

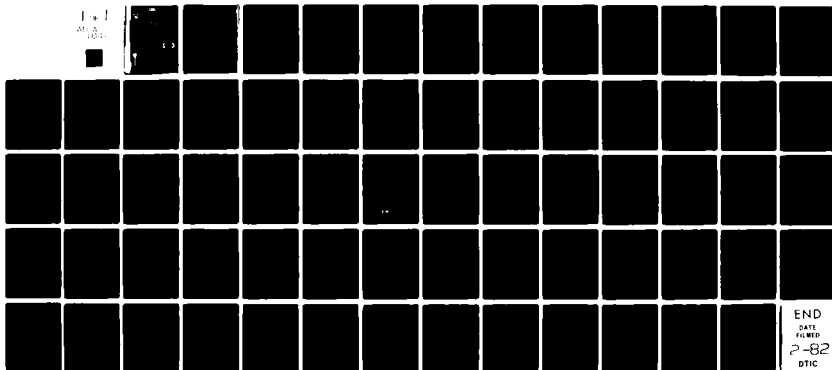
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TIDAL AND LUNAR DATA FOR POINT MUGU, SAN NICOLAS ISLAND, AND TH-ETC(U)
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PACIFIC MISSILE TEST CENTER

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Mr. J. S. Rosenfeld, Head, Geophysical Sciences Branch; Mr. R. A. Lee, Associate Head, Geophysics Division; Mr. E. G. Hyman, Project Manager; Mr. P. M. Wilson, Associate, Range Operations Department, and Mr. K. L. Lohr, Associate, Range Directorate, have reviewed this report for publication.

THAD FERRY
Technical Director

R. F. CRATER, CAPT USN
Vice Commander, Pacific Missile Test Center

Technical Publication TP-62-02

Published by: Technical Information Division
Security classification: Technical Support Department
First printing: UNCLASSIFIED
..... 250 copies

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER TP-82-02	2. GOVT ACCESSION NO. AD-A110 411	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) TIDAL AND LUNAR DATA FOR POINT MUGU, SAN NICOLAS ISLAND, AND THE BARKING SANDS AREA DURING 1982	5. TYPE OF REPORT & PERIOD COVERED	
7. AUTHOR(s) Richard W. Dixon	6. PERFORMING ORG. REPORT NUMBER	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Pacific Missile Test Center Point Mugu, CA 93042	8. CONTRACT OR GRANT NUMBER(s)	
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Air Systems Command Washington, DC 20361	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	12. REPORT DATE 15 December 1981	
	13. NUMBER OF PAGES 58	
	15. SECURITY CLASS. (of this report) UNCLASSIFIED	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Barking Sands, Hawaii area San Nicolas Island, California Lunar data Tide tables Point Mugu, California		
20. ☒ ABSTRACT (Continue on reverse side if necessary and identify by block number) Basic lunar and tidal data for Point Mugu, San Nicolas Island, and the Barking Sands area during 1982 are provided. The data presented are (1) tidal data, (2) times of moonrise and moonset, and (3) times of lunar phases. ↑		

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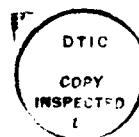
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CONTENTS

	Page
INTRODUCTION	1
DATA SOURCE AND TIME REFERENCES	1
TIDAL DATA	2
LUNAR DATA	2
APENDIXES	
A. Height of the Tide at Any Time	A-1
B. Equinoxes, Solstices, and Lunar Phases During 1982	B-1
TABLES	
1. Tidal Ranges for Point Mugu and San Nicolas Island	2
2. Tidal Ranges for Port Allen	2
3. Moonrise and Moonset, Point Mugu, California, 1982	3
4. Point Mugu Tides, January 1982	4
5. San Nicolas Island Tides, January 1982	4
6. Point Mugu Tides, February 1982	6
7. San Nicolas Island Tides, February 1982	6
8. Point Mugu Tides, March 1982	8
9. San Nicolas Island Tides, March 1982	8
10. Point Mugu Tides, April 1982	10
11. San Nicolas Island Tides, April 1982	10
12. Point Mugu Tides, May 1982	12
13. San Nicolas Island Tides, May 1982	12
14. Point Mugu Tides, June 1982	14
15. San Nicolas Island Tides, June 1982	14
16. Point Mugu Tides, July 1982	16
17. San Nicolas Island Tides, July 1982	16
18. Point Mugu Tides, August, 1982	
19. San Nicolas Island Tides, August 1982	18
20. Point Mugu Tides, September 1982	20
21. San Nicolas Island Tides, September 1982	20
22. Point Mugu Tides, October 1982	22
23. San Nicolas Island Tides, October 1982	22
24. Point Mugu Tides, November 1982	24
25. San Nicolas Island Tides, November 1982	24

CONTENTS (Concluded)

	Page
TABLES (Concluded)	
26. Point Mugu Tides, December 1982	26
27. San Nicolas Island Tides, December 1982	26
28. Moonrise and Moonset, Barking Sands, Hawaii 1982	26
29. Port Allen Tides, January 1982	30
30. Port Allen Tides, February 1982	32
31. Port Allen Tides, March 1982	34
32. Port Allen Tides, April 1982	36
33. Port Allen Tides, May 1982	38
34. Port Allen Tides, June 1982	40
35. Port Allen Tides, July 1982	42
36. Port Allen Tides, August 1982	44
37. Port Allen Tides, September 1982	46
38. Port Allen Tides, October 1982	48
39. Port Allen Tides, November 1982	50
40. Port Allen Tides, December 1982	52
A-1. Height of the Tide at Any Time	A-2
B-1. Equinoxes and Solstices, 1982, Point Mugu and San Nicolas Island	B-1
B-2. Lunar Phases, 1982, Point Mugu and San Nicolas Island	B-1
 FIGURES	
1. Tidal Graph for Point Mugu, January 1982	5
2. Tidal Graph for Point Mugu, February 1982	7
3. Tidal Graph for Point Mugu, March 1982	9
4. Tidal Graph for Point Mugu, April 1982	11
5. Tidal Graph for Point Mugu, May 1982	13
6. Tidal Graph for Point Mugu, June 1982	15
7. Tidal Graph for Point Mugu, July 1982	17
8. Tidal Graph for Point Mugu, August 1982	19
9. Tidal Graph for Point Mugu, September 1982	21
10. Tidal Graph for Point Mugu, October 1982	23
11. Tidal Graph for Point Mugu, November 1982	25
12. Tidal Graph for Point Mugu, December 1982	27
13. Tidal Graph for Port Allen, January 1982	31
14. Tidal Graph for Port Allen, February 1982	33
15. Tidal Graph for Port Allen, March 1982	35
16. Tidal Graph for Port Allen, April 1982	37
17. Tidal Graph for Port Allen, May 1982	39
18. Tidal Graph for Port Allen, June 1982	41
19. Tidal Graph for Port Allen, July 1982	43
20. Tidal Graph for Port Allen, August 1982	45
21. Tidal Graph for Port Allen, September 1982	47
22. Tidal Graph for Port Allen, October 1982	49
23. Tidal Graph for Port Allen, November 1982	51
24. Tidal Graph for Port Allen, December 1982	53
A-1. Tidal Curve for Solution of the Problem	A-3

INTRODUCTION

This publication combines into a single source all tidal and lunar data for operational locations of the Pacific Missile Test Center for use in Calendar Year 1982.

The data presentations are in two main divisions: one for Point Mugu and San Nicolas Island, and the other for the Barking Sands area. Within each division, the times of moonrise and moonset and tidal data are given. An appendix provides information regarding lunar phases. Since all such data change from year to year, this publication will be reissued annually.

Sunrise-sunset times for these locations, and associated solar data which do not change significantly from year to year, are issued as a single, permanent publication. Further information regarding any of these data may be obtained from the Geophysics Division of the Range Operations Department.

DATA SOURCE AND TIME REFERENCES

The data given here have been prepared from information contained in Tide Tables for the West Coast of North and South America including the Hawaiian Islands, 1982.*

For Point Mugu and San Nicolas Island, all times listed are Pacific Standard Time (PST); add eight hours to obtain Greenwich Mean Time (GMT or Z).**

For the Barking Sands Area, all times listed are Alaska-Hawaii Standard Time (AHST); add ten hours to obtain GMT. Daylight Saving Time is not observed in Hawaii.

*National Ocean Survey, Tide Tables for the West Coast of North and South America including the Hawaiian Islands, 1982. Washington, D.C., GPO, 1981.

**When Daylight Saving Time (PDT) is in effect, 1 hour is to be added to the times given. In 1982, Pacific Daylight Time is scheduled to commence at 0200 PST on Sunday, 25 April (add 1 hour), and to end at 0200 PDT on Sunday, 31 October (subtract 1 hour).

TIDAL DATA

The ranges of tidal heights that may be expected at Point Mugu and San Nicolas Island are shown in table 1. The range of heights for the primary harbor in the Barking Sands area, Port Allen, is shown in table 2. The times and heights of high and low tides for 1982 at Point Mugu are given in the even-numbered tables 4 through 26, and at San Nicolas Island in the odd-numbered tables 5 through 27. Similar tide data for Port Allen are given in tables 29 through 40.

Table 1. Tidal Ranges for Point Mugu and San Nicolas Island.

Tidal Levels	Point Mugu	San Nicolas Island
	Height (Feet)	Height (Feet)
Extreme high water	7.3	6.7
Mean higher high water	5.3	4.9
Mean high water	4.5	4.1
Mean tide level*	2.7	2.5
Mean low water	0.9	0.8
Mean lower low water	0.0	0.0
Extreme low water	-2.0	-1.8

*The mean tide level is also called mean sea level.

Table 2. Tidal Ranges for Port Allen.

Tidal Levels	Height (Feet)
Extreme high water	2.6
Mean higher high water	1.6
Mean high water	1.2
Mean tide level*	0.7
Mean low water	0.2
Mean lower low water	0.0
Extreme low water	-0.4

*The mean tide level is also called mean sea level.

Tidal graphs prepared from the Point Mugu data are presented in figures 1 through 12, and graphs prepared from the Port Allen tables are presented in figures 13 through 24. (Because of their close similarity to the Point Mugu graphs, graphical presentations of the San Nicolas Island data are not included in this publication.)

These tables list the times and heights of high and low tide for each month of the year and chronologically through each day. The heights are all measured from mean lower low water (see tables 1 and 2) and are values for a sea unaffected by wind waves or swell. The height and character of the sea surface are influenced by factors other than the predictable positions of the moon and sun, and is thus likely to be higher or lower than computed values may indicate. Information regarding the height of the tide at any time will be found in appendix A.

LUNAR DATA

Times of moonrise and moonset for the Point Mugu-San Nicolas Island area in 1982 are given in table 3, and for the Barking Sands area in table 28, preceding the tidal data for the respective stations. Information regarding the phases of the moon in 1982 will be found in appendix B.

Table 3. Moonrise and Moonset, Point Mugu, California, 1982.

Date	January		February		March		April		May		June		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1115	2306	1135	0009	1015	-----	1139	0121	1243	0149	1438	0209	1
2	1148	-----	1216	0115	1059	0014	1241	0216	1346	0228	1535	0239	2
3	1222	0008	1302	0222	1149	0121	1346	0305	1446	0302	1632	0309	3
4	1258	0112	1355	0329	1245	0225	1450	0348	1545	0334	1728	0341	4
5	1337	0219	1455	0434	1346	0325	1552	0425	1643	0405	1824	0415	5
6	1422	0328	1600	0534	1450	0419	1654	0500	1741	0435	1919	0452	6
7	1513	0439	1707	0627	1556	0507	1753	0532	1838	0506	2012	0534	7
8	1611	0548	1814	0714	1701	0549	1852	0603	1934	0539	2101	0620	8
9	1715	0652	1919	0755	1804	0626	1949	0634	2030	0615	2147	0709	9
10	1823	0750	2022	0831	1906	0700	2046	0706	2124	0654	2229	0802	10
11	1930	0841	2122	0904	2005	0733	2143	0740	2216	0737	2308	0858	11
12	2036	0924	2220	0936	2104	0804	2238	0817	2305	0824	2343	0955	12
13	2138	1002	2316	1007	2201	0835	2331	0857	2349	0915	-----	1053	13
14	2238	1036	-----	1038	2257	0908	-----	0942	-----	1009	0016	1153	14
15	2336	1107	0012	1111	2352	0943	0021	1031	0030	1106	0048	1254	15
16	-----	1137	0108	1147	-----	1021	0109	1123	0108	1204	0120	1357	16
17	0032	1208	0202	1227	0046	1104	0152	1219	0143	1304	0154	1503	17
18	0127	1240	0255	1311	0139	1150	0233	1318	0216	1406	0231	1612	18
19	0222	1313	0347	1359	0228	1241	0310	1419	0249	1510	0313	1723	19
20	0317	1351	0436	1452	0314	1336	0345	1521	0323	1616	0401	1835	20
21	0411	1432	0521	1549	0357	1434	0419	1625	0400	1725	0457	1943	21
22	0504	1518	0603	1648	0437	1534	0454	1731	0440	1837	0600	2046	22
23	0554	1608	0641	1749	0514	1636	0529	1839	0525	1949	0708	2139	23
24	0642	1702	0717	1851	0549	1740	0607	1949	0618	2059	0817	2225	24
25	0726	1800	0752	1954	0624	1844	0650	2100	0717	2203	0925	2305	25
26	0806	1859	0825	2058	0658	1950	0738	2209	0821	2259	1030	2350	26
27	0843	1959	0900	2202	0734	2059	0831	2314	0927	2348	1132	-----	27
28	0917	2100	0936	2308	0813	2206	0931	-----	1034	-----	1232	0012	28
29	0951	2202	-----	-----	0857	2314	1034	0013	1138	0029	1330	0042	29
30	1024	2305	-----	-----	0945	-----	1139	0105	1240	0106	1426	0112	30
31	1058	-----	-----	-----	1039	0020	-----	-----	1340	0138	-----	-----	31

Date	July		August		September		October		November		December		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1523	0143	1654	0214	1745	0335	1725	0420	1737	0617	1745	0724	1
2	1618	0216	1743	0301	1821	0433	1757	0521	1818	0725	1845	0833	2
3	1714	0253	1828	0352	1854	0532	1829	0623	1905	0835	1950	0938	3
4	1807	0333	1909	0447	1926	0632	1904	0727	1959	0944	2059	1034	4
5	1858	0417	1946	0543	1957	0733	1941	0833	2059	1049	2208	1122	5
6	1946	0505	2020	0641	2029	0834	2023	0940	2204	1148	2315	1203	6
7	2029	0558	2052	0740	2104	0937	2112	1048	2311	1239	-----	1239	7
8	2109	0653	2124	0839	2142	1042	2206	1153	-----	1323	0019	1312	8
9	2145	0749	2155	0939	2226	1148	2307	1255	0017	1402	0120	1343	9
10	2218	0847	2228	1040	2315	1254	-----	1350	0122	1436	0220	1413	10
11	2250	0945	2303	1143	-----	1359	0012	1439	0225	1508	0319	1444	11
12	2321	1045	2343	1249	0012	1459	0118	1522	0326	1539	0418	1516	12
13	2353	1145	-----	1356	0115	1554	0225	1600	0426	1610	0516	1552	13
14	-----	1248	0029	1503	0222	1642	0330	1634	0526	1642	0613	1631	14
15	0027	1353	0123	1609	0331	1724	0434	1706	0625	1716	0709	1715	15
16	0105	1501	0224	1709	0439	1801	0536	1738	0724	1753	0801	1803	16
17	0149	1611	0331	1803	0545	1835	0637	1809	0821	1834	0850	1854	17
18	0240	1721	0441	1849	0649	1908	0737	1843	0916	1920	0934	1948	18
19	0338	1826	0551	1930	0751	1940	0836	1918	1007	2009	1014	2044	19
20	0444	1924	0658	2006	0851	2012	0934	1957	1054	2101	1049	2140	20
21	0554	2015	0804	2040	0951	2046	1030	2040	1136	2156	1122	2237	21
22	0704	2059	0906	2111	1049	2123	1124	2127	1214	2253	1152	2335	22
23	0813	2137	1006	2143	1145	2203	1213	2218	1249	2350	1222	-----	23
24	0918	2211	1105	2216	1240	2248	1258	2311	1321	-----	1252	0033	24
25	1021	2242	1203	2250	1331	2336	1339	-----	1352	0048	1324	0134	25
26	1120	2313	1300	2328	1419	-----	1416	0007	1423	0148	1359	0238	26
27	1219	2344	1355	-----	1503	0028	1451	0105	1455	0250	1440	0346	27
28	1316	-----	1448	0009	1542	0123	1523	0204	1530	0354	1527	0456	28
29	1412	0017	1538	0055	1619	0221	1555	0304	1608	0502	1623	0607	29
30	1508	0052	1624	0145	1653	0320	1627	0406	1653	0612	1727	0716	30
31	1602	0131	1706	0238	-----	-----	1700	0510	-----	-----	1837	0818	31

TABLE 4
POINT MUGU TIDES
JANUARY 1982
34 DEG 06 MIN N, 119 DEG 06 MIN U - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0201	3.8	0700	2.7	1235	4.1
2	0251	4.1	0846	2.5	1348	3.6
3	0341	4.5	1019	1.9	1524	3.3
4	0427	5.0	1130	1.0	1710	3.3
5	0510	5.6	1227	.2	1828	3.5
6	0555	6.1	1316	-.6	1928	3.7
7	0623	1.7	0640	6.5	1401	-1.3
8	0113	1.8	0725	6.9	1447	-1.7
9	0204	1.8	0813	7.0	1532	-1.8
10	0250	1.8	0858	6.9	1618	-1.7
11	0341	1.8	0944	6.6	1700	-1.4
12	0434	1.9	1029	6.0	1744	-1.0
13	0517	4.2	1118	5.3	1829	-.4
14	0601	4.3	1210	4.5	1915	.2
15	0657	2.2	1316	3.8	2002	1.4
16	0757	2.0	1433	3.2	2051	1.8
17	0853	4.4	1534	2.9	2150	2.1
18	0941	4.7	1634	2.9	2250	2.2
19	1026	5.0	1709	3.1	2341	2.2
20	1105	5.2	1855	3.3	2411	2.2
21	1137	2.3	1955	3.1	2500	3.4
22	1211	2.2	2059	3.5	2559	3.5
23	1246	5.8	2127	3.6	2657	3.7
24	0117	2.1	2156	3.7	2755	3.8
25	0245	2.0	2227	3.8	2853	3.9
26	0321	2.0	2256	3.9	2951	4.0
27	0357	2.0	2330	4.0	3049	4.1
28	0442	2.0	1814	3.8	1942	1.3
29	0532	2.0	1854	3.8	1842	1.3
30	0641	1.9	1942	3.8	1742	1.3
31	0737	1.8	2030	3.4	1642	1.3

2 -- TIDE OCCURS ON NEXT DATE.

TABLE 5
SAN NICOLAS ISLAND TIDES
JANUARY 1982
33 DEG 16 MIN N, 119 DEG 30 MIN U - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0208	3.5	0710	2.5	1232	3.8
2	0258	3.8	0858	2.3	1355	3.4
3	0348	4.2	1029	1.7	1541	3.1
4	0434	4.6	1140	.9	1717	3.1
5	0517	5.2	1237	-.2	1836	3.3
6	0602	5.6	1326	-.5	1935	3.5
7	0643	1.5	0647	6.0	1411	-1.2
8	0733	1.6	0738	6.4	1457	-1.5
9	0814	1.6	0820	6.5	1542	-1.5
10	0890	1.6	0895	6.4	1628	-1.5
11	0951	1.6	0951	6.1	1710	-1.3
12	1044	1.7	1036	5.6	1754	-.9
13	1127	3.9	1125	5.9	1839	-.4
14	1217	4.2	1217	4.2	1925	.2
15	1304	4.0	1304	2.0	2012	.8
16	1350	4.1	1346	1.8	2101	1.3
17	1437	4.2	1437	1.5	2190	1.6
18	1524	4.4	1524	.9	2280	1.9
19	1611	4.6	1611	.5	2361	2.0
20	1658	4.8	1658	.1	2451	2.0
21	1745	2.1	1745	5.0	2541	2.0
22	1832	2.1	1832	5.2	2631	3.2
23	1919	2.0	1919	5.4	2721	3.3
24	2006	2.0	2006	5.5	2811	3.4
25	2093	1.9	2093	5.5	2901	3.5
26	2180	1.8	2180	5.1	2991	3.6
27	2267	1.8	2267	4.8	3081	3.7
28	2354	1.8	2354	4.8	3171	3.7
29	0041	3.8	0041	1.7	3261	3.7
30	0128	3.9	0128	1.6	3351	3.7
31	0214	4.1	0214	1.6	3441	3.7

2 -- TIDE OCCURS ON NEXT DATE.

POINT MUGU TIDES

JANUARY 1982

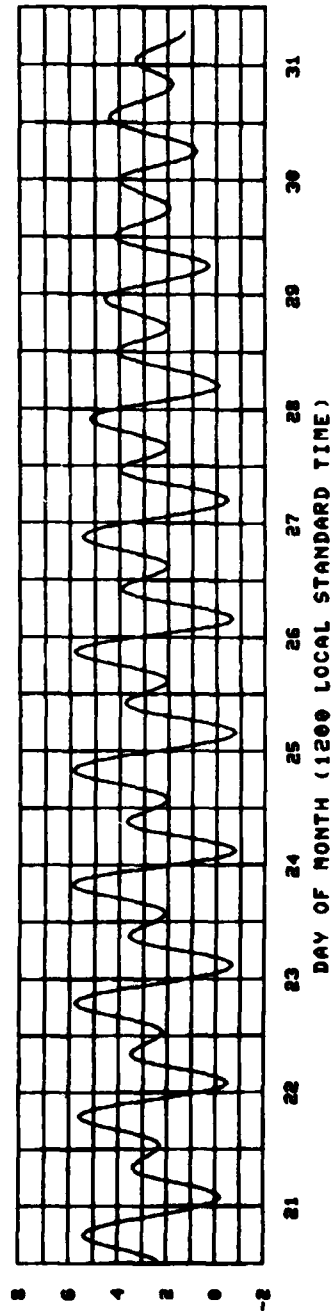
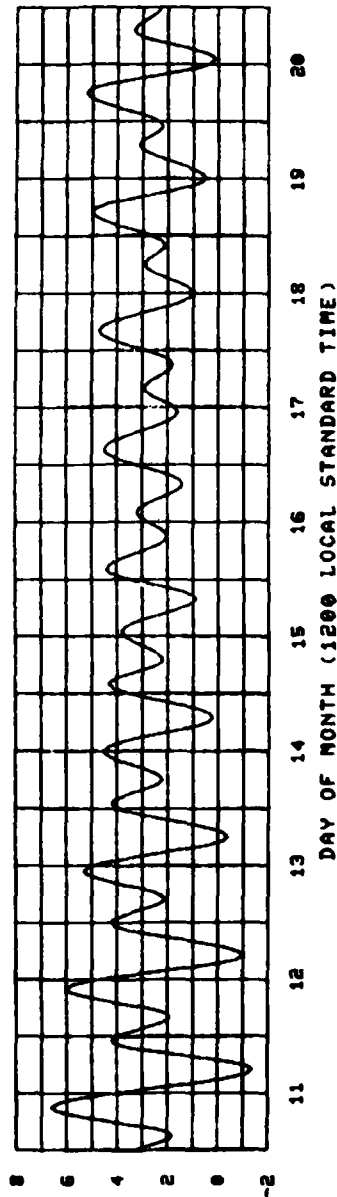
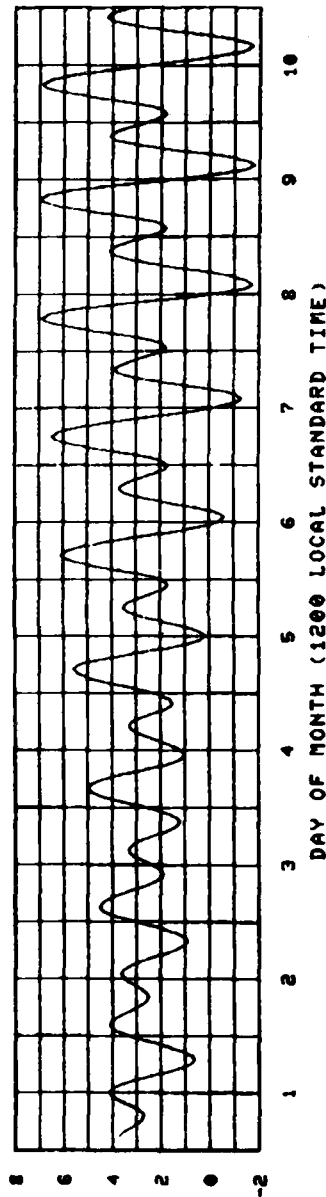


TABLE 6
POINT MUGU TIDES
FEBRUARY 1982
34 DEC 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0235	4.6	0946	1.3	1530	2.9	2044	1.8
2	0337	5.0	1113	.6	1726	3.0	2203	1.9
3	0441	5.4	1218	-.1	1843	3.3	2316	2.1
4	0538	5.8	1310	.8	1936	3.6	---	---
5	0629	6.3	0630	6.3	1355	1.3	2018	3.9
6	0720	6.5	0720	6.5	1436	1.6	2057	4.2
7	0813	1.8	0808	6.6	1518	1.6	2135	4.3
8	0902	1.5	0850	6.5	1554	1.4	2211	4.4
9	0933	1.4	0932	6.2	1631	1.1	2248	4.5
10	0930	1.3	1014	5.7	1708	-.6	2335	4.5
11	0908	1.2	1056	5.0	1740	0.9	---	---
12	0845	4.4	0559	1.5	1141	4.2	1817	.6
13	0842	4.3	0704	1.6	1237	3.5	1849	1.3
14	0829	4.3	0827	1.7	1357	2.9	1928	1.9
15	0826	4.2	1007	1.5	1615	2.6	2030	2.3
16	0833	4.2	1133	1.0	1819	2.8	2030	2.5
17	0839	4.4	1228	.6	1913	3.1	2133	2.5
18	0834	4.7	1318	.1	1945	3.3	---	---
19	0815	2.4	0617	5.0	1342	-.2	2011	3.5
20	0857	2.2	0656	5.3	1412	-.5	2033	3.7
21	0832	2.0	0730	5.6	1441	-.7	2055	3.9
22	0804	1.7	0803	5.7	1507	-.7	2130	4.1
23	0840	1.4	0838	5.8	1535	-.7	2145	4.2
24	0914	1.2	0913	5.6	1602	-.6	2213	4.4
25	0951	1.1	0950	5.4	1631	-.3	2242	4.5
26	0974	1.0	1030	4.9	1703	.1	2314	4.7
27	0958	.9	1119	4.3	1734	.7	2353	4.7
28	0925	.9	1215	3.6	1811	1.2	---	---

2 -- TIDE OCCURS ON NEXT DATE.

TABLE 7
SAN NICOLAS ISLAND TIDES
FEBRUARY 1982
33 DEC 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0242	4.3	0956	1.2	1537	2.7	2054	1.6
2	0344	4.6	1123	.5	1733	2.8	2213	1.9
3	0448	5.0	1228	-.1	1850	3.1	2326	1.9
4	0546	5.4	1320	.7	1943	3.4	---	---
5	0630	5.8	0637	5.8	1405	1.2	2025	3.6
6	0723	1.6	0727	6.0	1446	1.5	2104	3.9
7	0812	1.4	0815	6.1	1528	1.5	2142	4.0
8	0858	1.3	0857	6.0	1604	1.3	2218	4.1
9	0943	1.2	0939	5.7	1641	1.0	2255	4.2
10	0930	1.1	1021	5.3	1718	.5	2332	4.2
11	0918	1.2	1103	4.6	1750	0.0	---	---
12	0912	4.1	0609	1.4	1148	3.9	1827	.5
13	0949	4.0	0714	1.5	1244	3.3	1859	1.2
14	0936	4.0	0837	1.5	1344	2.7	1938	1.7
15	0933	3.9	1017	1.4	1404	2.7	2040	2.1
16	0946	3.9	1143	.9	1422	2.6	2040	2.1
17	0946	4.1	1238	.5	1426	2.9	2113	2.4
18	0941	4.4	1320	.1	1429	3.1	2333	2.4
19	0925	2.2	0624	4.6	1522	-.2	---	---
20	0907	2.0	0703	4.9	1552	-.5	2018	3.3
21	0842	1.8	0737	5.2	1617	-.6	2040	3.6
22	0814	1.5	0819	5.4	1645	-.6	2137	3.8
23	0750	1.3	0845	5.2	1645	-.6	2152	3.9
24	0824	1.1	0920	5.0	1612	-.5	2220	4.1
25	0840	1.0	0957	4.6	1641	-.3	2249	4.2
26	0844	.9	1037	4.5	1713	.1	2321	4.4
27	0836	.8	1126	4.0	1744	.6	0000	4.4
28	0835	.8	1223	3.4	1821	1.1	---	---

2 -- TIDE OCCURS ON NEXT DATE.

FEBRUARY 1982

POINT MUGU TIDES

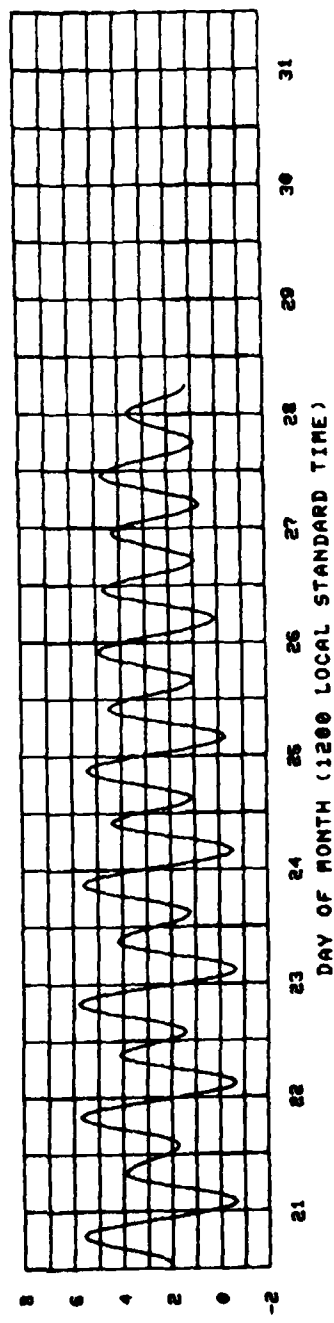
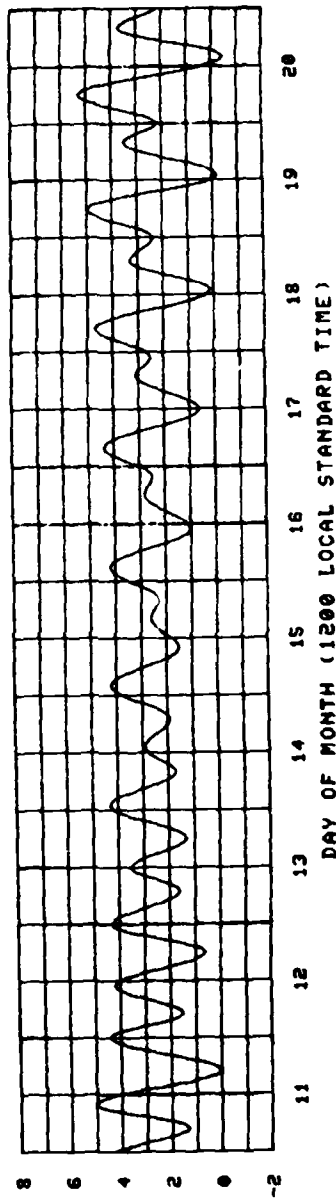
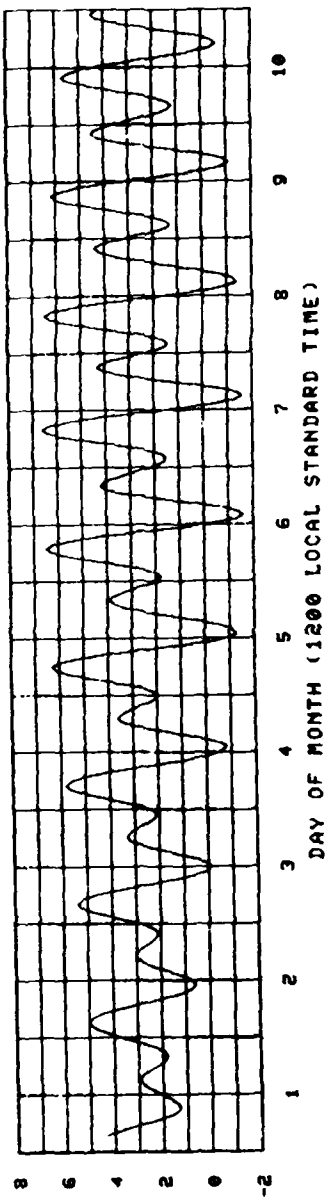


TABLE 8
POINT MUGU TIDES
MARCH 1982
34 DEC 06 MIN N, 119 DEG 06 MIN U - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0040	4.7	0748	.9	1342	2.9	1957	1.8
2	0142	4.8	0828	.7	1558	2.8	2112	2.3
3	0301	4.8	1058	.2	1750	3.1	2158	2.5
4	0420	5.1	1203	.4	1845	3.5	2325	2.3
5	0529	5.4	1258	.8	1927	3.8	---	---
6	0628	5.9	0119	5.8	1340	4.2	2002	4.2
7	0719	1.5	0212	6.0	1417	4.7	2103	4.7
8	0802	1.1	0302	5.0	1452	4.7	---	---
9	0845	.8	0359	5.0	1525	4.8	2155	4.8
10	0924	.6	0441	5.5	1556	4.8	2232	4.8
11	0406	.5	0520	5.0	1624	4.7	2301	4.7
12	0444	.6	0602	4.5	1652	4.5	2333	4.5
13	0529	.7	0640	3.9	1719	4.2	---	---
14	0619	.9	0724	3.2	1744	3.9	1908	3.2
15	0652	4.3	0807	1.1	1830	2.7	1933	2.5
16	0737	4.1	0857	1.2	1844	2.6	2117	2.8
17	0803	3.9	0940	1.0	1859	3.2	2110	2.7
18	0837	4.2	1046	.6	1914	3.4	0003	2.4
19	0952	4.5	1128	.2	1935	3.7	---	---
20	0544	4.5	1203	.1	1935	3.7	1951	4.0
21	0643	2.9	0630	4.9	1333	3.3	2015	4.2
22	0117	1.6	0708	5.1	1401	3.5	2151	4.5
23	0151	1.2	0747	5.3	1429	3.5	2303	4.8
24	0228	.7	0822	5.3	1455	3.2	2129	5.1
25	0305	.4	0901	5.2	1524	2.7	2204	5.2
26	0344	.1	0943	4.9	1555	2.2	2314	5.2
27	0428	-.1	1020	4.5	1627	1.7	2312	5.2
28	0521	0.0	1125	3.9	1700	1.2	1933	2.3
29	0622	0.0	1234	3.7	1741	1.8	2016	2.6
30	0730	5.1	0730	0.0	1417	3.0	---	---
31	0808	4.8	0808	0.0	1622	3.0	---	---

2 -- TIDE OCCURS ON NEXT DATE.

TABLE 9
SAN NICOLAS ISLAND TIDES
MARCH 1982
33 DEC 16 MIN N, 119 DEG 30 MIN U - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0047	4.4	0758	.8	1349	2.8	1907	1.6
2	0149	4.4	0838	.6	1605	2.6	2022	2.1
3	0308	4.5	1108	.2	1757	2.9	2208	2.3
4	0427	4.7	1213	-.4	1852	3.3	2335	2.1
5	0536	5.0	1308	-.7	1934	3.5	---	---
6	0638	1.7	0635	5.4	1350	1.0	2009	3.9
7	0129	1.4	0724	5.6	1427	1.1	2041	4.1
8	0212	1.0	0806	5.6	1502	1.0	2110	4.1
9	0255	.7	0848	5.5	1535	-.8	2142	4.5
10	0334	.5	0927	5.1	1606	-.5	2210	4.5
11	0416	.5	1009	4.6	1634	.0	2239	4.5
12	0454	.5	1047	4.2	1702	.5	2308	4.4
13	0529	.8	1127	3.6	1729	1.1	2340	4.2
14	0629	.8	1219	3.0	1754	1.5	---	---
15	0614	4.0	0734	1.0	1837	2.5	1814	2.0
16	0659	3.8	0807	1.1	1831	2.5	1843	2.4
17	0210	3.6	0850	.9	1851	2.7	2127	2.6
18	0344	3.6	1156	.5	1906	3.0	2320	2.5
19	0459	3.9	1238	.2	1921	3.2	0013	2.2
20	0551	4.2	1313	-.1	1942	3.5	---	---
21	0653	1.8	0837	4.6	1942	3.5	1858	3.7
22	0127	1.5	0875	4.7	1343	3.3	2022	3.9
23	0201	1.1	0754	4.9	1411	3.5	2044	4.2
24	0236	.6	0829	4.9	1439	3.5	2110	4.5
25	0315	.4	0850	4.8	1505	3.4	2136	4.7
26	0354	.1	0950	4.6	1534	3.2	2207	4.8
27	0438	-.1	1028	4.2	1605	2.6	2241	4.9
28	0531	-.1	1132	3.6	1637	1.6	2319	4.8
29	0632	0.0	1241	3.1	1710	1.1	---	---
30	0609	4.7	0746	0.0	1751	1.8	1843	2.1
31	0115	4.5	0619	0.0	1829	2.8	2036	2.5

2 -- TIDE OCCURS ON NEXT DATE.

POINT MUGU TIDES

MARCH 1982

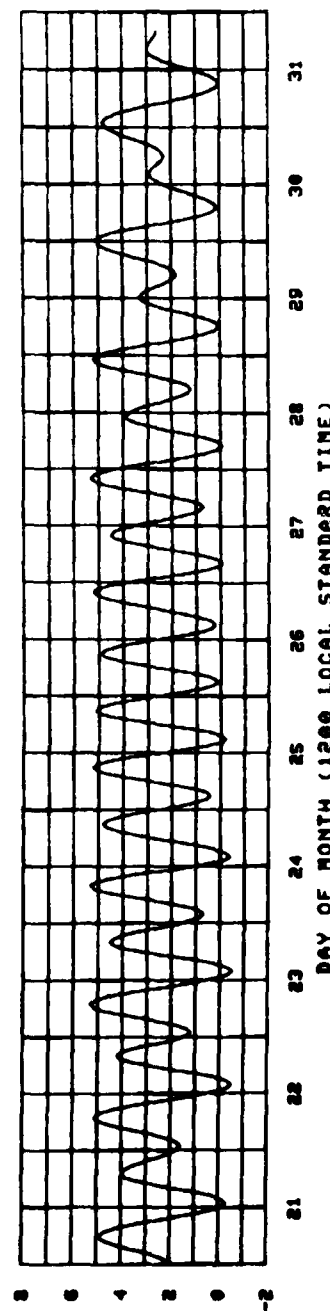
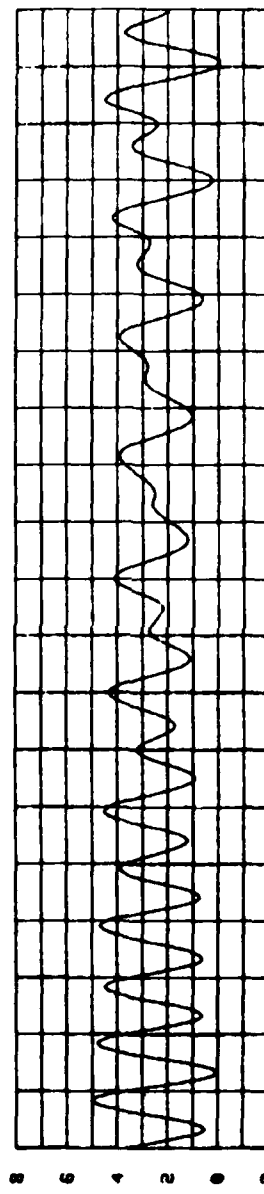
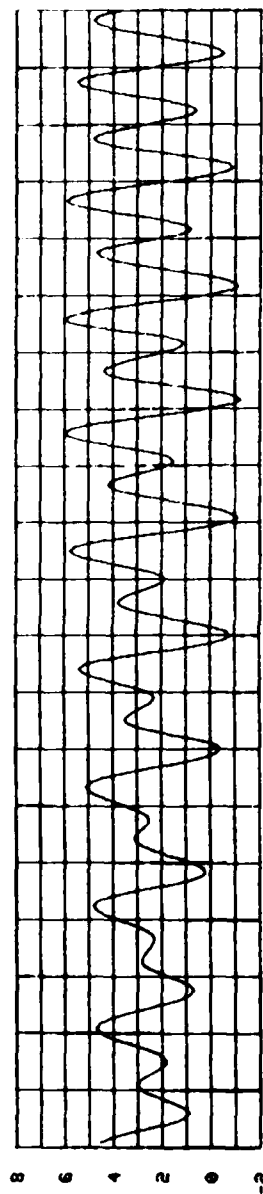


TABLE 10
POINT MUGU TIDES
APRIL 1982
34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0235	4.7	1035	-2	1741	3.4	2216	2.5
2	0408	4.7	1141	-5	1826	3.8	2338	2.1
3	0521	4.9	1231	-7	1902	4.2	---	---
4	0631	1.6	0619	5.1	1312	-1.7	1734	4.6
5	0119	1.0	0709	5.2	1348	-1.6	2002	4.8
6	0158	.6	0751	5.2	1420	-1.4	2027	5.0
7	0236	.3	0832	5.0	1448	-1.1	2055	5.1
8	0314	0.0	0911	4.7	1513	.3	2120	5.2
9	0350	-1	0948	4.3	1542	.8	2143	5.1
10	0426	0.0	1028	3.9	1604	1.2	2211	5.0
11	0504	.1	1111	3.5	1626	1.7	2236	4.8
12	0550	.3	1205	3.0	1651	2.1	2308	4.5
13	0645	.5	1327	2.7	1708	2.5	2343	4.2
14	0758	.7	---	---	---	---	---	---
15	0839	3.9	0936	.7	1808	3.1	2025	3.0
16	0217	3.7	1040	.6	1813	3.3	2243	2.8
17	0356	3.8	1133	.3	1828	3.6	2339	2.4
18	0505	4.1	1208	.1	1843	4.0	---	---
19	0621	1.9	0555	4.3	1244	0.0	1905	4.3
20	0058	1.3	0643	4.6	1312	0.0	1926	4.7
21	0134	.6	0725	4.7	1344	0.0	1951	5.1
22	0211	0.0	0808	4.8	1412	.2	2019	5.5
23	0252	-2	0854	4.7	1444	.4	2051	5.8
24	0335	-2	0942	4.4	1520	.8	2126	5.9
25	0423	-1.0	1034	4.0	1555	1.3	2202	5.7
26	0516	-1.0	1138	3.6	1634	1.8	2247	5.3
27	0615	-1.8	1253	3.3	1726	2.2	2341	5.3
28	0727	-4.9	1433	3.3	1838	2.6	---	---
29	0847	4.9	0846	-4	1903	3.5	2035	2.7
30	0216	4.5	1003	-4	1709	3.9	2221	2.4

2 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 11
SAN NICOLAS ISLAND TIDES
APRIL 1982
33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0242	4.4	1045	-2	1748	3.2	2226	2.4
2	0415	4.4	1151	-5	1833	3.5	2348	1.9
3	0528	4.6	1241	-6	1909	3.9	---	---
4	0641	1.5	0626	4.7	1322	-5	1941	4.3
5	0129	.9	0716	4.8	1358	-5	2009	4.5
6	0208	.5	0758	4.6	1430	-4	2034	4.6
7	0246	.3	0839	4.4	1458	-1	2102	4.7
8	0324	0.0	0918	4.4	1523	.3	2127	4.8
9	0400	-1	0955	4.0	1552	.7	2150	4.7
10	0436	0.0	1035	3.6	1614	1.1	2218	4.6
11	0514	.1	1118	3.3	1636	1.5	2243	4.5
12	0600	.3	1212	2.8	1701	1.9	2315	4.2
13	0655	.5	1334	2.5	1718	2.3	2350	3.9
14	0808	.6	---	---	---	---	---	---
15	0845	3.6	0936	.6	1815	2.9	2035	2.8
16	0224	3.5	1050	.5	1820	3.1	2253	2.6
17	0403	3.5	1143	.3	1835	3.4	2349	2.2
18	0512	3.8	1218	.1	1850	3.7	---	---
19	0631	1.7	0602	4.0	1254	0.0	1912	4.0
20	0108	1.2	0650	4.3	1322	0.0	1933	4.4
21	0144	.5	0732	4.4	1354	.2	1958	4.7
22	0221	0.0	0815	4.5	1422	.4	2026	5.1
23	0302	-7	0901	4.4	1454	.7	2058	5.4
24	0345	-9	0949	4.1	1530	1.2	2133	5.5
25	0433	-9	1041	3.7	1605	1.6	2209	5.3
26	0526	-7	1145	3.4	1644	2.0	2254	4.9
27	0625	-5	1300	3.1	1736	2.5	2348	4.8
28	0737	-4	1440	3.1	1848	3.3	---	---
29	0854	4.6	0855	-4	1910	3.6	2045	2.5
30	0223	4.2	1013	-4	1716	3.6	2231	2.2

2 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

APRIL 1982

POINT MUGU TIDES

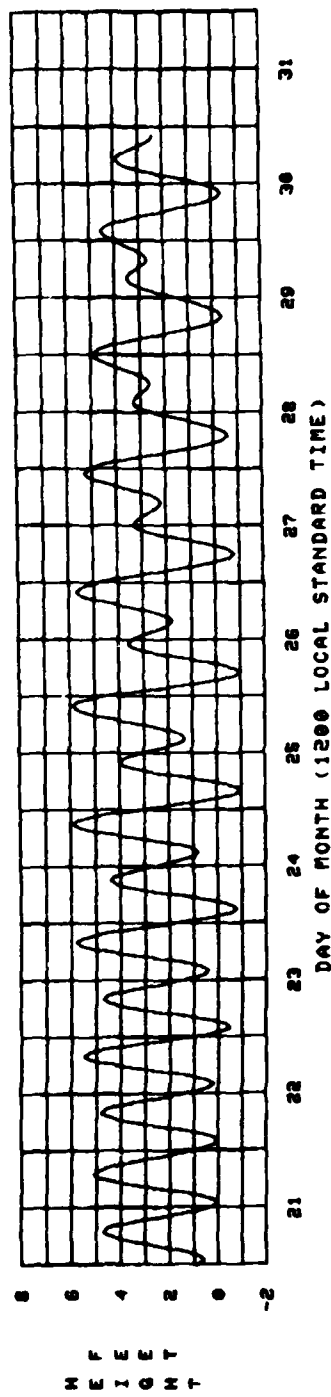
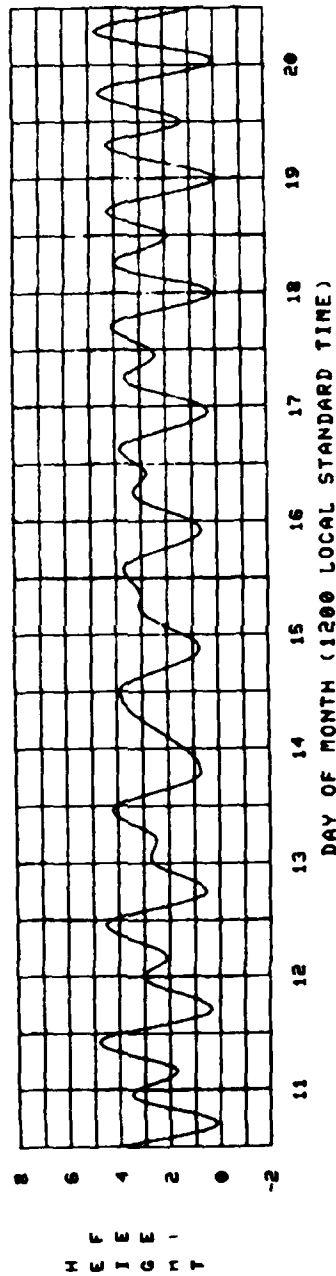
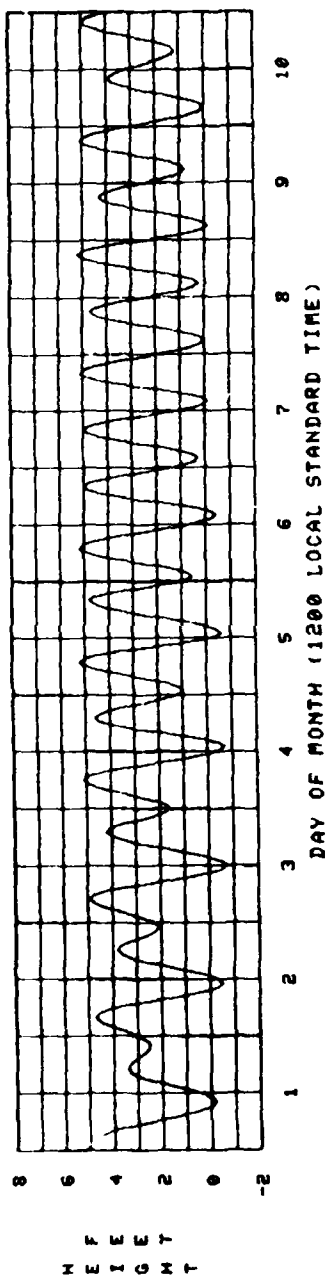


TABLE 12
POINT MUGU TIDES
MAY 1982
34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0349	4.4	1106	4.3	1752	1.9	2335	1.9
2	0505	4.4	1151	4.3	1829	1.9	2355	1.9
3	0628	1.2	1234	4.4	1906	5.0	2415	5.0
4	0745	4.4	1311	4.4	1958	5.2	2435	5.2
5	0852	4.3	1341	4.4	2016	5.4	2455	5.4
6	0958	4.2	1409	4.3	2066	5.5	2475	5.5
7	1052	4.0	1434	4.3	2104	5.4	2495	5.4
8	1145	3.7	1459	4.0	2129	5.3	2515	5.3
9	1234	3.5	1522	1.8	2158	5.1	2535	5.1
10	1311	3.3	1550	2.2	2227	4.8	2555	4.8
11	1326	2.9	1612	2.5	2257	4.5	2575	4.5
12	1359	3.0	1640	2.7	2304	4.2	2595	4.2
13	1428	3.2	1703	3.1	2354	4.2	2615	4.2
14	1459	3.5	1728	3.5	2382	2.8	2635	2.8
15	1522	3.7	1752	3.9	2415	1.7	2655	1.7
16	1545	3.8	1777	4.3	2435	1.7	2675	1.7
17	1558	4.0	1812	4.7	2455	1.7	2695	1.7
18	1612	4.1	1829	5.0	2475	1.7	2715	1.7
19	1628	4.2	1845	5.2	2495	1.7	2735	1.7
20	1640	4.3	1858	5.4	2515	1.7	2755	1.7
21	1652	4.4	1870	5.6	2535	1.7	2775	1.7
22	1703	4.5	1882	5.7	2555	1.7	2795	1.7
23	1715	4.6	1894	5.8	2575	1.7	2815	1.7
24	1728	4.7	1906	5.9	2595	1.7	2835	1.7
25	1740	4.8	1918	6.0	2615	1.7	2855	1.7
26	1752	4.9	1929	6.1	2635	1.7	2875	1.7
27	1804	5.0	1940	6.2	2655	1.7	2895	1.7
28	1816	5.1	1951	6.3	2675	1.7	2915	1.7
29	1828	5.2	1962	6.4	2695	1.7	2935	1.7
30	1840	5.3	1973	6.5	2715	1.7	2955	1.7
31	1852	5.4	1984	6.6	2735	1.7	2975	1.7

1 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 13
SAN NICOLAS ISLAND TIDES
MAY 1982
33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0356	4.1	1116	4.0	1759	1.7	2345	1.7
2	0512	4.1	1201	4.4	1836	4.4	2365	4.4
3	0638	1.1	1244	4.1	1906	4.6	2385	4.6
4	0752	4.1	1321	4.1	1933	4.8	2405	4.8
5	0858	4.0	1351	4.0	1958	5.0	2425	5.0
6	0952	3.9	1419	3.7	2023	5.1	2445	5.1
7	1052	3.7	1444	3.5	2046	5.0	2465	5.0
8	1145	3.5	1468	3.3	2068	4.9	2485	4.9
9	1234	3.3	1502	3.1	2111	4.7	2505	4.7
10	1311	3.1	1532	2.9	2136	4.5	2525	4.5
11	1326	2.8	1560	2.7	2162	4.2	2545	4.2
12	1359	2.7	1589	2.5	2188	4.0	2565	4.0
13	1428	2.8	1622	2.3	2211	3.8	2585	3.8
14	1459	3.0	1650	2.1	2231	3.6	2605	3.6
15	1522	3.2	1672	1.9	2251	3.4	2625	3.4
16	1545	3.4	1692	1.7	2271	3.2	2645	3.2
17	1558	3.5	1710	1.5	2292	3.0	2665	3.0
18	1612	3.6	1735	1.3	2316	2.8	2685	2.8
19	1628	3.7	1754	1.1	2341	2.6	2705	2.6
20	1640	3.8	1770	0.9	2366	2.4	2725	2.4
21	1652	3.9	1786	0.7	2391	2.2	2745	2.2
22	1703	4.0	1800	0.5	2416	2.0	2765	2.0
23	1715	4.1	1819	0.3	2441	1.8	2785	1.8
24	1728	4.2	1836	0.1	2466	1.6	2805	1.6
25	1740	4.3	1850	0.0	2491	1.4	2825	1.4
26	1752	4.4	1862	0.0	2516	1.2	2845	1.2
27	1804	4.5	1873	0.0	2541	1.0	2865	1.0
28	1816	4.6	1884	0.0	2566	0.8	2885	0.8
29	1828	4.7	1894	0.0	2591	0.6	2905	0.6
30	1840	4.8	1906	0.0	2616	0.4	2925	0.4
31	1852	4.9	1918	0.0	2641	0.2	2945	0.2

1 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

MAY 1982

POINT MUGU TIDES

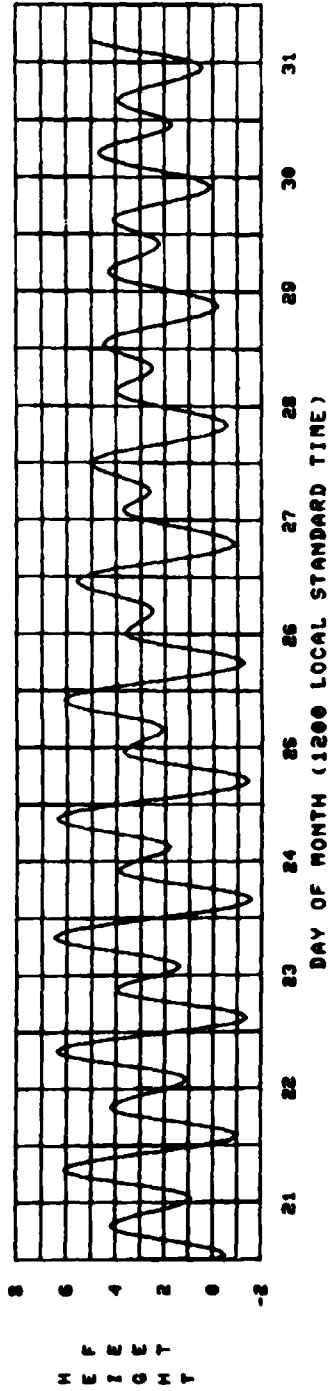
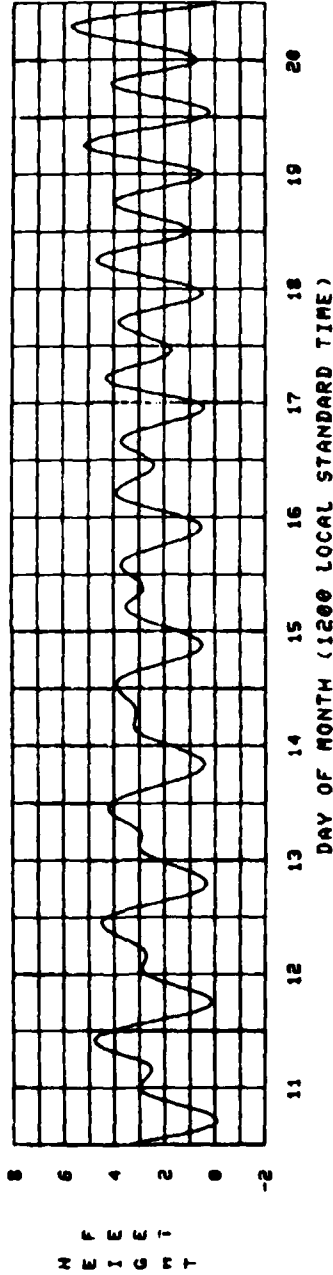
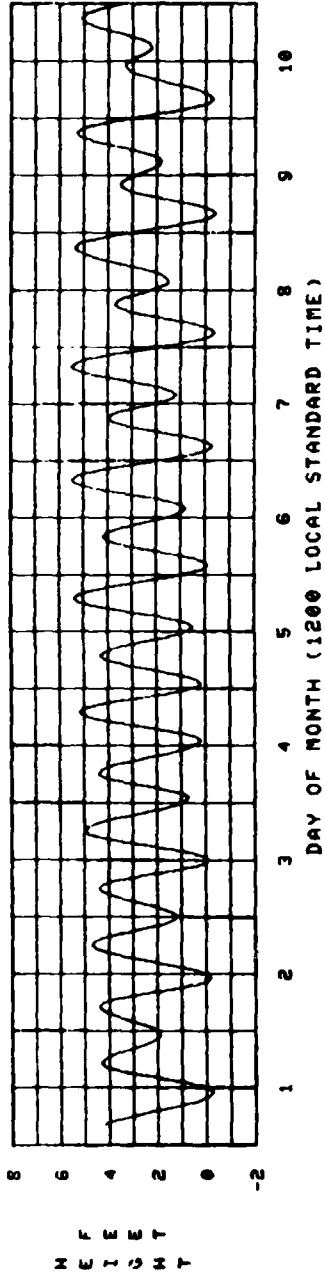


TABLE 14
POINT MUGU TIDES
JUNE 1982
34 DEG 06 MIN N, 119 DEG 06 MIN U - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0021	1.1	0552	3.8	1151	1.7	1819	5.3
2	0105	.5	0651	3.7	1228	1.0	1849	5.5
3	0144	.1	0743	3.6	1301	1.3	1916	5.7
4	0214	-.2	0823	3.5	1359	1.6	1943	5.7
5	0254	-.4	0903	3.4	1427	2.1	2008	5.7
6	0326	-.5	0945	3.5	1456	2.3	2036	5.6
7	0400	-.5	1027	3.4	1525	2.5	2104	5.4
8	0436	-.3	1109	3.3	1557	2.6	2136	5.2
9	0513	-.2	1157	3.2	1642	2.8	2208	4.9
10	0556	-.2	1257	3.2	1737	2.9	2244	4.5
11	0638	0.0	1356	3.3	1817	3.0	2336	4.5
12	0726	.3	1455	3.5	1910	3.2	2332	2.8
13	0828	4.1	0817	.5	1537	3.8	2221	2.3
14	0917	3.7	0907	.7	1614	4.2	2322	1.6
15	0917	3.5	0959	.8	1647	4.6	2332	1.6
16	0943	3.5	1045	1.0	1723	5.1	2332	1.6
17	0916	3.8	0955	3.5	1730	5.1	2332	1.6
18	0849	4.1	0858	3.7	1816	1.4	1835	6.2
19	0817	4.8	0754	3.8	1901	1.5	1917	6.9
20	0822	1.7	0851	3.9	1946	1.7	1959	6.9
21	0831	1.7	0944	4.0	1435	1.8	2044	6.9
22	0410	1.8	1039	4.0	1524	2.0	2133	6.8
23	0459	1.6	1133	4.0	1620	2.3	2232	5.4
24	0549	1.3	1229	4.1	1720	2.3	2317	5.8
25	0643	.9	1329	4.2	1834	2.5	2317	5.8
26	0717	5.1	0736	4.2	1931	4.4	2005	2.4
27	0812	4.4	0832	.2	1431	4.6	2136	2.1
28	0851	3.8	0926	.7	1527	4.9	2258	1.6
29	0422	3.4	1020	1.2	1619	5.1	0000	1.1
30	0542	3.3	1108	1.5	1739	5.3	0000	1.1

2 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 15
SAN NICOLAS ISLAND TIDES
JUNE 1982
33 DEG 16 MIN N, 119 DEG 30 MIN U - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0031	1.0	0559	3.5	1201	.6	1826	4.9
2	0115	.5	0658	3.5	1238	.9	1856	5.1
3	0154	.1	0750	3.4	1311	1.2	1923	5.2
4	0229	-.2	0830	3.3	1340	1.5	1950	5.3
5	0304	-.4	0910	3.3	1409	1.7	2015	5.3
6	0336	-.5	0952	3.2	1437	1.9	2043	5.2
7	0410	-.5	1034	3.1	1506	2.1	2111	5.2
8	0445	-.3	1116	3.0	1535	2.3	2143	5.0
9	0523	-.3	1204	3.0	1567	2.5	2215	4.8
10	0606	-.2	1294	3.0	1607	2.6	2251	4.6
11	0648	0.0	1384	3.1	1647	2.7	2337	4.2
12	0736	.3	1482	3.3	1680	2.8	2402	2.6
13	0835	3.8	0827	.5	1544	3.5	2231	2.1
14	0934	3.5	0917	.6	1621	3.9	2332	1.5
15	0954	3.3	1000	.7	1654	4.2	2332	1.5
16	0954	3.3	1055	.9	1730	4.7	2332	1.5
17	0926	4.0	0952	3.3	1740	1.1	1802	5.3
18	0851	4.7	0851	3.5	1826	1.3	1842	5.7
19	0817	5.4	0801	3.5	1911	1.4	1924	6.1
20	0822	1.2	0851	3.6	1956	1.5	2006	6.4
21	0831	1.5	0951	3.7	2045	1.6	2051	6.4
22	0840	1.5	1040	3.7	2134	1.8	2140	6.3
23	0850	1.2	1140	3.7	2220	2.0	2230	5.9
24	0850	1.2	1236	3.8	2306	2.1	2324	5.4
25	0853	.8	1336	3.9	2391	2.3	2401	2.2
26	0854	4.7	0746	.2	1438	4.1	2015	2.2
27	0854	4.1	0842	.6	1534	4.3	2146	1.9
28	0858	3.5	0936	.6	1626	4.6	2308	1.5
29	0429	3.2	1030	1.1	1719	4.7	0010	1.9
30	0549	3.1	1118	1.4	1740	4.9	0010	1.9

2 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

POINT MUGU TIDES

JUNE 1982

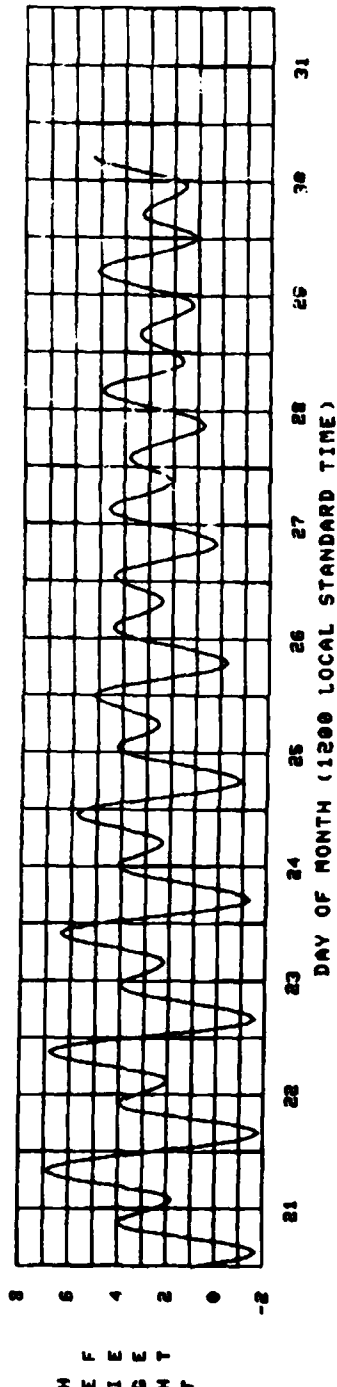
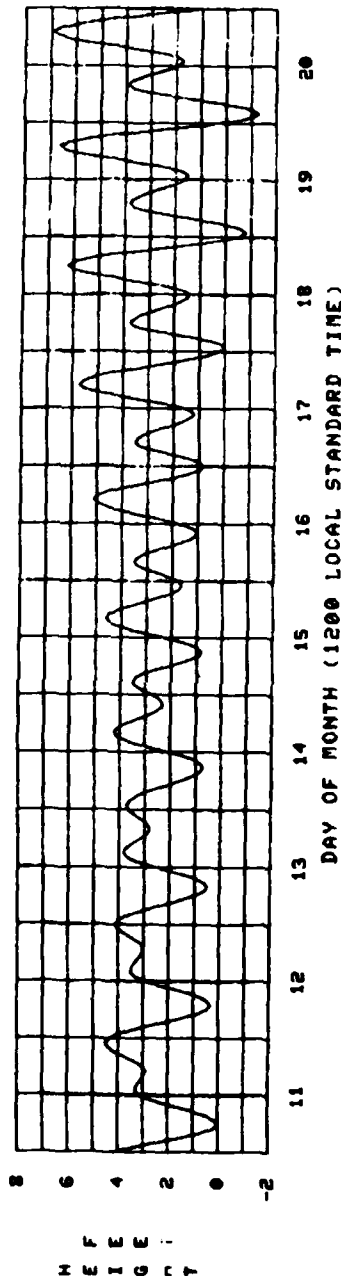
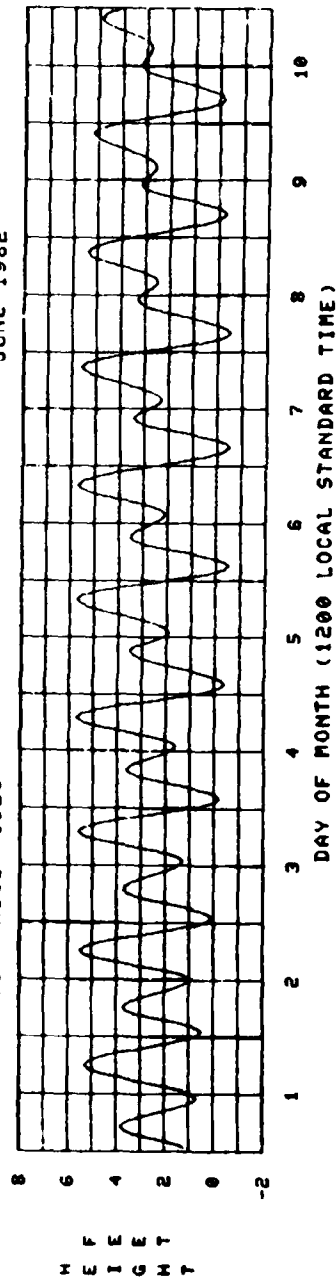


TABLE 16
POINT MUGU TIDES
JULY 1982
34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0653	.6	0648	3.3	1151	1.8	1814	5.5
2	0132	.2	0743	3.4	1229	2.1	1877	5.7
3	0207	-.1	0828	3.5	1305	2.2	1918	5.8
4	0232	-.3	0904	3.6	1386	2.3	1949	5.9
5	0317	-.5	0939	3.6	1408	2.4	2009	5.9
6	0346	-.5	1015	3.6	1440	2.4	2052	5.8
7	0418	-.5	1050	3.6	1516	2.5	2131	5.7
8	0452	-.4	1125	3.6	1554	2.5	2156	5.5
9	0527	-.2	1207	3.7	1636	2.6	2231	5.2
10	0601	0.0	1250	3.8	1727	2.6	2311	4.8
11	0637	.3	1332	3.9	1840	2.6	---	---
12	0655	4.3	0718	7.7	1414	4.2	2003	2.5
13	0111	3.8	0804	1.0	1459	4.5	2139	2.1
14	0244	3.3	0854	1.4	1548	4.9	2253	1.4
15	0428	3.2	0952	1.7	1635	5.4	2357	.6
16	0555	3.2	1051	1.9	1724	5.0	---	---
17	0709	2.2	1150	3.6	1850	2.0	1833	6.4
18	0138	-.8	1242	4.1	1947	2.0	1859	6.8
19	0258	-1.3	1335	4.1	2035	1.9	1947	7.1
20	0359	-1.6	1427	4.2	2154	1.8	2035	7.1
21	0439	-1.4	1519	4.4	2213	1.9	2154	6.9
22	0523	-1.0	1612	4.5	2332	1.9	2332	5.8
23	0608	-.4	1708	4.6	2357	2.0	2357	5.0
24	0651	.2	1812	4.7	---	---	---	---
25	0737	.9	1927	4.7	2055	1.9	2055	1.9
26	0819	3.6	2055	4.7	2223	1.6	2223	1.6
27	0904	3.2	2223	4.8	2339	1.2	2339	1.2
28	0951	3.2	2339	5.0	---	---	---	---
29	1026	3.2	1026	5.1	1727	5.3	1727	5.3
30	0634	.3	0653	3.3	1214	2.5	1826	5.5
31	0116	.3	0741	3.5	1214	2.5	1826	5.5

2 --- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 17
SAN NICOLAS ISLAND TIDES
JULY 1982
33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0103	.5	0655	3.1	1201	1.5	1821	5.1
2	0127	-.1	0750	3.2	1239	1.9	1854	5.3
3	0211	-.3	0836	3.3	1315	2.0	1955	5.4
4	0245	-.5	0911	3.3	1346	2.2	1956	5.4
5	0321	-.5	0946	3.4	1418	2.2	2027	5.5
6	0400	-.5	1022	3.4	1450	2.2	2059	5.4
7	0448	-.5	1057	3.4	1526	2.3	2128	5.3
8	0537	-.4	1134	3.4	1604	2.4	2203	5.1
9	0627	-.2	1213	3.5	1646	2.5	2238	4.8
10	0717	0.0	1257	3.5	1737	2.5	2318	4.5
11	0812	4.5	1338	3.6	1850	2.5	---	---
12	0912	3.9	1421	3.9	1421	3.9	2013	2.4
13	0118	3.1	1506	4.2	1506	4.2	2139	1.9
14	0251	2.1	1555	4.6	1555	4.6	2303	1.3
15	0435	3.0	1602	1.5	1642	5.0	0007	5.2
16	0622	3.1	1681	1.7	1731	5.5	---	---
17	0809	2.2	1708	3.4	1800	1.8	1820	5.9
18	0148	-.7	1804	3.5	1852	1.8	1946	6.3
19	0236	-1.2	1853	3.8	1945	1.7	1954	6.6
20	0319	-1.5	1938	3.9	1437	1.7	2042	6.4
21	0404	-1.3	1026	4.1	1529	1.6	2131	6.4
22	0449	-1.0	1109	4.2	1622	1.7	2209	5.9
23	0533	-.9	1158	4.2	1718	1.7	2309	5.4
24	0618	-.4	1243	4.3	1822	1.8	0004	4.62
25	0701	.2	1334	4.4	1937	1.9	---	---
26	0747	.8	1428	4.4	1937	1.9	2105	1.7
27	0834	1.4	1526	4.5	1526	4.5	2233	1.5
28	0924	1.8	1621	4.6	1621	4.6	2349	1.1
29	1026	3.0	1709	4.7	1709	4.7	---	---
30	1128	2.1	1800	3.1	1800	3.1	1754	4.9
31	0126	.3	0748	3.3	1824	2.4	1833	5.1

2 --- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

POINT MUGU TIDES

JULY 1982

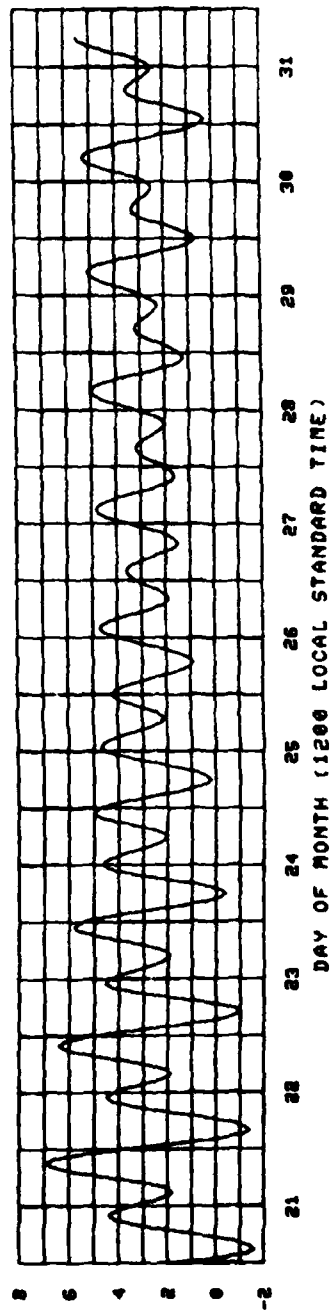
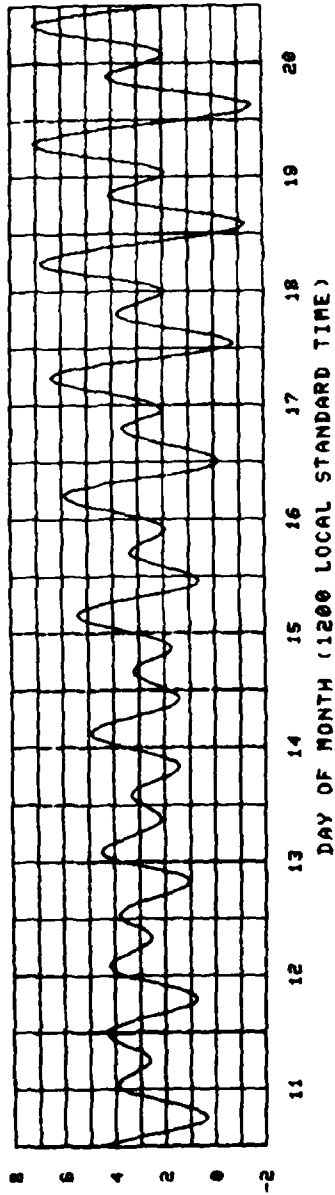
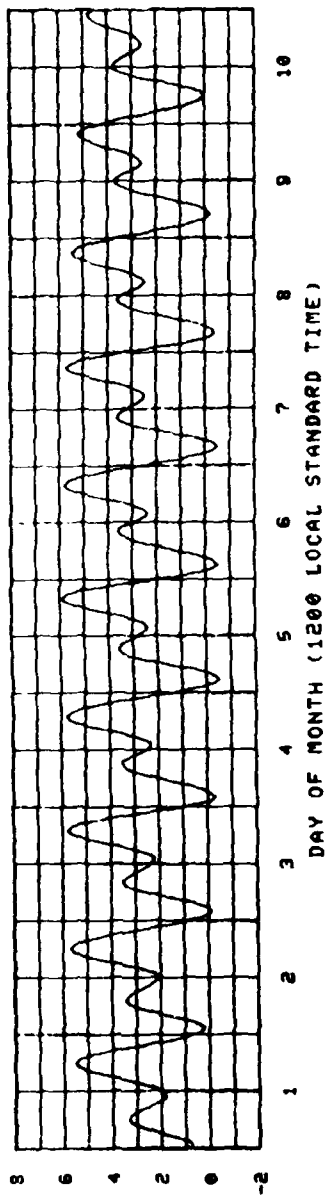


TABLE 18
POINT MUGU TIDES
AUGUST 1982
34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0152	0.0	0820	3.6	1252	2.5	1901	5.7
2	0225	-0.2	0849	3.9	1329	2.4	1933	5.9
3	0254	-0.4	0917	3.9	1403	2.3	2008	6.0
4	0324	-0.4	0943	4.0	1436	2.2	2040	6.0
5	0353	-0.3	1011	4.0	1512	2.2	2112	5.9
6	0422	-0.2	1040	4.1	1548	2.1	2144	5.6
7	0449	0.0	1111	4.2	1626	2.1	2219	5.3
8	0519	0.3	1143	4.3	1713	2.1	2301	4.8
9	0548	0.7	1218	4.5	1814	2.0	2359	4.2
10	0626	1.1	1300	4.6	1930	2.0	---	---
11	0657	3.6	1306	1.6	1953	4.8	2103	1.7
12	0728	3.2	0808	2.1	1456	5.1	2232	1.1
13	0741	3.1	0815	2.4	1601	5.4	2345	1.4
14	0759	3.4	0836	2.5	1704	5.9	---	---
15	0839	-0.3	0706	3.8	1145	5.4	1800	6.3
16	0127	-0.8	0751	4.1	1244	2.1	1853	6.7
17	0210	-1.1	0830	4.4	1337	1.8	1941	6.9
18	0251	-1.2	0900	4.7	1424	1.6	2027	6.8
19	0330	-1.1	0944	4.8	1514	1.4	2112	6.6
20	0409	-0.8	1023	5.0	1600	1.3	2157	6.1
21	0447	-0.3	1101	5.0	1649	1.3	2244	5.5
22	0521	0.0	1137	5.0	1742	1.4	2332	4.7
23	0558	0.9	1219	4.9	1845	1.6	---	---
24	0631	4.0	0633	1.6	1908	4.8	2003	1.7
25	0151	3.4	0718	2.2	1402	4.7	2140	1.6
26	0256	3.1	0821	2.6	1500	4.6	2306	1.2
27	0355	3.3	0954	2.8	1622	4.7	0007	0.8
28	0453	3.5	1114	2.8	1718	5.0	---	---
29	0550	5.5	0726	3.8	1808	5.0	1903	5.2
30	0127	0.0	0754	3.9	1847	2.5	1943	5.5
31	0156	0.0	0817	4.1	1921	2.3	1917	5.7

1 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 19
SAN NICOLAS ISLAND TIDES
AUGUST 1982
33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0202	0.0	0827	3.4	1302	2.3	1908	5.3
2	0235	-0.2	0856	3.5	1339	2.2	1940	5.5
3	0304	-0.3	0924	3.6	1413	2.1	2015	5.6
4	0334	-0.4	0950	3.7	1446	2.0	2047	5.6
5	0403	-0.3	1018	3.7	1522	2.0	2119	5.5
6	0432	-0.2	1047	3.8	1558	1.9	2151	5.2
7	0459	0.0	1118	3.9	1636	1.9	2226	4.9
8	0529	0.3	1150	4.0	1723	1.9	2308	4.5
9	0558	0.6	1225	4.2	1824	1.9	2357	3.9
10	0636	1.0	1307	4.3	1940	1.8	---	---
11	0716	1.5	0716	1.5	1400	4.5	2113	1.5
12	0749	3.0	0810	1.9	1503	4.7	2242	1.0
13	0818	2.8	0926	2.3	1608	5.0	2355	1.4
14	0848	3.2	1046	2.3	1711	5.5	---	---
15	0919	-0.3	0713	3.5	1155	2.2	1807	5.8
16	0137	-0.7	0758	3.8	1254	1.9	1900	6.2
17	0220	-1.0	0837	4.1	1347	1.6	1948	6.4
18	0301	-1.1	0916	4.4	1434	1.5	2034	6.4
19	0340	-1.0	0951	4.5	1524	1.3	2119	6.1
20	0419	-0.7	1029	4.8	1610	1.2	2204	5.6
21	0457	-0.3	1108	4.6	1659	1.2	2251	5.1
22	0531	0.0	1144	4.6	1752	1.3	2339	4.4
23	0608	0.8	1226	4.5	1855	1.5	---	---
24	0638	3.7	0643	1.5	1315	4.5	2013	1.5
25	0158	3.2	0728	2.0	1409	4.4	2150	1.5
26	0403	2.9	0831	2.5	1516	4.3	2316	1.1
27	0602	3.1	1004	2.8	1639	4.4	0017	0.8
28	0700	3.3	1124	2.8	1725	4.6	---	---
29	0800	5.5	0733	3.5	1818	2.5	1810	4.8
30	0137	0.2	0801	3.8	1857	2.3	1850	5.1
31	0206	0.0	0824	3.8	1931	2.1	1924	5.3

1 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

AUGUST 1982

POINT MUGU TIDES

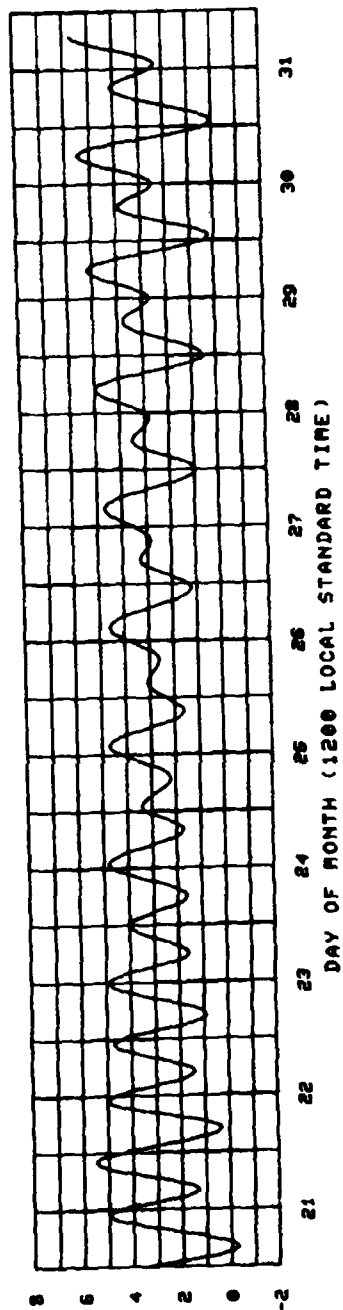
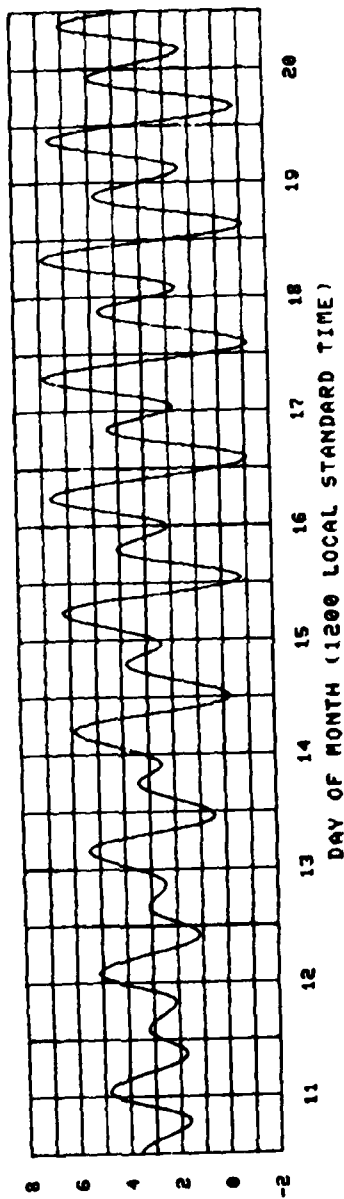
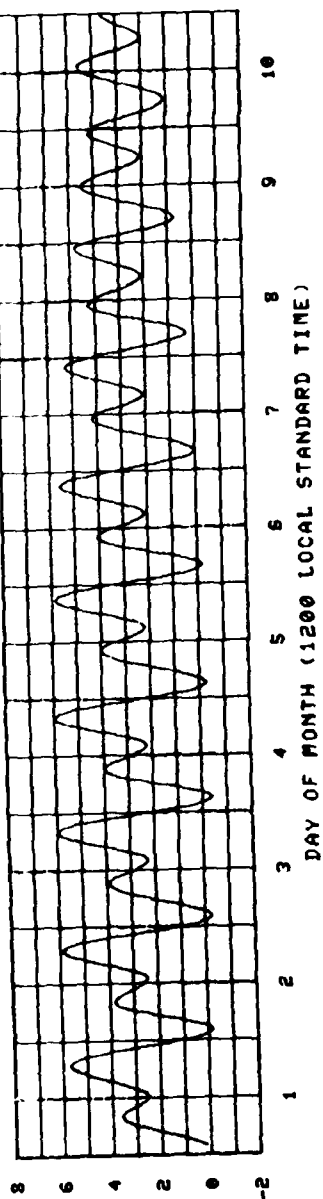


TABLE 20

POINT MUGU TIDES

SEPTEMBER 1982

34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0222	-1	0838	4.3	1354	2.0	1951	5.8
2	0250	-1	0853	4.5	1427	1.6	2025	5.9
3	0315	-1	0925	4.6	1500	1.4	2102	5.5
4	0341	.3	0959	4.8	1538	1.3	2132	5.1
5	0409	.7	1019	4.9	1618	1.2	2211	4.6
6	0436	1.2	1047	5.0	1703	1.2	2256	4.0
7	0505	1.7	1122	5.1	1758	1.2	2349	4.0
8	0540	1.7	1205	5.1	1819	1.2	---	---
9	0608	3.4	1259	5.1	1910	1.2	---	---
10	0632	3.2	1342	5.1	2041	1.1	---	---
11	0651	3.4	1412	5.1	2216	.2	---	---
12	0714	3.8	1537	5.3	2326	---	---	---
13	0748	4.2	1652	5.6	---	---	---	---
14	0823	4.6	1755	6.0	1755	6.0	---	---
15	0858	4.9	1847	6.3	1847	6.3	---	---
16	0924	5.2	1933	6.4	1933	6.4	---	---
17	0959	5.4	2021	6.3	2021	6.3	---	---
18	1033	5.5	2103	5.5	2103	5.5	---	---
19	1109	5.4	2145	4.9	2145	4.9	---	---
20	1144	5.1	2227	4.3	2227	4.3	---	---
21	1214	4.9	2314	4.3	2314	4.3	---	---
22	1236	4.6	---	---	---	---	---	---
23	1258	4.3	---	---	---	---	---	---
24	1321	4.3	---	---	---	---	---	---
25	1344	4.5	---	---	---	---	---	---
26	1406	4.2	---	---	---	---	---	---
27	1428	4.0	---	---	---	---	---	---
28	1450	3.8	---	---	---	---	---	---
29	1512	3.5	---	---	---	---	---	---
30	1534	3.2	---	---	---	---	---	---

Z -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 21

SAN NICOLAS ISLAND TIDES

SEPTEMBER 1982

33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0232	-1	0845	4.0	1404	1.8	1958	5.4
2	0300	-1	0910	4.2	1437	1.6	2032	5.5
3	0325	-1	0932	4.3	1510	1.5	2104	5.4
4	0351	.3	0957	4.5	1548	1.3	2138	5.1
5	0419	.6	1026	4.6	1628	1.2	2218	4.7
6	0446	1.1	1054	4.6	1713	1.1	2303	4.3
7	0515	1.5	1120	4.7	1808	1.1	2356	3.7
8	0550	3.2	1212	4.7	1920	1.1	---	---
9	0615	3.0	1258	4.7	2051	1.0	---	---
10	0642	3.2	1333	2.5	2226	.2	---	---
11	0719	3.5	1419	2.7	2336	---	---	---
12	0758	3.5	1508	2.5	---	---	---	---
13	0833	3.3	1593	2.2	---	---	---	---
14	0918	3.5	1670	2.2	---	---	---	---
15	1003	3.7	1740	1.7	---	---	---	---
16	1034	3.6	1812	1.3	---	---	---	---
17	1109	3.4	1843	.9	---	---	---	---
18	1143	3.1	1914	.7	---	---	---	---
19	1213	2.9	1946	.6	---	---	---	---
20	1244	2.7	2019	.5	---	---	---	---
21	1314	2.5	2044	.4	---	---	---	---
22	1344	2.3	2119	.3	---	---	---	---
23	1414	2.1	2144	.2	---	---	---	---
24	1444	1.9	2219	.1	---	---	---	---
25	1514	1.7	2244	.0	---	---	---	---
26	1544	1.5	2319	.0	---	---	---	---
27	1614	1.3	---	---	---	---	---	---
28	1644	1.1	---	---	---	---	---	---
29	1714	1.0	---	---	---	---	---	---
30	1744	.9	---	---	---	---	---	---

Z -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

SEPTEMBER 1982

POINT MUGU TIDES

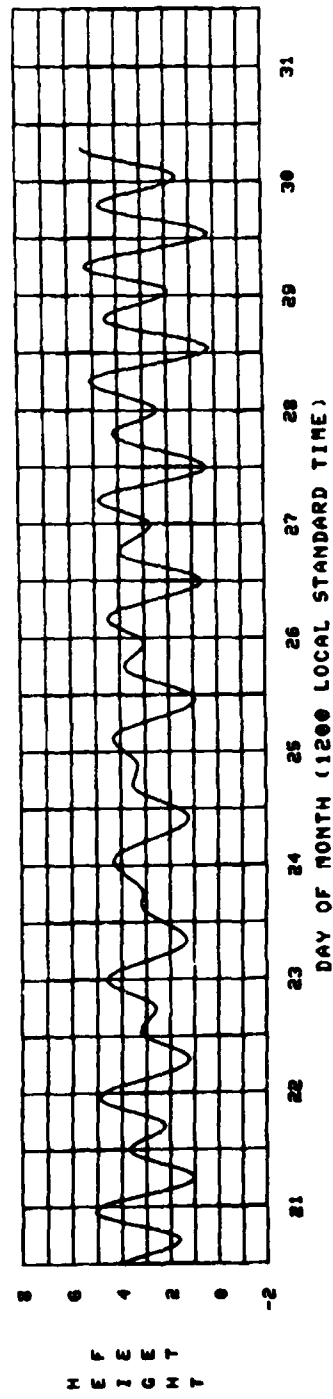
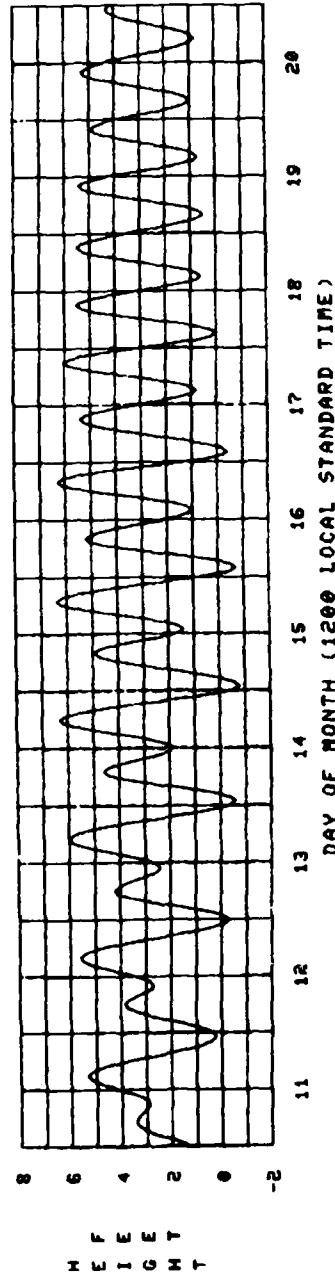
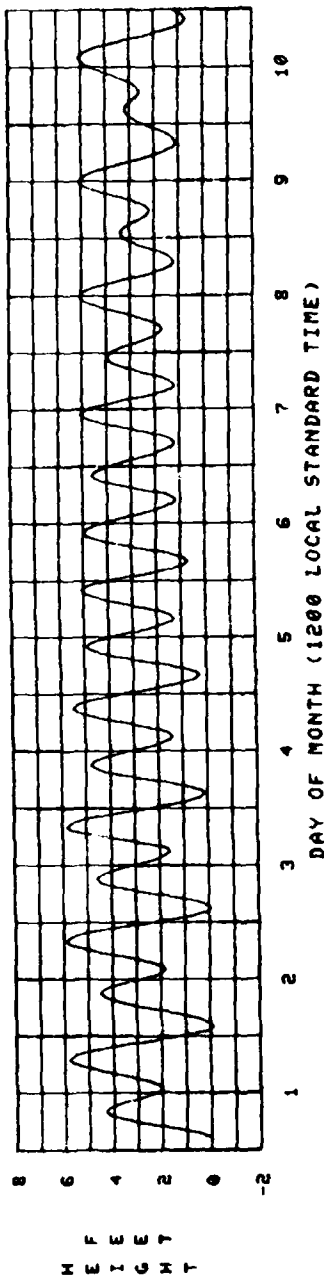


TABLE 22
POINT HUGU TIDES
OCTOBER 1982
34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0208	2.3	0817	5.0	1412	1.1	2006	5.5
2	0233	.3	0839	5.3	1448	.8	2044	5.3
3	0300	.5	0905	5.5	1524	.5	2123	5.1
4	0325	.8	0930	5.6	1606	.3	2205	4.7
5	0357	1.2	1003	5.7	1654	.2	2258	4.2
6	0429	1.7	1040	5.7	1750	.3	---	---
7	0505	3.7	0505	2.2	1124	5.5	1859	.4
8	0140	3.4	0553	2.7	1223	5.3	2028	.4
9	0345	3.8	0726	3.1	1345	5.0	2152	.3
10	0510	4.2	0936	3.0	1524	5.0	2304	0.0
11	0632	4.7	1106	2.6	1644	5.2	2357	-.2
12	0839	-3.3	1205	2.1	1747	5.4	---	---
13	0118	-2.2	0704	5.0	1252	1.4	1840	5.5
14	0153	0.0	0733	5.4	1317	.9	1928	5.4
15	0224	.3	0801	5.8	1417	.2	2013	5.1
16	0254	.8	0856	5.8	1455	.1	2055	4.7
17	0319	1.2	0923	5.8	1534	.1	2135	4.3
18	0347	1.7	0950	5.6	1612	.1	2218	3.9
19	0412	2.2	1019	5.4	1654	.2	2303	3.4
20	0434	2.5	1048	5.1	1737	.5	---	---
21	0122	4.3	0456	2.9	1832	.7	---	---
22	1220	4.3	2109	1.0	1125	4.7	1945	.9
23	0542	3.6	0845	3.5	---	---	2222	.9
24	0653	3.9	1044	3.1	1403	4.1	2314	.7
25	0813	4.1	1137	2.6	1543	4.3	---	.6
26	0930	4.4	1215	2.2	1652	4.5	---	---
27	1052	.5	0135	4.8	1744	4.5	1827	4.7
28	0224	.5	0248	5.1	1251	1.6	1909	4.8
29	0352	.5	0709	5.1	1324	1.0	1951	4.8
30	0121	.6	0732	5.5	1358	.5	2033	4.8
31	0149	.7	0757	5.9	1433	0.0	---	---

2 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 23
SAN NICOLAS ISLAND TIDES
OCTOBER 1982
33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0218	.2	0824	4.6	1422	1.0	2013	5.1
2	0243	.3	0846	4.9	1458	.7	2051	4.9
3	0310	.5	0912	5.1	1534	.5	2130	4.7
4	0335	.7	0937	5.2	1616	.3	2212	4.4
5	0407	1.1	1010	5.3	1704	.2	2305	3.9
6	0439	1.5	1047	5.3	1800	.3	---	---
7	0512	2.5	0515	2.0	1311	5.1	1909	.4
8	0147	3.2	0603	2.5	1230	4.9	2038	.4
9	0352	3.5	0736	2.8	1362	4.6	2202	.3
10	0517	3.9	1116	2.5	1531	4.6	2314	0.0
11	0603	4.4	1215	1.9	1651	4.8	0007	-.2
12	0630	4.4	0711	4.5	1754	5.0	---	---
13	0649	4.2	0740	5.0	1802	1.3	1847	5.1
14	0128	0.0	0808	5.2	1347	.8	1935	5.1
15	0234	.3	0836	5.4	1427	.4	2020	5.0
16	0320	.7	0903	5.4	1544	.2	2102	4.4
17	0357	1.1	0930	5.2	1622	.1	2142	4.0
18	0444	1.5	0957	5.2	1704	.2	2225	3.6
19	0432	2.0	1055	5.0	1747	.5	2310	3.2
20	0444	2.4	1055	4.7	1842	.6	0006	3.2
21	0139	3.0	0606	2.7	1842	.6	---	---
22	1227	3.0	2119	.9	1132	4.4	1955	.8
23	0549	3.4	0855	3.3	---	---	---	---
24	0640	3.6	1054	2.9	1410	3.8	2232	.8
25	0650	3.8	1147	2.5	1550	3.8	2324	.6
26	0637	4.1	1235	2.0	1659	4.0	0001	.5
27	0924	.5	0655	4.5	1751	4.2	---	---
28	0132	.5	0716	4.7	1801	1.5	1834	4.4
29	0131	.5	0739	5.1	1901	.9	1916	4.5
30	0159	.6	0804	5.5	1908	.5	1958	4.5
31	---	---	---	---	1443	0.0	2040	4.5

2 -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

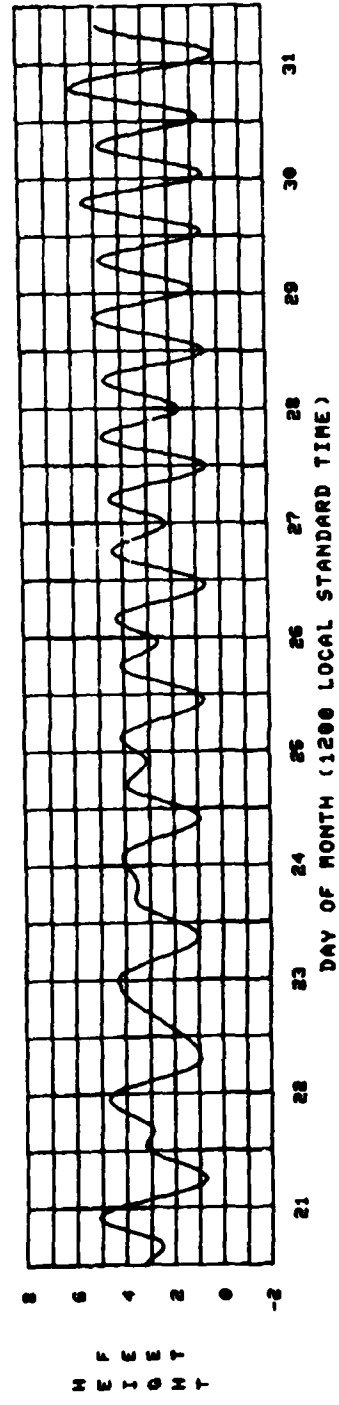
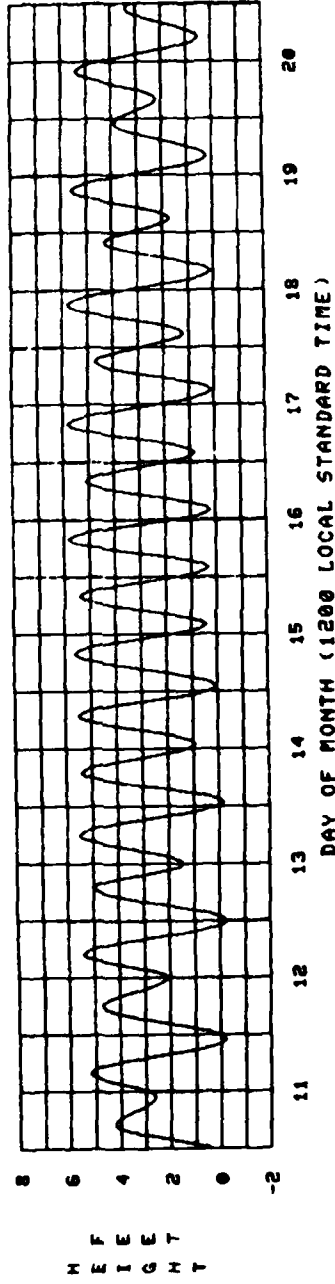
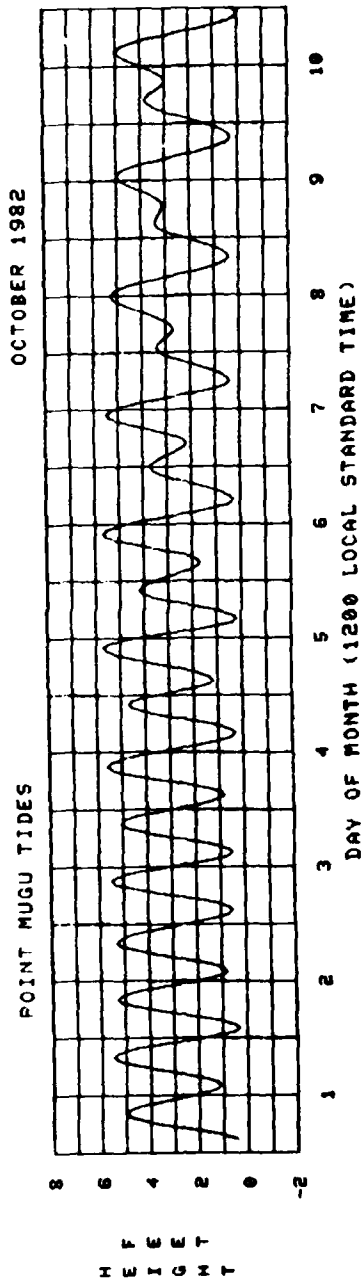


TABLE 24
POINT MUGU TIDES
NOVEMBER 1982
34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0221	1.0	0826	6.1	1514	-4	2119	4.6
2	0251	1.3	0856	6.3	1557	-6	2209	4.9
3	0325	1.7	0934	6.3	1646	-7	2309	3.9
4	0401	2.1	1013	6.2	1745	-5	---	---
5	0420	3.6	1047	2.5	1804	5.8	1851	-3
6	0513	3.5	1104	2.9	1904	5.4	2007	-2
7	0632	3.8	1204	3.1	2007	4.9	2124	-1
8	0741	4.2	1304	2.8	2107	4.7	2229	0.0
9	0821	4.6	1404	2.3	2207	4.6	2322	1.1
10	0921	5.0	1504	1.6	2307	4.7	0005	2.4
11	1021	5.4	1604	1.0	0007	4.7	---	---
12	1121	5.8	1704	0.7	0107	4.4	1925	4.6
13	1221	6.2	1804	0.4	0207	4.0	2008	4.6
14	1321	6.6	1904	0.0	0307	3.6	2050	4.3
15	1421	7.0	2004	-0.4	0407	3.2	2131	4.0
16	1521	7.4	2104	-0.8	0507	2.8	2216	3.8
17	1621	7.8	2204	-1.2	0607	2.4	2301	3.6
18	1721	8.2	2304	-1.6	0707	2.0	2357	3.4
19	1821	8.6	0004	-2.0	0807	1.6	---	---
20	1921	9.0	0104	-2.4	0907	1.2	1857	5.7
21	2021	9.4	0204	-2.8	1007	0.8	2000	5.7
22	2121	9.8	0304	-3.2	1107	0.4	2106	5.8
23	2221	10.2	0404	-3.6	1207	0.0	2206	5.9
24	2321	10.6	0504	-4.0	1307	-0.4	2324	6.0
25	0021	11.0	0604	-4.4	1407	-0.8	0000	6.1
26	0121	11.4	0704	-4.8	1507	-1.2	---	---
27	0221	11.8	0804	-5.2	1607	-1.6	1942	4.2
28	0321	12.2	0904	-5.6	1707	-2.0	2036	4.2
29	0421	12.6	1004	-6.0	1807	-2.4	2120	4.2
30	0521	13.0	1104	-6.4	1907	-2.8	---	---

X -- TIDE OCCURS ON NEXT DATE.

TABLE 25
SAN NICOLAS ISLAND TIDES
NOVEMBER 1982
33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0231	0.9	0833	5.6	1524	-4	2126	4.3
2	0301	1.2	0903	5.8	1597	-5	2216	4.0
3	0335	1.5	0941	5.8	1656	-6	2316	3.6
4	0411	1.9	1020	5.7	1755	-5	---	---
5	0437	3.4	1057	2.4	1811	5.4	1901	-3
6	0509	3.3	1131	2.7	1911	5.0	2017	-2
7	0539	3.5	1201	2.9	2011	4.6	2134	-1
8	0609	3.9	1251	2.6	2111	4.4	2239	0.0
9	0639	4.3	1341	2.1	2211	4.3	2332	1.1
10	0669	4.6	1411	1.5	2311	4.4	0015	2.1
11	0699	5.0	1451	0.9	0011	4.4	---	---
12	0729	5.3	1501	0.3	0111	4.0	1932	4.3
13	0759	5.6	1551	0.0	0211	3.6	2015	4.2
14	0829	5.9	1641	-0.4	0311	3.2	2057	4.0
15	0859	6.2	1731	-0.8	0411	2.8	2138	3.7
16	0929	6.5	1821	-1.2	0511	2.4	2223	3.5
17	0959	6.8	1911	-1.6	0611	2.0	2308	3.4
18	1029	7.1	2001	-2.0	0711	1.6	0004	3.2
19	1059	7.4	2051	-2.4	0811	1.2	---	---
20	1129	7.7	2141	-2.8	0911	0.8	1907	5.6
21	1159	8.0	2231	-3.2	1011	0.4	2010	5.7
22	1229	8.3	2321	-3.6	1111	0.0	2116	5.7
23	1259	8.6	0011	-4.0	1211	-0.4	2210	5.8
24	1329	8.9	0101	-4.4	1311	-0.8	2305	5.8
25	1359	9.2	0151	-4.8	1411	-1.2	0010	5.9
26	1429	9.5	0241	-5.2	1511	-1.6	---	---
27	1459	9.8	0331	-5.6	1611	-2.0	1949	3.9
28	1529	10.1	0421	-6.0	1711	-2.4	2037	3.9
29	1559	10.4	0511	-6.4	1811	-2.8	2127	3.9
30	1629	10.7	0601	-6.8	1911	-3.2	---	---

X -- TIDE OCCURS ON NEXT DATE.

NOVEMBER 1982

POINT MUGU TIDES

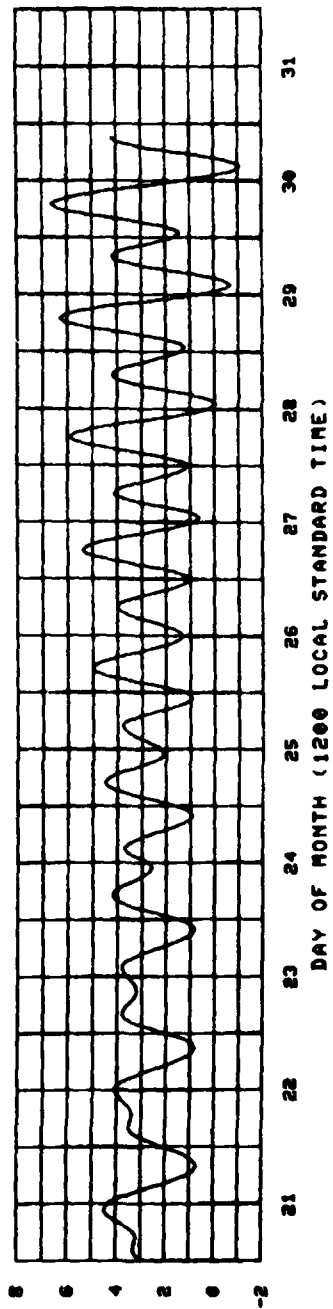
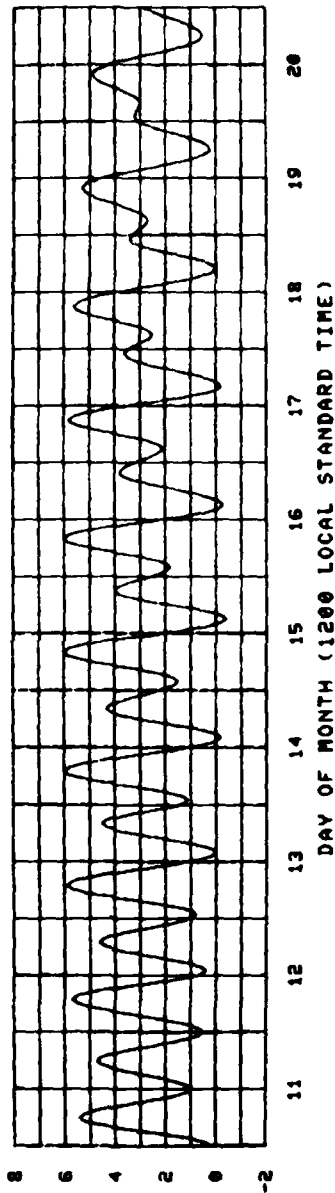
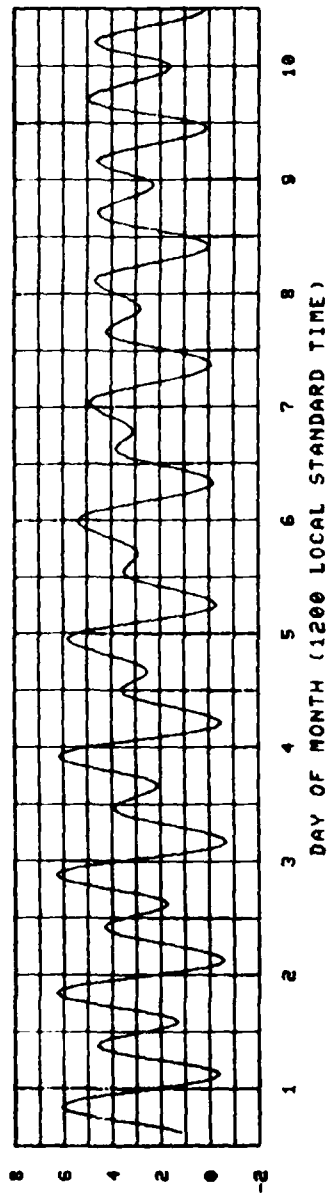


TABLE 26

POINT MUGU TIDES
DECEMBER 1982

34 DEG 06 MIN N, 119 DEG 06 MIN U - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0224	1.7	0835	6.8	1552	-1.4	2212	4.0
2	0306	1.9	0915	6.8	1641	-1.4	2312	3.9
3	0352	2.2	1002	6.5	1726	-1.2	1833	-3
4	0415	3.8	1047	5.5	1853	6.1	1936	-3
5	0427	3.8	1101	4.8	1955	5.5	2042	-1
6	0444	4.0	1155	4.3	2042	4.8	2143	2
7	0458	4.4	1248	4.0	2139	4.3	2239	6
8	0508	4.8	1339	3.9	2239	3.9	2329	9
9	0523	5.2	1432	3.8	1825	3.8	1925	3.8
10	0538	5.5	1525	3.8	1925	3.8	2013	3.8
11	0558	1.2	1616	3.8	2013	3.8	2101	3.7
12	0645	1.5	1701	5.9	2101	3.7	2189	3.7
13	0729	1.8	1758	6.0	2189	3.7	2277	3.7
14	0817	2.2	1847	5.9	2277	3.7	2365	3.4
15	0905	2.5	1937	5.7	2365	3.4	1814	1
16	0955	2.6	2027	5.4	1814	1	1900	4.6
17	1042	3.4	2118	5.1	1900	4.6	1986	6.8
18	1126	3.6	2209	4.7	1986	6.8	2072	1.3
19	1209	3.8	2300	4.2	2072	1.3	2159	1.1
20	1291	4.1	1802	3.2	2159	1.1	2247	1.5
21	1372	4.5	1894	3.2	2247	1.5	2335	1.6
22	1453	5.0	1986	3.2	2335	1.6	1814	1
23	1534	5.5	2078	3.2	1814	1	1900	4.6
24	1615	6.0	2169	3.2	1900	4.6	1986	6.8
25	1696	6.5	2260	3.2	1986	6.8	2072	1.3
26	1777	7.0	2351	3.2	2072	1.3	2159	1.1
27	1858	7.5	1802	3.2	2159	1.1	2247	1.5
28	1939	8.0	1894	3.2	2247	1.5	2335	1.6
29	2020	8.5	1986	3.2	2335	1.6	1814	1
30	2101	9.0	2078	3.2	1814	1	1900	4.6
31	2182	9.5	2169	3.2	1900	4.6	1986	6.8

* -- TIDE OCCURS ON NEXT DATE.

TABLE 27

SAN NICOLAS ISLAND TIDES
DECEMBER 1982

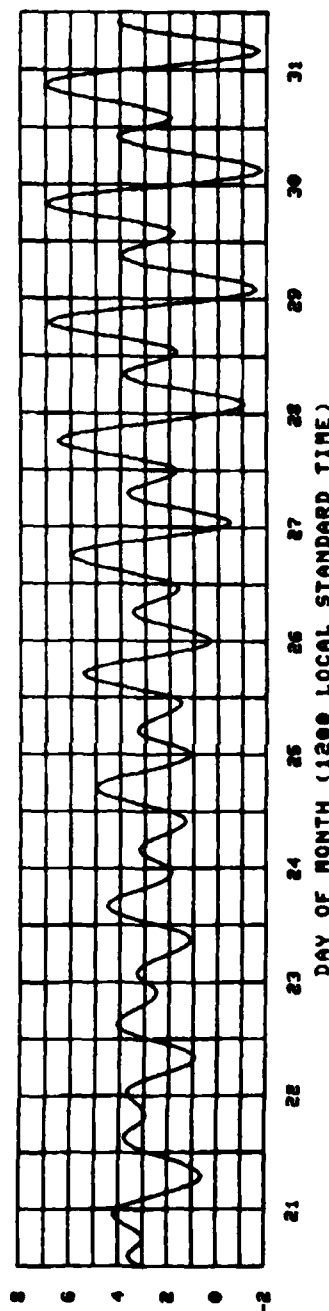
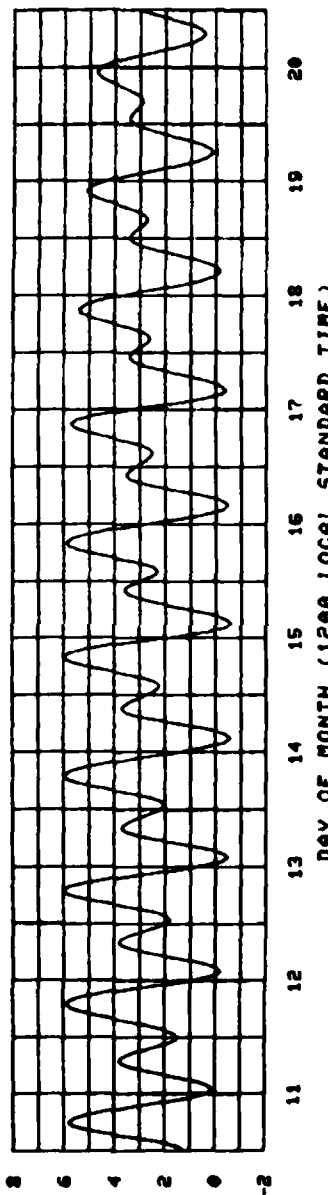
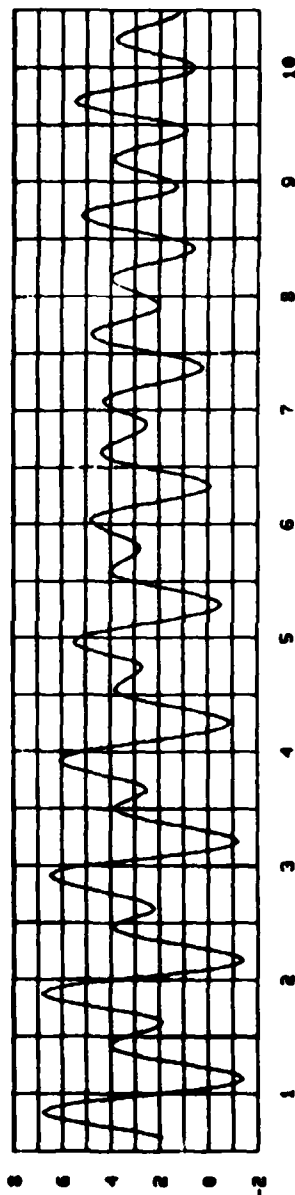
33 DEG 16 MIN N, 119 DEG 30 MIN U - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0334	1.5	0843	6.3	1602	-1.3	2319	3.7
2	0316	1.7	0922	6.3	1651	-1.3	2319	3.6
3	0402	2.0	1009	6.0	1746	-1.1	1843	-8
4	0482	3.5	1057	5.6	1843	-1.1	1946	-5
5	0513	3.5	1145	5.1	1946	-1.1	2052	-1
6	0551	3.7	1233	4.5	2052	-1.1	2153	2
7	0634	4.1	1321	4.0	2153	-1.1	2249	5
8	0715	4.5	1409	3.7	2249	-1.1	2339	8
9	0800	4.8	1497	3.6	2339	-1.1	1839	3.5
10	0885	5.1	1585	3.5	1839	3.5	1932	3.5
11	0970	5.4	1673	5.4	1932	-1.1	2020	3.5
12	1055	5.6	1761	5.5	2020	-1.1	2103	3.5
13	1140	5.6	1849	5.6	2103	-1.1	2182	3.4
14	1225	5.6	1937	5.5	2182	-1.1	2260	3.3
15	1310	5.5	2025	5.3	2260	-1.1	2342	3.2
16	1395	5.3	2113	5.0	2342	-1.1	1824	1
17	1480	5.0	2201	4.7	1824	1	1910	4
18	1565	4.7	2289	4.4	1910	4	1996	5
19	1650	4.4	2377	4.1	1996	5	2082	8
20	1735	4.1	1802	3.5	2082	8	2169	1.0
21	1820	3.8	1894	3.1	2169	1.0	2256	1.2
22	1905	3.5	1986	3.1	2256	1.2	2342	1.5
23	1990	3.2	2078	3.1	2342	1.5	1848	1.5
24	2075	3.0	2169	3.1	1848	1.5	1934	3.5
25	2160	2.7	2260	3.1	1934	3.5	2020	3.7
26	2245	2.4	2351	3.1	2020	3.7	2106	3.8
27	2330	2.1	1802	2.7	2106	3.8	2192	3.8
28	1814	2.7	1894	2.7	2192	3.8	2278	3.8
29	1900	2.7	1986	2.7	2278	3.8	2364	3.8
30	1986	2.7	2078	2.7	2364	3.8	1848	1.5
31	2072	2.7	2169	2.7	1848	1.5	1934	3.5

* -- TIDE OCCURS ON NEXT DATE.

POINT MUGU TIDES

DECEMBER 1982



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Table 28. Moonrise and Moonset, Barking Sands, Hawaii, 1982.

Date	January		February		March		April		May		June		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1154	-----	1236	0047	1121	-----	1255	0143	1350	0217	1524	0255	1
2	1233	0000	1323	0148	1210	0044	1356	0239	1447	0300	1615	0331	2
3	1313	0056	1414	0250	1303	0146	1456	0330	1542	0340	1707	0406	3
4	1355	0155	1511	0354	1401	0248	1555	0417	1635	0417	1758	0443	4
5	1441	0256	1612	0457	1502	0347	1652	0500	1727	0453	1850	0522	5
6	1531	0400	1715	0557	1603	0443	1747	0539	1819	0529	1941	0604	6
7	1627	0505	1818	0653	1705	0534	1841	0617	1911	0605	2032	0648	7
8	1728	0612	1920	0743	1804	0620	1934	0653	2003	0643	2122	0736	8
9	1832	0715	2020	0829	1902	0703	2026	0730	2055	0723	2209	0825	9
10	1936	0815	2116	0910	1957	0742	2118	0807	2146	0806	2253	0917	10
11	2039	0908	2210	0948	2051	0820	2210	0846	2237	0852	2335	1009	11
12	2139	0956	2303	1025	2143	0857	2301	0927	2325	0940	-----	1102	12
13	2236	1038	2354	1101	2235	0933	2352	1011	-----	1030	0014	1155	13
14	2330	1117	-----	1138	2327	1011	-----	1057	0011	1122	0052	1249	14
15	-----	1154	0045	1216	-----	1051	0042	1147	0055	1215	0130	1344	15
16	0022	1229	0136	1256	0018	1133	0130	1238	0136	1309	0208	1442	16
17	0112	1305	0227	1339	0109	1218	0216	1331	0216	1404	0249	1542	17
18	0203	1341	0318	1425	0200	1305	0259	1426	0255	1500	0332	1645	18
19	0253	1420	0408	1515	0249	1356	0341	1522	0334	1558	0420	1751	19
20	0344	1501	0457	1607	0337	1449	0422	1618	0415	1658	0514	1859	20
21	0435	1545	0545	1701	0423	1544	0501	1716	0458	1801	0614	2006	21
22	0526	1633	0630	1756	0506	1640	0542	1816	0544	1907	0718	2108	22
23	0616	1723	0713	1853	0548	1736	0624	1918	0636	2015	0824	2204	23
24	0704	1816	0753	1949	0628	1834	0709	2022	0733	2121	0929	2254	24
25	0750	1910	0833	2046	0709	1933	0757	2128	0834	2225	1032	2339	25
26	0834	2005	0913	2143	0749	2033	0850	2233	0938	2323	1130	-----	26
27	0916	2101	0953	2242	0832	2134	0948	2336	1042	-----	1226	0019	27
28	0955	2156	1035	2342	0917	2237	1048	-----	1143	0014	1320	0056	28
29	1034	2252	-----	-----	1006	2340	1150	0035	1242	0100	1412	0132	29
30	1113	2349	-----	-----	1059	-----	1251	0129	1338	0141	1503	0208	30
31	1153	-----	-----	-----	1156	0043	-----	-----	1432	0219	-----	-----	31

Date	July		August		September		October		November		December		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1554	0244	1714	0329	1812	0446	1805	0519	1840	0654	1902	0748	1
2	1646	0322	1803	0417	1852	0540	1843	0614	1927	0757	2004	0855	2
3	1737	0403	1849	0508	1931	0634	1922	0710	2019	0901	2109	0958	3
4	1828	0446	1933	0600	2008	0738	2003	0808	2117	1006	2214	1056	4
5	1918	0532	2014	0653	2045	0823	2046	0908	2218	1110	2318	1148	5
6	2006	0621	2053	0747	2124	0919	2134	1009	2321	1209	-----	1234	6
7	2052	0713	2131	0840	2205	1016	2227	1112	-----	1303	0018	1316	7
8	2134	0805	2208	0934	2249	1115	2324	1215	0024	1351	0116	1354	8
9	2215	0858	2245	1028	2337	1216	-----	1316	0124	1435	0211	1431	9
10	2253	0951	2324	1123	-----	1318	0025	1412	0223	1515	0304	1507	10
11	2330	1044	-----	1220	0031	1420	0127	1504	0320	1552	0358	1543	11
12	-----	1137	0306	1320	0130	1520	0229	1551	0415	1629	0451	1621	12
13	0007	1232	0051	1423	0232	1617	0330	1634	0509	1705	0544	1702	13
14	0045	1329	0143	1527	0336	1709	0429	1715	0603	1743	0637	1745	14
15	0125	1429	0240	1630	0440	1756	0526	1753	0656	1823	0730	1832	15
16	0210	1531	0342	1731	0542	1839	0622	1830	0750	1905	0821	1920	16
17	0259	1637	0447	1827	0641	1919	0717	1908	0844	1949	0909	2011	17
18	0355	1743	0553	1918	0739	1957	0812	1946	0936	2037	0955	2103	18
19	0456	1848	0657	2004	0834	2035	0906	2027	1026	2126	1037	2155	19
20	0602	1948	0758	2046	0929	2113	0959	2110	1114	2217	1117	2246	20
21	0708	2042	0857	2125	1023	2152	1052	2156	1158	2309	1154	2338	21
22	0814	2130	0953	2203	1116	2233	1143	2244	1240	-----	1230	-----	22
23	0916	2214	1047	2240	1209	2317	1232	2334	1319	0001	1305	0030	23
24	1015	2253	1141	2318	1301	-----	1319	-----	1356	0054	1341	0123	24
25	1111	2331	1233	2358	1351	0004	1402	0026	1433	0147	1420	0218	25
26	1205	-----	1326	-----	1439	0053	1444	0119	1509	0241	1502	0316	26
27	1257	0007	1417	0039	1525	0144	1523	0212	1548	0336	1548	0417	27
28	1349	0044	1508	0124	1608	0236	1601	0306	1629	0435	1642	0523	28
29	1441	0121	1558	0211	1649	0330	1638	0400	1714	0536	1742	0630	29
30	1532	0201	1645	0301	1728	0424	1716	0456	1805	0641	1847	0737	30
31	1624	0243	1730	0353	-----	-----	1756	0554	-----	-----	1955	0840	31

TABLE 29
PORT ALLEN TIDES
JANUARY 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME AMST	HGT FT	TIME AMST	HGT FT	TIME AMST	HGT FT	TIME AMST	HGT FT
1	0033	.5	0727	1.6	1511	.1	2126	.8
2	0207	.6	0818	1.4	1550	0.0	2237	1.1
3	0405	.6	0917	1.2	1632	-.1	-----	----
4	2339	1.4*	0556	.6	1023	1.0	1715	-.2
5	0028	1.7	0724	.5	1132	.8	1757	-.2
6	0117	1.9	0829	.3	1234	.7	1843	-.3
7	0201	2.1	0924	.2	1337	.6	1926	-.3
8	0246	2.3	1014	.1	1432	.6	2011	-.3
9	0328	2.3	1059	0.0	1522	.6	2056	-.3
10	0410	2.3	1144	0.0	1612	.6	2141	-.2
11	0452	2.2	1223	0.0	1704	.6	2223	-.1
12	0532	2.0	1305	0.0	1804	.6	2312	.1
13	0612	1.8	1344	0.0	1906	.7	-----	----
14	0608	.3	0651	1.7	1423	0.0	2021	.8
15	0110	.5	0733	1.4	1505	0.0	2138	1.0
16	0247	.6	0815	1.1	1541	0.0	2254	1.2
17	0448	.7	0907	.9	1623	0.0	-----	----
18	2348	1.4*	0642	.6	1009	.7	1706	0.0
19	0034	1.6	0754	.6	1122	.6	1744	0.0
20	0113	1.7	0843	.4	1228	.6	1826	-.1
21	0152	1.8	0922	.3	1317	.6	1905	-.1
22	0225	1.9	0956	.2	1401	.6	1940	-.1
23	0256	1.9	1028	.2	1441	.6	2015	-.1
24	0330	2.0	1054	.1	1517	.6	2050	-.1
25	0359	2.0	1122	.1	1553	.6	2126	-.1
26	0431	1.9	1150	.1	1635	.6	2204	0.0
27	0502	1.8	1222	.1	1721	.7	2246	.1
28	0536	1.7	1251	0.0	1817	.8	-----	----
29	2337	.3*	0612	1.6	1326	0.0	1921	.9
30	0042	.4	0649	1.4	1403	0.0	2035	1.1
31	0212	.6	0732	1.1	1447	0.0	2158	1.3

* -- TIDE OCCURS ON PREVIOUS DATE.

PORT ALLEN TIDES

JANUARY 1982

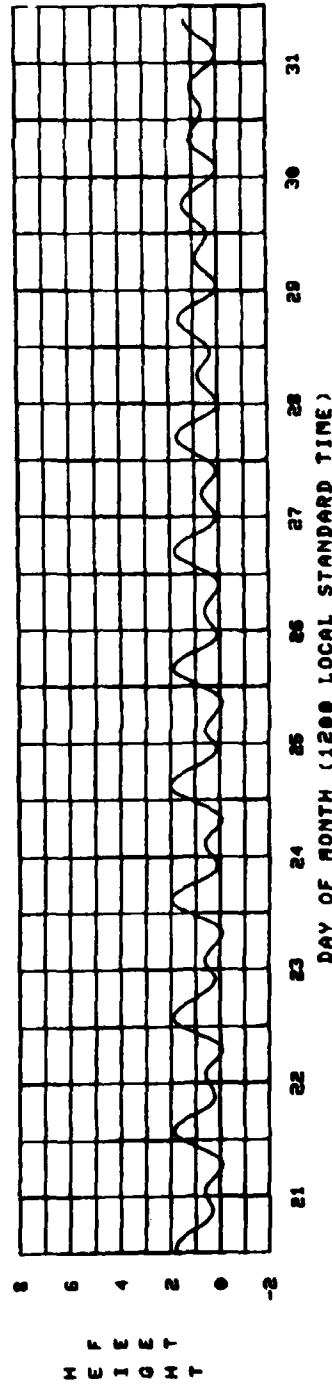
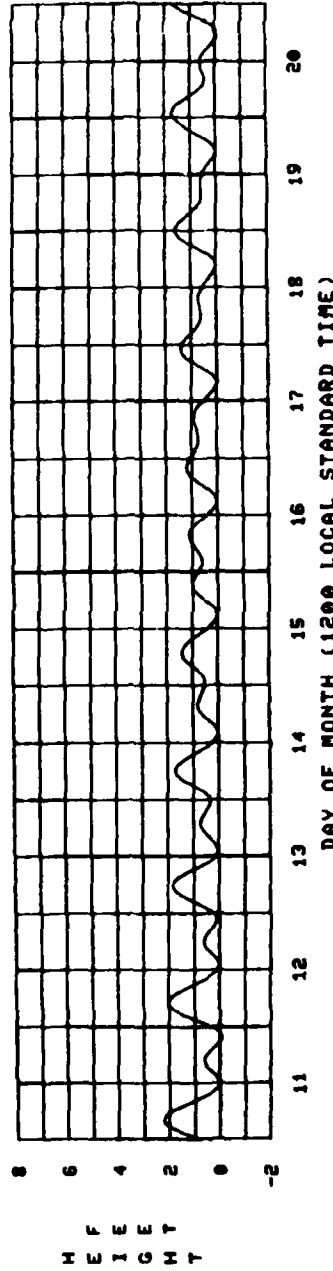
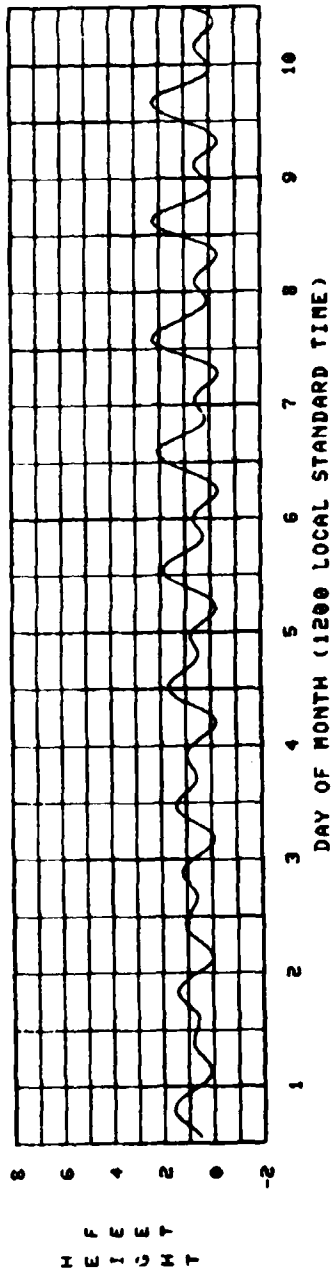


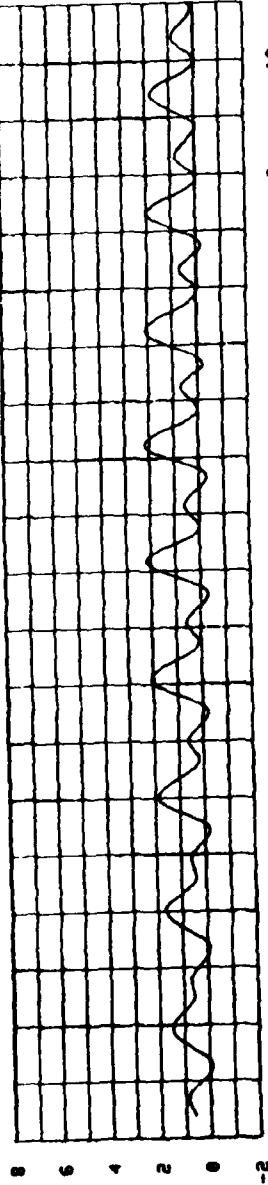
TABLE 30
PORT ALLEN TIDES
FEBRUARY 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	0416	.6	0831	.9	1537	-.1	2307	1.5
2	0616	.6	0954	.7	1629	-.1	---	---
3	0805	1.7	0739	.4	1123	.6	1728	-.2
4	0858	1.9	0834	.2	1239	.6	1824	-.2
5	0148	2.1	0919	.1	1340	.6	1916	-.3
6	0230	2.2	0958	0.0	1430	.6	2005	-.3
7	0312	2.2	1034	0.0	1518	.7	2054	-.2
8	0351	2.1	1108	0.0	1603	.7	2139	-.2
9	0429	2.0	1141	0.0	1646	.8	2222	0.0
10	0504	1.8	1200	0.0	1735	.9	2310	.1
11	0537	1.6	1238	0.0	1822	1.0	---	---
12	0600	.3	0608	1.4	1310	0.0	1922	1.0
13	0102	.5	0640	1.2	1344	.1	2025	1.1
14	0224	.6	0715	.9	1421	.1	2141	1.2
15	0430	.6	0804	.7	1507	.1	2253	1.4
16	0636	.6	0820	.6	1602	.1	---	---
17	2349	1.5*	0742	.5	1104	.6	1701	.1
18	0839	1.7	0821	.3	1218	.6	1753	.1
19	0121	1.7	0853	.2	1309	.6	1842	0.0
20	0156	1.8	0918	.2	1351	.6	1928	-.1
21	0228	1.8	0946	.1	1428	.7	2006	-.1
22	0303	1.9	1008	.1	1506	.8	2045	-.1
23	0332	1.8	1033	0.0	1542	.9	2127	-.1
24	0404	1.8	1100	0.0	1620	1.0	2209	0.0
25	0436	1.7	1126	0.0	1706	1.1	2258	.1
26	0507	1.5	1155	0.0	1753	1.2	---	---
27	2350	.3*	0539	1.3	1225	-.1	1850	1.3
28	0059	.4	0621	1.1	1302	0.0	1956	1.4

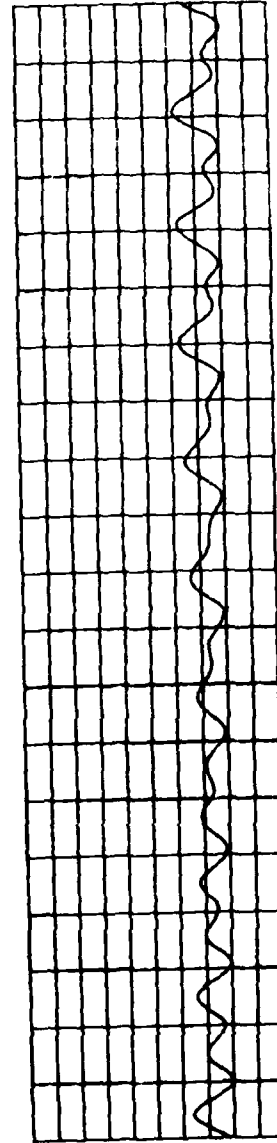
* -- TIDE OCCURS ON PREVIOUS DATE.

FEBRUARY 1982

PORT ALLEN TIDES

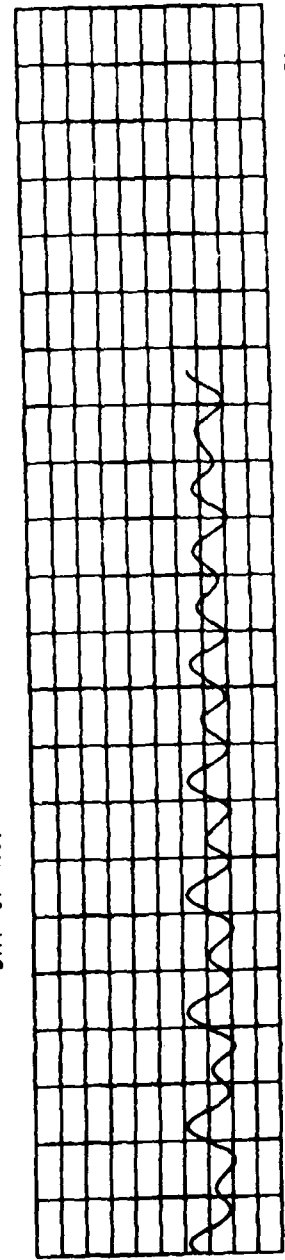


HEIGHT



HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)



HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)

TABLE 31
PORT ALLEN TIDES
MARCH 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	0232	.5	0703	.8	1348	0.0	2115	1.5
2	0438	.5	0813	.6	1445	0.0	2231	1.6
3	0628	.4	1002	.6	1557	0.0	----	----
4	2341	1.7*	0730	.2	1138	.6	1711	0.0
5	0037	1.8	0817	.1	1252	.6	1815	-.1
6	0126	1.9	0851	0.0	1345	.7	1914	-.1
7	0211	1.9	0923	0.0	1428	.8	2006	-.1
8	0250	1.9	0951	-.1	1508	.9	2055	-.1
9	0325	1.8	1020	-.1	1547	1.0	2141	0.0
10	0400	1.7	1046	0.0	1624	1.1	2223	.1
11	0429	1.5	1110	0.0	1705	1.2	2308	.2
12	0458	1.3	1132	0.0	1748	1.3	----	----
13	0000	.3	0529	1.1	1200	0.0	1833	1.3
14	0059	.5	0558	.9	1226	.1	1925	1.3
15	0218	.6	0633	.7	1301	.1	2030	1.4
16	0411	.5	0725	.6	1347	.2	2143	1.4
17	0611	.4	0908	.5	1453	.2	2253	1.5
18	0703	.4	1102	.5	1612	.3	----	----
19	2349	1.6*	0735	.3	1213	.6	1725	.2
20	0036	1.7	0805	.2	1258	.6	1820	.1
21	0117	1.7	0830	.1	1337	.8	1913	.1
22	0152	1.7	0854	0.0	1412	.9	1958	0.0
23	0228	1.7	0918	0.0	1446	1.1	2043	0.0
24	0300	1.7	0940	-.1	1523	1.2	2129	0.0
25	0332	1.5	1006	-.1	1604	1.4	2217	0.0
26	0407	1.4	1033	-.1	1647	1.5	2310	.1
27	0439	1.2	1102	-.1	1732	1.6	----	----
28	0011	.2	0517	1.0	1134	-.1	1828	1.7
29	0126	.3	0603	.7	1214	-.1	1930	1.7
30	0303	.4	0701	.6	1300	0.0	2043	1.7
31	0453	.3	0835	.5	1405	.1	2158	1.7

* -- TIDE OCCURS ON PREVIOUS DATE.

MARCH 1982

PORT ALLEN TIDES

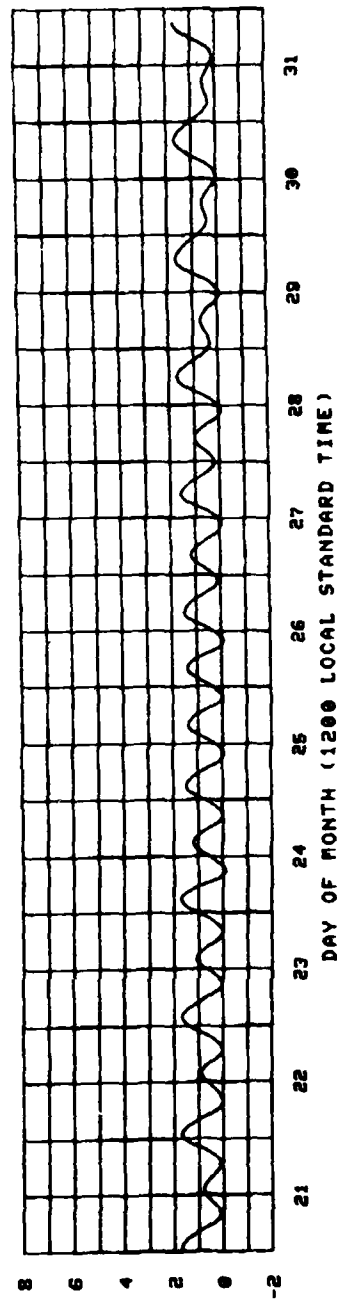
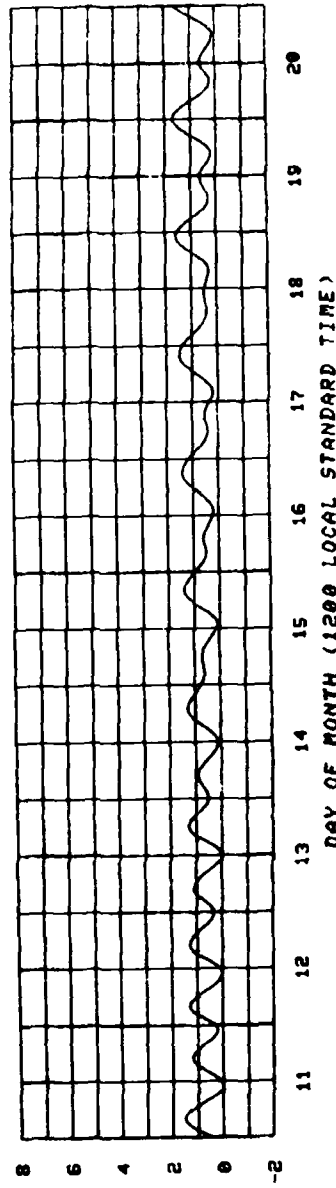
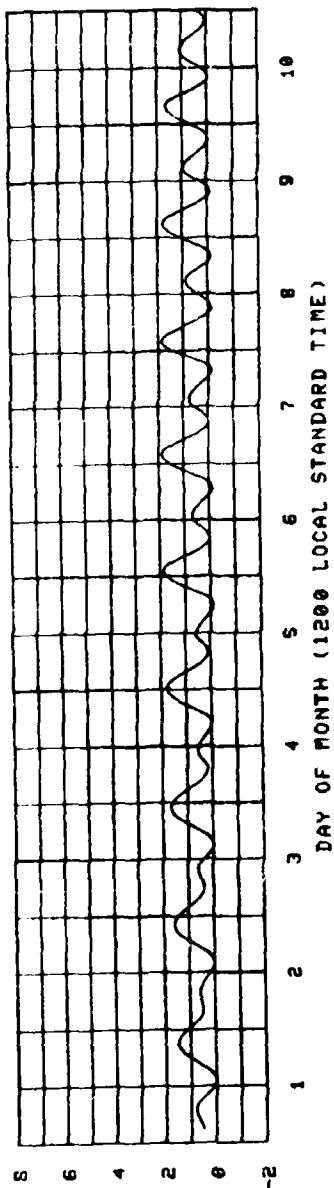


TABLE 32
PORT ALLEN TIDES
APRIL 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	0607	.2	1037	.5	1535	.2	2309	1.7
2	0700	.1	1150	.6	1701	.2	---	---
3	0808	1.7	0738	0.0	1255	.7	1815	.1
4	0057	1.7	0810	-.1	1340	.9	1916	.1
5	0140	1.7	0837	-.1	1419	1.1	2011	.1
6	0221	1.6	0904	-.1	1457	1.2	2058	.1
7	0254	1.5	0926	-.1	1530	1.4	2144	.1
8	0326	1.3	0949	-.1	1605	1.5	2230	.2
9	0356	1.1	1011	-.1	1637	1.6	2317	.2
10	0425	.9	1033	0.0	1715	1.6	---	---
11	0007	.3	0453	.8	1058	0.0	1754	1.6
12	0107	.4	0525	.6	1123	.1	1830	1.6
13	0216	.4	0607	.6	1155	.1	1932	1.5
14	0349	.4	0718	.5	1235	.2	2037	1.5
15	0511	.3	0914	.5	1344	.3	2144	1.5
16	0602	.2	1058	.5	1519	.4	2247	1.5
17	0637	.2	1157	.6	1645	.4	---	---
18	2339	1.5*	0706	.1	1239	.8	1756	.3
19	0025	1.5	0732	0.0	1318	1.0	1857	.2
20	0106	1.5	0758	-.1	1353	1.2	1951	.1
21	0145	1.4	0822	-.1	1429	1.4	2043	.1
22	0220	1.3	0848	-.2	1507	1.6	2137	.1
23	0259	1.2	0914	-.2	1546	1.7	2230	.1
24	0338	1.0	0946	-.3	1630	1.8	2326	.1
25	0416	.8	1018	-.2	1717	1.9	---	---
26	0033	.1	0502	.6	1054	-.2	1809	1.9
27	0147	.2	0601	.6	1135	-.1	1908	1.8
28	0308	.2	0720	.5	1227	.1	2011	1.7
29	0427	.1	0807	.5	1336	.2	2121	1.7
30	0528	0.0	1052	.6	1516	.3	2226	1.7

* -- TIDE OCCURS ON PREVIOUS DATE.

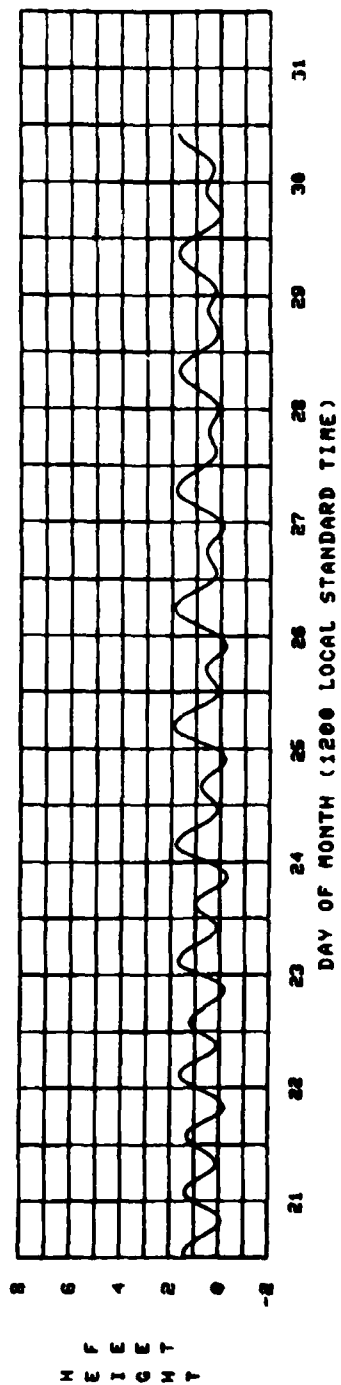
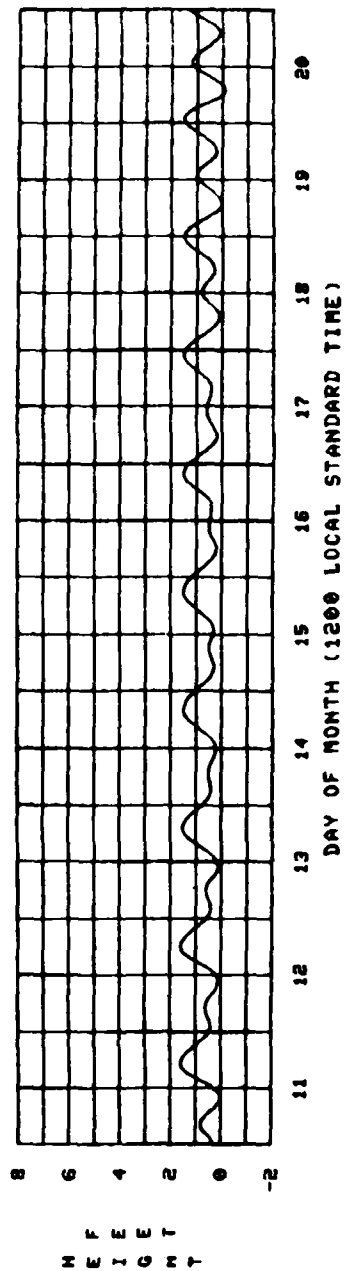
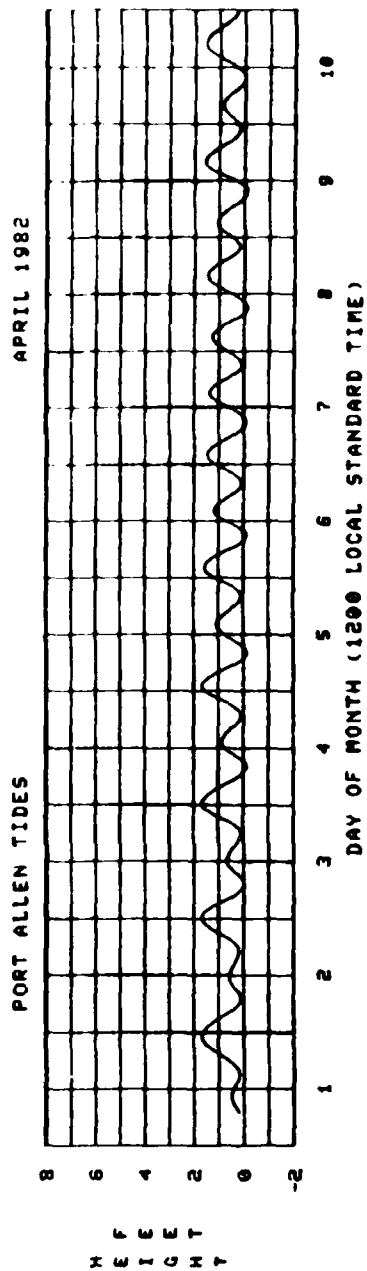


TABLE 33
PORT ALLEN TIDES
MAY 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	0612	0.0	1157	.7	1652	.4	----	----
2	2326	1.6x	0650	-.1	1246	.9	1812	.4
3	0017	1.5	0720	-.1	1328	1.2	1919	.3
4	0103	1.3	0747	-.1	1404	1.4	2015	.3
5	0142	1.2	0812	-.1	1439	1.5	2106	.2
6	0217	1.0	0833	-.1	1511	1.7	2153	.2
7	0252	.9	0856	-.1	1543	1.7	2238	.2
8	0324	.8	0920	-.1	1617	1.7	2324	.2
9	0353	.6	0944	-.1	1650	1.7	----	----
10	0016	.3	0428	.6	1006	0.0	1727	1.7
11	0110	.3	0510	.5	1035	0.0	1807	1.7
12	0207	.3	0559	.5	1107	.1	1854	1.7
13	0313	.2	0716	.4	1148	.2	1944	1.6
14	0411	.2	0800	.5	1247	.4	2042	1.6
15	0456	.1	1029	.6	1424	.5	2140	1.5
16	0532	.1	1128	.7	1606	.5	2236	1.4
17	0604	0.0	1210	.9	1733	.5	----	----
18	2328	1.3x	0630	-.1	1252	1.2	1845	.4
19	0015	1.2	0700	-.2	1328	1.5	1949	.3
20	0102	1.1	0728	-.3	1410	1.7	2049	.2
21	0144	1.0	0801	-.3	1451	1.9	2146	.1
22	0230	.8	0836	-.3	1531	2.0	2243	.1
23	0315	.7	0900	-.3	1616	2.1	----	----
24	2342	.1x	0404	.6	0947	-.3	1705	2.2
25	0040	0.0	0500	.5	1028	-.2	1754	2.1
26	0147	0.0	0604	.5	1113	-.1	1845	2.0
27	0252	0.0	0726	.5	1208	.1	1942	1.8
28	0348	0.0	0807	.6	1321	.3	2042	1.7
29	0440	0.0	1033	.7	1457	.5	2140	1.5
30	0522	-.1	1139	.9	1640	.6	2239	1.4
31	0556	-.1	1227	1.2	1813	.6	----	----

x -- TIDE OCCURS ON PREVIOUS DATE.

MAY 1982

PORT ALLEN TIDES

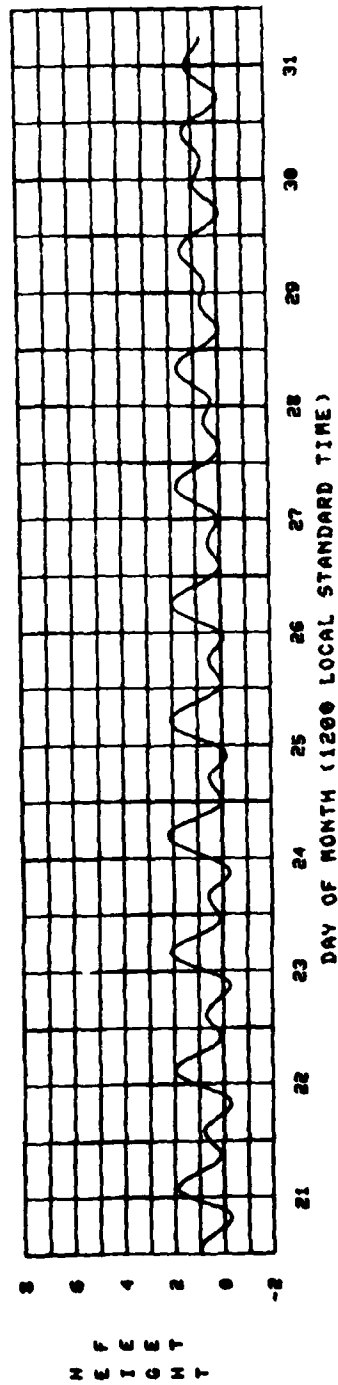
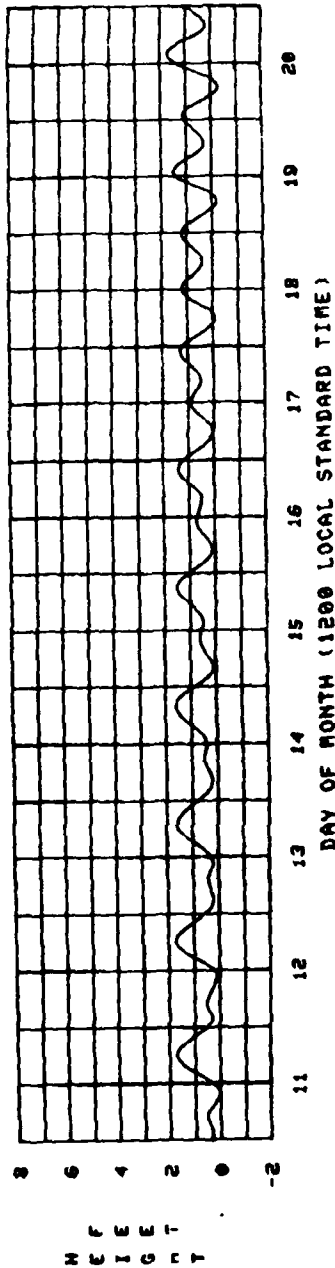
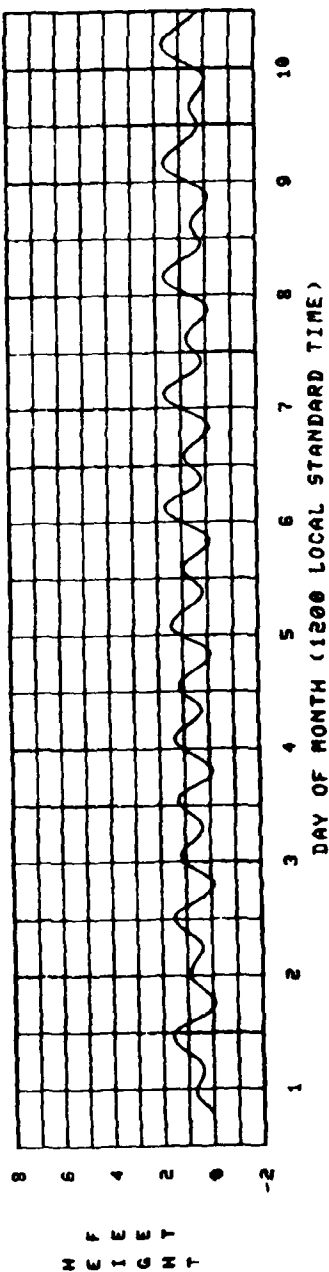


TABLE 34
PORT ALLEN TIDES
JUNE 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	2328	1.2*	0626	-.1	1313	1.4	1926	.5
2	0017	1.0	0656	-.2	1345	1.6	2026	.4
3	0103	.9	0721	-.2	1420	1.7	2116	.4
4	0141	.7	0748	-.2	1452	1.8	2204	.3
5	0217	.6	0812	-.2	1527	1.8	2247	.3
6	0255	.6	0841	-.1	1559	1.9	2332	.2
7	0334	.6	0908	-.1	1631	1.9	----	----
8	0414	.2	0412	.5	0937	0.0	1705	1.9
9	0456	.2	0455	.5	1003	0.0	1742	1.8
10	0142	.2	0549	.5	1044	.1	1820	1.7
11	0226	.2	0656	.5	1126	.2	1902	1.7
12	0309	.1	0819	.6	1222	.4	1949	1.6
13	0348	.1	0940	.6	1348	.5	2038	1.5
14	0426	0.0	1046	.9	1534	.6	2133	1.3
15	0458	-.1	1137	1.1	1717	.6	2230	1.2
16	0533	-.1	1223	1.5	1842	.5	----	----
17	2328	1.0*	0607	-.2	1309	1.7	1954	.4
18	0023	.9	0645	-.3	1351	1.9	2057	.3
19	0116	.7	0722	-.3	1436	2.1	2156	.2
20	0211	.6	0804	-.4	1520	2.3	2248	.1
21	0303	.6	0846	-.3	1604	2.3	----	----
22	2340	0.0*	0357	.6	0930	-.3	1650	2.3
23	0032	0.0	0455	.6	1015	-.2	1735	2.2
24	0120	0.0	0601	.6	1104	0.0	1822	2.0
25	0210	0.0	0712	.6	1200	.2	1910	1.8
26	0258	0.0	0834	.7	1309	.4	2000	1.7
27	0341	0.0	0956	.9	1442	.6	2048	1.4
28	0420	0.0	1110	1.1	1629	.6	2143	1.2
29	0459	0.0	1158	1.3	1812	.6	2239	1.0
30	0533	-.1	1244	1.6	1933	.6	----	----

* -- TIDE OCCURS ON PREVIOUS DATE.

JUNE 1982

PORT ALLEN TIDES

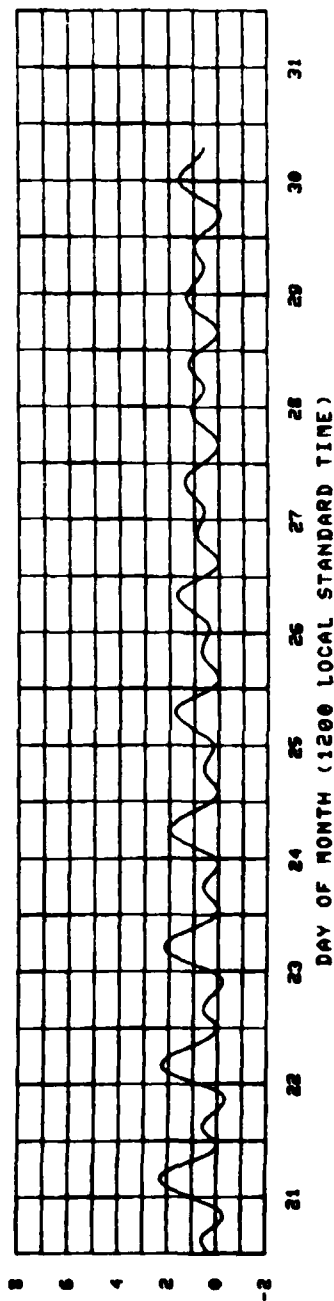
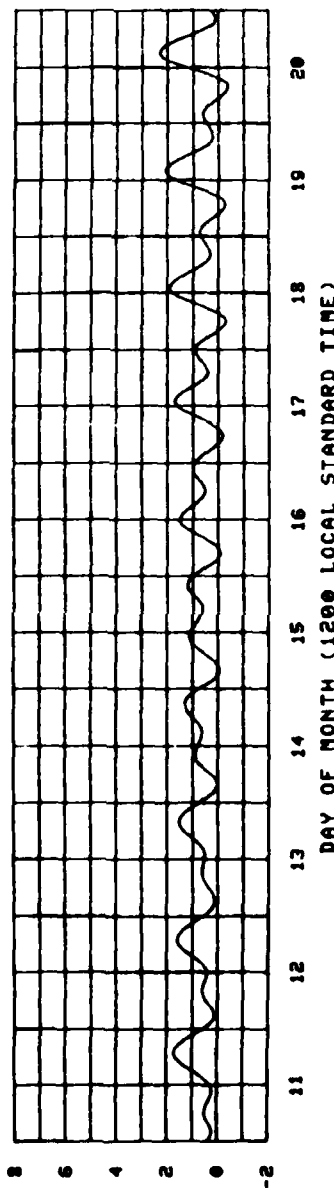
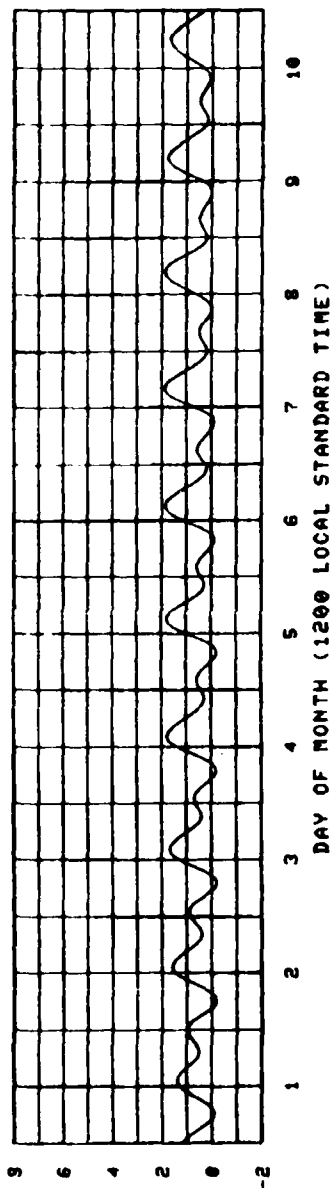


TABLE 35
PORT ALLEN TIDES
JULY 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	2334	.8*	0606	-.1	1326	1.7	2035	.5
2	0028	.7	0638	-.1	1400	1.8	2124	.4
3	0114	.6	0710	-.1	1435	1.9	2203	.3
4	0158	.6	0745	-.1	1507	2.0	2241	.3
5	0240	.6	0817	-.1	1540	2.0	2316	.2
6	0319	.6	0849	0.0	1612	2.0	----	----
7	2348	.2*	0921	.6	0921	0.0	1643	2.0
8	0022	.2	0442	.6	0953	.1	1717	1.9
9	0056	.2	0531	.6	1035	.2	1749	1.8
10	0131	.2	0625	.6	1118	.3	1825	1.7
11	0203	.1	0731	.7	1216	.5	1903	1.6
12	0240	.1	0844	.9	1336	.6	1949	1.4
13	0317	.1	0959	1.1	1522	.7	2040	1.2
14	0358	0.0	1102	1.4	1717	.6	2139	1.0
15	0440	-.1	1155	1.7	1852	.6	2252	.8
16	0525	-.1	1247	1.9	2006	.5	----	----
17	0601	.7	0612	-.2	1336	2.1	2102	.3
18	0103	.6	0658	-.2	1421	2.3	2150	.2
19	0204	.6	0748	-.3	1506	2.4	2236	.1
20	0258	.6	0833	-.2	1549	2.4	2318	.1
21	0351	.6	0921	-.2	1632	2.3	----	----
22	0000	.1	0444	.7	1010	0.0	1713	2.2
23	0038	.1	0540	.8	1102	.1	1753	1.9
24	0117	.1	0643	.9	1155	.3	1834	1.7
25	0156	.1	0750	1.0	1301	.6	1913	1.5
26	0234	.1	0904	1.1	1428	.6	1958	1.3
27	0313	.1	1014	1.3	1620	.7	2040	1.0
28	0356	.1	1118	1.5	1815	.7	2146	.8
29	0435	.1	1210	1.7	1938	.6	2302	.7
30	0524	.1	1256	1.7	2030	.5	----	----
31	0606	.7	0607	.1	1336	1.9	2108	.4

* -- TIDE OCCURS ON PREVIOUS DATE.

JULY 1982

PORT ALLEN TIDES

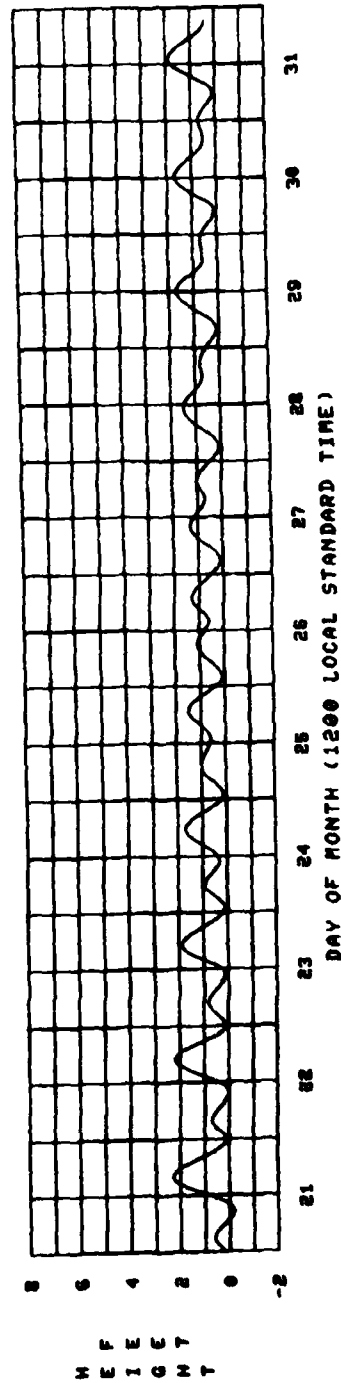
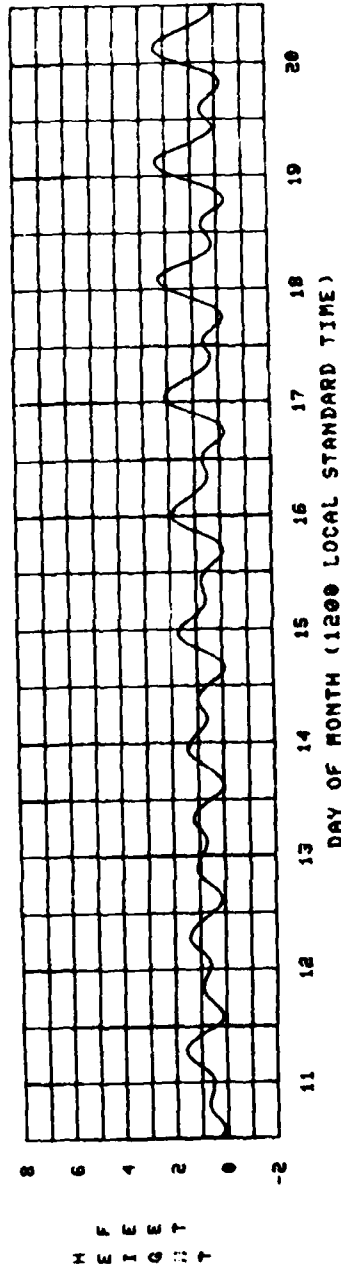
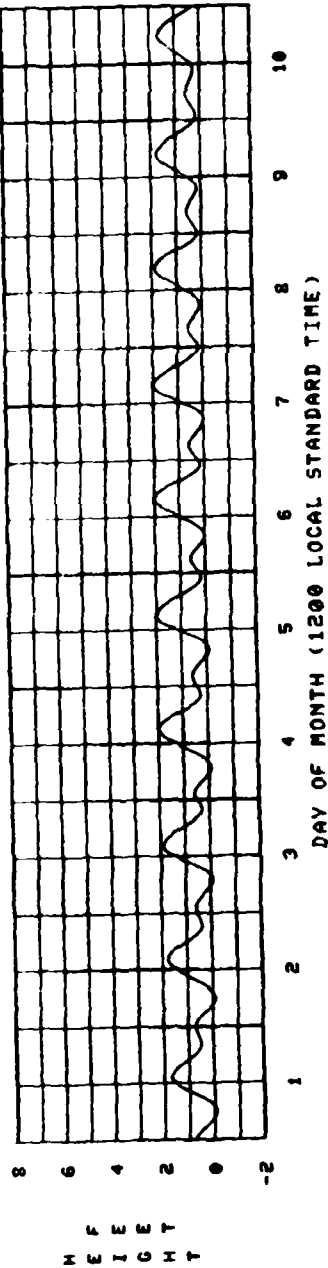


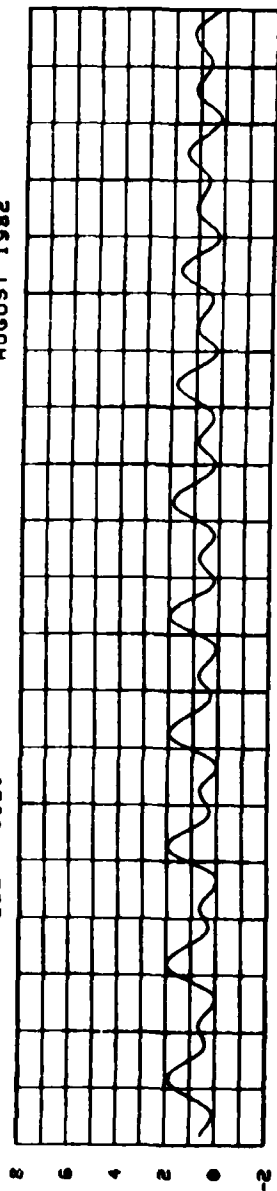
TABLE 36
PORT ALLEN TIDES
AUGUST 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME AMST	HGT FT	TIME AMST	HGT FT	TIME AMST	HGT FT	TIME AMST	HGT FT
1	0104	.6	0649	.1	1410	1.9	2140	.4
2	0140	.7	0727	0.0	1444	2.0	2200	.3
3	0230	.7	0805	0.0	1516	2.0	2240	.3
4	0307	.7	0841	0.0	1548	2.0	2305	.3
5	0343	.8	0916	.1	1616	2.0	2334	.2
6	0422	.8	0955	.2	1646	1.9	-----	---
7	0500	.2	0504	.9	1033	.3	1718	1.8
8	0527	.2	0553	1.0	1123	.4	1750	1.7
9	0559	.2	0649	1.1	1221	.6	1825	1.5
10	0132	.2	0757	1.2	1341	.6	1906	1.3
11	0213	.1	0911	1.4	1520	.7	1958	1.0
12	0258	.1	1027	1.6	1735	.7	2110	.8
13	0355	.1	1130	1.8	1905	.6	2243	.7
14	0455	0.0	1227	2.0	2001	.4	-----	---
15	0503	.7	0554	0.0	1317	2.2	2049	.3
16	0109	.7	0650	-.1	1404	2.3	2128	.2
17	0205	.8	0742	-.1	1446	2.3	2204	.1
18	0251	.9	0834	-.1	1528	2.3	2239	.1
19	0341	1.0	0920	0.0	1600	2.1	2311	.1
20	0426	1.1	1009	.1	1645	2.0	-----	---
21	2345	.2*	0515	1.2	1100	.3	1720	1.7
22	0015	.2	0604	1.3	1153	.5	1755	1.6
23	0046	.2	0659	1.3	1256	.6	1830	1.3
24	0118	.3	0802	1.4	1420	.7	1909	1.1
25	0157	.3	0914	1.5	1616	.7	1955	.9
26	0246	.3	1025	1.6	1812	.6	2117	.7
27	0342	.3	1126	1.7	1919	.6	2257	.7
28	0442	.3	1218	1.7	2001	.5	-----	---
29	0507	.7	0530	.3	1301	1.8	2032	.4
30	0100	.8	0629	.3	1338	1.9	2058	.4
31	0141	.8	0713	.2	1413	2.0	2123	.3

* -- TIDE OCCURS ON PREVIOUS DATE.

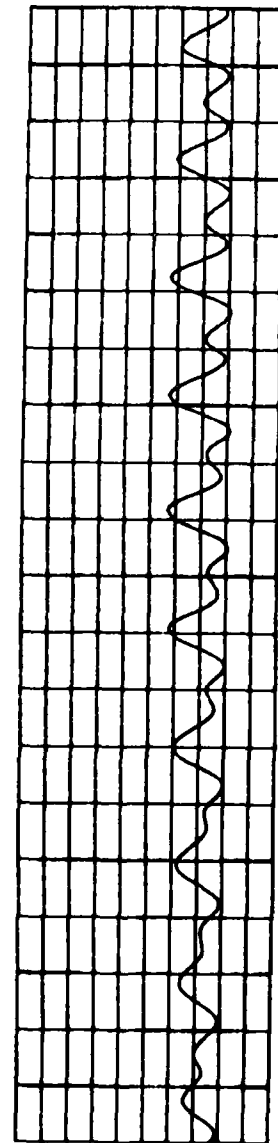
AUGUST 1982

PORT ALLEN TIDES



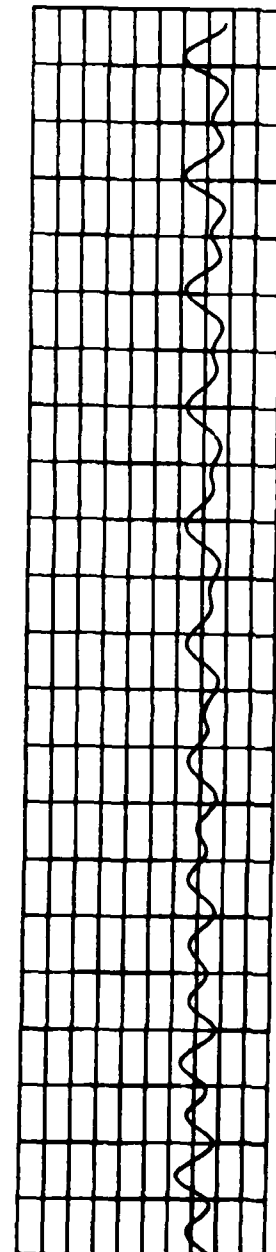
HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)



HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)



HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)

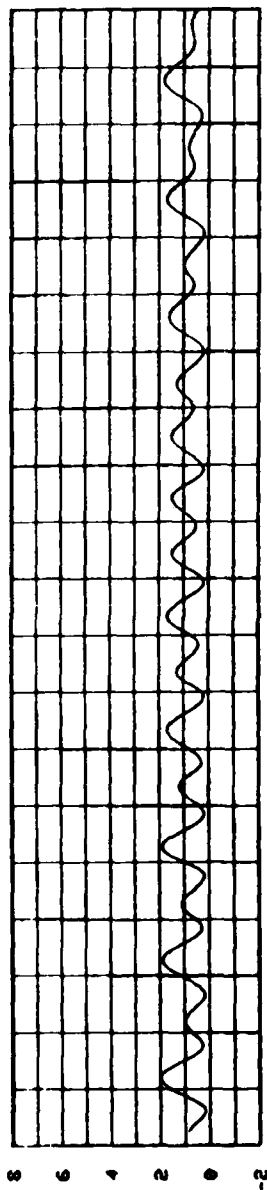
TABLE 37
PORT ALLEN TIDES
SEPTEMBER 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME AMST	HGT FT	TIME AMST	HGT FT	TIME AMST	HGT FT	TIME AMST	HGT FT
1	0218	.9	0753	.2	1445	2.0	2148	.3
2	0250	1.0	0835	.2	1515	1.9	2213	.3
3	0325	1.1	0914	.2	1544	1.9	2235	.2
4	0404	1.2	0956	.3	1613	1.7	2300	.2
5	0445	1.3	1039	.4	1644	1.7	2324	.2
6	0528	1.5	1134	.5	1716	1.5	----	----
7	2353	.2x	0620	1.5	1237	.6	1751	1.3
8	0030	.2	0719	1.6	1405	.6	1837	1.0
9	0111	.2	0832	1.7	1557	.6	1938	.8
10	0204	.3	0951	1.8	1747	.6	2122	.7
11	0317	.3	1101	1.9	1853	.5	2306	.7
12	0434	.3	1202	2.0	1942	.3	----	----
13	0523	.8	0545	.2	1255	2.1	2017	.2
14	0616	.9	0648	.2	1341	2.1	2053	.2
15	0701	1.1	0743	.1	1423	2.1	2123	.1
16	0746	1.2	0835	.1	1459	2.0	2150	.1
17	0825	1.4	0924	.2	1537	1.8	2218	.2
18	0904	1.5	1011	.3	1612	1.7	2245	.2
19	0946	1.6	1100	.4	1644	1.5	2308	.2
20	0527	1.6	1153	.5	1713	1.3	----	----
21	2335	.3x	0617	1.7	1259	.6	1745	1.1
22	0003	.3	0709	1.7	1418	.6	1825	.9
23	0037	.4	0808	1.7	1608	.6	1922	.7
24	0120	.5	0920	1.7	1744	.6	2119	.7
25	0230	.5	1029	1.7	1840	.5	2304	.7
26	0357	.5	1128	1.7	1912	.5	----	----
27	0507	.8	0511	.5	1215	1.8	1940	.4
28	0552	.9	0610	.4	1257	1.8	2007	.3
29	0124	1.1	0700	.4	1332	1.8	2030	.3
30	0159	1.2	0748	.3	1404	1.8	2052	.2

x -- TIDE OCCURS ON PREVIOUS DATE.

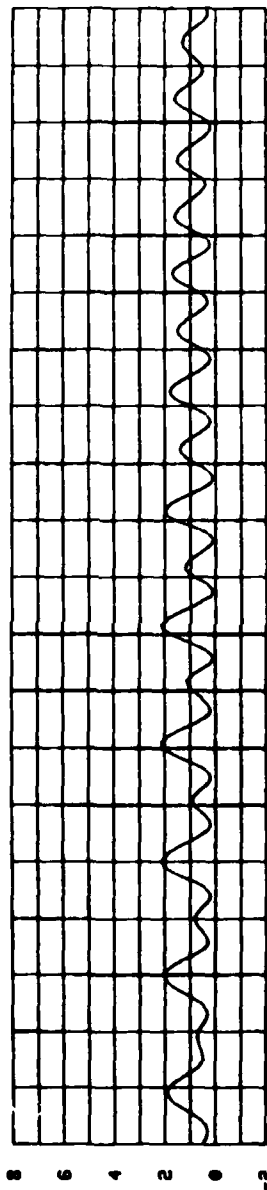
PORT ALLEN TIDES

SEPTEMBER 1982



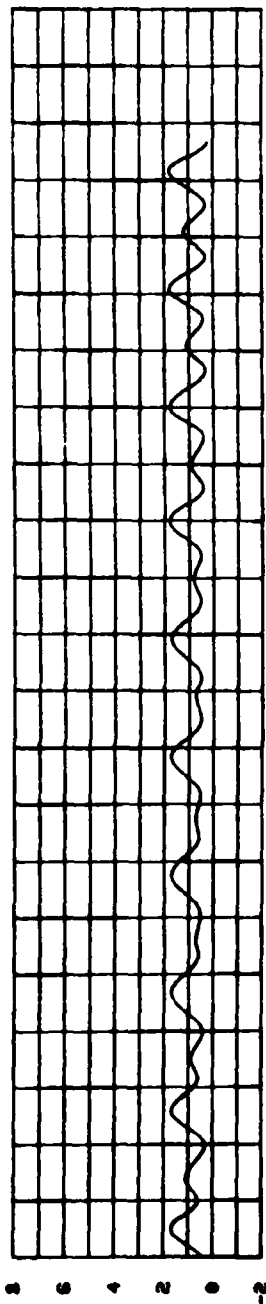
HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)



HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)



HEIGHT

DAY OF MONTH (1200 LOCAL STANDARD TIME)

TABLE 38

PORT ALLEN TIDES

OCTOBER 1982

21 DEG 54 MIN N, 159 DEG 35 MIN W - NANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	0233	1.4	0830	.3	1439	1.7	2116	.2
2	0306	1.5	0916	.3	1511	1.7	2139	.1
3	0342	1.7	1002	.3	1540	1.5	2204	.1
4	0423	1.7	1052	.4	1615	1.3	2232	.1
5	0506	1.8	1148	.5	1650	1.1	2300	.1
6	0555	1.8	1259	.5	1733	.9	---	---
7	2337	.2*	0653	1.9	1430	.6	1825	.7
8	0022	.2	0803	1.9	1613	.5	1958	.6
9	0122	.3	0915	1.9	1732	.4	2159	.6
10	0248	.4	1029	1.9	1825	.3	---	---
11	2329	.2*	0424	.5	1131	1.9	1905	.2
12	0028	.9	0544	.4	1228	1.9	1938	.1
13	0116	1.2	0652	.4	1312	1.8	2009	.1
14	0156	1.4	0748	.3	1351	1.7	2035	.1
15	0234	1.5	0841	.3	1430	1.6	2102	.1
16	0310	1.7	0930	.3	1502	1.5	2124	.1
17	0345	1.7	1018	.4	1537	1.3	2147	.1
18	0424	1.8	1108	.4	1608	1.1	2210	.1
19	0459	1.8	1201	.5	1640	.9	2233	.2
20	0538	1.8	1300	.6	1713	.8	2300	.3
21	0623	1.8	1413	.6	1758	.7	2332	.4
22	0715	1.7	1539	.6	1810	.6	---	---
23	0811	.5	0817	1.7	1855	.5	2119	.6
24	0117	.6	0923	1.7	1743	.4	2259	.7
25	0256	.6	1023	1.7	1818	.3	---	---
26	2351	.8*	0432	.6	1119	1.7	1844	.3
27	0029	1.0	0546	.6	1204	1.7	1911	.2
28	0104	1.2	0647	.5	1243	1.6	1934	.1
29	0137	1.4	0738	.4	1322	1.5	1958	.1
30	0215	1.7	0829	.4	1358	1.4	2023	0.0
31	0247	1.8	0919	.3	1433	1.3	2049	0.0

* -- TIDE OCCURS ON PREVIOUS DATE.

PORT ALLEN TIDES

OCTOBER 1982

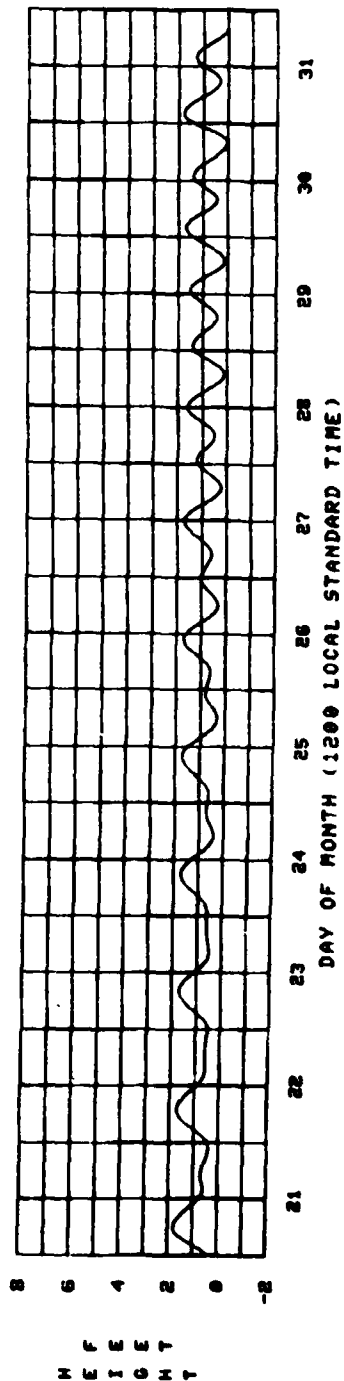
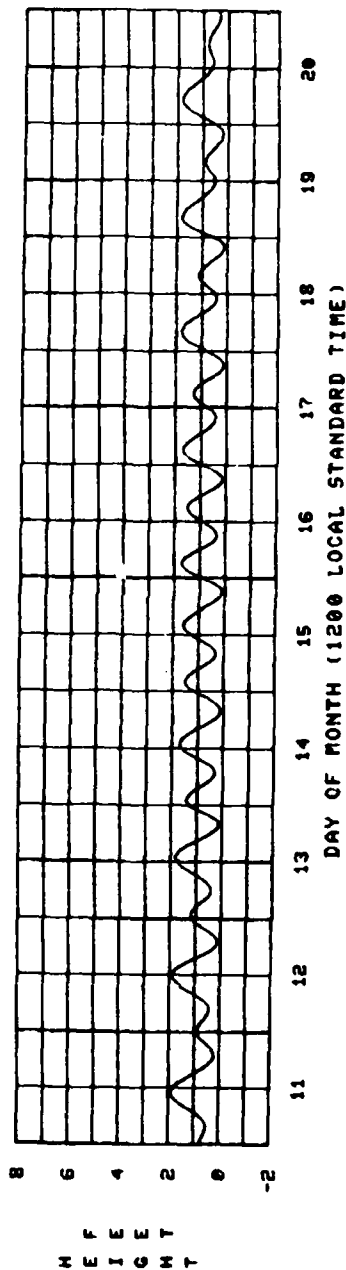
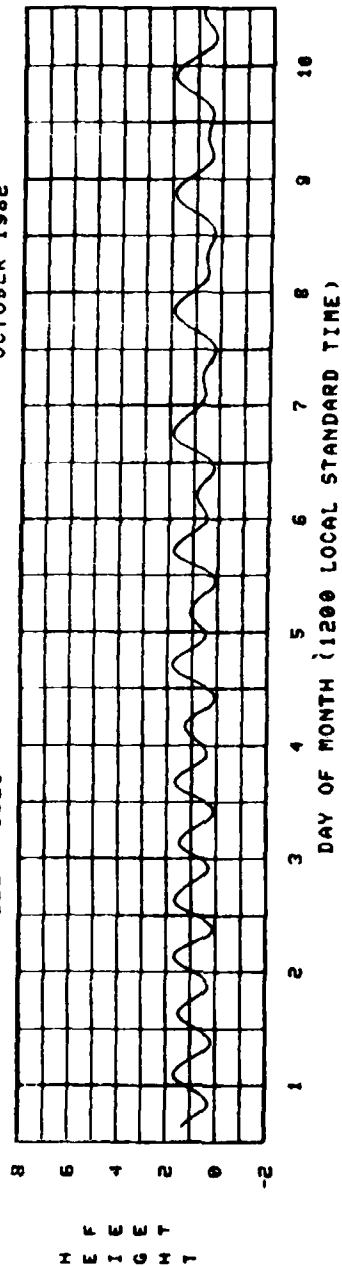


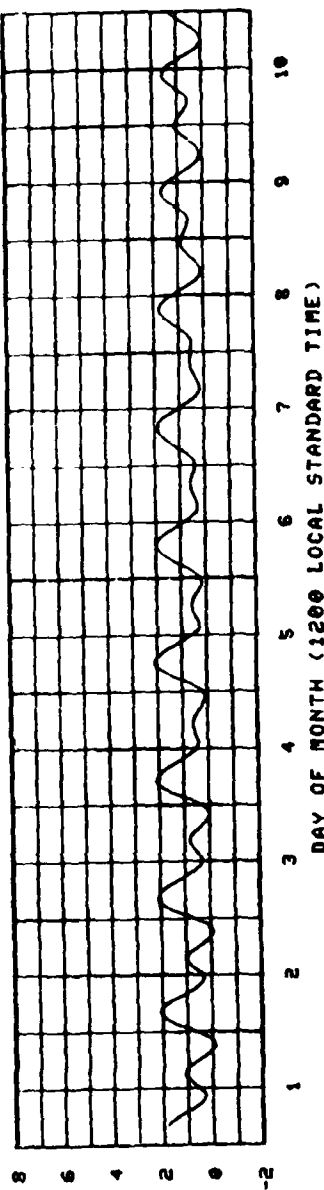
TABLE 39
PORT ALLEN TIDES
NOVEMBER 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	0326	1.9	1012	.3	1511	1.1	2118	-.1
2	0405	2.1	1107	.3	1548	1.0	2147	-.1
3	0450	2.1	1206	.3	1635	.8	2223	0.0
4	0539	2.1	1318	.4	1727	.6	2302	.1
5	0635	2.1	1435	.3	1838	.6	---	---
6	2348	.2*	0734	2.0	1554	.3	2024	.6
7	0053	.4	0842	1.9	1656	.2	2215	.6
8	0229	.5	0950	1.8	1743	.1	---	---
9	2336	.9*	0416	.6	1052	1.7	1820	.1
10	0023	1.1	0544	.6	1147	1.6	1852	0.0
11	0105	1.4	0657	.5	1236	1.5	1921	0.0
12	0147	1.6	0759	.5	1318	1.3	1948	0.0
13	0222	1.7	0853	.4	1357	1.2	2012	0.0
14	0256	1.8	0942	.4	1431	1.0	2037	0.0
15	0330	1.9	1028	.4	1504	.9	2059	0.0
16	0401	2.0	1116	.4	1539	.8	2124	0.0
17	0437	2.0	1206	.4	1611	.7	2149	.1
18	0511	1.9	1258	.4	1653	.6	2218	.2
19	0551	1.9	1354	.4	1746	.6	2247	.3
20	0634	1.8	1456	.4	1857	.6	2325	.4
21	0723	1.7	1552	.3	2043	.6	---	---
22	0817	.5	0816	1.7	1637	.3	2222	.6
23	0153	.6	0914	1.6	1712	.2	---	---
24	2322	.8*	0343	.6	1009	1.5	1743	.1
25	0001	1.1	0510	.6	1058	1.4	1812	0.0
26	0039	1.3	0634	.6	1151	1.3	1839	0.0
27	0115	1.6	0737	.5	1237	1.2	1906	-.1
28	0153	1.8	0835	.4	1321	1.0	1936	-.2
29	0229	2.0	0927	.3	1403	.9	2009	-.2
30	0311	2.2	1020	.2	1449	.8	2043	-.3

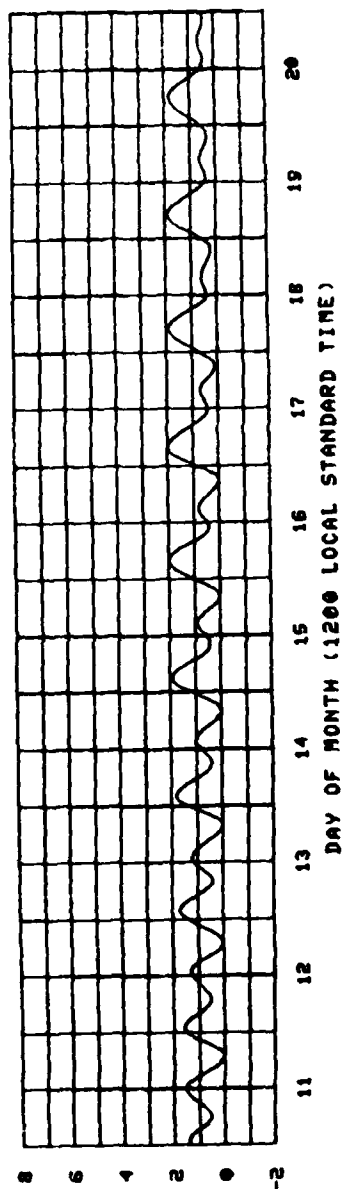
* -- TIDE OCCURS ON PREVIOUS DATE.

NOVEMBER 1982

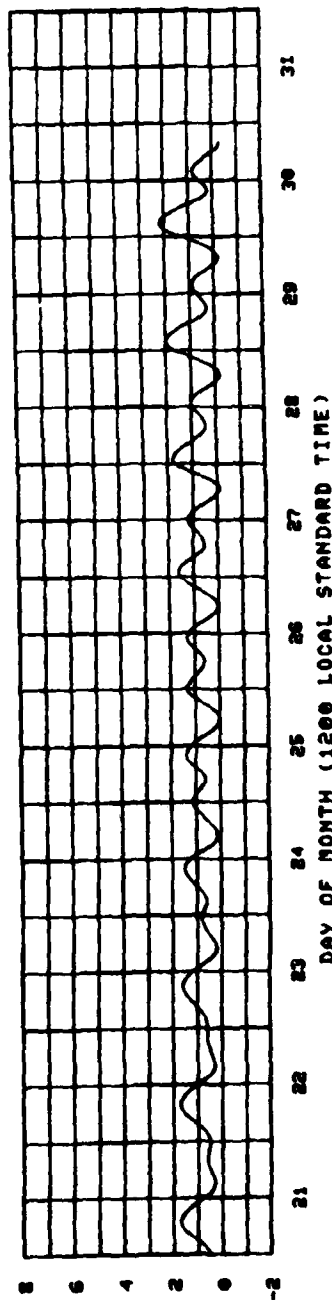
PORT ALLEN TIDES



HEIGHT
FEET



HEIGHT
FEET



HEIGHT
FEET

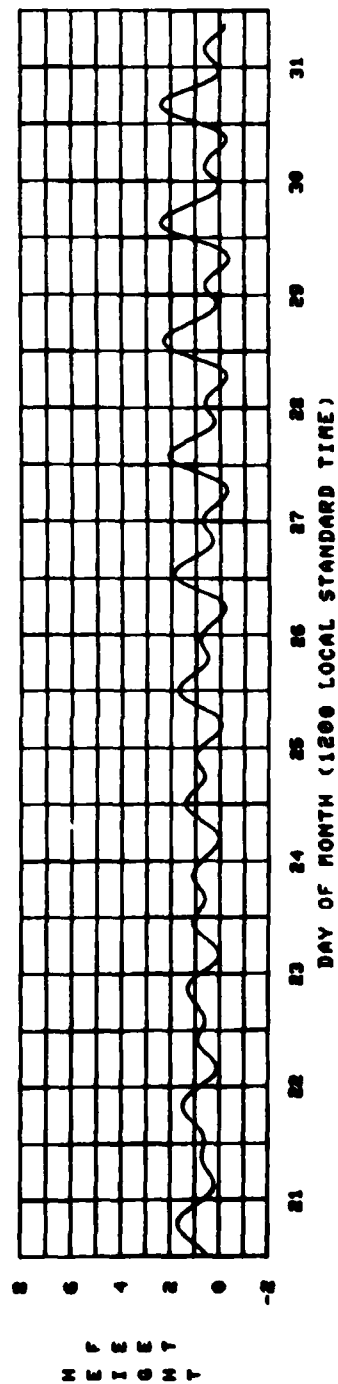
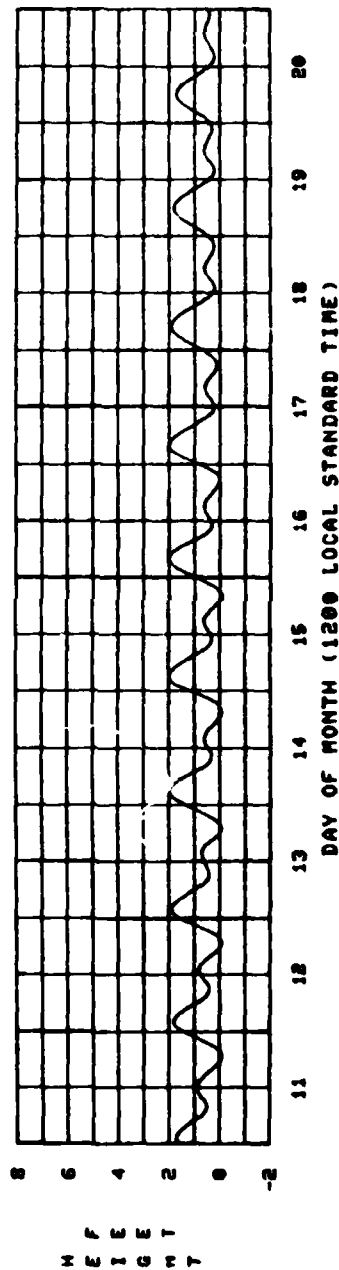
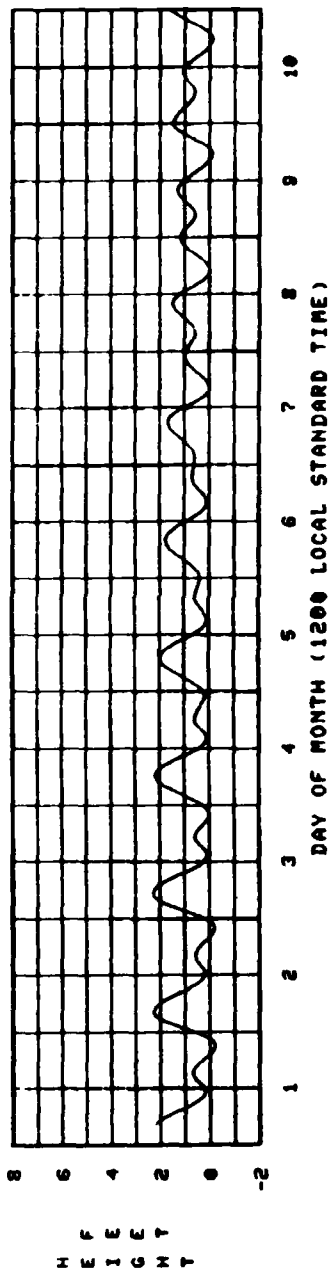
TABLE 40
PORT ALLEN TIDES
DECEMBER 1982
21 DEG 54 MIN N, 159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT	TIME AHST	HGT FT
1	0353	2.3	1118	.2	1534	.7	2120	-.2
2	0438	2.3	1214	.2	1626	.6	2201	-.2
3	0526	2.3	1316	.1	1726	.6	2246	0.0
4	0614	2.2	1412	.1	1843	.6	-----	-----
5	2336	.2*	0709	2.0	1511	.1	2010	.6
6	0041	.4	0805	1.8	1605	.1	2156	.7
7	0214	.6	0907	1.7	1651	0.0	2312	1.0
8	0403	.6	1006	1.5	1730	0.0	-----	-----
9	0008	1.2	0546	.6	1058	1.3	1804	-.1
10	0052	1.5	0708	.6	1157	1.1	1834	-.1
11	0131	1.7	0814	.5	1243	.9	1906	-.1
12	0207	1.8	0908	.4	1328	.8	1930	-.1
13	0239	1.9	0955	.4	1407	.7	1959	-.1
14	0314	2.0	1036	.3	1446	.6	2028	-.1
15	0346	2.0	1116	.3	1521	.6	2055	-.1
16	0418	2.0	1158	.3	1559	.6	2124	0.0
17	0450	2.0	1236	.2	1642	.6	2156	.1
18	0525	1.9	1315	.2	1727	.6	2228	.2
19	0601	1.8	1402	.2	1830	.6	2310	.3
20	0640	1.7	1442	.2	1947	.6	-----	-----
21	2358	.4*	0722	1.7	1521	.2	2110	.7
22	0114	.6	0806	1.5	1600	.1	2226	.9
23	0258	.6	0903	1.3	1634	0.0	-----	-----
24	2322	1.1*	0453	.6	0956	1.1	1700	0.0
25	0010	1.4	0528	.6	1058	1.0	1744	-.1
26	0052	1.7	0741	.5	1157	.8	1823	-.2
27	0135	1.9	0844	.3	1252	.7	1902	-.3
28	0217	2.1	0935	.2	1348	.6	1943	-.3
29	0258	2.3	1025	.1	1440	.6	2021	-.4
30	0341	2.4	1113	0.0	1530	.6	2107	-.3
31	0426	2.4	1159	0.0	1623	.6	2152	-.2

* -- TIDE OCCURS ON PREVIOUS DATE.

PORT ALLEN TIDES

DECEMBER 1982



APPENDIX A

HEIGHT OF THE TIDE AT ANY TIME*

The height of the tide at times intermediate to the times of high and low water is needed on occasion, and may be computed by either numerical or graphical methods. One example of each method is presented here, using the predicted tides for a day at Point Mugu.

Problem: Given that the predicted times and heights of the tides are:

Time	Height	Time	Height	Time	Height	Time	Height
0039	4.9	0814	0.2	1510	3.1	1933	2.4

Find the height of the tide at 0300.

Numerical Method

The duration of fall is $08^h 14^m - 00^h 39^m = 7^h 35^m$.

The time after high water for which the height is required is $03^h 00^m - 00^h 39^m = 02^h 21^m$.

The range of tide is $4.9 - 0.2 = 4.7$ feet.

Entering table A-1 at the duration of fall of $7^h 40^m$, which is the nearest value to $7^h 35^m$, the nearest value on the horizontal line to $2^h 21^m$ is $2^h 18^m$ after high water. Following down this column to its intersection with a range of 4.5 feet which is the nearest tabular value to 4.7 feet, one obtains 0.9 which, being calculated from high water, must be subtracted from it. The approximate height at $03^h 00^m$ is, therefore, $4.9 - 0.9 = 4.0$ feet.

When the duration of rise or fall is greater than $10^h 40^m$, enter the table with one-half the given duration and with one-half the time from the nearest high or low water; but if the duration of rise or fall is less than 4 hours, enter the table with double the given duration and with double the time from the nearest high or low water.

*This information is adapted from table 3 of the data source for this publication (see page 1).

Table A-1. Height of the Tide at Any Time

		Time from the nearest high water or low water															
		A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.
Duration of rise or fall, see footnote.	4.00	0.08	0.16	0.24	0.32	0.40	0.48	0.56	1.04	1.12	1.20	1.28	1.36	1.44	1.52	2.00	2.08
	4.20	0.09	0.17	0.26	0.35	0.43	0.52	1.01	1.09	1.18	1.27	1.35	1.44	1.53	2.01	2.10	2.19
	4.40	0.09	0.19	0.28	0.37	0.47	0.56	1.05	1.15	1.24	1.33	1.43	1.52	2.01	2.11	2.20	2.30
	4.60	0.10	0.20	0.30	0.40	0.50	1.00	1.10	1.20	1.30	1.40	1.50	2.00	2.10	2.20	2.30	2.40
	4.80	0.11	0.21	0.32	0.43	0.53	1.04	1.15	1.25	1.36	1.47	1.57	2.08	2.19	2.29	2.40	2.50
	5.00	0.11	0.23	0.34	0.45	0.57	1.08	1.19	1.31	1.42	1.53	2.05	2.16	2.27	2.39	2.50	2.60
	5.20	0.12	0.24	0.36	0.48	1.00	1.12	1.24	1.36	1.48	2.00	2.12	2.24	2.36	2.48	3.00	3.10
	5.40	0.13	0.25	0.38	0.51	1.03	1.16	1.29	1.41	1.54	2.07	2.19	2.32	2.45	2.57	3.10	3.20
	5.60	0.13	0.27	0.40	0.53	1.07	1.20	1.33	1.47	2.00	2.13	2.27	2.40	2.53	3.07	3.20	3.30
	5.80	0.14	0.28	0.42	0.56	1.10	1.24	1.38	1.52	2.06	2.20	2.34	2.48	3.02	3.16	3.30	3.40
	6.00	0.15	0.29	0.44	0.59	1.13	1.28	1.43	1.57	2.12	2.27	2.41	2.56	3.11	3.25	3.40	3.50
	6.20	0.15	0.31	0.46	1.01	1.17	1.32	1.47	2.03	2.18	2.33	2.49	3.04	3.19	3.35	3.50	3.60
	6.40	0.16	0.32	0.48	1.04	1.20	1.36	1.52	2.08	2.24	2.40	2.56	3.12	3.28	3.44	4.00	4.10
	6.60	0.17	0.33	0.50	1.07	1.23	1.40	1.57	2.13	2.30	2.47	3.03	3.20	3.37	3.53	4.10	4.20
	6.80	0.17	0.35	0.52	1.09	1.27	1.44	2.01	2.19	2.36	2.53	3.11	3.28	3.45	4.03	4.20	4.30
	7.00	0.18	0.36	0.54	1.12	1.30	1.48	2.06	2.24	2.42	3.00	3.18	3.36	3.54	4.12	4.30	4.40
	7.20	0.19	0.37	0.56	1.15	1.33	1.52	2.11	2.29	2.48	3.07	3.25	3.44	4.03	4.21	4.40	4.50
	7.40	0.19	0.39	0.58	1.17	1.37	1.56	2.15	2.35	2.54	3.13	3.33	3.52	4.11	4.31	4.50	4.60
	7.60	0.20	0.40	1.00	1.20	1.40	2.00	2.20	2.40	3.00	3.20	3.40	4.00	4.20	4.40	5.00	5.10
	7.80	0.21	0.41	1.02	1.23	1.43	2.04	2.25	2.45	3.06	3.27	3.47	4.08	4.29	4.49	5.10	5.20
	8.00	0.21	0.43	1.04	1.25	1.47	2.08	2.29	2.51	3.12	3.33	3.55	4.16	4.37	4.59	5.20	5.30
		Correction to height															
		Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
Range of tide, see footnote.	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5
	1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
	2.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
	2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
	3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5	1.6
	3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8	2.0
	4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2
	4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2	2.5
	5.0	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.8
	5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.8	3.0
	6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.2
	6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2	3.5
	7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5	3.8
	7.5	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.2	1.5	1.9	2.2	2.6	3.0	3.4	3.8	4.2
	8.0	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.3	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.5
	8.5	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.4	1.8	2.2	2.5	2.9	3.4	3.8	4.2	4.8
	9.0	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.2	2.7	3.1	3.6	4.0	4.5	5.0
	9.5	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.6	2.0	2.4	2.8	3.3	3.8	4.3	4.8	5.3
	10.0	0.0	0.1	0.2	0.4	0.7	1.0	1.3	1.7	2.1	2.5	3.0	3.5	4.0	4.5	5.0	5.5
	10.5	0.0	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2.2	2.6	3.1	3.6	4.2	4.7	5.2	5.7
	11.0	0.0	0.1	0.3	0.5	0.7	1.1	1.4	1.8	2.3	2.8	3.3	3.8	4.4	4.9	5.5	6.0
	11.5	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.9	2.4	2.9	3.4	4.0	4.6	5.1	5.8	6.3
	12.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.0	3.6	4.1	4.8	5.4	6.0	6.6
	12.5	0.0	0.1	0.3	0.5	0.8	1.2	1.6	2.1	2.6	3.1	3.7	4.3	5.0	5.6	6.2	6.8
	13.0	0.0	0.1	0.3	0.6	0.9	1.2	1.7	2.2	2.7	3.2	3.9	4.5	5.1	5.8	6.5	7.0
	13.5	0.0	0.1	0.3	0.6	0.9	1.3	1.7	2.2	2.8	3.4	4.0	4.7	5.3	6.0	6.8	7.3
	14.0	0.0	0.2	0.3	0.6	0.9	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.3	7.0	7.7
	14.5	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.2	7.9
	15.0	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.5	3.1	3.8	4.4	5.2	5.9	6.7	7.5	8.2
	15.5	0.0	0.2	0.4	0.7	1.0	1.5	2.0	2.6	3.2	3.9	4.6	5.4	6.1	6.9	7.8	8.5
	16.0	0.0	0.2	0.4	0.7	1.1	1.5	2.1	2.6	3.3	4.0	4.7	5.5	6.3	7.2	8.0	8.8
	16.5	0.0	0.2	0.4	0.7	1.1	1.6	2.1	2.7	3.4	4.1	4.9	5.7	6.5	7.4	8.2	9.0
	17.0	0.0	0.2	0.4	0.7	1.1	1.6	2.2	2.8	3.5	4.2	5.0	5.9	6.7	7.6	8.5	9.3
	17.5	0.0	0.2	0.4	0.8	1.2	1.7	2.2	2.9	3.6	4.4	5.2	6.0	6.9	7.8	8.8	9.6
	18.0	0.0	0.2	0.4	0.8	1.2	1.7	2.3	3.0	3.7	4.5	5.3	6.2	7.1	8.1	9.0	9.9
	18.5	0.1	0.2	0.5	0.8	1.2	1.8	2.4	3.1	3.8	4.6	5.5	6.4	7.3	8.3	9.2	10.0
	19.0	0.1	0.2	0.5	0.8	1.3	1.8	2.4	3.1	3.9	4.8	5.6	6.6	7.5	8.5	9.5	10.4
	19.5	0.1	0.2	0.5	0.8	1.3	1.9	2.5	3.2	4.0	4.9	5.8	6.7	7.7	8.7	9.8	10.7
	20.0	0.1	0.2	0.5	0.9	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.9	7.9	9.0	10.0	11.0

Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between their heights is the range of tide for the above table. Find the difference between the nearest high or low water and the time for which the height is required.

Enter the table with the duration of rise or fall, printed in heavy-faced type, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual difference. The correction sought is in the column directly below, on the line with the range of tide.

When the nearest tide is high water, subtract the correction.

When the nearest tide is low water, add the correction.

Graphical Method

If the height of the tide is required for a number of times on a certain day the full tide curve for the day may be obtained by the *one-quarter, one-tenth rule*. The procedure is as follows:

1. On cross-section paper plot the high and low water points in the order of their occurrence for the day, measuring time horizontally and height vertically. These are the basic points for the curve.
2. Draw light straight lines connecting the points representing successive high and low waters.
3. Divide each of these straight lines into four equal parts. The halfway point of each line gives another point for the curve.
4. At the quarter point adjacent to high water, draw a vertical line above the point, and at the quarter point adjacent to low water, draw a vertical line below the point, making the length of these lines equal to one-tenth of the range between the high and low waters used. The points marking the ends of these vertical lines give two additional intermediate points for the curve.
5. Draw a smooth curve through the points of high and low waters and the intermediate points, making the curve well rounded near high and low waters. This curve will approximate the actual tide curve and heights for any time of the day may be readily scaled from it. The resulting graph is shown in figure A-1.

CAUTION

Both methods presented are based on the assumption that the rise and fall conform to simple cosine curves. Therefore the heights obtained will be approximate. The roughness of approximation will vary as the tide curve differs from a cosine curve.

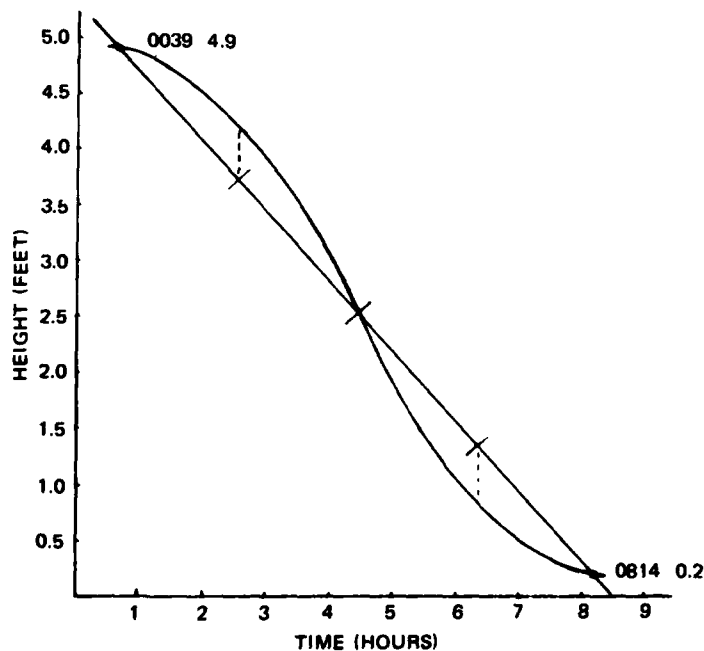


Figure A-1. Tidal Curve for Solution of the Problem.

APPENDIX B

EQUINOXES, SOLSTICES, AND LUNAR PHASES DURING 1982

The dates and times for Vernal and Autumnal Equinoxes and Summer and Winter Solstices during 1982 are listed in the table B-1. The 1982 dates and times for phases of the moon are given in table B-2. Both tables have been calculated for Point Mugu and San Nicolas Island. Two hours must be subtracted for times in the Barking Sands area.

Table B-1. Equinoxes and Solstices, 1982, Point Mugu and San Nicolas Island.

NOTE: All times are Pacific Standard Time; add 1 hour when Daylight Saving Time (PDT) is in effect. Subtract 2 hours for times in the Barking Sands area.

Vernal Equinox	20 March, 1456 PST	Beginning of Spring; day and night of equal length.
Summer Solstice	21 June, 0923 PST	Beginning of Summer; greatest duration of daylight.
Autumnal Equinox	23 September, 0046 PST	Beginning of Autumn; day and night of equal length.
Winter Solstice	21 December, 2039 PST	Beginning of Winter; greatest duration of darkness.

Table B-2. Lunar Phases, 1982, Point Mugu and San Nicolas Island.

NOTE: All times are Pacific Standard Time; add 1 hour when Daylight Saving Time (PDT) is in effect. Subtract 2 hours for times in the Barking Sands area.

Phase	January		February		March		April	
	Date	Time	Date	Time	Date	Time	Date	Time
First Quarter	02	2045	01	0628	02	1415	-----	-----
Full Moon	09	1153	07	2357	09	1245	08	0218
Last Quarter	16	1558	15	1221	17	0915	16	0442
New Moon	24	2056	23	1313	25	0217	23	1229
First Quarter	-----	-----	-----	-----	31	2108	30	0407
Phase	May		June		July		August	
	Date	Time	Date	Time	Date	Time	Date	Time
Full Moon	07	1645	06	0759	05	2332	04	1434
Last Quarter	15	2111	14	1006	13	1947	12	0308
New Moon	22	2040	21	0352	20	1057	18	1845
First Quarter	29	1207	27	2156	27	1022	26	0149
Phase	September		October		November		December	
	Date	Time	Date	Time	Date	Time	Date	Time
Full Moon	03	0428	02	1708	01	0457	-----	-----
Last Quarter	10	0919	09	1526	07	2238	07	0753
New Moon	17	0409	16	1604	15	0710	15	0118
First Quarter	24	2007	24	1608	23	1205	23	0617
Full Moon	-----	-----	-----	-----	30	1621	30	0333

Because the earth's period of revolution about the sun (365.24+ days) is not evenly divisible by the moon's period of revolution about the earth (27.32+ days), the dates and times of lunar phases, moonrise and moonset, and tidal data must be recomputed for each year. The following information, however, is based on geometrical relationships and holds true for all times:

1. The New Moon rises at sunrise, crosses the meridian at noon, and sets at sunset.
2. The First Quarter Moon rises at noon, crosses the meridian at sunset, and sets at midnight.
3. The Full Moon rises at sunset, crosses the meridian at midnight, and sets at sunrise.
4. The Last Quarter Moon rises at midnight, crosses the meridian at sunrise, and sets at noon.

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