

BOLETIN SÍSMICO

DEL

INSTITUTO Y OBSERVATORIO DE MARINA

SAN FERNANDO

$\varphi = 36^{\circ} 27' 42''$

$\lambda = 6^{\circ} 12' 20'' W$

$a = 28^m$

Subsuelo: ROCA CALCÁREA.

INSTRUMENTOS


		Registro	Com- ponente	M	T <sub>0</sub>	V	$\varepsilon$	$\frac{r}{T_0^2}$	Extensión de 1 <sup>m</sup> en el registro
Péndulo horizontal	Bifilar	Mecánico	N-S	kg. 700	s 15	150	0	0,006	mm 15
Idem idem	idem	Idem	E-W	1100	20	200	0	0,008	15
Idem idem	Alfani	Fotográfico	N-S	3	8	1000	$\infty$	»	17
Idem idem	idem	Idem	E-W	3	8	465	$\infty$	»	17
Idem zenital	idem	Idem	Z	3	5	600	1,81	»	17
Idem vertical		Mecánico	E-W	700	2	270	0	0,060	15

TIEMPO MEDIO CIVIL DE EUROPA OCCIDENTAL  
(GREENWICH)

Núm.	Fecha	Com- ponente	Fase	Hora	T	A	$\Delta$	Observaciones
				h m s	s	μ	km	
1	Enero 2	N-E	L	0 56,0				
2	» 2/3	N	i (S)	22 59 57				
		N	(SR <sub>2</sub> )	23 12 32				
		N	L	23 24,0				
		E	L	23 27,0			(12.800)	
3	» 14	E	e (S)	6 1 16				
		E	i (S <sub>c</sub> P <sub>c</sub> S)	6 1 50				
		E	(SR <sub>1</sub> )	6 8 20				
		N-E	L	6 17,0	20	52	(9.700)	
4	» 14	Z-N-E	P	14 23 47				Dilatación.
		N-E	i S	14 33 14				
		N	(SR)	14 37 12				
		E	L	14 46,0			8.000	
5	» 14	Z	e P <sup>1</sup>	18 1 7				
		E	e (S <sub>c</sub> P <sub>c</sub> P <sub>c</sub> S)	18 11 26				
		N	(SR <sub>1</sub> )	18 26 35				
		N-E	L	18 56,5			(16.700)	
6	» 15	N-E	L	16 10,0				
7	» 20	N	i (S)	8 11 54				
8	» 20	N	(PR <sub>1</sub> )	17 19 25				
		N-E	(?)	17 22 24				
		N-E	(S <sub>c</sub> P <sub>c</sub> S)	17 26 37				
		N-E	(PPS)	17 29 31				
		N	(SR <sub>2</sub> )	17 38 38				
		N-E	L	17 51,0				
9	» 22	N	M <sub>N</sub>	17 55,0	40	49		
		E	M <sub>E</sub>	18 1,0	34	72	(11.500)	
10	» 27	N-E	L	16 20,0				
11	» 27	N-E	L	20 9,0				
12	Febrero 7	N-E	L	2 20,0				
13	» 7	N-E	e (PR <sub>1</sub> )	9 19 19				
		N	e (S)	9 26 19				
		N	e (SR <sub>1</sub> )	9 31 44				
		E	e (SR <sub>2</sub> )	9 35 15				
		N-E	L	9 40,5				
		E	M <sub>E</sub>	9 41,5	26	47		
14	» 8	N	M <sub>N</sub>	9 48,0	24	48	(8.800)	
		N-E	L	13 25,0				
15	» 15	Z	e	13 6 13				
		Z-E	i	13 8 30				
		N	(S)	13 17 14				
		N	(SR <sub>1</sub> )	13 26 3				
		N-E	L	13 50,0				
		N	M <sub>N</sub>	14 4,5	28	72		
15	» 15	E	M <sub>E</sub>	14 5,5	20	82		
		N	M <sub>N</sub>	14 23,5	19	50	(14.500)	

Núm.	Fecha	Com- ponente	Fase	Hora	T	A	$\Delta$	Observaciones
				h m s	s	$\mu$	km	
16	Febrero	Z	e (P <sup>1</sup> )	1 27 6				
		N-E	L	2 3,0				
17	»	N-E	L	7 8,0				
18	»	N	e (P <sup>1</sup> )	17 17 18				
		N-E	e (PR <sub>1</sub> )	17 20 15				
		N	e (S <sub>c</sub> P <sub>c</sub> S)	17 24 24				
		N-E	e (SR <sub>1</sub> )	17 40 39				
		N-E	L	18 5,0			(15.500)	
19	»	Z-E	e (P <sup>1</sup> )	15 52 6				
		N-E	(?)	16 2 49				
		N	i (SR <sub>1</sub> )	16 17 39				
		N	i (SR <sub>2</sub> )	16 23 31				
		N-E	L	16 45,5				
		N	M <sub>N</sub>	17 3,0	21	68		
		E	M <sub>E</sub>	17 3,0	33	142	(18.500)	
20	»	N	e (PR <sub>1</sub> )	19 49 40				
		N	e (PR <sub>2</sub> )	19 52 11				
		N-E	e (P <sub>c</sub> S <sub>c</sub> P <sub>c</sub> S)	19 58 21				
		N-E	L	20 44,5			(18.000)	
21	»	N	e (P <sup>1</sup> )	10 26 40				
		N-E	(?)	10 27 19				
		N	e (SR <sub>1</sub> )	10 46 50				
		N-E	L	11 12,0				(15.000)
22	»	N-E	L	3 55,0				
23	»	N-E	L	17 23,0				

El Director,



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SAN FERNANDO

$\varphi = 36^{\circ} 27' 42''$

$\lambda = 6^{\circ} 12' 20'' W$

$a = 28^m$

Subsuelo: ROCA CALCÁREA.

INSTRUMENTOS

			Registro	Com- ponente	M	T <sub>0</sub>	V	$\varepsilon$	$\frac{r}{T_0^2}$	Extensión de 1 <sup>m</sup> en el registro
					kg.	s				mm
Péndulo horizontal		Bifilar	Mecánico	N—S	700	15	150	0	0,006	15
Idem idem		idem	Idem	E—W	1100	20	200	0	0,008	15
Idem idem		Alfani	Fotográfico	N—S	3	8	1000	$\infty$	$\gg$	17
Idem idem		idem	Idem	E—W	3	8	465	$\infty$	$\gg$	17
Idem zenital		idem	Idem	Z	3	5	600	1,81	$\gg$	17
Idem vertical			Mecánico	E—W	700	2	270	0	0,060	15

TIEMPO MEDIO CIVIL DE EUROPA OCCIDENTAL  
(GREENWICH)

Núm.	Fecha	Com- ponente	Fase	Hora	T	A	$\Delta$	Observaciones	
				h m s	s	$\mu$	km		
24	Marzo	N N-E	i (PR <sub>1</sub> )	10 44 20				Agitación microsísmica.	
			L	11 32,0					
25	»	N N-E	(PR <sub>2</sub> )	3 43 9				Agitación microsísmica.	
			(?)	3 43 40					
			(S <sub>c</sub> P <sub>c</sub> S)	3 47 19					
			e (SR <sub>1</sub> )	3 54 34					
			L	4 8,0					
			E	M <sub>E</sub>	4 13,5	26	85		
26	»	N N-E	E	M <sub>E</sub>	4 17,0	22	72	(11.000)	
			N	M <sub>N</sub>	4 22,0	19	77		
			E	M <sub>E</sub>	4 23,0	20	53		
			L						
27	»	N-E	L	15 35,0					
28	»	N-E	L	15 52,0					
29	»	N-E	L	8 36,0					
30	»	N N-E	e (?)	1 18 36					
			L	1 40,0					
31	»	N N-E	i $\bar{P}$	10 5 11			150		
			i $\bar{S}$	10 5 28					
33	»	N N-E	L	13 15,0			(17.300)		
			e (P <sup>1</sup> )	0 12 35					
			e (PR <sub>1</sub> )	0 17 22					
			e (?)	0 27 39					
			e (SR <sub>1</sub> )	0 37 15					
34	»	N N-E	L	1 13,0			(17.300)	Agitación microsísmica.	
			e	4 50,0					
			L	13 30,0					
			e (?)	8 54 52					
36	»	N N-E	L	9 11,5			(400)	Agitación microsísmica.	
			N	M <sub>N</sub>	9 13,5	19			25
			E	M <sub>E</sub>	9 13,5	15			24
37	»	N N-E	e ( $\bar{P}$ )	3 6 55			(400)		
			i ( $\bar{S}$ )	3 7 42					
38	»	N-E	e	21 38,0					
39	Abril	E-Z N-E	e P <sup>1</sup>	2 28 17			13.800	Dilatación.	
			i PR <sub>1</sub>	2 29 48					
			i S <sub>c</sub> P <sub>c</sub> S	2 35 14					
			(S)	2 37 55					
			(SR <sub>1</sub> )	2 46 7					
			(SR <sub>1</sub> )	2 46 28					
			L	3 7,5					
			E	M <sub>E</sub>	3 15,0	32			269
39	»	N N-E	N	M <sub>N</sub>	3 19,0	25	167		
			E	M <sub>E</sub>	3 24,5	21	229		
			N	M <sub>N</sub>	3 29,5	21	164		
			E	M <sub>E</sub>	3 29,5	21	164		

Núm.	Fecha	Componento	Fase	Hora	T	A	Δ	Observaciones
				h m s	s	μ	km	
40	Abril	1	E	P <sub>1</sub>	20 30 13			
		E	PR <sub>1</sub>	20 32 31				
		E	S <sub>c</sub> P <sub>c</sub> S	20 36 38				
		E	PS	20 41 13				
		N	SR <sub>1</sub>	20 48 38				
		E	SR <sub>2</sub>	20 52 23				
		N-E	L	21 16,0	21	33	13.000	
41	»	2	N-E	e (P <sub>1</sub> )	6 37 4			
		N-E	e (PR <sub>1</sub> )	6 39 32				
		N-E	(S <sub>c</sub> P <sub>c</sub> S)	6 43 41				
		E	(SR <sub>1</sub> )	6 57 53				
		N-E	(SR <sub>2</sub> )	7 3 27			(15.000)	
		N-E	L	7 28,0				
42	»	8	N-E	e	4 29,0			
43	»	9	N-E	e	8 39,0			
44	»	9	E	e (P <sub>1</sub> )	16 22 25			
		N	e (P <sub>1</sub> )	16 22 37				
		E	e (PR <sub>1</sub> )	16 26 21				
		N	e (S <sub>c</sub> P <sub>c</sub> S)	16 29 25			(16.700)	
		N	e (SR <sub>1</sub> )	16 45 36				
45	»	10	N-E	e	20 50,0			
46	»	11	N-E	e (S)	3 39 30			Sismo cercano.
47	»	12	N	e	21 6 20			
		E	e	21 11 3				
		E	(PR <sub>1</sub> )	21 14 34				
		N-E	(S)	21 21 59				
		N-E	(SR <sub>1</sub> )	21 30 17				
		N-E	L	21 53,0				
		E	M <sub>E</sub>	22 1,5	18	22		
N	M <sub>N</sub>	22 2,5	20	25				
N	M <sub>N</sub>	22 14,5	19,5	27	(14.400)			
48	»	18	N	e (S)	0 37 43			
			N-E	L	0 42,5			
49	»	18	N-E	L	2 3,0			
50	»	19	N	i P <sub>1</sub>	5 26 59			
		Z	i P <sub>1</sub>	5 27 1				
		Z	i (PR <sub>1</sub> )	5 29 12				
		N-E	PR <sub>2</sub>	5 32 42				
		N-E	S <sub>c</sub> P <sub>c</sub> S	5 34 6				
		N-E	SR <sub>1</sub>	5 47 41				
		N-E	L	6 13,5				
		N	M <sub>N</sub>	6 21,5	32	106		
		N	M <sub>N</sub>	6 23,0	25	91		
		E	M <sub>E</sub>	6 23,0	23	100		
E	M <sub>E</sub>	6 25,0	23	108				
E	M <sub>E</sub>	6 45,0	22	64	15.200			
51	»	19	N-S	(S)	9 28 4			
		N-S	L	9 52,0				
52	»	21	Z	P	2 1 14			
		Z-N-E	S	2 1 35			(180)	
53	»	21	N-E	L	2 46,0			
54	»	22	N	e (P)	10 6 13			
		N-E	i (S)	10 12 05				
		N-E	L	10 19,5			(4.000)	
55	»	23	N	e (PR <sub>1</sub> )	23 31 10			
		N-E	i (S)	23 38 24				
		N	(SR <sub>1</sub> )	23 45 24				
		N-E	L	0 1,0			(11.200)	
56	»	24	N	e P	10 36 19			
		N-E	i S	10 36 30			100	
57	»	24	N	e P	17 8 25			Réplica del núm. 56.
		N-E	i S	17 8 36			100	
58	»	25	N-E	i P	6 6 54			Réplica del núm. 56.
		N	i S	6 7 2			80	
59	»	26	N-E	L	10 1,0			
60	»	27	N	e (PR <sub>1</sub> )	0 20 6			
		N-E	e (PR <sub>2</sub> )	0 22 44				
		N-E	e (SR <sub>2</sub> )	0 36 23				
		N-E	L	0 44,0				
		N	M <sub>N</sub>	0 46,5	30	49		
		E	M <sub>E</sub>	0 47,0	26	54	(8.900)	

Núm.	Fecha	Com- ponente	Fase	Hora	T	A	Δ	Observaciones
				h m s	s	μ	km	
61	Abril	27	N-E	e (L)	7	1,0		
62	}	28	N	e (PR <sub>1</sub> )	6	6	13	(17.500)
			N	e (PPS)	6	19	19	
			N	e (SR <sub>1</sub> )	6	25	37	
			N-E	L	6	57,0		
63	>	28	N	L	17	40,0		
64	>	29	N-E	L	9	42,0		

El Director,

*Leon Henares*

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SAN FERNANDO

$\varphi = 36^{\circ} 27' 42''$

$\lambda = 6^{\circ} 12' 20'' W$

$a = 28^m$

Subsuelo: ROCA CALCÁREA.

## INSTRUMENTOS

		Registro	Com- ponento	M	$T_0$	V	$\epsilon$	$\frac{r}{T_0^2}$	Extensión de 1 <sup>m</sup> en el registro
				kg.	s				mm
Péndulo horizontal	Bifilar	Mecánico	N—S	700	15	150	0	0,006	15
Idem idem	idem	Idem	E—W	1100	20	200	0	0,008	15
Idem idem	Alfani	Fotográfico	N—S	3	8	1000	$\infty$	"	17
Idem idem	idem	Idem	E—W	3	8	465	$\infty$	"	17
Idem zenital	idem	Idem	Z	3	5	600	1,81	"	17
Idem vertical		Mecánico	E—W	700	2	270	0	0,060	15

## TIEMPO MEDIO CIVIL DE EUROPA OCCIDENTAL

(GREENWICH)

Núm.	Fecha	Com- ponente	Fase	Hora	T	A	$\Delta$	Observaciones
				h m s	s	"	km	
65	Mayo	Z	(P <sub>N</sub> )	11 26 7				
		Z-N-E	i P	11 26 21				
		N-E	i S	11 26 30			90	
66	>	N-E	e L	9 7,0				
67	>	Z	e P <sub>N</sub>	3 11 16				
		N-E	i P	3 11 31				
		N-E	i S	3 11 42			100	
68	>	N	e P	3 46 44				
		Z-N-E	S	3 46 52			80	
69	>	N-E	L	21 0,0				
70	>	N-E	P	0 32 17				
		Z-N-E	i S	0 32 25			80	
71	>	Z	e P <sub>N</sub>	1 50 0				
		Z-N-E	P	1 50 13				
		Z-N-E	S	1 50 21			80	
72	>	N	e P	9 56 28				
		N-E	S	9 56 35			70	
73	>	N-E	P	10 2 5				
		Z-N-E	S	10 2 14			90	
74	>	N	e L	8 4,0				
75	>	N-E	P <sub>1</sub>	17 47 00				
		N-E	P <sub>2</sub>	17 47 25				
		N-E	S <sub>C</sub> P <sub>C</sub> S	17 50 17				
		N	PR <sub>1</sub>	17 50 44				
		N-E	SR <sub>1</sub>	18 10 37				
		N-E	L	18 39,5			17.300	
76	>	Z	e P <sub>N</sub>	2 31 20				
		N-E	i P	2 31 31				
		Z-N-E	i S	2 31 40			90	
77	>	Z	e P <sub>N</sub>	17 10 24				
		N-E	i P	17 10 38				
		N-E	i S	17 10 51			110	
78	>	N	L	6 33,0				
79	>	E	e (P)	7 18 35				
		N-E	i (S <sub>C</sub> P <sub>C</sub> S)	7 29 19				
		N	i (S)	7 29 49				
		N	(SR <sub>2</sub> )	7 40 54				
		N-E	L	7 51,5				
		N	M <sub>N</sub>	7 53,0	34	67	(10.500)	
E	M <sub>E</sub>	7 53,5	28	56				
80	>	N-E	e	21 21,0				
		N-E	L	22 15,0				
81	>	Z	e (P <sup>1</sup> )	3 25 12				
		N	e (PR <sub>2</sub> )	3 31 46				
		N	e (SR <sub>1</sub> )	3 47 38				
		N	e (SR <sub>2</sub> )	3 53 24				
		N-E	L	4 16,0				
		E	M <sub>E</sub>	4 31,5	21	28	(16.000)	
N	M <sub>N</sub>	4 35,0	20	25				

Núm.	Fecha	Com- ponente	Fase	Hora	T	A	$\Delta$	Observaciones	
				h m s	s	$\mu$	km		
82	Mayo	21	N N-E	e L	4 5,0 4 10,0				
83		22	E E N-E	e (P) e (S) L	0 29 17 0 39 39 1 4,5		(9.245)		
84	»	22/23	N N E N-E	e (PR <sub>1</sub> ) e (PR <sub>2</sub> ) e (SR <sub>2</sub> ) L	23 52 19 23 57 5 0 22 19 0 51,0		(20.000)		
85		25	N N-E	e L	4 43,5 3 12,0				
86	»	27	N-E N N-E N N-E	e P e PR <sub>1</sub> i S i SR <sub>1</sub> L	6 30 50 6 33 41 6 40 14 6 44 55 6 57,5				
			E N	M <sub>E</sub> M <sub>X</sub>	7 3,0 7 6,5	22 15	29 43	7.950	
		»	28	N-E N-E N-E N-E	i (P) i i i	0 28 59 0 29 6 0 29 14 0 29 23			
			28	N-E N-E N-E N N-E	e P S <sub>c</sub> P <sub>c</sub> S S SR <sub>1</sub> L	19 2 15 19 12 38 19 12 58 19 18 54 19 30,0			9.700
89	Junio	3	N-E	L	3 43,0				
90	»	3	E N-E	(S) L	9 38 36 9 57,5				
91	»	6	E N-E	e L	16 28 12 16 37,0				
92	»	7	E E	e (PR <sub>1</sub> ) e (S)	4 45 46 4 51 19		(5.700)		
93	»	8	N-E	L	16 35,0				
94	»	9	E E N-E	e e (S) L	16 54 38 17 2 51 17 35,0				
95		»	10	N-E N-E	e (S) L	3 47 24 4 4,0			
96	»	10	E N-E N-E N N-E N E	e i (PR <sub>1</sub> ) (PS) (SR <sub>1</sub> ) L M <sub>N</sub> M <sub>E</sub>	8 42 36 8 46 54 8 56 47 9 3 37 9 21,0 9 40,0 9 40,0	21 21	17 19	(13.200)	
		»	10	E N-E	e L	18 58 50 19 5,0			
		»	13	N-E	L	0 25,0			
		»	13	N-E N-E N-E	e (P) e (PR <sub>1</sub> ) (S)	0 37 52 0 38 23 0 42 14			(2.700)
100	»	14	N-E	L	3 22,0				
101	»	14	E N-E N-E	e (PR <sub>1</sub> ) e (S) L	17 8 9 17 13 32 17 21,0		(5.600)		
102		»	16	E N-E	e L	0 53 27 1 53,0			
103	»	19	N	e L	17 24,0				
104	»	20	N-E E N-E	(P) (S) L	6 36 30 6 40 18 6 41,5		(2 250)		
105		»	20	N-E E N-E	e (P) e (S) L	8 29 13 8 33 2 8 34,0		(2.250)	
106	»	20	N-E N-E	e $\bar{P}$ i $\bar{S}$	14 6 18 14 7 14		550		
107		»	22	N-E N-E	e (PR <sub>1</sub> ) e (S)	19 35 27 19 41 15		(6.300)	
108	»	27	E N-E	e (S) L	3 32 1 3 36,0				

Núm.	Fecha	Com- ponente	Fase	Hora			T	A	Δ	Observaci
				h	m	s				
109	Junio	27	N-E L	22	6,0					
110	»	28	N-E L	9	6,0					
111	»	29	N-E e P	14	39	57				
			E PR <sub>1</sub>	14	41	48				
			E e S	14	49	9				
			N-E i PS	14	49	29				
			E SR <sub>1</sub>	14	53	15			7.700	
112	»	30	Z e P	15	19	48				
			N-E e P	15	19	52				
			N PR <sub>1</sub>	15	23	15				
			N i S <sub>c</sub> P <sub>c</sub> S	15	30	23				
			E i S	15	30	30				
			N-E L	15	55,0					
113	»	30	E M <sub>E</sub>	16	6,0		18	130		
			N M <sub>N</sub>	16	9,5		18	139	9.500	
			N-E e (S)	19	43	1				
			N L	19	52,0					

El Director,

*Leon Herrera*



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INSTITUTO Y OBSERVATORIO DE MARINA

SAN FERNANDO

$\varphi = 36^{\circ} 27' 42''$

$\lambda = 6^{\circ} 12' 20'' W$

$a = 28^m$

Subsuelo: ROCA CALCÁREA.

INSTRUMENTOS

		Registro	Com- ponente	M	$T_0$	V	$\varepsilon$	$\frac{r}{T_0^2}$	Extensión de 1 <sup>m</sup> en el registro
Péndulo horizontal	Bifilar	Mecánico	N-S	kg 700	s 15	150	0	0,006	mm 15
Idem idem	idem	Idem	E-W	1100	20	200	0	0,008	15
Idem idem	Alfani	Fotográfico	N-S	3	8	1000	$\infty$	$\gg$	17
Idem idem	idem	Idem	E-W	3	8	465	$\infty$	$\gg$	17
Idem zenital	idem	Idem	Z	3	5	600	1,81	$\gg$	17
Idem vertical		Mecánico	E-W	700	2	270	0	0,060	15

TIEMPO MEDIO CIVIL DE EUROPA OCCIDENTAL

(GREENWICH)

Núm.	Fecha.	Com- ponente	Fase	Hora	T	$\Lambda$	$\Delta$	Observaciones
114	Julio	2	N-E	L	h m s 23 47,0	s	$\mu$	km.
115	}	3	Z	e (P <sub>1</sub> )	3 18 29			
		Z-E	i	3 18 38				
		Z-N-E	(P <sub>2</sub> )	3 19 13				
		N-E	L	4 17,0			> 18.000	
116	}	4	E	e (S)	9 14 40			Perdido en el cambio de los mecá- nicos.
		N	e (PS)	9 15 39				
117	}	5	N	e (PR <sub>1</sub> )	19 15 43			
		N	(S <sub>c</sub> P <sub>c</sub> S)	19 21 24				
		N	(S)	19 23 39				
		N	(PS)	19 25 39				
		N-E	L	19 51,5				
118	}	N	M <sub>N</sub>	19 54,5	42	56	(13.000)	
		119	12	Z	(P <sub>1</sub> )	3 2 13		
120	}	13	N-E	L	4 9,0			Compresión.
		Z-N-E	P	11 24 54				
		N	i S <sub>c</sub> P <sub>c</sub> S	11 35 19				
		N-E	i S	11 35 32				
		N	i SR <sub>1</sub>	11 41 31				
		N-E	L	11 53,5				
		N	M <sub>N</sub>	11 56,5	32	212		
E	M <sub>E</sub>	12 0,0	22	108				
121	}	N	M <sub>N</sub>	12 7,5	21,5	104	9.650	
		122	14	N-E	L	11 15,0		
123	15	N-E	L	2 54,0				
124	}	15	N-E	L	12 13,0			
		18	Z	e	16 25 5			
		Z-N-E	i	16 25 34				
		Z-N-E	i	16 26 1				
125	}	E	(L)	16 26 21				
		21	N-E	e	18 24,0			
126	}	22	Z	e (P <sub>1</sub> )	6 38 47			> 15.000
		E	L	7 46,5				
127	}	23	Z	P <sub>1</sub>	6 40 16			Compresión.
		Z-E	i	6 40 27				
		E	e (S <sub>c</sub> P <sub>c</sub> S)	6 52 58				
		N-E	L	7 48,0			(20.000)	
128	23	N-E	e	19 51,0				
129	}	26	Z-N-E	i P	7 49 33			
		Z	i	7 49 46				
		N-E	i S	8 0 8				
		Z-N	i	8 0 23				
		N-E	L	8 17,5				
		N	M <sub>N</sub>	8 30,0	22	22		
130	}	E	M <sub>E</sub>	8 30,0	21	19	9.600	
		28	Z	(P <sub>1</sub> )	5 37 49			Dilatación.
		Z-N-E	e (PR <sub>1</sub> )	5 41 23				
		N-E	L	6 29,0			(16.500)	

Núm.	Fecha.	Com- ponente	Fase	Hora	T	A	$\Delta$	Observaciones	
131	{ Julio	Z	(P <sub>1</sub> )	h m s 8 15 37			km. > 12.000	Dilatación.	
		N-E	L	9 4,5					
132	>	31	N-E	(L)	18 23,0				
133	Agosto	1	N-E	e (L)	7 9,0				
134		>	1	N-E	e (L)	8 48,0			
135	>	4	N-E	e (L)	15 9,0				
136	{ >	8	Z	e (P)	4 19 1		(3.000)	No está en función el péndulo zenital Alfani.	
		N-E	(S)	4 23 35					
137	{ >	14	N	e (S <sub>c</sub> P <sub>c</sub> S)	20 30 28	21 18	11 16	> 12.000	Idem.
		N	e (S)	20 32 38					
		N	e (SR <sub>1</sub> )	20 40 35					
		N-E	L	21 4,5					
		N	M <sub>N</sub>	21 13,5					
	E	M <sub>E</sub>	21 19,5						
138	>	14	N-E	e	23 39,5			Idem.	
139	>	15	N-E	e	3 45,5			Idem.	
140	>	16	N-E	e	14 44,0			Idem.	
141	>	17	N-E	e	7 42,0			Idem.	
142	{ >	17	E	e (P <sub>1</sub> )	14 19 45			> 15.000	Idem.
		E	e (P <sub>2</sub> )	14 20 37					
		N-E	e (S <sub>c</sub> P <sub>c</sub> S)	14 26 44					
		N-E	L	15 12,5					
143	>	18	N-E	e	7 53,0			Idem.	
144	{ >	22	N-E	e (P)	7 5 43			Idem.	
		N-E	S <sub>c</sub> P <sub>c</sub> S	7 16 15					
		N	S	7 17 43					
		N-E	SR <sub>1</sub>	7 24 21					
		N-E	L	7 44,5					
		E	M <sub>E</sub>	7 58,5					
	N	M <sub>N</sub>	8 0,0	21,5 20,0	74 96	11.500			
145	{ >	23	E	e	21 25 38			Idem.	
		N-E	(S <sub>c</sub> P <sub>c</sub> S)	21 35 40					
		N	i (S)	21 36 41					
		N	M <sub>N</sub>	22 10,0					
		E	M <sub>E</sub>	22 10,5					
					22 21	41 33	(10.600)		
146	{ >	24	N-S	e (P')	22 43 13			> 15.000	Idem.
		N-S	L	23 36,0					
		N	M <sub>N</sub>	23 45,5					
		E	M <sub>E</sub>	23 48,5					
147	>	26	N-E	e (L)	22 7,0			Idem.	
148	{ >	28	N-E	e (S)	22 21 33			Idem.	
		N	(L)	22 22,2					

El Director,

*Leon Herrera*

BOLETIN SÍSMICO  
DEL  
INSTITUTO Y OBSERVATORIO DE MARINA  
~~~~~  
SAN FERNANDO

$\varphi = 36^{\circ} 27' 42''$

$\lambda = 6^{\circ} 12' 20'' W$

$a = 28^m$

Subsuelo: ROCA CALCÁREA.

INSTRUMENTOS

|                    |         | Registro    | Com-<br>ponente | M          | T <sub>0</sub> | V    | ε | $\frac{\Gamma}{T_0^2}$ | Extensión<br>de 1 <sup>m</sup><br>en el registro |
|--------------------|---------|-------------|-----------------|------------|----------------|------|---|------------------------|--------------------------------------------------|
| Péndulo horizontal | Bifilar | Mecánico    | N—S             | kg.<br>700 | s<br>15        | 150  | 0 | 0,006                  | mm<br>15                                         |
| Idem idem          | idem    | Idem        | E—W             | 1100       | 20             | 200  | 0 | 0,008                  | 15                                               |
| Idem idem          | Alfani  | Fotográfico | N—S             | 3          | 8              | 1000 | ∞ | »                      | 17                                               |
| Idem idem          | idem    | Idem        | E—W             | 3          | 8              | 465  | ∞ | »                      | 17                                               |
| Idem vertical      |         | Mecánico    | E—W             | 700        | 2              | 270  | 0 | 0,060                  | 15                                               |

NOTA.—Los péndulos ALFANI quedaron fuera de función el 3 de Octubre por falta de papel sensible.

TIEMPO MEDIO CIVIL DE EUROPA OCCIDENTAL  
(GREENWICH)

| Núm. | Fecha.     | Com-<br>ponente | Fase | Hora                                               | T        | A  | Δ  | Observaciones |
|------|------------|-----------------|------|----------------------------------------------------|----------|----|----|---------------|
| 149  | Septiembre | 4               | N-E  | e (?)                                              | h m s    | s  | μ  | km.           |
|      |            |                 | N-E  | L                                                  | 8 34 36  |    |    |               |
| 150  | >          | 6               | N-E  | L                                                  | 9 5,0    |    |    |               |
| 151  | >          | 6               | E    | e (P')                                             | 17 59 38 |    |    | > 18.000      |
|      |            |                 | N    | e (P')                                             | 17 59 46 |    |    |               |
|      |            |                 | N    | e (S <sub>c</sub> P <sub>c</sub> P <sub>c</sub> S) | 18 12 31 |    |    |               |
|      |            |                 | N-E  | L                                                  | 19 4,5   |    |    |               |
| 152  | >          | 7               | E    | e (S)                                              | 12 41 35 |    |    |               |
|      |            |                 | N    | e (S)                                              | 12 41 47 |    |    |               |
|      |            |                 | N-E  | L                                                  | 13 2,0   |    |    |               |
| 153  | >          | 12              | N-E  | L                                                  | 18 55,0  |    |    |               |
| 154  | >          | 17              | N-E  | $\bar{P}$                                          | 1 12 34  |    |    | 190           |
|      |            |                 | N-E  | i $\bar{S}$                                        | 1 12 53  |    |    |               |
| 155  | >          | 17              | N-E  | e (S <sub>c</sub> P <sub>c</sub> P)                | 17 41 1  |    |    | (20.000)      |
|      |            |                 | N    | e (S <sub>c</sub> P <sub>c</sub> S)                | 17 44 39 |    |    |               |
|      |            |                 | N    | e (S <sub>c</sub> P <sub>c</sub> P <sub>c</sub> S) | 17 50 5  |    |    |               |
|      |            |                 | N-E  | L                                                  | 18 44,0  |    |    |               |
| 156  | >          | 18              | N    | e (P)                                              | 19 0 4   |    |    | (11.400)      |
|      |            |                 | N    | e (PR <sub>1</sub> )                               | 19 3 46  |    |    |               |
|      |            |                 | N    | e (PR <sub>2</sub> )                               | 19 6 32  |    |    |               |
|      |            |                 | N    | e (S <sub>c</sub> P <sub>c</sub> S)                | 19 10 33 |    |    |               |
|      |            |                 | N-E  | L                                                  | 19 36,0  |    |    |               |
| 157  | >          | 19              | N    | e (P)                                              | 1 16 32  |    |    | 10.500        |
|      |            |                 | N    | e PR <sub>1</sub>                                  | 1 18 39  |    |    |               |
|      |            |                 | N    | e PR <sub>2</sub>                                  | 1 20 53  |    |    |               |
|      |            |                 | N    | S <sub>c</sub> P <sub>c</sub> S                    | 1 25 32  |    |    |               |
|      |            |                 | N-E  | S                                                  | 1 26 8   |    |    |               |
|      |            |                 | N    | PS                                                 | 1 27 15  |    |    |               |
|      |            |                 | N    | SR <sub>1</sub>                                    | 1 32 48  |    |    |               |
|      |            |                 | N    | SR <sub>2</sub>                                    | 1 36 33  |    |    |               |
| 158  | >          | 19              | N    | L                                                  | 1 46,5   | 29 | 92 |               |
| N    | M          | 2 3,0           |      |                                                    |          |    |    |               |
| 159  | >          | 21              | N    | e (S)                                              | 7 27,0   |    |    |               |
| 159  | >          | 21              | N    | e (S)                                              | 11 52 47 |    |    |               |
|      |            |                 | N    | L                                                  | 11 58,0  |    |    |               |
| 160  | >          | 21              | N    | L                                                  | 17 50,0  |    |    |               |
| 161  | >          | 25              | N    | e (P)                                              | 13 7 6   |    |    | (8.200)       |
|      |            |                 | N    | (S)                                                | 13 16 42 |    |    |               |
|      |            |                 | N    | L                                                  | 13 30,0  |    |    |               |
| 162  | Octubre    | 3               | N-E  | L                                                  | 16 0,0   |    |    |               |
| 163  | >          | 3               | N    | e (S <sub>c</sub> P <sub>c</sub> S)                | 22 23 25 |    |    | (14.200)      |
|      |            |                 | N    | e (SR <sub>1</sub> )                               | 22 35 37 |    |    |               |
|      |            |                 | N-E  | L                                                  | 22 58,0  |    |    |               |
| 164  | >          | 4               | N-E  | L                                                  | 7 48,0   |    |    |               |

| Núm. | Fecha.  | Com-<br>ponente | Fase | Hora                 | T        | A | Δ | Observaciones   |
|------|---------|-----------------|------|----------------------|----------|---|---|-----------------|
| 165  | Octubre | 5               | N    | P'                   | h m s    | s | μ | km.<br>(19.800) |
|      |         |                 | N    | e (ScPcPcS)          | 0 14 11  |   |   |                 |
|      |         |                 | N    | (SR <sub>1</sub> )   | 0 26 11  |   |   |                 |
|      |         |                 | N-E  | L                    | 0 40 7   |   |   |                 |
| 166  | »       | 5               | N    | e (P)                | 10 3 17  |   |   | (14.200)        |
|      |         |                 | N    | e (P')               | 10 6 15  |   |   |                 |
|      |         |                 | N-E  | (ScPcPcS)            | 10 14 31 |   |   |                 |
|      |         |                 | N    | (PS)                 | 10 18 34 |   |   |                 |
| 167  | »       | 14              | N    | e (?)                | 1 14 26  |   |   |                 |
|      |         |                 | N    | (S)                  | 1 15 54  |   |   |                 |
|      |         |                 | N    | L                    | 1 17 5   |   |   |                 |
| 168  | »       | 15              | N-E  | L                    | 22 0,0   |   |   |                 |
| 169  | »       | 16              | N-E  | L                    | 13 10,0  |   |   |                 |
| 170  | »       | 27              | N    | e P                  | 3 14 23  |   |   | 1.800           |
|      |         |                 | N-E  | i S                  | 3 17 31  |   |   |                 |
|      |         |                 | N-E  | L                    | 3 20,0   |   |   |                 |
| 171  | »       | 18              | N-E  | L                    | 17 16,0  |   |   |                 |
| 172  | »       | 19              | N    | e (PR <sub>1</sub> ) | 12 25 7  |   |   | (14.000)        |
|      |         |                 | N    | e (SR <sub>1</sub> ) | 12 42 7  |   |   |                 |
|      |         |                 | N-E  | L                    | 13 9,0   |   |   |                 |
| 173  | »       | 22              | N-E  | L                    | 4 22,0   |   |   |                 |
| 174  | »       | 23              | N-E  | L                    | 0 17,0   |   |   |                 |
| 175  | »       | 23              | N-E  | e P                  | 6 36 26  |   |   | 9.200           |
|      |         |                 | N-E  | i S                  | 6 46 45  |   |   |                 |
|      |         |                 | N-E  | L                    | 7 1,5    |   |   |                 |
| 176  | »       | 26              | N-E  | L                    | 20 30,5  |   |   |                 |
| 177  | »       | 26              | E    | e P                  | 23 12 39 |   |   | 3.600           |
|      |         |                 | N    | i S                  | 23 18 3  |   |   |                 |
|      |         |                 | N-E  | L                    | 23 22,0  |   |   |                 |
| 178  | »       | 29              | N    | (SR <sub>1</sub> )   | 6 16,8   |   |   |                 |
|      |         |                 | E    | L                    | 6 28,0   |   |   |                 |
| 179  | »       | 29              | N    | e (PR <sub>1</sub> ) | 19 0 43  |   |   | (12.300)        |
|      |         |                 | N    | e (ScPcPcS)          | 19 7 17  |   |   |                 |
|      |         |                 | N    | e (SR <sub>1</sub> ) | 19 16 21 |   |   |                 |
|      |         |                 | N-E  | L                    | 19 41,0  |   |   |                 |

El Director,

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SAN FERNANDO

$\psi = 36^\circ 27' 42''$

$\lambda = 6^\circ 12' 20'' W$

$a = 28^m$

Subsuelo: ROCA CALCÁREA.

INSTRUMENTOS

|                    |         | Registro | Com-<br>ponente | M         | T <sub>0</sub> | V   | ε | $\frac{\Gamma}{T_0^2}$ | Extensión<br>de 1 <sup>m</sup><br>en el registro |
|--------------------|---------|----------|-----------------|-----------|----------------|-----|---|------------------------|--------------------------------------------------|
| Péndulo horizontal | Bifilar | Mecánico | N-S             | kg<br>700 | s<br>15        | 150 | 0 | 0,006                  | mm<br>15                                         |
| Idem idem          | idem    | Idem     | E-W             | 1100      | 20             | 200 | 0 | 0,008                  | 15                                               |
| Idem vertical      |         | Idem     | E-W             | 700       | 2              | 270 | 0 | 0,060                  | 15                                               |

TIEMPO MEDIO CIVIL DE EUROPA OCCIDENTAL  
(GREENWICH)

| Núm. | Fecha.      | Com-<br>ponente | Fase                              | Hora     | T | A | Δ        | Observaciones |
|------|-------------|-----------------|-----------------------------------|----------|---|---|----------|---------------|
| 180  | Noviembre 1 | N-E             | L                                 | h m s    | s | μ | km.      |               |
|      | >           | N               | e PR <sub>1</sub>                 | 17 5,5   |   |   |          |               |
|      | >           | N               | e PR <sub>1</sub>                 | 15 14 34 |   |   |          |               |
| 181  | >           | E               | e S <sub>c</sub> P <sub>c</sub> S | 15 20 50 |   |   |          |               |
|      | >           | N               | i S                               | 15 22 15 |   |   |          |               |
|      | >           | N               | SR <sub>1</sub>                   | 15 28 46 |   |   |          |               |
|      | >           | N-E             | L                                 | 15 46,0  |   |   | 10.800   |               |
|      | >           | N               | e P                               | 20 59 44 |   |   |          |               |
|      | >           | N               | PR <sub>1</sub>                   | 21 3 51  |   |   |          |               |
| 182  | >           | N               | i S <sub>c</sub> P <sub>c</sub> S | 21 10 6  |   |   |          |               |
|      | >           | N               | PS                                | 21 12 43 |   |   |          |               |
|      | >           | N               | SR <sub>1</sub>                   | 21 18 6  |   |   |          |               |
|      | >           | N               | SR <sub>2</sub>                   | 21 21 52 |   |   |          |               |
|      | >           | N-E             | L                                 | 21 32,0  |   |   | 10.800   |               |
| 183  | >           | N-E             | L                                 | 5 33,0   |   |   |          |               |
|      | >           | N               | i P                               | 12 44 22 |   |   |          |               |
|      | >           | N               | PR <sub>1</sub>                   | 12 48 18 |   |   |          |               |
|      | >           | N               | PR <sub>2</sub>                   | 12 49 56 |   |   |          |               |
| 184  | >           | N               | S <sub>c</sub> P <sub>c</sub> S   | 12 54 6  |   |   |          |               |
|      | >           | N-E             | i S                               | 12 55 4  |   |   |          |               |
|      | >           | N               | SR <sub>2</sub>                   | 13 4 2   |   |   |          |               |
|      | >           | N-E             | L                                 | 13 11,5  |   |   | 9.800    |               |
| 185  | >           | N-E             | L                                 | 16 8,0   |   |   |          |               |
|      | >           | N-E             | e (P)                             | 21 22 29 |   |   |          |               |
|      | >           | N               | (PR <sub>1</sub> )                | 21 25 12 |   |   |          |               |
| 186  | >           | N-E             | (S)                               | 21 32 10 |   |   |          |               |
|      | >           | N               | (PS)                              | 21 32 34 |   |   |          |               |
|      | >           | E               | (SR <sub>1</sub> )                | 21 37 46 |   |   |          |               |
|      | >           | N-E             | L                                 | 21 44,5  |   |   | (8.300)  |               |
| 187  | >           | N-E             | e (L)                             | 16 21,0  |   |   |          |               |
|      | >           | N               | e (P)                             | 18 31 17 |   |   |          |               |
| 188  | >           | N               | e (PS)                            | 18 42 21 |   |   |          |               |
|      | >           | N-E             | L                                 | 18 57,0  |   |   | (9.200)  |               |
| 189  | >           | N               | e (S)                             | 2 34 29  |   |   |          |               |
|      | >           | N-E             | L                                 | 2 46,0   |   |   |          |               |
| 190  | >           | N-E             | e (S)                             | 11 56 8  |   |   |          |               |
|      | >           | N-E             | M                                 | 11 59,0  |   |   |          |               |
| 191  | >           | N-E             | e (?)                             | 9 52,0   |   |   |          |               |
| 192  | >           | N-E             | i (S)                             | 15 17 14 |   |   |          |               |
| 193  | Diciembre 1 | E               | L                                 | 1 5,0    |   |   |          |               |
| 194  | >           | N-E             | L                                 | 22 40,0  |   |   |          |               |
| 195  | >           | E               | L                                 | 5 11,0   |   |   |          |               |
| 196  | >           | N-E             | L                                 | 3 18,0   |   |   |          |               |
| 197  | >           | N-E             | L                                 | 19 44,0  |   |   |          |               |
|      | >           | E               | e (P')                            | 23 12 46 |   |   |          |               |
|      | >           | N               | e                                 | 23 13 8  |   |   |          |               |
|      | >           | N               | e (PR <sub>1</sub> )              | 23 18 32 |   |   |          |               |
| 198  | >           | N               | e S <sub>c</sub> P <sub>c</sub> S | 23 25 5  |   |   |          |               |
|      | >           | N-E             | e (SR <sub>1</sub> )              | 23 39 24 |   |   |          |               |
|      | >           | N-E             | L                                 | 24 15,0  |   |   | (20.000) |               |
| 199  | >           | N-E             | e (S)                             | 0 35 38  |   |   |          |               |
|      | >           | E               | e (P')                            | 15 7 17  |   |   |          |               |
|      | >           | N               | e                                 | 15 7 41  |   |   |          |               |
|      | >           | N               | e (PR <sub>1</sub> )              | 15 10 43 |   |   |          |               |
| 200  | >           | N-E             | e (SR <sub>1</sub> )              | 15 30 5  |   |   |          |               |
|      | >           | N-E             | L                                 | 16 0,0   |   |   | (16.000) |               |

El Director,

*Leon Herrera*