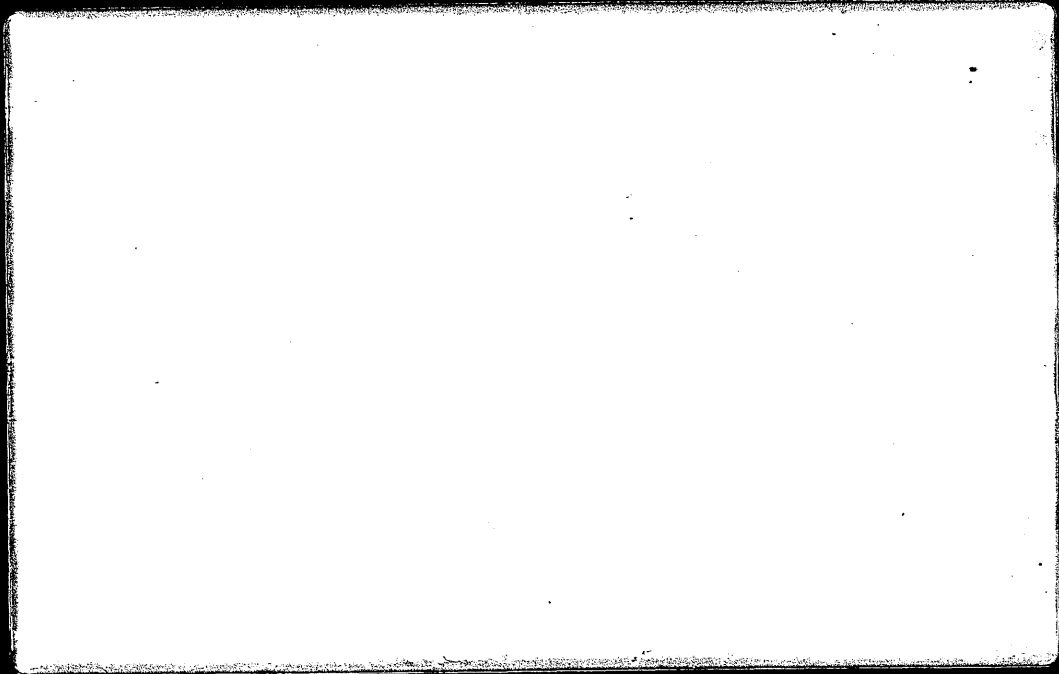




DEPT. NAT. RES & ENV  
  
PE905429



**PHILLIPS PETROLEUM COMPANY**

**FAR EAST**

**Singapore**

**OIL and GAS DIVISION**

WB17

SYNTHETIC SEISMOGRAM REPORT

ATHENE NO. 1 17 AUG 1983

Phillips Petroleum Company Far East (Singapore)  
Seismic Stratigraphy Section

WCA, TW

Well: Phillips Athene No. 1 is located S 38° 35' 52.188" and E 148° 27' 20.628" or approximately SP 1809 Line G72A-601 in the Gippsland Basin, Victoria, Australia. The final well logs were run July 8, 1983 to a TD of 3386 m. At the time of this writing the rig was still on location.

Logs: Sonic and density logs were edited to remove cycle skips and noise. The sonic log was interpolated from the start of the log at 550 m (RKB) to the sea floor at 288 m. A break from 180  $\mu$ sec/ft to 200  $\mu$ sec/ft was input at the sea floor in order to give a sea floor reflection. From 0 to 2750 m the density log was not recorded, Gardner's equation was used to estimate the density response within this interval.

Checkshots:

Checkshots were reviewed and edited. Values at 500, 750, 1100, 2370, 2861, 3117, 3224, 3299, and 3255 m were not used. Table 1 is a list of checkshots applied. A plot was made of the difference between the time-depth curve derived from integrating the sonic log without checkshots and the time-depth curve derived from the checkshot corrected sonic. This difference is the net checkshot correction applied to the integrated sonic log (figure 1). A fourth order trend was fit to the checkshot correction (not to the checkshots) in order to insure that no false, checkshot induced, reflection coefficients would be introduced into the data. This smoothed checkshot correction (figure 2) was applied to calibrate the integrated sonic log. Table 2 is a listing of the final, checkshot corrected, time-depth function.

Wavelets: Three Ricker wavelets (17, 20 and 25 Hz) and a Butterworth Bandpass wavelet (7-10-40-57) were used to generate synthetic seismograms. The Butterworth wavelet ties the seismic section (G72A-601 SP 1809, GSI migrated TCOMP) very well. Below 2100 ms the 20 Hz Ricker gives a marginally better match.

Problems: The matching polarity (+) at the Athene is opposite that of Helios, Hermes, and Selene wells (-). This is due to a polarity error in the plotting of seismic section G72A-601.

Other Displays:

Enclosure 5 is an interpretation montage showing the correlation between seismic sequences and the well stratigraphy. Enclosures 6 and 7 are condensed log displays in time and depth. Enclosure 8 is a composite display of the synthetic seismogram, gamma ray and resistivity logs.

Table 1: Checkshots Applied Athene No. 1

Depth in Meters (RKB)	Two Way Time (MSL)
23	0
850	837
980	925
1200	1069
1290	1124
1400	1184
1500	1236
1600	1286
1715	1346
1800	1390
1900	1440
2000	1492
2100	1544
2175	1584
2270	1638
2470	1772
2550	1830
2630	1884
2715	1942
2745	1962
2782	1986
2938	2076
3020	2124

TABLE 2: DEPTH - TIME LISTING

Datums: Time = MSL, Depth = RKB (+23m)  
Time Values in Two-way time

PAGE: 1

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DEPTH	SAMPLING INTERVAL: 5.00 METERS									
	0	5	10	15	20	25	30	35	40	45
	50	55	60	65	70	75	80	85	90	95
0.00										
50.00	34.66	41.28	47.91	54.53	61.15	67.77	8.15	14.78	21.41	28.03
100.00	100.83	107.44	114.04	120.65	127.25	133.85	140.45	147.05	153.65	160.24
150.00	166.84	173.43	180.02	186.61	193.20	199.78	206.37	212.95	219.53	226.11
200.00	232.69	239.27	245.84	252.42	258.99	265.56	272.13	278.70	285.27	291.83
250.00	298.40	304.96	311.52	318.08	324.64	331.20	337.75	344.30	349.91	355.79
300.00	361.63	367.44	373.22	378.96	384.67	390.34	395.98	401.59	407.17	412.71
350.00	418.22	423.69	429.13	434.54	439.91	445.25	450.55	455.82	461.06	466.27
400.00	471.44	476.57	481.68	486.75	491.79	496.79	501.76	506.69	511.60	516.47
450.00	521.30	526.10	530.87	535.61	540.31	544.98	549.61	554.22	558.78	563.32
500.00	567.82	572.29	576.72	581.12	585.49	589.82	594.12	598.39	602.62	606.82
550.00	610.99	615.15	619.28	623.41	627.48	631.48	635.46	639.47	643.46	647.49
600.00	651.43	655.46	659.39	663.21	666.99	670.91	674.84	678.65	682.47	686.41
650.00	690.26	693.98	697.67	701.43	705.23	709.01	712.78	716.59	720.53	724.43
700.00	728.05	731.56	735.13	738.75	742.45	746.11	749.91	753.96	758.20	762.21
750.00	765.83	769.45	773.08	776.70	780.31	783.93	787.38	791.02	794.67	798.22
800.00	802.00	805.59	809.08	812.57	815.98	819.40	822.91	826.84	830.71	834.30
850.00	837.70	841.12	844.56	847.94	851.34	854.87	858.41	862.06	865.47	868.76
900.00	872.07	875.50	878.87	882.25	885.57	888.88	892.30	895.67	898.96	902.21
950.00	905.46	908.75	912.04	915.34	918.71	922.21	925.54	929.04	932.24	935.31
1000.00	938.37	941.51	944.77	948.08	951.29	954.56	957.82	961.05	964.29	967.55
1050.00	970.80	974.01	977.26	980.42	983.63	986.70	990.07	993.31	996.48	999.70
1100.00	1002.90	1006.00	1009.30	1012.60	1015.90	1019.10	1022.30	1025.70	1029.00	1032.10
1150.00	1035.30	1038.50	1041.80	1045.10	1048.40	1051.40	1054.60	1057.90	1061.20	1064.50
1200.00	1067.70	1070.90	1074.00	1077.00	1080.10	1083.10	1086.10	1089.10	1092.20	1095.20
1250.00	1098.20	1101.20	1104.20	1107.20	1110.20	1113.20	1116.10	1119.00	1121.70	1124.40
1300.00	1127.20	1130.00	1132.70	1135.50	1138.30	1141.00	1143.80	1146.50	1149.30	1151.90
1350.00	1154.70	1157.50	1160.30	1162.90	1165.50	1168.20	1170.80	1173.60	1176.30	1179.10
1400.00	1181.90	1184.60	1187.30	1190.00	1192.60	1195.30	1198.10	1200.80	1203.60	1206.40
1450.00	1209.20	1211.90	1214.60	1217.30	1220.10	1222.80	1225.60	1228.30	1230.80	1233.70
1500.00	1236.20	1238.80	1241.40	1244.10	1246.60	1249.20	1251.80	1254.30	1256.90	1259.50
1550.00	1262.00	1264.50	1267.00	1269.50	1272.10	1274.60	1277.10	1279.60	1282.20	1284.80
1600.00	1287.30	1289.80	1292.30	1294.80	1297.40	1299.90	1302.50	1305.10	1307.60	1310.10
1650.00	1312.70	1315.20	1317.60	1320.10	1322.60	1325.10	1327.50	1330.00	1332.50	1335.10
1700.00	1337.70	1340.20	1342.90	1345.40	1348.00	1350.50	1353.00	1355.60	1358.10	1360.70
1750.00	1363.20	1365.70	1368.30	1370.90	1373.50	1376.00	1378.60	1381.10	1383.80	1386.30
1800.00	1388.90	1391.50	1394.00	1396.50	1399.10	1401.60	1404.20	1406.70	1409.20	1411.70
1850.00	1414.20	1416.90	1419.50	1422.00	1424.50	1427.10	1429.70	1432.20	1434.70	1437.20
1900.00	1440.00	1442.60	1445.10	1447.60	1450.10	1452.60	1455.20	1457.80	1460.40	1463.00
1950.00	1465.80	1468.40	1471.10	1473.80	1476.40	1479.00	1481.50	1484.10	1486.60	1489.40
2000.00	1492.10	1494.80	1497.50	1500.30	1503.00	1505.70	1508.40	1511.10	1513.70	1516.30
2050.00	1518.90	1521.50	1524.10	1526.60	1529.30	1531.90	1534.50	1537.20	1539.80	1542.60
2100.00	1545.30	1547.80	1550.40	1553.00	1555.70	1558.40	1561.10	1563.70	1566.40	1569.00
2150.00	1571.60	1574.30	1576.90	1579.50	1582.00	1584.70	1587.40	1590.10	1592.90	1595.60
2200.00	1598.60	1601.50	1604.40	1607.40	1610.40	1613.30	1616.20	1619.20	1622.20	1625.00
2250.00	1627.90	1630.80	1633.60	1636.50	1639.80	1643.10	1646.40	1649.70	1653.00	1656.30

DATA BEGINS: 0.00

DATA ENDS: 3380.

Datums: Time = MSL, Depth = RKB (+23m)  
Time Values in Two-way time  
SAMPLING INTERVAL: 5.00 METERS

PAGE: 2

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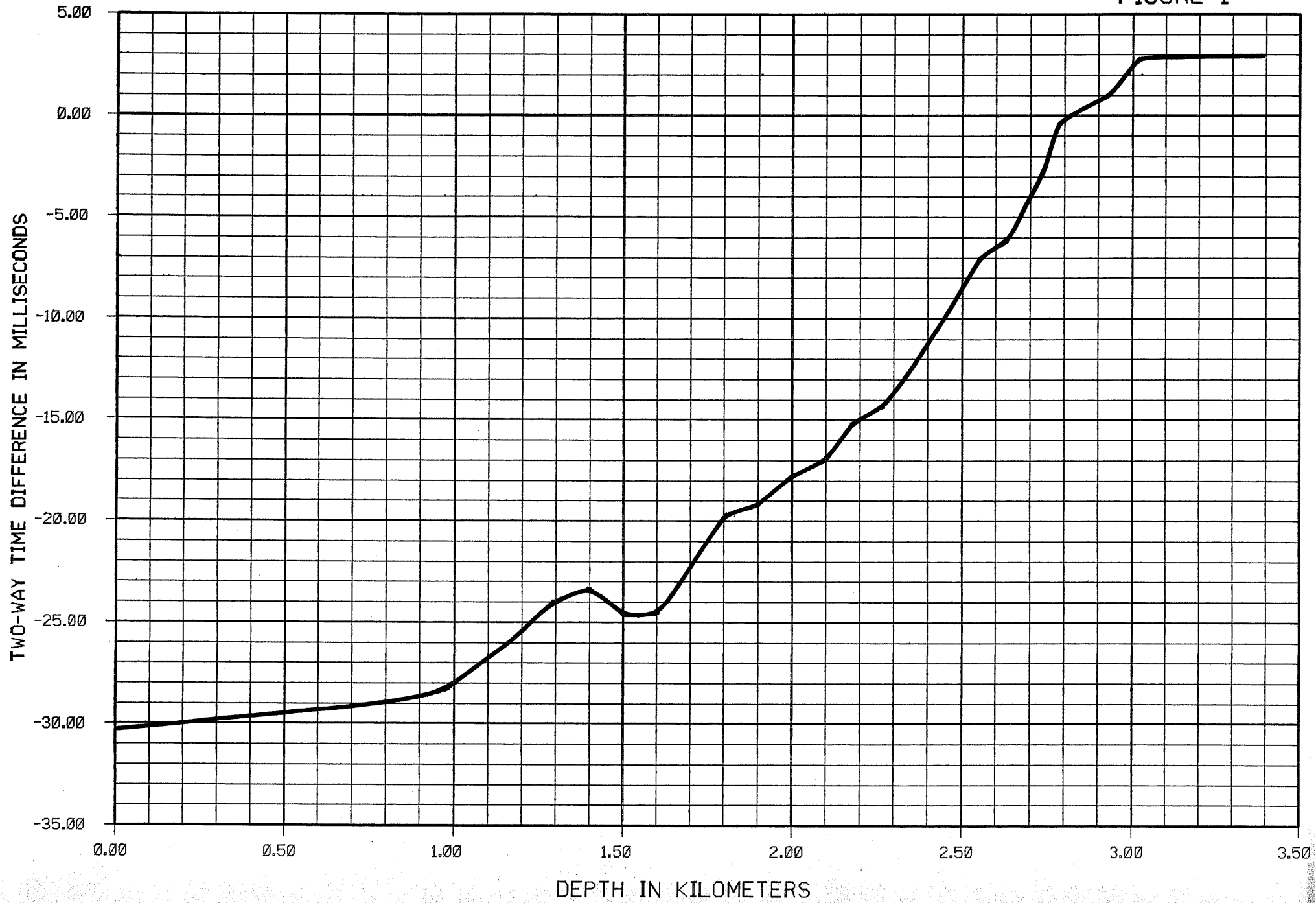
DEPTH	DATA BEGINS: 0.00 DATA ENDS: 3380.									
	0	5	10	15	20	25	30	35	40	45
2300.00	1659.60	1662.90	1666.20	1669.50	1672.70	1675.90	1679.10	1682.30	1685.50	1688.70
2350.00	1692.00	1695.30	1698.50	1701.70	1705.00	1708.30	1711.50	1714.70	1718.00	1721.20
2400.00	1724.50	1727.70	1730.90	1734.20	1737.60	1741.00	1744.40	1747.80	1751.30	1754.80
2450.00	1758.30	1761.80	1765.50	1769.30	1772.80	1776.20	1779.80	1783.40	1787.00	1790.70
2500.00	1794.50	1798.30	1801.90	1805.50	1809.10	1812.60	1816.10	1819.60	1823.00	1826.50
2550.00	1829.90	1833.60	1837.00	1840.50	1843.90	1847.30	1850.80	1854.30	1857.80	1861.30
2600.00	1864.70	1868.10	1871.50	1874.90	1878.20	1881.50	1884.80	1888.10	1891.50	1894.70
2650.00	1898.10	1901.40	1904.70	1908.00	1911.30	1914.60	1917.80	1921.20	1924.70	1928.10
2700.00	1931.60	1934.90	1938.20	1941.60	1945.10	1948.50	1951.80	1955.00	1958.20	1961.40
2750.00	1964.50	1967.70	1970.80	1973.90	1976.90	1979.80	1982.60	1985.50	1988.40	1991.40
2800.00	1994.30	1997.20	2000.10	2003.10	2006.00	2009.00	2012.00	2014.90	2017.90	2020.80
2850.00	2023.60	2026.40	2029.30	2032.40	2035.40	2038.30	2041.30	2044.20	2047.20	2050.20
2900.00	2053.00	2055.90	2058.80	2061.60	2064.60	2067.50	2070.40	2073.30	2076.20	2079.10
2950.00	2082.10	2085.00	2087.90	2090.90	2093.90	2096.70	2099.50	2102.40	2105.40	2108.40
3000.00	2111.30	2114.10	2117.00	2119.70	2122.40	2125.20	2128.00	2130.80	2133.70	2136.50
3050.00	2139.30	2142.20	2144.90	2147.50	2150.10	2152.80	2155.50	2158.20	2160.80	2163.40
3100.00	2166.00	2168.60	2171.20	2173.80	2176.50	2179.20	2181.80	2184.50	2187.20	2189.70
3150.00	2192.30	2195.10	2197.70	2200.30	2203.00	2205.80	2208.50	2211.20	2213.80	2216.40
3200.00	2219.00	2221.60	2224.20	2226.70	2229.10	2231.80	2234.40	2237.00	2239.60	2242.20
3250.00	2245.00	2247.70	2250.30	2252.90	2255.60	2258.20	2260.80	2263.20	2265.70	2268.00
3300.00	2270.50	2273.20	2275.80	2278.40	2281.00	2283.70	2286.30	2289.00	2291.70	2294.30
3350.00	2296.90	2299.50	2302.20	2304.90	2307.50	2310.10	2312.70	0.00	0.00	0.00

\*\*\*\* END OF LISTING \*\*\*\*

CHECKSHOT CORRECTION (RAW)



FIGURE 1

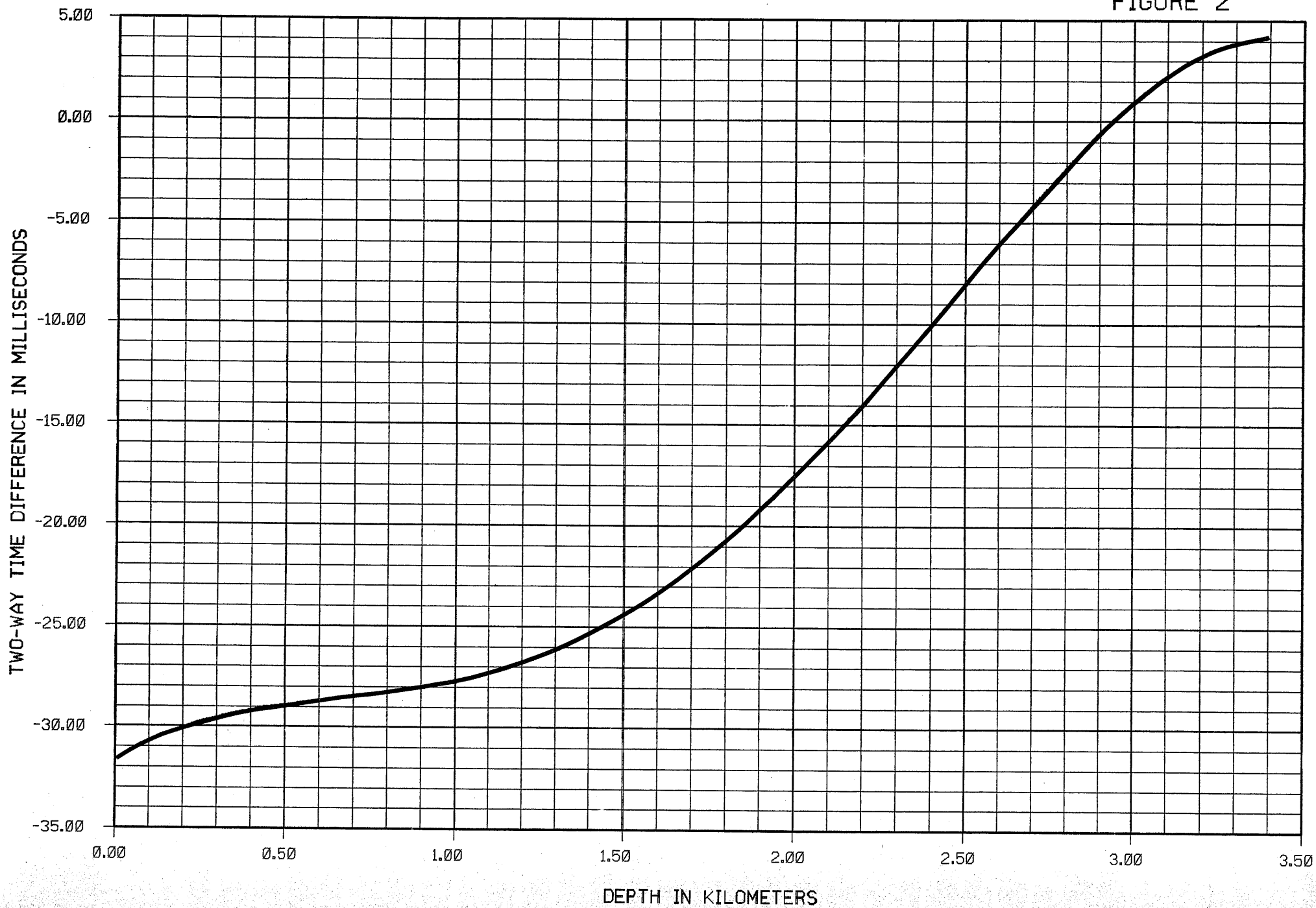




CHECKSHOT CORRECTION APPLIED TO INTEGRATED SONIC  
(4TH ORDER TREND)

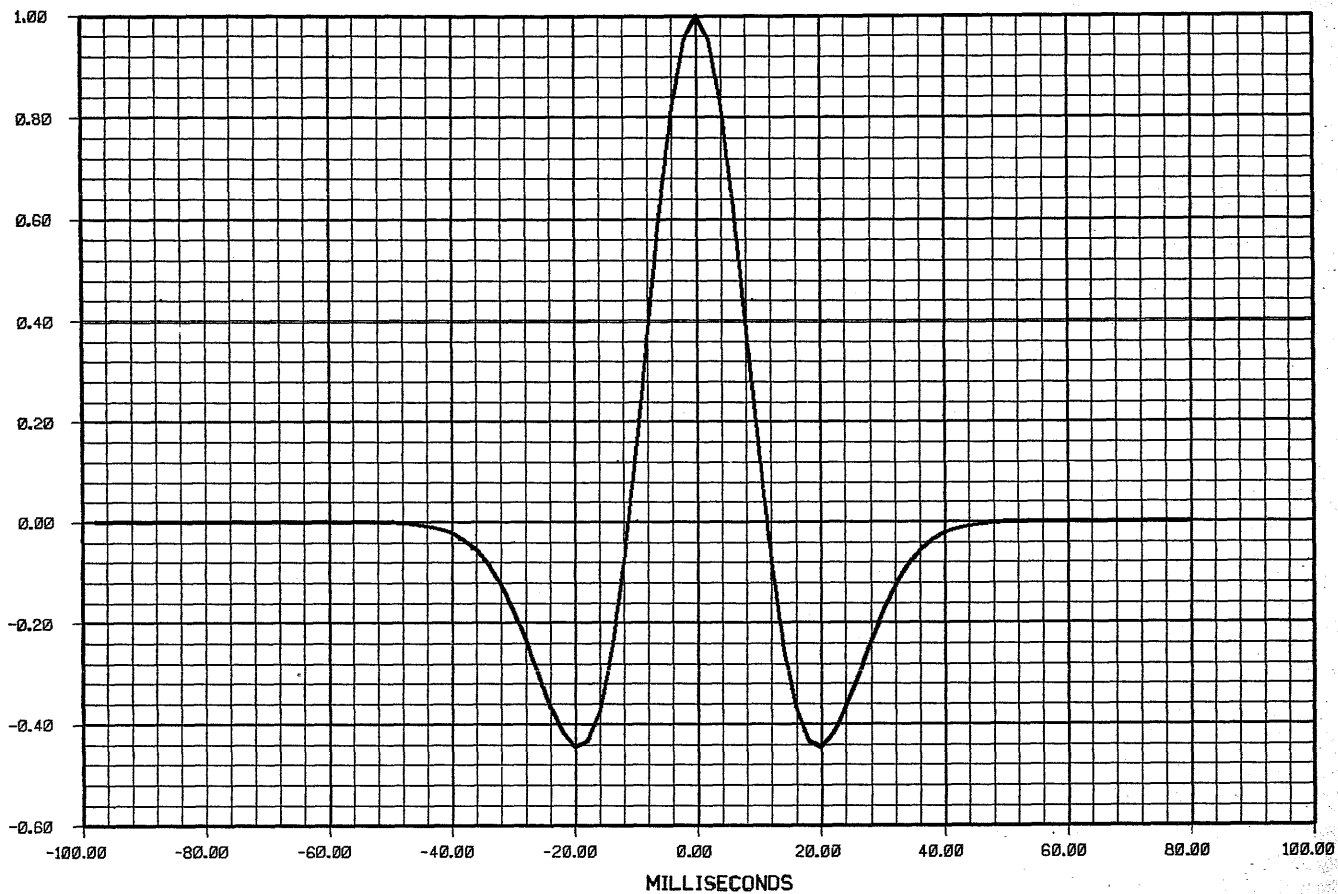


FIGURE 2



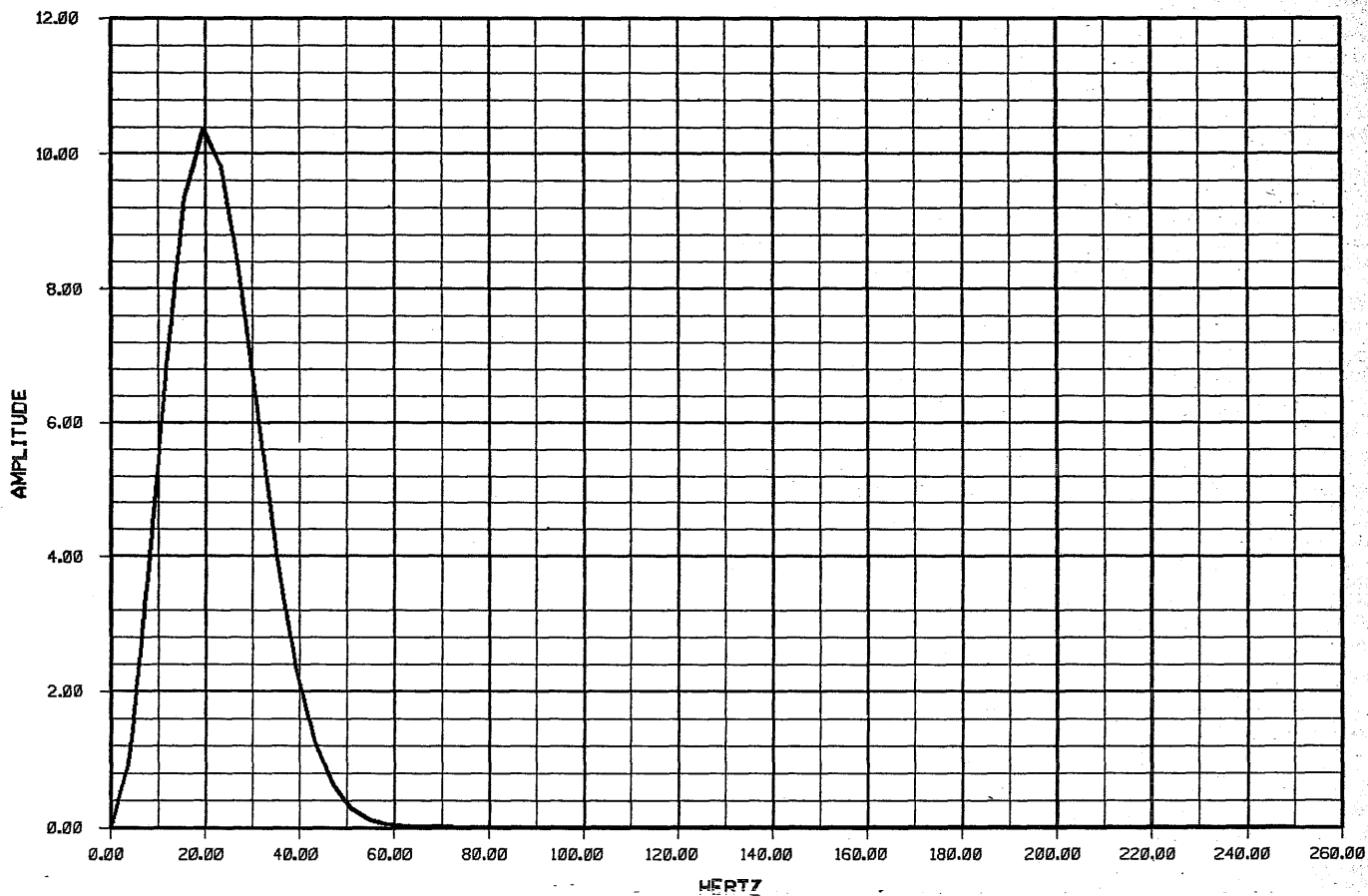
RICKER (20HZ) WAVELET

FIGURE 3



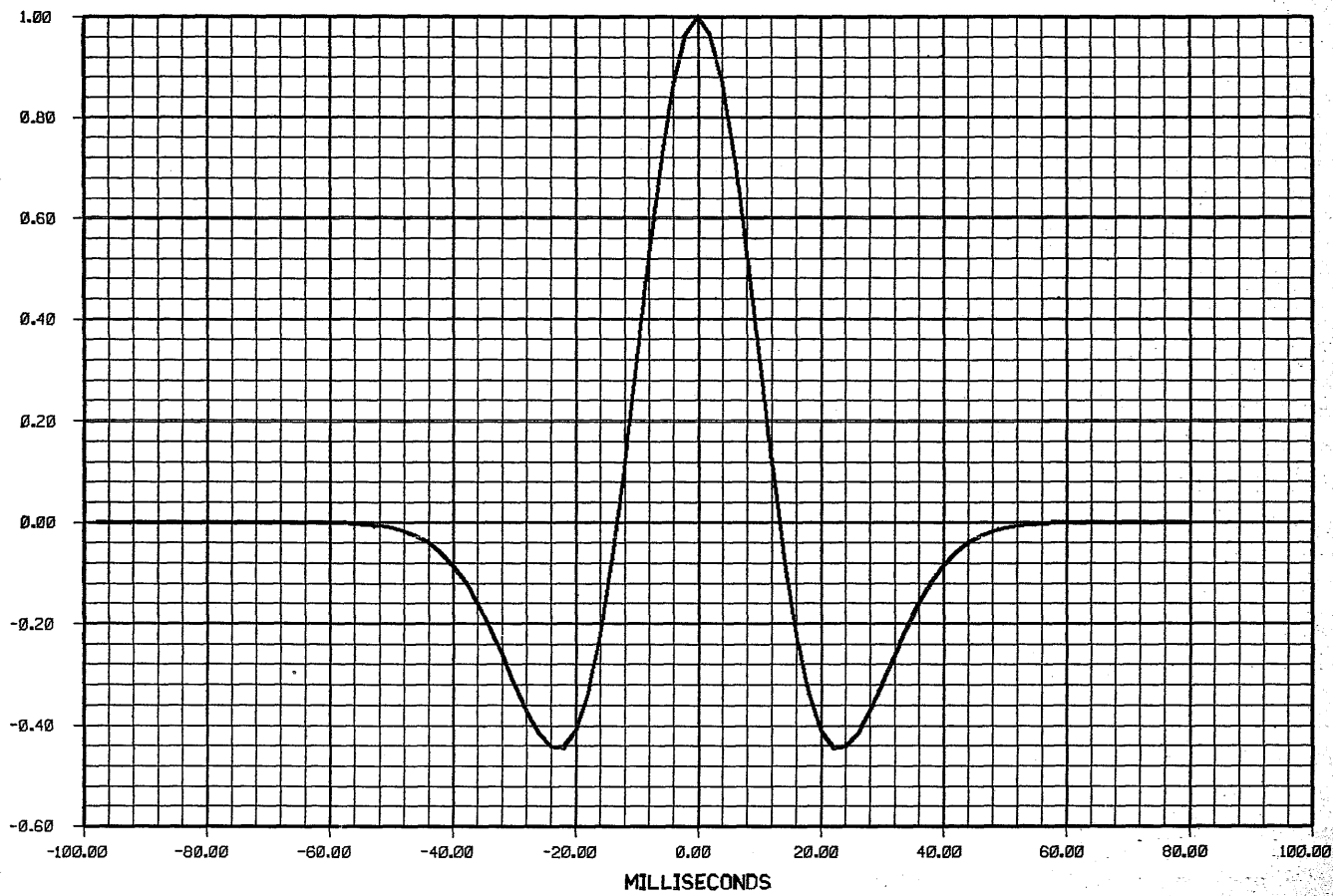
RICKER (20HZ) WAVELET

FIGURE 4



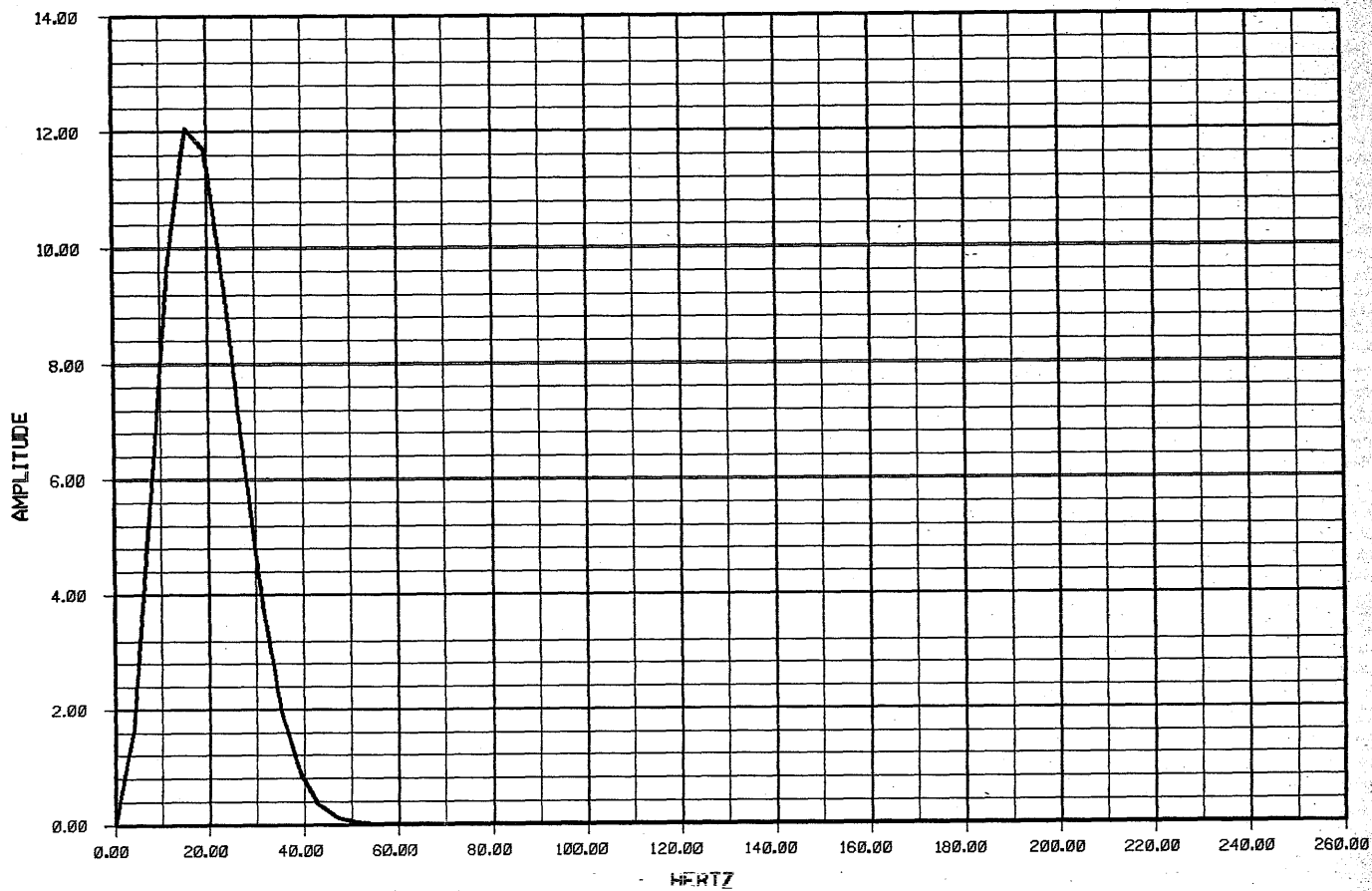
RICKER (17HZ) WAVELET

FIGURE 5



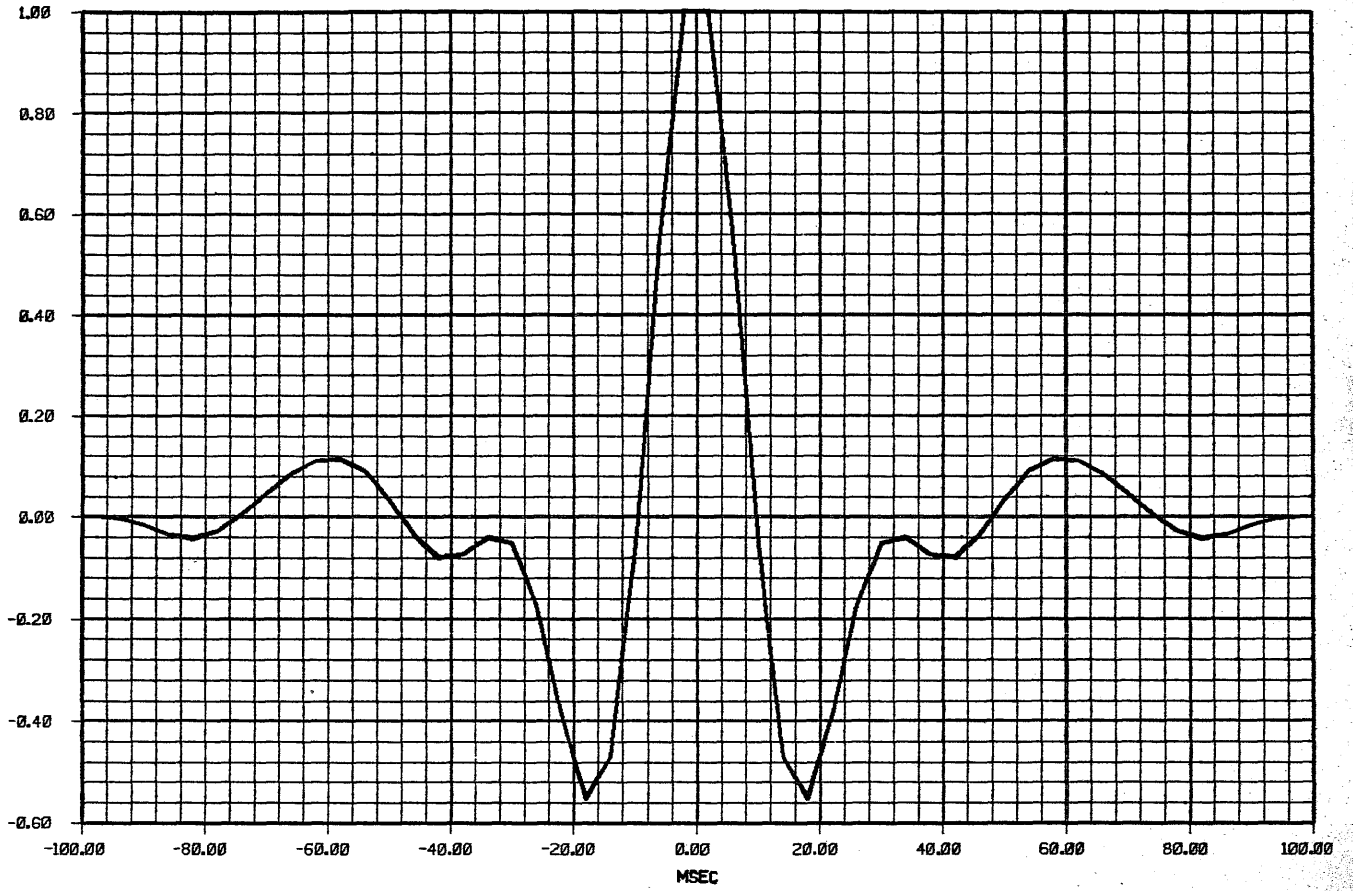
RICKER (17HZ) WAVELET

FIGURE 6



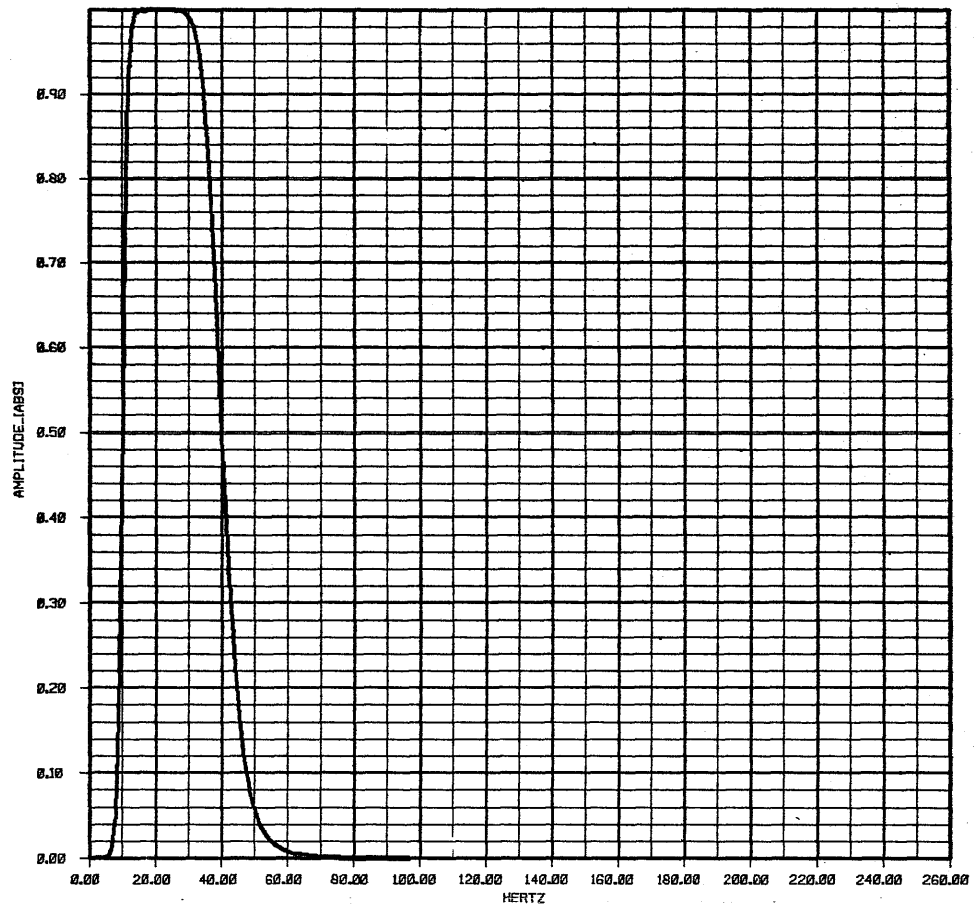
BUTTERWORTH (7-10-40-57) WAVLET

FIGURE 7



BUTTERWORTH (7-10-40-57) WAVLET

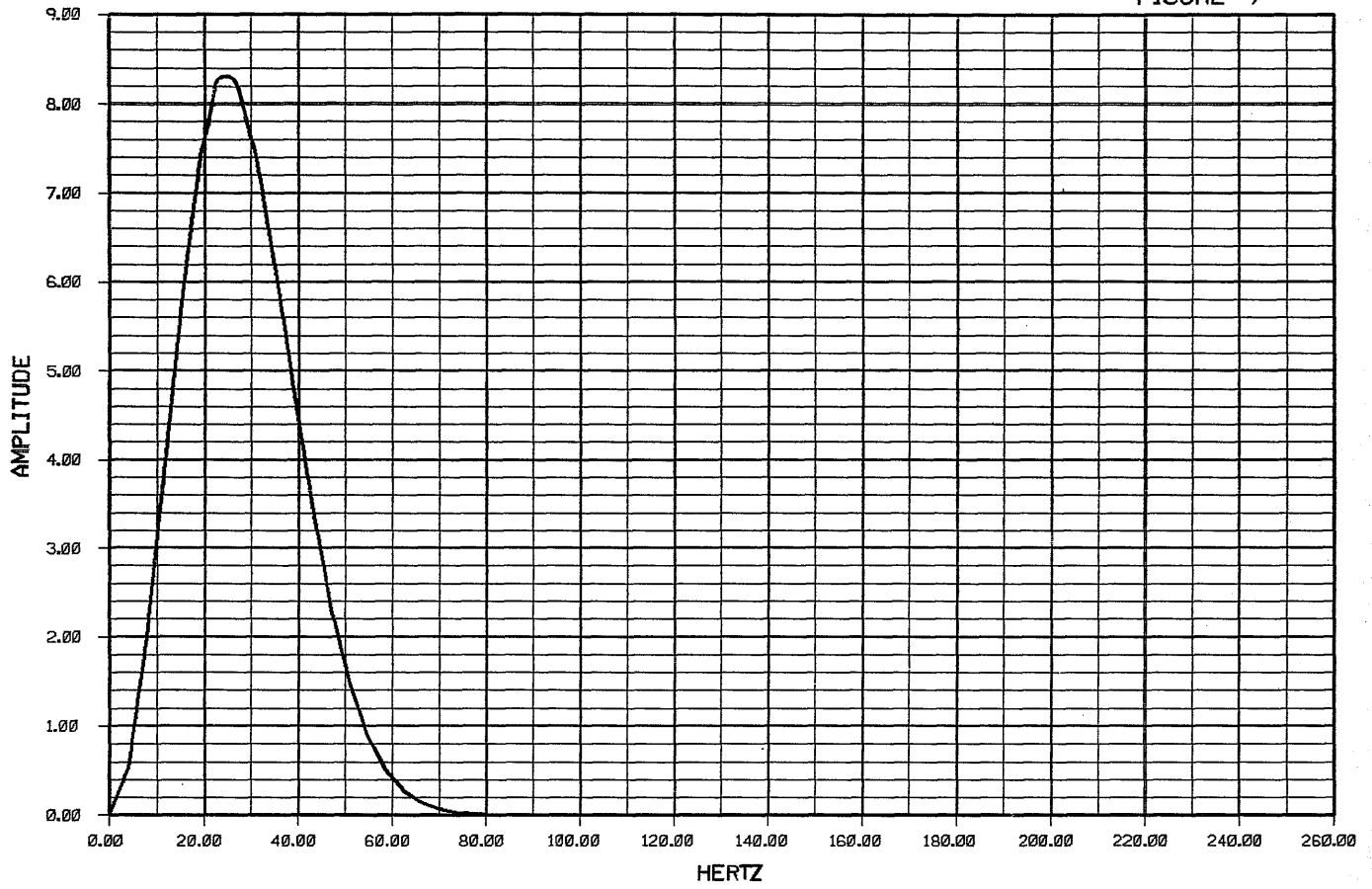
FIGURE 8





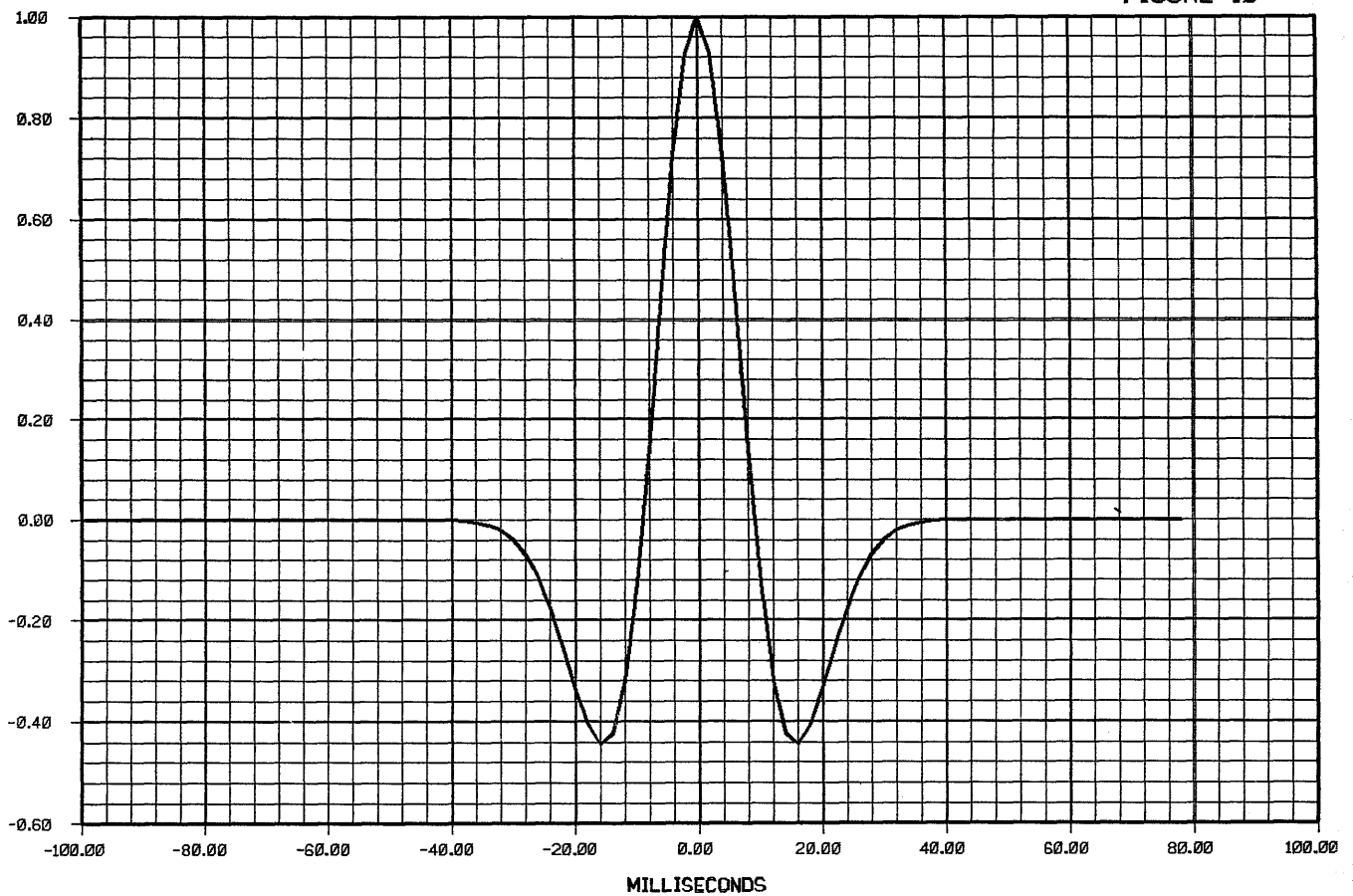
# RICKER (25HZ) WAVELET

FIGURE 9



# RICKER (25HZ) WAVELET

FIGURE 10



PE603709

This is an enclosure indicator page.  
The enclosure PE603709 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603709 has the following characteristics:

ITEM\_BARCODE = PE603709  
CONTAINER\_BARCODE = PE905429  
NAME = Athene 1 Synthetic Seismogram 17 Hz  
(encl 1.)  
BASIN = GIPPSLAND  
ON\_OFF = OFFSHORE  
PERMIT = VIC/P18  
TYPE = WELL  
SUBTYPE = SYNTH\_SEISMOGRAM  
DESCRIPTION = Athene 1 Synthetic Seismogram 17 Hz  
Ricker Wavelet, zero phase. Enclosure 1  
of Addendum 4 of WCR  
REMARKS =  
DATE\_CREATED = 31/7/83  
DATE\_RECEIVED = 17/8/83  
W\_NO = W817  
WELL\_NAME = Athene 1  
CONTRACTOR = Phillips Petroleum Company (Far East)  
CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE603710

This is an enclosure indicator page.  
The enclosure PE603710 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603710 has the following characteristics:

- ITEM\_BARCODE = PE603710
- CONTAINER\_BARCODE = PE905429
  - NAME = Athene 1 Synthetic Seismogram 20 Hz  
(encl 2.)
  - BASIN = GIPPSLAND
  - ON\_OFF = OFFSHORE
  - PERMIT = VIC/P18
  - TYPE = WELL
  - SUBTYPE = SYNTH\_SEISMOGRAM
- DESCRIPTION = Athene 1 Synthetic Seismogram 20 Hz  
Ricker Wavelet, zero phase. Enclosure 2  
of Addendum 4 of WCR
- REMARKS =
- DATE\_CREATED = 31/7/83
- DATE\_RECEIVED = 17/8/83
- W\_NO = W817
- WELL\_NAME = Athene 1
- CONTRACTOR = Phillips Petroleum Company (Far East)
- CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE603711

This is an enclosure indicator page.  
The enclosure PE603711 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603711 has the following characteristics:

- ITEM\_BARCODE = PE603711
- CONTAINER\_BARCODE = PE905429
  - NAME = Athene 1 Synthetic Seismogram 25 Hz  
(encl 3.)
  - BASIN = GIPPSLAND
  - ON\_OFF = OFFSHORE
  - PERMIT = VIC/P18
  - TYPE = WELL
  - SUBTYPE = SYNTH\_SEISMOGRAM
- DESCRIPTION = Athene 1 Synthetic Seismogram 25 Hz  
Ricker Wavelet, zero phase. Enclosure 3  
of Addendum 4 of WCR
- REMARKS =
- DATE\_CREATED = 31/7/83
- DATE\_RECEIVED = 17/8/83
- W\_NO = W817
- WELL\_NAME = Athene 1
- CONTRACTOR = Phillips Petroleum Company (Far East)
- CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)



PE603712

This is an enclosure indicator page.  
The enclosure PE603712 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603712 has the following characteristics:

ITEM\_BARCODE = PE603712  
CONTAINER\_BARCODE = PE905429  
NAME = Athene 1 Synthetic Seismogram  
7-10-40-57 Hz  
BASIN = GIPPSLAND  
ON\_OFF = OFFSHORE  
PERMIT = VIC/P18  
TYPE = WELL  
SUBTYPE = SYNTH\_SEISMOGRAM  
DESCRIPTION = Athene 1 Synthetic Seismogram  
7-10-40-57 Hz Butterworth Bandpass,  
zero phase. Enclosure 4 of Addendum 4  
of WCR  
REMARKS =  
DATE\_CREATED = 31/7/83  
DATE\_RECEIVED = 17/8/83  
W\_NO = W817  
WELL\_NAME = Athene 1  
CONTRACTOR = Phillips Petroleum Company (Far East)  
CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE905430

This is an enclosure indicator page.  
The enclosure PE905430 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE905430 has the following characteristics:

- ITEM\_BARCODE = PE905430
- CONTAINER\_BARCODE = PE905429
  - NAME = Athene 1 Synthetic Seismogram  
Interpretation
  - BASIN = GIPPSLAND
  - ON\_OFF = OFFSHORE
  - PERMIT = VIC/P18
  - TYPE = SEISMIC
  - SUBTYPE = SECTION
- DESCRIPTION = Athene 1 Synthetic Seismogram  
Interpretation (Line G72A-601A -  
Migrated).
- REMARKS =
- DATE\_CREATED = 17/8/83
- DATE\_RECEIVED = 17/8/83
- W\_NO = W817
- WELL\_NAME = Athene 1
- CONTRACTOR = Phillips Petroleum Company (Far East)
- CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE603713

This is an enclosure indicator page.  
The enclosure PE603713 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603713 has the following characteristics:

ITEM\_BARCODE = PE603713  
CONTAINER\_BARCODE = PE905429  
    NAME = Athene 1 Condensed Log Display  
          (Enclosure 6)  
    BASIN = GIPPSLAND  
    ON\_OFF = OFFSHORE  
    PERMIT = VIC/P18  
    TYPE = WELL  
    SUBTYPE = LOG  
    DESCRIPTION = Athene 1 Condensed Log Display  
                  (Enclosure 6 of Addendum 4 of WCR)  
    REMARKS =  
    DATE\_CREATED = 31/7/83  
    DATE\_RECEIVED = 17/8/83  
    W\_NO = W817  
    WELL\_NAME = Athene 1  
    CONTRACTOR = Phillips Petroleum Company (Far East)  
    CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE603714

This is an enclosure indicator page.  
The enclosure PE603714 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603714 has the following characteristics:

ITEM\_BARCODE = PE603714  
CONTAINER\_BARCODE = PE905429  
    NAME = Athene 1 Consensed Time Log Display  
          (Enclosure 7)  
    BASIN = GIPPSLAND  
    ON\_OFF = OFFSHORE  
    PERMIT = VIC/P18  
    TYPE = WELL  
    SUBTYPE = LOG  
DESCRIPTION = Athene 1 Condensed Time Log Display.  
              (Enclosure 7 of Addendum 4 of WCR)  
REMARKS =  
DATE\_CREATED = 31/7/83  
DATE\_RECEIVED = 17/8/83  
    W\_NO = W817  
    WELL\_NAME = Athene 1  
CONTRACTOR = Phillips Petroleum Company (Far East)  
CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE603715

This is an enclosure indicator page.  
The enclosure PE603715 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603715 has the following characteristics:

ITEM\_BARCODE = PE603715  
CONTAINER\_BARCODE = PE905429  
NAME = Athene 1 Composite Log -Synthetic  
(enclosure 8)  
BASIN = GIPPSLAND  
ON\_OFF = OFFSHORE  
PERMIT = VIC/P18  
TYPE = WELL  
SUBTYPE = LOG  
DESCRIPTION = Athene 1 Composite Log-Synthetic  
display (Enclosure 8 of Addendum 4 of  
WCR)  
REMARKS =  
DATE\_CREATED = 31/7/83  
DATE\_RECEIVED = 17/8/83  
W\_NO = W817  
WELL\_NAME = Athene 1  
CONTRACTOR = Phillips Petroleum Company (Far East)  
CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)

PE603716

This is an enclosure indicator page.  
The enclosure PE603716 is enclosed within the  
container PE905429 at this location in this  
document.

The enclosure PE603716 has the following characteristics:

ITEM\_BARCODE = PE603716  
CONTAINER\_BARCODE = PE905429  
NAME = Athene 1 Synthetic Seismogram  
7-10-40-57 Hz  
BASIN = GIPPSLAND  
ON\_OFF = OFFSHORE  
PERMIT = VIC/P18  
TYPE = WELL  
SUBTYPE = SYNTH\_SEISMOGRAM  
DESCRIPTION = Athene 1 Synthetic Seismogram  
7-10-40-57 Hz Butterworth Bandpass,  
zero phase. Enclosure 9 of Addendum 4  
of WCR.  
REMARKS =  
DATE\_CREATED = 31/7/83  
DATE\_RECEIVED = 17/8/83  
W\_NO = W817  
WELL\_NAME = Athene 1  
CONTRACTOR = Phillips Petroleum Company (Far East)  
CLIENT\_OP\_CO = Phillips Australian Oil Company

(Inserted by DNRE - Vic Govt Mines Dept)