 34.5 <sup>C</sup>			USCGS: 5.6 N 82.5 W South of Panama △ = 200 miles
5	2	iP <sub>z</sub>	18 18 30.5 <sup>C</sup>			USCGS: 6.9 N 73.1 W Northern Colombia △ = 300 miles
6	3	eP <sub>z</sub>	05 15 56 <sup>D</sup>			
7	8	eP <sub>z</sub>	02 04 50 <sup>D</sup>			USCGS: 51.2 N 157.7 E Near East Coast of Kamchatka
8	8	eP <sub>z</sub> eS <sub>N</sub>	14 16 38 <sup>C</sup> 23 53			USCGS: 26.2 S 114.4 W Easter Island Region
9	9	iP <sub>zZ</sub> iS <sub>N</sub>	02 35 32 <sup>C</sup>			USCGS: 9.4 N 84.2 W Costa Rica △ = 250 miles
10	9	iP <sub>zZ</sub> iS <sub>N</sub>	02 43 17 <sup>C</sup>			USCGS: 9.6 N 84.1 W Costa Rica △ = 250 miles
11	10	iP <sub>zZ</sub> iS <sub>nN</sub>	10 35 10 <sup>D</sup> 36 24			USCGS: 6.9 N 73.0 W Northern Colombia △ = 300 miles



## Seismological Bulletin - April 1966

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
12	10	iP <sub>zZ</sub> iS <sub>n</sub>	16 43 55 <sup>D</sup> 44 10			USCGS: 31.5 S 71.2 W Near Coast of Central Chile
13	11	iP <sub>z</sub> S <sub>n</sub>	14 36 30.5 <sup>D</sup> 37 14	0.3	2.2	USCGS: 9.1 N 83.3 W Costa Rica $\triangle = 210$ miles
14	11	eP <sub>zZ</sub>	17 22 44 <sup>G</sup>			USCGS: 18.4 N 102.3 W Michoacan, Mexico
15	12	iP <sub>Z</sub> iS <sub>N</sub>	23 46 12 <sup>C</sup> 53 08			USCGS: 38.1 S 73.0 W Central Chile
16	13	eP <sub>Z</sub>	03 43 48 <sup>C</sup>			USCGS: 36.5 N 70.8 E Hindu Kush
17	14	iP <sub>z</sub> iS <sub>n</sub>	02 48 41 <sup>D</sup> 49 06			USCGS: 7.9 N 77.8 W Panama-Colombia Border
18	15	iP <sub>zZ</sub> S <sub>n</sub>	06 44 14.5 <sup>D</sup> 45 06			USCGS: 5.0 N 82.4 W South of Panama $\triangle = 250$ miles
19	16	eP <sub>Z</sub>	01 38 54 <sup>D</sup>			USCGS: 57.0 N 153.6 W Kodiak Island Region
20	21	eP <sub>z</sub> eS <sub>n</sub>	08 20 01 <sup>C</sup>			USCGS: 6.9 N 73.1 W Northern Colombia $\triangle = 345$ miles
21	22	eS <sub>N</sub>	03 21 57 <sup>C</sup>			USCGS: 37.8 S 73.4 W Near Coast of Central Chile
22	23	eS <sub>N</sub>	00 29 30 <sup>D</sup>			USCGS: 0.9 S 122.4 E Northern Celebres

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Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - MAY 1966

Standard Seismograph System USC&GS: Sprengnether LP (Z.N.E); Benioff SP (z.n.e)

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
1	1	iP <sub>zZ</sub>	16 26 58.5 <sup>C</sup>			USCGS: 8.5 S 74.3 W Peru-Brazilian Border
2	1	iP <sub>zZ</sub>	23 29 46 <sup>C</sup>			
3	3	eP <sub>z</sub>	23 42 02.5 <sup>C</sup>			
4	4	iP <sub>z</sub>	16 16 02.5 <sup>D</sup>			
5	4	iP <sub>z</sub>	17 01 39.5 <sup>D</sup>			
6	5	iP <sub>z</sub> S <sub>e</sub>	17 43 9.5 <sup>D</sup> 23			△ = 75 miles
7	9	iP <sub>zZ</sub> iS <sub>nN</sub>	05 30 59 <sup>C</sup> 31 42			USCGS: 8.4 N 83.0 W Costa Rica △ = 220 miles
8	9	eP <sub>z</sub>	10 48 25 <sup>D</sup>			USCGS: 8.7 N 82.9 W Panama-Costa Rica Border △ = 220 miles
9	10	eP <sub>z</sub>	01 56 25.5 <sup>C</sup>			
10	10	iP <sub>z</sub> iS <sub>n</sub>	20 02 39 <sup>C</sup> 03 29			△ = 240 miles
11	11	iP <sub>z</sub> iS <sub>n</sub>	05 12 52 <sup>C</sup> 13 29			△ = 180 miles
12	11	eP <sub>z</sub> eS <sub>n</sub>	05 32 40.5 <sup>C</sup> 33 20			△ = 190 miles

## Seismological Bulletin - MAY 1966

No.	Date	Phase	G.C.T.	Period	Amplitude mm	Remarks
13	14	eP <sub>z</sub> eS <sub>n</sub>	03 00 49 <sup>D</sup> 01 37			USCGS: 7.5 N 82.6 W South of Panama $\Delta = 235$ miles
14	14	eP <sub>zZ</sub>	20 31 17.5 <sup>D</sup>			USCGS: 10.5 N 63.0 W Near Coast of Venezuela $\Delta = 1200$ miles
15	15	eP <sub>zZ</sub>	14 58 57.5 <sup>D</sup>			USCGS: 51.5 N 178.4 W Andreanof Island
16	16	eP <sub>z</sub>	03 06 13 <sup>C</sup>			
17	18	eP <sub>z</sub>	07 38 32 <sup>C</sup>			USCGS: 2.8 S 137.2 E West New Guinea
18	19	eP <sub>z</sub>	07 28 26 <sup>D</sup>			USCGS: 54.1 N 164.1 W Unimak Island Region
19	20	iP <sub>z</sub> S <sub>n</sub>	03 59 02 <sup>D</sup> 45			USCGS: 11.7 N 82.6 W North of Panama $\Delta = 205$ miles
20	20	eP <sub>z</sub>	09 37 12 <sup>C</sup>			USCGS: 13.9 N 146.1 E South of Mariana Islands
21	20	iP <sub>z</sub>	18 22 07 <sup>C</sup>			
22	22	eP <sub>z</sub>	07 54 14			USCGS: 21.2 N 108.7 W Revillo Gigado Islands
23	23	eP <sub>z</sub>	11 57 43 <sup>C</sup>			USCGS: 21.4 N 108.7 W Revillo Gigado Islands
24	24	iP <sub>z</sub> S <sub>n</sub>	20 01 29.5 <sup>D</sup> 59			$\Delta = 145$ miles
25	24	E <sub>z</sub> E <sub>z</sub>	20 38 25 57 26			USCGS: 21.3 N 108.7 W Revilla Gigado Islands
26	25	iP <sub>z</sub>	08 48 47			
27	25	E <sub>z</sub> E <sub>z</sub>	13 40 32 50 19			USCGS: 52.9 S 160 E Macquarie Island Region

## Seismological Bulletin - MAY 1966

<u>No.</u>	<u>Date</u>	<u>Phase</u>	<u>Time</u> <u>G.C.T.</u>	<u>Period</u>	<u>Ampli-</u> <u>tude</u> <u>mm</u>	<u>Remarks</u>
28	28	iP <sub>z</sub> iS <sub>n</sub>	20 07 25 <sup>D</sup>			△ = 230 miles
29	29	iP <sub>z</sub> iS <sub>n</sub>	13 52 11 <sup>C</sup> 33			△ = 105 miles
30	30	iP <sub>zZ</sub>	03 11 19.5 <sup>C</sup>		USCGS: 7.6 N 77 W Northern Colombia	△ = 500 miles

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Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - JUNE 1966

-----Standard Seismograph System USC&GS: Sprengnether LP (Z,N,E); Benioff SP (z,n,e)-----

No.	Date	Phase	Time	Period	Ampli-	Remarks
			G.C.T.		tude	
					mm	
1	4	iP <sub>zZ</sub>	05 59 51.5 <sup>C</sup>			USCGS: 36.3 N 70.8 E Hindu Kush Region
2	5	e <sub>z</sub>	00 16 05			USCGS: 46.5 N 152.5 E Kurile Islands
3	5	iP <sub>z</sub>	03 27 01 <sup>C</sup>			△ = 180 miles
		iS <sub>n</sub>	39.5			
4	5	iP <sub>z</sub>	18 44 30 <sup>C</sup>			△ = 100 miles
		iS <sub>n</sub>	51.5			
5	6	eP <sub>z</sub>	08 04 54.5			USCGS: 36.3 N 71.2 E Afghanistan - U.S.S.R.
		eS <sub>N</sub>	08 10			
6	6	eP <sub>zZ</sub>	21 06 55 <sup>D</sup>			USCGS: 9.6 N 126.4 E Mindanao, Philippine Islands
7	7	iP <sub>zZ</sub>	01 05 00 <sup>C</sup>			USCGS: 15 S 75.8 W Near Coast of Peru
		iS <sub>nN</sub>	09 14			
8	7	iP <sub>zZ</sub>	14 18 54 <sup>C</sup>			USCGS: 11.3 N 139.6 E West Carolina Island
		iS <sub>N</sub>	20 30			
9	10	eP <sub>zZ</sub>	08 18 41 <sup>C</sup>			USCGS: 14.8 S 76.0 W Near Coast of Peru
10	12	eP <sub>zZ</sub>	03 15 22 <sup>D</sup>			
11	12	iP <sub>z</sub>	03 57 59.5 <sup>D</sup>			USCGS: 6.5 N 73.0 W Northern Colombia △ = 350 miles
		iS <sub>n</sub>	59 13			
12	13	iP <sub>z</sub>	02 48 57 <sup>D</sup>			USCGS: 7.6 N 82.6 W South of Panama △ = 180 miles
		iS <sub>n</sub>	49 35			

Seismological Bulletin - JUNE 1966

No.	Date	Phase	G.C.T.	Period	Amplitude mm	Remarks
13	13	eP <sub>zZ</sub>	18 27 48.5 <sup>C</sup>			USCGS: 12.2 S 167.1 E Santa Cruz Islands
14	15	eP <sub>Z</sub> iPR <sub>2</sub> iSR <sub>1</sub>	01 15 06 <sup>C</sup> 20 04 29 54			USCGS: 10.4 S 160.8 E Solomon Islands
15	15	eP <sub>z</sub> eS <sub>n</sub>	16 17 31 <sup>D</sup> 18 15			△ = 210 miles
16	16	e <sub>Z</sub>	10 24 48 <sup>C</sup>			USCGS: 15.5 N 104.3 W Off Coast Michoacan, Mexico △ = 1800 miles
17	21	iP <sub>z</sub> eS <sub>n</sub>	11 31 41.5 <sup>D</sup> 58			
18	21	eP <sub>zZ</sub>	18 15 34 <sup>C</sup>			USCGS: 16.3 N 94.8 W Oaxaca, Mexico △ = 1400 miles
19	21	iP <sub>zZ</sub> iS <sub>n</sub>	19 55 29 <sup>D</sup> 56 15			USCGS: 7.4 N 82.6 W South of Panama △ = 220 miles
20	22	eP <sub>zZ</sub>	07 14 09 <sup>C</sup>			
21	22	iP <sub>zZ</sub>	20 48 00.5 <sup>D</sup>			
22	24	iP <sub>z</sub> iS <sub>n</sub>	20 01 43.5 <sup>C</sup>			USCGS: 6.9 N 73.1 W Northern Colombia △ = 350 miles
23	26	iP <sub>z</sub> iS <sub>n</sub>	16 07 46.5 <sup>D</sup> 08 02			△ = 75 miles
24	27	eP <sub>zZ</sub> e e eS <sub>Z</sub>	11 00 31 <sup>C</sup> 3 14 3 41 18 42			USCGS: 29.7 N 80.9 E Nepal-India Border Region

Seismological Bulletin - JUNE 1966

No.	Date	Phase	Time		Ampli- tude mm	Remarks
			G.C.T.	Period		
25	28	eP <sub>Z</sub>	04 33 13		USCGS: 35.9 N 120.5 Central California	
		eS <sub>N</sub>	45 08			
		i <sub>L</sub>	49 04			
26	30	eP <sub>zZ</sub>	12 47 26			
27	30	eP <sub>zZ</sub>	22 23 06 <sup>C</sup>			

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 Engineering and Construction Bureau  
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Lat. 8° 57' 39" N  
 Long. 79° 33' 29" W

Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - July 1966

----- Standard Seismograph System USC&GS: Sprengnether LP (Z.N.E): Benioff SP (z.n.e) -----

No.	Date	Phase	Time	Period	Ampli-	Remarks
			G.C.T.		tude	
				mm		
1	1	eP <sub>zZ</sub>	06 09 49 <sup>C</sup>			
2	4	iP <sub>zZ</sub> iS <sub>nN</sub>	18 46 34 <sup>C</sup> 57 12		USCGS: 51.7 N 179.9 E Rat Islands, Alaska	
3	6	e	00 11 15		USCGS: 15.3 S 75.5 W Near Coast of Peru	
4	6	iP <sub>z</sub> iS <sub>n</sub>	10 41 36.5 <sup>D</sup> 42 12		USCGS: 7.8 N 82.2 W South of Panama	△ = 170 miles
5	6	e	19 37 12			
6	7	iP <sub>z</sub> iS <sub>n</sub>	00 12 07 <sup>C</sup> 13 21			△ = 360 miles
7	8	eP <sub>z</sub> eS <sub>n</sub>	03 15 28 <sup>D</sup> 16 15			△ = 275 miles
8	8	iP <sub>zZ</sub> iS <sub>nN</sub>	03 52 48 53 33		USCGS: 8.4 N 82.9 W Panama - Costa Rica Border	△ = 275 miles
9	8	eP <sub>z</sub> eS <sub>n</sub>	05 10 59 11 45			△ = 275 miles
10	8	eP <sub>z</sub> eS <sub>n</sub>	07 05 02 05 47			△ = 275 miles
11	10	e <sub>z</sub>	10 27 48		USCGS: 30.5 S 177.8 W Kermadac Islands	
12	10	e <sub>z</sub>	16 38 22		USCGS: 24.2 N 125.2 E Ryukyu Islands	



## Seismological Bulletin - JULY 1966

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
13	10	eP <sub>z</sub>	19 20 03			USCGS: 9.9 N 83.7 W Costa Rica △ = 250 miles
14	12	iP <sub>z</sub> iP <sub>n</sub>	19 08 23.5 <sup>C</sup> 52			△ = 140 miles
15	13	iP <sub>zZ</sub> iS <sub>N</sub>	08 23 8.7 <sup>C</sup> 24 54			
16	15	eP <sub>zZ</sub>	08 04 21 <sup>C</sup>			
17	16	iP <sub>z</sub>	17 00 4.5 <sup>C</sup>			
18	16	iP <sub>z</sub>	17 00 28.5 <sup>C</sup>			
19	16	iP <sub>z</sub>	17 01 20 <sup>D</sup>			
20	16	eP <sub>z</sub> eS <sub>n</sub>	21 08 29 <sup>D</sup> 09 21			△ = 250 miles
21	16	iP <sub>zZ</sub> iS <sub>Nn</sub>	00 14 44.5 16 56			USCGS: 9.2 N 82.4 W Panama-Costa Rica Border △ = 250 miles
22	17	eP <sub>z</sub> eS <sub>n</sub>	08 57 39 <sup>C</sup> 58 43			USCGS: 7.6 N 84.5 W Off Coast of Costa Rica △ = 300 miles
23	20	eP <sub>z</sub> eS <sub>n</sub>	09 42 52 <sup>D</sup> 44 10			USCGS: 6.8 N 73.0 W Northern Colombia
24	20	e <sub>z</sub>	11 08 14			
25	20	e <sub>z</sub> e <sub>z</sub> e <sub>z</sub>	12 30 14 36 18 41 21			USCGS: 6.0 S 133.0 E Tanimbar Islands
26	21	e <sub>z</sub>	05 44 39			USCGS: 3.9 S 104.3 W Easter Islands

## Seismological Bulletin - JULY 1966

No.	Date	Phase	Time		Period	Ampli- tude mm	Remarks
			G.C.T.				
27	21	eP <sub>z</sub> eS <sub>n</sub>	20 20 04 21 00				△ = 270 miles
28	22	eP <sub>z</sub> eS <sub>E</sub>	10 30 00 40 26			USCGS: 51.7 N 173.6 W Andreanof, Aleutian Islands	
29	23	eP <sub>z</sub>	14 44 26			USCGS: 51.7 N 173.5 W Andreanof, Aleutian Islands	
30	24	eP <sub>z</sub> eS <sub>n</sub>	07 26 59 <sup>C</sup>				△ = 70 miles
31	26	eL <sub>z</sub>	06 39 42			USCGS: 3.8 S 103.3 W Northern Easter Island	
32	26	iP <sub>z</sub> iS <sub>n</sub>	16 17 57 <sup>D</sup> 18 37			USCGS: 6.1 N 77.5 W Near West Coast of Colombia	
33	27	eP <sub>z</sub> eS <sub>N</sub>	04 55 44 <sup>C</sup> 05 01 12			USCGS: 24.2 S 70.3 W Northern Chile	△ = 1500 miles
34	28	iP <sub>z</sub> iS <sub>n</sub>	22 12 54 <sup>D</sup> 13 12				△ = 90 miles

Harold J. Million  
Chief Hydrographer



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Balboa Heights, Canal Zone

h: 36 meters

Seismological Bulletin - AUGUST 1966

----- Standard Seismograph System USC&GS: Sprengnether LP (Z,N,E); Benioff SP (z,n,e) -----

No.	Date	Phase	Time		Period	Amplitude mm	Remarks
			G.C.T.				
1	1	eP <sub>Zz</sub> ePP <sub>Zz</sub>	21 22 11 25 40			USCGS: 30.0 N 68.7 E West Pakistan	
2	4	eP <sub>z</sub> eS <sub>n</sub>	15 30 38 31 45				△ = 375 miles
3	4	iP <sub>z</sub>	23 40 02 <sup>D</sup>			USCGS: 7.6 N 82.9 W South of Panama	△ = 280 miles
4	5	eP <sub>z</sub> eS <sub>n</sub>	00 01 41 <sup>C</sup> 02 22				△ = 190 miles
5	5	eP <sub>z</sub> eS <sub>n</sub>	01 01 41 <sup>C</sup> 02 21.5				△ = 190 miles
6	5	iP <sub>z</sub>	01 05 01 <sup>D</sup>				△ = 190 miles
7	5	eP <sub>z</sub>	01 09 33.5 <sup>C</sup>				△ = 190 miles
8	5	iP <sub>z</sub> iS <sub>n</sub>	01 19 04 <sup>D</sup> 45				△ = 190 miles
9	5	iP <sub>z</sub> iS <sub>n</sub>	01 22 20.5 <sup>D</sup> 23 01				△ = 190 miles
10	5	iP <sub>zZ</sub> iS <sub>Nn</sub>	20 10 09 <sup>D</sup> 57			USCGS: 6.1 N 82.6 W South of Panama	△ = 280 miles
11	7	iP <sub>zZ</sub> iS <sub>N</sub>	02 25 33 <sup>D</sup> 35 57			USCGS: 50.6 N 171.3 W Aleutian Islands	

## Seismological Bulletin - AUGUST 1966

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
12	7	eP <sub>z</sub> eS <sub>n</sub>	05 15 38 <sup>C</sup> 16 34			USCGS: 5.9 N 82.5 W South of Panama △ = 270 miles
13	7	iP <sub>z</sub> eS <sub>n</sub>	08 22 35 23 48			USCGS: 6.9 N 73.1 W Northern Colombia △ = 400 miles
14	7	iP <sub>z</sub> iS <sub>N</sub>	17 43 55.5 <sup>C</sup> 50 08			USCGS: 31.8 N 114.5 W Gulf of California △ = 2000 miles
15	8	eP <sub>zZ</sub> eS <sub>N</sub>	08 08 50 16 04			USCGS: 19.3 N 108.1 W Revilla Gigedos Islands △ = 2500 miles
16	8	eP <sub>z</sub>	10 04 40.8 <sup>D</sup>			USCGS: 32.8 S 69.0 W Northern Chile △ = 2300 miles
17	8	eP <sub>z</sub> eS <sub>n</sub>	22 34 34.8 <sup>D</sup> 34 21			△ = 220 miles
18	9	iP <sub>zZ</sub> iS <sub>n</sub>	11 33 44 <sup>C</sup> 34 35			△ = 245 miles
19	9	eP <sub>z</sub>	17 18 15 <sup>D</sup>			
20	9	eP <sub>z</sub> eS <sub>n</sub>	21 26 50.3 <sup>D</sup> 27 22			△ = 150 miles
21	11	iP <sub>z</sub> iS <sub>n</sub>	04 45 37 <sup>C</sup> 46 11			△ = 170 miles
22	11	iP <sub>z</sub> iS <sub>n</sub>	09 51 49.5 <sup>C</sup> 52 42			USCGS: 10.5 N 83.9 W Costa Rica △ = 250 miles
23	18	iP <sub>zZ</sub> iS <sub>N</sub>	10 36 22 <sup>C</sup> 39 41			USCGS: 14.6 N 91.7 W Guatemala △ = 900 miles

Seismological Bulletin - AUGUST 1966

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
24	19	e <sub>Z</sub>	12 36 34			USCGS: 39.2 N 41.7 E
		e <sub>Z</sub>	44 01.5 <sup>C</sup>			Turkey 3,000 killed
		e <sub>Z</sub>	46 10.5 <sup>D</sup>			
25	20	iP <sub>Z</sub>	07 46 20 <sup>C</sup>			USCGS: 3.2 S 77.2 W
		iS <sub>N</sub>	48 40			Peru-Ecuador Border
						△ = 600 miles
26	21	iP <sub>ZZ</sub>	05 20 05.5 <sup>C</sup>			
27	22	eP <sub>ZZ</sub>	17 21 43.5 <sup>D</sup>			
28	24	eP <sub>ZZ</sub>	07 23 25 <sup>D</sup>			USCGS: 19.9 S 69.2 W
						Northern Chile
29	24	iP <sub>Z</sub>	14 44 04 <sup>D</sup>			
30	25	eP <sub>ZZ</sub>	23 25 18 <sup>D</sup>			USCGS: 22.4 S 68.6 W
						Northern Chile
31	29	iP <sub>ZZ</sub>	19 32 18 <sup>D</sup>			USCGS: 6.8 N 82.2 W
		iS <sub>N</sub>	33 27			South of Panama
						△ = 350 miles
32	29	iP <sub>Z</sub>	19 56 19.5 <sup>C</sup>			
		iS <sub>N</sub>	57 01			
						△ = 195 miles

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Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - SEPTEMBER 1966

Standard Seismograph System USC&GS: Sprengnether LP (Z.N.E): Benioff SP (z.n.e)

No.	Date	Phase	G.C.T.	Period	Amplitude mm	Remarks
1	3	iP <sub>z</sub> eS <sub>n</sub>	16 29 38 <sup>C</sup> 34 14			USCGS: 10.2 N 104.2 W Off Coast of Mexico
2	4	eP <sub>z</sub> eS <sub>n</sub>	06 22 54.4 <sup>D</sup> 23 14			△ = 100 miles
3	4	eP <sub>nz</sub> eP <sub>z</sub> eS <sub>n</sub>	13 25 02.6 <sup>C</sup> 06 38			
4	4	iP <sub>zZ</sub> iS <sub>nE</sub>	22 16 38.7 <sup>D</sup> 18 27			USCGS: 4.6 N 74.0 W Colombia Moderate damage at Bogota, six killed and 40 injured
5	5	iP <sub>z</sub> iS <sub>n</sub>	15 45 49 <sup>C</sup> 46 28			△ = 182 miles
6	6	iP <sub>z</sub>	23 22 28.5 <sup>D</sup>			
7	8	iP <sub>z</sub> eS <sub>N</sub>	21 35 31 <sup>C</sup> 49 26			USCGS: 2.4 N 128.4 E Halmahera
8	9	eP <sub>z</sub> eS <sub>n</sub>	18 42 24 <sup>D</sup> 44 12			USCGS: 49.2 N 129.5 W Vancouver Island Region
9	11	iP <sub>z</sub> iS <sub>n</sub>	03 22 28 <sup>D</sup> 23 41			USCGS: 6.8 N 73.1 W Northern Colombia
10	11	iP <sub>zZ</sub> iS <sub>N</sub>	17 55 39.7 D 56 54			△ = 375 miles

Seismological Bulletin - SEPTEMBER 1966

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
11	12	eP <sub>Z</sub>	11 44 08			USCGS: 23.1 S 170.6 E Loyalty Islands Region
12	12	eP <sub>Z</sub>	17 49 41			
13	14	iP <sub>zZ</sub>	23 30 51 <sup>C</sup>			USCGS: 60.1 S 27.0 W South Sandwich Islands Region
14	15	eP <sub>Z</sub>	12 04 06 <sup>C</sup>			USCGS: 34.8 N 24.3 E Crete
15	16	iP <sub>Z</sub>	12 29 34.4 <sup>C</sup>	0.3	9.5	
16	19	iP <sub>Z</sub> iS <sub>n</sub>	01 33 32 33 59.5			△ = 130 miles
17	25	iP <sub>zZ</sub> iS <sub>E</sub>	06 07 22 11 16			USCGS: 18.3 N 100.8 W Guerrero Mexico
18	25	iP <sub>Z</sub> iS <sub>n</sub>	17 51 37 <sup>D</sup> 51 48.5	0.5	7.0	△ = 56 miles
19	28	iP <sub>zZ</sub>	14 19 56 <sup>C</sup>			
20	30	iP <sub>Z</sub>	03 57 33.3 <sup>C</sup>			

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h: 36 meters

SEISMOLOGICAL BULLETIN - OCTOBER 1966

----- Standard Seismograph System USC&GS: Sprengnether LP (Z,N,E); Benioff SP (z,n,e) -----

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
1	7	eP <sub>Z</sub>	16 13 04			USCGS: 21.6 S 170.5 E Loyalty Islands Region
2	8	iP <sub>ZZ</sub>	20 38 36.5	0.7	11.0	USCGS: 13.3 N 82.3 W Caribbean Sea
3	8	iP <sub>Z</sub> iS <sub>n</sub>	21 19 06	0.6	4.2	△ = 177 miles
4	8	eP <sub>Z</sub>	21 25 23			
5	9	iP <sub>Z</sub>	02 20 06 <sup>D</sup>			USCGS: 1.5 N 85.2 W Off Coast of Ecuador
6	11	iP <sub>ZZ</sub> iS <sub>n</sub>	06 59 03 <sup>C</sup> 07 00 03	0.5	9.5	USCGS: 4.9 N 76.0 W Colombia △ = 288 miles
7	12	iP <sub>Z</sub> iS <sub>n</sub>	14 45 40 45 49.5			△ = 46 miles
8	12	iP <sub>ZZ</sub>	20 21 51.5 <sup>D</sup>	0.9	4.0	USCGS: 11.2 N 86.2 W Near Coast of Nicaragua △ = 650 miles
9	13	iP <sub>ZZ</sub> iS <sub>n</sub>	08 32 08 <sup>D</sup> 32 45	0.7	5.0	USCGS: 5.6 N 79.8 W South of Panama △ = 177 miles
10	13	iP <sub>Z</sub>	15 49 19.5 <sup>C</sup>	0.8	6.5	USCGS: 8.8 S 74.3 W Peru-Brazil Border Region
11	16	iP <sub>Z</sub> iS <sub>n</sub>	18 26 39.5 <sup>C</sup> 27 19.3			△ = 190 miles



## Seismological Bulletin - OCTOBER 1966

No.	Date	Phase	Time G.C.T.	Period	Ampli- tude mm	Remarks
12	17	iP <sub>zZ</sub> iS <sub>n</sub>	21 46 22.6 <sup>C</sup> 53 16			△ = 3295 miles
13	17	iP <sub>z</sub>	23 51 14.7 <sup>D</sup>			USCGS: 10.0 S 79.6 W Off Coast of Peru
14	19	iP <sub>z</sub> iS <sub>n</sub>	08 12 13 <sup>D</sup> 13 35	1.0	8.6	△ = 495 miles
15	19	iP <sub>z</sub> iS <sub>n</sub>	08 55 14 <sup>C</sup> 55 48	0.8	3.5	△ = 164 miles
16	19	iP <sub>z</sub> iS <sub>1e</sub>	12 37 44 <sup>C</sup> 38 30	0.5	3.0	△ = 221 miles
17	21	iP <sub>z</sub> iS <sub>e</sub>	00 02 02.5 <sup>D</sup> 02 56	1.0	2.8	△ = 257 miles
18	22	iP <sub>z</sub> iS <sub>e</sub>	00 19 10.5 <sup>D</sup> 20 01	0.8	2.5	USCGS: 6.9 N 82.2 W South of Panama △ = 242 miles
19	23	iP <sub>z</sub> iS <sub>n</sub>	03 19 47 <sup>C</sup> 20 02.5	0.5	2.8	△ = 27 miles
20	24	iP <sub>z</sub> iS <sub>e</sub>	06 41 32 <sup>D</sup> 41 45	0.5	9.0	△ = 63 miles
21	26	iP <sub>z</sub> iS <sub>n</sub>	04 13 33 <sup>D</sup> 14 16.8	0.4	2.7	△ = 210 miles
22	29	iP <sub>z</sub> iS <sub>n</sub>	23 56 42.5 <sup>C</sup> 57 19	0.6	2.6	△ = 175 miles

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Balboa Heights, Canal Zone

h: 36 meters

SEISMOLOGICAL BULLETIN - NOVEMBER 1966

-----Standard Seismograph System USC&GS: Sprengnether LP (Z.N.E): Benioff SP (z.n.e)-----

No.	Date	Phase	Time	Period	Ampli-	Remarks
			G.C.T.		tude	
				mm		
1	1	iP <sub>z</sub>	00 11 50.5 <sup>D</sup>	0.8	3.8	△ = 182 miles
		iS <sub>n</sub>	12 28.5			
2	2	iP <sub>z</sub>	11 06 31.5 <sup>C</sup>	0.5	5.9	USCGS: 19.1 N 67.9 W Mona Passage
		i <sub>n</sub>	07 16			
3	3	iP <sub>z</sub>	11 40 40.8 <sup>D</sup>	0.7	2.8	△ = 91 miles
		iS <sub>n</sub>	41 00			
4	3	iP <sub>z</sub>	16 28 04.1 <sup>D</sup>	1.0	3.3	USCGS: 19.2 N 67.9 W Mona Passage
		i <sub>e</sub>				
5	5	iP <sub>z</sub>	23 42 24.5 <sup>D</sup>	0.9	2.2	△ = 285 miles
		iS <sub>n</sub>	43 24			
6	8	eP <sub>z</sub>	22 48 14	0.7	2.0	△ = 200 miles
		iS <sub>n</sub>	48 55.5			
7	9	iP <sub>z</sub>	21 59 13.4 <sup>C</sup>	1.4	3.3	USCGS: 19.3 N 67.9 W Mona Passage
		i <sub>n</sub>	59 52			
8	10	iP <sub>z</sub>	03 10 14.4 <sup>D</sup>	1.3	7.5	USCGS: 31.9 S 68.4 W San Juan Province, Argentina Felt at San Juan and Mendoza
		i <sub>n</sub>				
9	10	iP <sub>z</sub>	12 27 24.2 <sup>D</sup>	0.3	4.6	△ = 79 miles
		iS <sub>n</sub>	27 40.5			
10	12	eP <sub>z</sub>	04 08 19.7	0.9	6.8	USCGS: 8.7 N 83.6 W Costa Rica
		iS <sub>n</sub>	09 14			

## Seismological Bulletin - NOVEMBER 1966

No.	Date	Phase	Time		Period	Ampli- tude mm	Remarks	
			G.C.T.					
11	12	eP <sub>Z</sub>	08 25 53		0.6	2.6		
		iS <sub>n</sub>	26 52.8					
							△ = 287 miles	
12	12	eP <sub>Z</sub>	11 13 34.5 <sup>C</sup>		0.6	1.6		
		iS <sub>n</sub>	14 34					
							△ = 286 miles	
13	12	iP <sub>Z</sub>	11 57 10.5 <sup>D</sup>		1.4	3.3	USCGS: 23.8 S 67.6 W Chile-Argentina Border Region	
14	12	iP <sub>Z</sub>	16 15 43		1.0	5.4		
15	13	iP <sub>Z</sub>	02 56 08.5 <sup>C</sup>		0.8	4.3	USCGS: 17.1 N 61.9 W Leeward Islands Felt on Antigua, Guadalupe and Montserrat	
		i <sub>n</sub>	56 34.7					
16	13	iP <sub>Z</sub>	14 28 39.6 <sup>C</sup>		1.1	2.1	USCGS: 8.3 S 74.2 W Peru-Brazil Border Region	
17	17	eP <sub>Z</sub>	10 40 47.3 <sup>D</sup>		0.5	1.9		
		iS <sub>n</sub>	41 18.3					
							△ = 149 miles	
18	18	iP <sub>Z</sub>	09 21 54.5 <sup>C</sup>				USCGS: 36.3 S 100.7 W Southern Pacific Ocean	
		iS <sub>N</sub>	28 02					
		iL <sub>N</sub>	35 28					
19	19	iP <sub>Z</sub>	18 24 57 <sup>C</sup>				USCGS: 10.7 S 79.1 W Off Coast of Peru	
		iS <sub>E</sub>	28 40.5					
		iL <sub>E</sub>	30 41					
20	20	eP <sub>Z</sub>	17 08 09.5 <sup>C</sup>					
		iS <sub>N</sub>	23 38					
		iL <sub>N</sub>	33 27					
							△ = 530 miles	
21	21	iP <sub>Z</sub>	10 22 35.7 <sup>C</sup>		0.7	2.9		
		iS <sub>n</sub>	23 13.5					
							△ = 182 miles	

## Seismological Bulletin - NOVEMBER 1966

No.	Date	Phase	Time		Ampli- tude mm	Remarks
			G.C.T.	Period		
22	23	eP <sub>Z</sub>	02 48 34 <sup>C</sup>			
		eS <sub>N</sub>	56 15			
		eL <sub>E</sub>	03 12 07			△ = 3990 miles
23	24	iP <sub>Z</sub>	17 01 40.5 <sup>D</sup>			
		iS <sub>N</sub>	06 38.5			
		iL <sub>N</sub>	10 39			△ = 2055 miles
24	28	iP <sub>Z</sub>	07 33 43.3 <sup>D</sup>	0.5	4.6	USCGS: 6.6 N 82.7 W
		iS <sub>E</sub>	34 37			South of Panama △ = 258 miles
25	29	iP <sub>Z</sub>	19 26 08.5 <sup>C</sup>			USCGS: 0.1 N 77.2 W
		iS <sub>N</sub>	26 33.2			Near North Coast of Colombia
26	29	iP <sub>Z</sub>	22 56 23 <sup>C</sup>			
		iL <sub>E</sub>	23 11 51			△ = 3530 miles
27	30	iP <sub>Z</sub>	08 44 12.7 <sup>D</sup>	0.8	3.3	
		iS <sub>n</sub>	45 05.6			△ = 255 miles

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