

5646

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
FEB 8 1965
Acc. No. _____

5646

Form 504
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

State: California

11-5613

DESCRIPTIVE REPORT.

Hydro Sheet No. 41

LOCALITY:

Southern California Coast

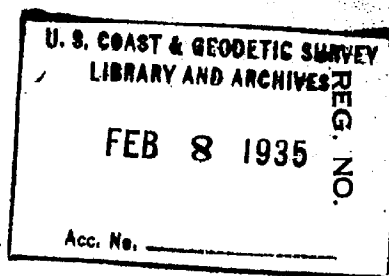
Offshore San Nicolas Island

192/32-3

CHIEF OF PARTY:

O. W. Swainson,

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY



HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 41 5646

REGISTER NO.

State California
General locality Southern California Coast
Locality Offshore San Nicolas Island
Scale 1:40,000 Date of survey Dec. 7, 1932 - March 1, 1933., 19
Vessel Ship PIONEER
Chief of Party O. W. Swainson
Surveyed by O. W. Swainson
Protracted by J. R. Jahn (Draftsman)
Soundings penciled by J. R. Jahn
Soundings in fathoms feet
Plane of reference MLLW
Subdivision of wire dragged areas by _____
Inked by Mark S. Gurnee
Verified by Mark S. Gurnee
Instructions dated November 18, 19 32
Remarks: _____

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. 5646

The following statistics will be submitted with the cartographer's report on the sheet:

| | |
|--|-----------------|
| Number of positions on sheet | .1295. |
| Number of positions checked | .500. |
| Number of positions revised | .300. |
| Number of soundings recorded | 6561.. |
| Number of soundings revised | .1600. (Approx) |
| Number of signals erroneously plotted or transferred | .2.... |

Date: April 30, 1935

Verification by MARK S. GURNEE

Time: 10 1/2 hrs.

Review by R. J. Christman

Time: 19 hrs.

DESCRIPTIVE REPORT TO ACCOMPANY

HYDROGRAPHIC SHEET FIELD NO. 41.

U.S.C. & G.S.S. PIONEER

O. W. SWAINSON, COMMANDING.

AUTHORITY

This hydrographic survey was made in accordance with instructions dated November 18, 1932, to the Commanding Officer of the PIONEER for Project No. 120, and those of April 4, 1932 to the Commanding Officer of the GUIDE, Project No. 101. The sheet was started December 7, 1932, and field work completed March 1, 1933. ✓

LOCALITY

Sheet 41 embraces the area around San Nicolas Island, Southern California. It joins the 1932-33 work of Lt. Robert W. Knox inshore; No. H4447 and 1933 R.A.R. sheet 121 on the south; No. H4447 on the east; 1933 R.A.R. sheet 121, No. H4559 and No. H4550 on the west; and No. H4559 on the north. ✓

CONTROL

The datum is the same as that used by Lt. Robert W. Knox in 1932. The signals built and located by Lt. Robert W. Knox in 1932, supplemented by two hydrographic buoys planted on the east and two on the west side of the island were used for the visual fix control. A hydrophone station was established on the south side of San Nicolas, and on several days a hydrophone was maintained near Beggs Rock and tended by an R.A.R. station in a ship's launch. Very little dead reckoning was done without the assistance of an R.A.R. distance. ✓

The buoys had to be planted in from 25 to 30 fathoms of water. Hence, some change in their position due to swaying on their anchor lines could not be avoided. Therefore, the control of the eastern portion of the sheet is somewhat weak. Also the control of the Northwest portion is weak. It is not thought that the position of any of the soundings is in error to a serious degree. ✓

For the R.A.R. a velocity of 1480 to 1490 meters per second was used depending upon the distance. A series of velocity tests was made but poor results were obtained as the fixes were on the hydrographic buoys. In some cases during the tests the echo from the bottom was recorded on the chronograph as the initial instead of the bomb. Adding the depth to these distances introduced a probable error. A theoretical velocity could not be computed due to the irregularity of the bottom. ✓

SURVEY METHODS

The scale of the sheet is 1:40,000. No launch hydrography or hand lead was required or used as the soundings were all deep. The ship used the fathometer, obtaining practically all the soundings with the red light-- either fast or slow speed. The fathometer was checked with vertical casts sufficiently often to see that it was working properly and to obtain its error. In many cases the exact position of these vertical casts was not obtained, and hence not plotted. A complete system of cross lines was run. The old surveys will have to be relied on for the character of the bottom as few bottom specimens were obtained.

TIDES

Tidal data for reducing the soundings were obtained from the standard gage maintained at Santa Barbara by Lt. C. K. Green.

FATHOMETER CORRECTIONS

A general description of the method of computing the fathometer corrections was contained in the Season's Report, PIONEER, 1932-33. Attached hereto is a description of the corrections for sheets 41, 42, 121, and 122.

While the corrections indicate an additional positive correction for the FRx6 (slow speed, red light) it is doubtful if this should be applied. It was not added to the fathometer soundings on this sheet, no difference being considered between the fast speed and slow speed soundings.

An abstract of the comparisons made on this sheet is attached.

SLOPE CORRECTIONS

No slope corrections were made to the soundings on this sheet.

JUNCTION WITH OTHER SHEETS

The soundings at the junction with sheet No. 121 and with the inshore hydrography of Lt. R. W. Knox' 1932-33 work check very well. A very poor check was obtained with H4447. This was noted while the work was in progress and extra care was exercised to see that right signals were used. Check angles were often taken at the fixes. The weak control at the east end of the sheet might account for some of the difficulty in that area, but not for that south of the island. No doubt the old work was mostly dead reckoning and Navy sonic sounding.

The crossings check fairly well. The small discrepancies are mainly unimportant as a slight shift of the position of the lines

would make the soundings agree. The maximum disagreement is less than five per cent.

MAGNETICS

No magnetic observations were made and no unusual variations noted. ✓

VAR = 15° 45' E

CURRENTS

There were no strong currents observed. They were small and varied with the wind and tide, although perhaps more easterly than westerly. ✓

SALINITY AND TEMPERATURES

Serial temperatures and salinities of the water were obtained. The water samples were sent to the Scripps Institute at La Jolla for salinity determination. The Institute was furnished with the temperature observations. A special report on oceanography for the season was forwarded; ✓

DANGERS

No dangers except Begg Rock were found on this sheet. ✓

A thorough search was made at Latitude 33° 13', Long 119° 22', for reported shoal. Finally the area was gone over with the ship running at slow speed and the sound machine sounding continuously to 0/25. The few questionable shoal soundings the fathometer had obtained were proven to be strays. The least depth found here was 26 fathoms. ✓

O. W. Swainson

O. W. Swainson,
Chief of Party,
Commanding PIONEER.

CHIEF OF PARTY'S REPORT OF INSPECTION
OF RECORDS AND SHEETS.

While I did not personally verify the plotting of the soundings I did examine every one to see that no shoals existed. If a sounding did not seem to agree with those adjacent to it, I verified it from the sounding record. A small pencil check mark in the upper right hand corner of each square shows that I have examined all soundings in that square.

The plotting was verified by comparing with the boat sheet.

I examined each page of the sounding records to see that the records was clear and contained no doubtful remarks or soundings.

The ^{fathometer soundings} vertical casts are placed on the position of the sounding and the corresponding ^{vertical cast} fathometer sounding in parentheses opposite it. In some cases no fix was obtained at the comparison of fathometer and vertical cast, in which cases the soundings were not plotted. ^{M.S.}

The follow is a list of the worst crossings.

Lat. $33^{\circ} 11'$, Long. $119^{\circ} 21'$. Line 72B-74B seems to be too far north but angles appear to be correct and therefore there is no reason for changing the positions. ✓

Lat. $33^{\circ} 13'$, Long. $119^{\circ} 21'$. Least depth found in this area was 26 fathoms. ✓

Lat. $33^{\circ} 09'.5$, Long. $119^{\circ} 31'$. This crossing is somewhat poor but it is on a steep slope. ✓

Lat. $33^{\circ} 25'$, Long. $119^{\circ} 45'$. The crossing is poor; reject the 66 fathoms. PLOTTED (3 FATHOMS DIFFERENCE (5%)) ✓

Lat. $33^{\circ} 19'$, Long. $119^{\circ} 50'$. Reject 6N-8N as soundings do not check L day. L day is the best. ✓

Lat. $33^{\circ} 11'.5$, Long. $119^{\circ} 35'$. Crossing is poor. Line 94S-97S is controlled by bomb from only one station. Therefore the line could be moved southward slightly. ✓

Lat. $33^{\circ} 12'.5$, Long. $119^{\circ} 37'.5$. Crossing not very good. Accept sounding on K day line. ^{both edge inked} ✓

Lat. $33^{\circ} 14'$, Long. $119^{\circ} 52'$. Positions 58M to 64M. This section of the line does not check the position on the boat sheet. Although the soundings do not check the adjacent line very well it is thought to be the best position. The poor crossings are not of importance. ✓

O.W. Swanson
Candy Slip Pinner

STATISTICS FOR SHEET NO 41.

| Date 1933 | Day | Positions | Soundings | Stat. Mi. Sndg. Lines |
|--------------|-----|----------------|-----------|--------------------------|
| 12/7 | A | 72 | 264 | 45.7 |
| 8 | B | 141 | 459 | 90.1 |
| 9 | C | 114 | 617 | 45.0 |
| | D | Buoy Positions | | |
| 14 | E | 160 | 789 | 59.4 |
| 15 | F | 126 | 193 | 26.9 |
| 16 | G | 63 | 209 | 33.0 |
| 1/6/33 | H | 19 | 66 | 11.0 |
| 7 | K | 23 | 144 | 21.0 |
| 8 | L | 54 | 418 | 57.0 |
| 9 | M | 74 | 397 | 60.0 |
| 10 | N | 74 | 574 | 99.0 |
| | P | Lag Tests | | |
| 25 | Q | 116 | 619 | 79.0 |
| 26 | R | 110 | 553 | 94.0 |
| 27 | S | 97 | 647 | 102.0 |
| 2/8 | T | 120 | 567 | 100.6 |
| 3/1 | U | 6 | 45 | 7.0 |
| Totals | | 1295 | 6561 | 930.7 |

AREA covered by sheet 41 : 702 square statute miles.

Abstract of R.A.R. Velocities - Sheet 41-PI20 - From Velocity Tests Season 1932-33

| R.A.R. Vol. | Pgs. No. | Day | Spd. Kts. | Seeds of Run | Spd. Corr. | Spd. Time | Rec'd. Corr. | Bomb Bomb | Final Bomb | Bomb Sta. | Hyd. Sta. | Depth fms. | Comp. Vel. m/s | Remarks |
|-------------|----------|-----|-----------|--------------|------------|-----------|--------------|-----------|------------|-----------|-----------|------------|----------------|------------------|
| 1 | 16 | K | 9.5 | 19 | 0.06 | 7.12 | 0.01 | -- | 7.19 | 10644 | Nick | 130 | 1480 +2 | |
| 1 | 19 | K | 9.5 | 25 | 0.08 | 7.05 | 0.01 | -- | 7.14 | 10564 | " | 230 | 1480 +2 | |
| 1 | 49 | N | 9.0 | 17 | 0.05 | 46.80 | 0.01 | -- | 46.86 | 69727 | Rosa | 50 | 1488 -6 | |
| 1 | 32 | R | 9.5 | 17 | 0.06 | 12.16 | 0.01 | -- | 12.17 | 18022 | Nick | 47 | 1481 +1 | |
| 1 | 33 | R | 9.5 | 16 | 0.06 | 11.33 | 0.01 | -- | 11.40 | 16896 | " | 50 | 1482 0 | |
| 1 | 43 | R | 8.7 | 15 | 0.04 | 13.15 | 0.01 | -- | 13.20 | 19620 | " | 47 | 1486 -4 | |
| 1 | 52 | R | 10.0 | 18 | 0.06 | 13.54 | 0.01 | -- | 13.61 | 20144 | " | 54 | 1480 +2 | |
| 1 | 60 | R | 9.0 | 15 | 0.05 | 13.44 | 0.01 | -- | 13.50 | 19976 | " | 64 | 1480 +2 | |
| 1 | 61 | R | 9.0 | 18 | 0.06 | 14.04 | 0.01 | -- | 14.11 | 21112 | " | 56 | 1495 R | |
| 1 | 63 | R | 9.0 | 16 | 0.05 | 15.71 | 0.03 | -- | 15.79 | 23476 | " | 54 | 1487 -5 | |
| 1 | 65 | R | 9.0 | 18 | 0.06 | 18.00 | 0.03 | -- | 18.09 | 26420 | " | 55 | 1460 R | small rt 2 |
| 1 | 68 | R | 9.0 | 17 | 0.06 | 16.17 | 0.03 | -- | 16.26 | 24116 | " | 51 | 1483 -1 | |
| 1 | 71 | R | 9.0 | 15 | 0.05 | 13.58 | 0.03 | 0.25 | 13.91 | 20360 | " | 105 | 1444 R | Adding 2 x depth |
| 1 | 80 | R | 9.0 | 17 | 0.05 | 13.59 | 0.03 | 0.44 | 14.11 | 20852 | " | 180 | 1478 +4 | |
| 1 | 85 | R | 9.0 | 18 | 0.06 | 10.58 | 0.03 | 0.49 | 11.16 | 16488 | " | 200 | 1478 +4 | |
| 1 | 87 | R | 9.0 | 20 | 0.06 | 11.30 | 0.03 | 0.69 | 12.08 | 17880 | " | 280 | 1480 +2 | |
| 1 | 92 | R | 9.0 | 16 | 0.05 | 9.48 | 0.03 | 0.57 | 10.13 | 14892 | " | 231 | 1450 +2 | |
| 1 | 97 | R | 9.0 | 15 | 0.05 | 7.09 | 0.03 | 0.50 | 7.67 | 11284 | " | 205 | 1471 +1 | |
| 1 | 99 | R | 9.0 | 17 | 0.05 | 5.71 | 0.03 | 0.68 | 6.57 | 9340 | " | 238 | 1467 +1 | |
| 1 | 100 | R | 9.0 | 17 | 0.05 | 4.95 | 0.03 | 0.68 | 5.71 | 8316 | " | 277 | 1457 R | |
| 1 | 102 | R | 9.0 | 15 | 0.05 | 5.16 | 0.01 | -- | 5.22 | 7756 | " | 276 | 1486 -4 | |
| 1 | 104 | R | 9.0 | 15 | 0.05 | 4.07 | 0.01 | -- | 4.13 | 6088 | " | 310 | 1474 +4 | |
| 1 | 107 | R | 6.0 | 17 | 0.04 | 4.45 | 0.01 | -- | 4.50 | 6708 | " | 450 | 1490 -4 ? Fix | |
| 1 | 109 | R | 8.0 | 17 | 0.05 | 5.29 | 0.01 | -- | 5.35 | 8032 | " | 430 | 1500 R | |
| 1 | 23 | S | 9.0 | 18 | 0.06 | 16.37 | 0.01 | -- | 16.44 | 24424 | " | 55 | 1487 -5 | |
| 1 | 26 | S | 9.0 | 13 | 0.06 | 19.29 | 0.01 | -- | 19.36 | 28652 | " | 55 | 1481 +1 | 1 angle fix |
| 1 | 40 | S | 9.0 | 15 | 0.05 | 15.57 | 0.01 | -- | 15.63 | 23252 | " | 74 | 1488 -6 | |
| 1 | 44 | S | 9.0 | 18 | 0.06 | 15.19 | 0.01 | -- | 15.26 | 19763 | " | 45 | 1491 -9 | |
| 1 | 47 | S | 9.0 | 18 | 0.06 | 15.38 | 0.01 | -- | 15.35 | 22164 | " | 80 | 1442 | ? |
| 1 | 58 | S | 9.0 | 19 | 0.06 | 14.31 | 0.01 | -- | 14.36 | 22164 | " | 170 | 1489 -7 | |
| 1 | 61 | S | 9.0 | 18 | 0.06 | 14.24 | 0.01 | -- | 14.31 | 21340 | " | 200 | 1491 -4 | |
| 1 | 73 | S | 9.0 | 16 | 0.05 | 14.64 | 0.01 | -- | 14.70 | 21844 | " | 255 | 1487 -5 | |

Cor = 1482 on V=5

Abstract of R.A.R. Velocities - Sheet 41-PI20 - From Velocity Tests - Season 1932-33

| R.A.R. Vol. | Pos. No. | Bay | Spd. Kts. | Secs. Run | Spd. Corr. Time | Sold. Time | Rec'er Corr. | Bomb Corr. | Signal Time | Bomb Sta. Hyd. Dist. | Hyd. Sta. Bomb | Depth fms. | Temp. Val. m/s | Remarks |
|-------------|----------|-----|-----------|-----------|-----------------|------------|--------------|------------|-------------|----------------------|----------------|------------|----------------|----------------|
| 2 | 42 | T | 1000 | 16 | 0.06 | 6.15 | 0.01 | 0.01 | 47.25 | 70200 | qt | 65 | 1485 | Begg Rosa |
| 2 | 51 | T | 10.0 | 15 | 0.05 | 6.05 | 0.01 | 0.01 | 46.23 | 70812 | qt | 59 | 1561 | Begg Rosa |
| 2 | 68 | T | 10.0 | 14 | 0.05 | 40.06 | 0.01 | 0.01 | 47.36 | 70224 | qt | 60 | 1483 | Begg Rosa |
| 2 | 71 | T | 10.0 | 14 | 0.05 | 5.38 | 0.01 | 0.01 | 47.29 | 70200 | qt | 64 | 1484 | Begg Rosa |
| 2 | 91 | T | 10.0 | 16 | 0.06 | 40.87 | 0.01 | 0.01 | 68.84 | 111832 | qt | 64 | 1479 | Miguel Begg |
| 2 | 98 | T | 10.0 | 13 | 0.04 | 8.98 | 0.01 | 0.01 | 47.72 | 70656 | qt | 65 | 1483 | Begg Rosa |

1485
 83
 84
 79
 83

 5114
 1483
 in 60 fms

av v = 1.4
 Mean of 36
 1481

FATHOMETER CORRECTIONS

FOR

FIELD SHEETS NOS. 41, 42, 45, 46, 121, 122, 123.
From beginning of season to October 1, 1933.

PROJECT NO. 120.

British Admiralty Tables were used to obtain theoretical velocities of sound through sea water, and are tabulated in meters per second.

TABLE A

Column 1 is true depth of water. Due to the hydrophone-oscillator base line being at a depth of two fathoms below the surface, the initial depth (draft) was taken as 2 fathoms.

Column 2 is the salinity at different depths as scaled from a curve plotted with data furnished by the Scripps Institute of Oceanography at La Jolla, California. These salinities were obtained by a representative of the Scripps Institute on the Steamer PIONEER, west of San Miguel Island.

Column 3 is the temperature as scaled from a curve plotted with data taken on sheets 41 and 121. There was another curve (see blue print) but since the corrections as computed from both curves differed by only 0.1 fathom up to 200 fathoms, the corrections as figured from the first curve were used. At depths over 200 fathoms the two curves are practically coincident.

Column 4 is the velocity of sound through sea water as taken from the British Admiralty Tables at each depth.

Column 5 is the mean of the velocities from the surface to each succeeding depth.

Column 6 is D , or $\frac{1}{2}$ the distance the sound travels from the oscillator to the bottom and back to the hydrophone for the number 3 (Navy rat) hydrophone and Large Oscillator combination.

Column 7 is the uniform scale reading on a fathometer for each true depth of water. This computation was made as follows: since the fathometer speed was 248 r.p.m. or 4.133 r.p.s., a theoretical velocity of 826.6 fathoms per second was used. The uniform scale reading equals $\frac{1511.8 \text{ m/s}}{\text{mean velocity (m/s)}}$

x D.

Column 8 is the correction to the existing non-uniform scale of the fathometer. This correction is necessary only in that part of the dial between zero and 25 fathoms, the rest of the scale being uniform. This column is left blank where it coincides with column 7.

In column 9 will be found the theoretical corrections, for the No. 3 Hydrophone - Large Oscillator combination, which is equal to column 1 minus column 8.

Column 10 is the index correction (I.C.) from Table B.

Column 11 is the final correction to the fathometer and equals column 9 plus column 10, This is for the No. 3 Hydrophone - Large Oscillator.

Column 12 is D for the Number 2 Hydrophone - Small Oscillator combination.

Column 13 is the uniform scale reading for the same combination (refer to column 6 for method of computation).

Column 14 is the correction to the existing non-uniform scale, corresponding to column 7.

Column 15 is the total theoretical correction for No. 2 Hydrophone - Small Oscillator, and equals column 1 minus column 14.

Column 16 is I.C. (computed in Table C).

Column 17 is the final fathometer correction, column 15 plus column 16, for the No. 2 Hydrophone - Small Oscillator combination.

TABLE B is the comparison of the fathometer readings, No. 3 Hydrophone - Large Oscillator, with the vertical casts to determine an index correction for this combination.

TABLE C is the comparison of the fathometer readings, No. 2 Hydrophone - Small Oscillator, with the vertical casts to determine an index correction for this combination.

In TABLE D is listed the final corrections which are entered in the sounding records. These corrections are obtained by plotting final corrections against indicated depths on curves and scaling the depth ranges for each correction therefrom.

TABLE A
 (All sheets except 43 and 44 up to Oct. 1, 1933)

No. 3 Hydrophone - Big Oscillator

| True Depth | Salinity o/oo | Temp. 41&121 | Theor. Velocity | Mean Th. Velocity | D | Uniform scale rdg. | Non-unif. scale rdg. | Theor. Corr. | I.C. Corr. | Final Corr. |
|------------|---------------|--------------|-----------------|-------------------|-------|--------------------|----------------------|--------------|------------|-------------|
| 1 | 2 | 3 | 4 m/s | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 2 | 33.60 | 13.1 | 1496.2 | | | | | | | |
| 4 | | 13.1 | 96.2 | 1496.2 | 8.0 | 8.1 | 7.8 | - 3.8 | - 0.8 | - 4.6 |
| 6 | | 13.1 | 96.2 | 96.2 | 8.7 | 8.8 | 8.4 | - 2.4 | | - 3.2 |
| 8 | .70 | 13.0 | 96.1 | 96.2 | 9.8 | 9.9 | 9.7 | - 1.7 | | - 2.5 |
| 10 | | 13.0 | 96.0 | 96.1 | 11.1 | 11.2 | 11.0 | - 1.0 | | - 1.8 |
| 12 | | 12.9 | 95.8 | 96.1 | 12.6 | 12.7 | 12.6 | - 0.6 | | - 1.4 |
| 14 | | 12.8 | 95.6 | 96.0 | 14.3 | 14.4 | 14.3 | - 0.3 | | - 1.1 |
| 16 | | 12.7 | 95.3 | 95.9 | 16.0 | 16.2 | 16.1 | - 0.1 | | - 0.9 |
| 18 | | 12.6 | 95.0 | 95.8 | 17.8 | 18.0 | 17.9 | + 0.1 | | - 0.7 |
| 20 | | 12.5 | 94.9 | 95.7 | 19.6 | 19.8 | 19.8 | + 0.2 | | - 0.6 |
| 24 | .80 | 12.2 | 94.0 | 95.4 | 23.3 | 23.6 | | + 0.4 | | - 0.4 |
| 28 | | 11.8 | 92.8 | 95.1 | 27.1 | 27.4 | | + 0.6 | | - 0.2 |
| 32 | | 11.4 | 91.6 | 94.6 | 31.0 | 31.4 | | + 0.6 | | - 0.2 |
| 42 | .90 | 10.7 | 89.3 | 93.6 | 40.8 | 41.2 | | + 0.8 | | 0 |
| 52 | | 10.2 | 87.9 | 92.6 | 50.6 | 51.2 | | + 0.8 | | 0 |
| 62 | | 9.8 | 86.8 | 91.8 | 60.5 | 61.3 | | + 0.7 | | - 0.1 |
| 72 | 34.00 | 9.4 | 85.8 | 91.0 | 70.4 | 71.4 | | + 0.6 | | - 0.2 |
| 82 | | 9.1 | 85.0 | 90.4 | 80.4 | 81.5 | | + 0.5 | | - 0.3 |
| 92 | | 8.8 | 84.2 | 89.8 | 90.4 | 91.7 | | + 0.3 | | - 0.5 |
| 102 | | 8.6 | 83.8 | 89.2 | 100.3 | 101.8 | 101.6 | + 0.4 | | - 0.4 |
| 112 | .10 | 8.4 | 83.3 | 88.7 | 110.3 | 112.0 | 111.8 | + 0.2 | | - 0.6 |
| 122 | | 8.2 | 83.0 | 88.3 | 120.2 | 122.1 | | - 0.1 | | - 0.9 |
| 142 | | 8.0 | 82.9 | 87.8 | 140.2 | 142.5 | | - 0.5 | | - 1.3 |
| 162 | .20 | 7.8 | 82.7 | 87.0 | 160.2 | 162.9 | | - 0.9 | | - 1.7 |
| 182 | | 7.4 | 82.2 | 86.5 | 180.2 | 183.3 | | - 1.3 | | - 2.1 |
| 202 | | 7.0 | 81.4 | 86.0 | 200.2 | 203.7 | 203.4 | - 1.4 | | - 2.2 |
| 242 | .30 | 6.5 | 80.5 | 85.2 | 240.2 | 244.5 | | - 2.5 | | - 3.3 |
| 282 | | 6.0 | 79.9 | 84.6 | 280.2 | 285.4 | | - 3.4 | | - 4.2 |
| 322 | | 5.6 | 79.6 | 84.0 | 320.2 | 326.2 | | - 4.2 | | - 5.0 |
| 362 | | 5.2 | 79.7 | 83.6 | 360.2 | 367.1 | | - 5.1 | | - 5.9 |
| 402 | | 4.9 | 79.8 | 83.2 | 400.2 | 407.9 | 407.6 | - 5.6 | | - 6.4 |
| 442 | .40 | 4.6 | 79.9 | 83.0 | 440.1 | 448.6 | | - 6.6 | | - 7.4 |
| 482 | | 4.4 | 80.1 | 82.7 | 480.1 | 489.3 | | - 7.3 | | - 8.1 |
| 522 | | 4.2 | 80.7 | 82.6 | 520.1 | 530.1 | | - 8.1 | | - 8.9 |
| 562 | | 4.0 | 81.3 | 82.5 | 560.1 | 571.0 | | - 9.0 | | - 9.8 |
| 602 | | 3.8 | 81.8 | 82.5 | 600.1 | 612 | | - 10.0 | | - 10.8 |
| 642 | .50 | 3.6 | 82.3 | 82.5 | 640.0 | 652 | | - 10.0 | | - 10.8 |
| 682 | | 3.4 | 82.7 | 82.5 | 680.0 | 693 | | - 11.0 | | - 11.8 |
| 722 | | 3.3 | 83.4 | 82.6 | 720 | 734 | | - 12.0 | | - 12.8 |
| 762 | | 3.1 | 84.2 | 82.7 | 760 | 775 | | - 13.0 | | - 13.8 |
| 802 | | 3.0 | 84.9 | 82.8 | 800 | 815 | | - 13.0 | | - 13.8 |
| 842 | | 2.8 | 85.5 | 82.9 | 840 | 856 | | - 14.0 | | - 14.8 |
| 882 | | 2.6 | 86.3 | 83.1 | 880 | 897 | | - 15.0 | | - 15.8 |
| 922 | | 2.5 | 87.3 | 83.2 | 920 | 937 | | - 15.0 | | - 15.8 |
| 962 | | 2.4 | 88.0 | 83.4 | 960 | 978 | | - 16.0 | | - 16.8 |
| 1002 | .60 | 2.4 | 89.1 | 83.6 | 1000 | 1019 | | - 17.0 | | - 17.8 |
| 1042 | | 2.3 | 90.1 | 83.8 | 1040 | 1060 | | - 18.0 | | - 18.8 |
| 1082 | | 2.2 | 91.2 | 84.1 | 1080 | 1101 | | - 19.0 | | - 19.8 |
| 1122 | | 2.2 | 92.3 | 84.4 | 1120 | 1141 | | - 19.0 | | - 19.8 |
| 1162 | | 2.1 | 93.4 | 84.7 | 1160 | 1181 | | - 19.0 | | - 19.8 |
| 1202 | | 2.1 | 94.5 | 85.0 | 1200 | 1222 | | - 20.0 | | - 20.8 |
| 1242 | | 2.1 | 95.7 | 85.4 | 1240 | 1262 | | - 20.0 | | - 20.8 |

(Table B)

TABLE A Continued No. 3 Hydrophone, Big Oscillator.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|------|-------|-----|--------|--------|------|------|---|-----|------|-------|
| 1282 | 34.65 | 2.1 | 1497.0 | 1485.7 | 1280 | 1303 | | -21 | -0.8 | -21.8 |
| 1322 | | 2.0 | 98.2 | 86.1 | 1320 | 1343 | | -21 | | -21.8 |
| 1362 | | 2.0 | 99.4 | 86.5 | 1360 | 1383 | | -21 | | -21.8 |
| 1402 | | 2.0 | 1500.7 | 86.9 | 1400 | 1423 | | -21 | | -21.8 |
| 1442 | | 2.0 | 02.0 | 87.3 | 1440 | 1464 | | -22 | | -22.8 |
| 1482 | | 2.0 | 03.2 | 87.7 | 1480 | 1504 | | -22 | | -22.8 |
| 1522 | | 1.9 | 04.4 | 88.1 | 1520 | 1544 | | -22 | | -22.8 |
| 1562 | | 1.9 | 05.7 | 88.5 | 1560 | 1584 | | -22 | | -22.8 |
| 1602 | | 1.9 | 06.9 | 89.0 | 1600 | 1624 | | -22 | | -22.8 |
| 1642 | | 1.9 | 08.1 | 89.5 | 1640 | 1664 | | -22 | | -22.8 |
| 1682 | | 1.8 | 09.3 | 89.9 | 1680 | 1704 | | -22 | | -22.8 |
| 1722 | | 1.8 | 10.7 | 90.4 | 1720 | 1744 | | -22 | | -22.8 |
| 1762 | | 1.8 | 11.9 | 90.8 | 1760 | 1784 | | -22 | | -22.8 |
| 1802 | | 1.8 | 13.1 | 91.3 | 1800 | 1824 | | -22 | | -22.8 |
| 1842 | | 1.8 | 14.4 | 91.8 | 1840 | 1864 | | -22 | | -22.8 |
| 1882 | | 1.8 | 15.6 | 92.3 | 1880 | 1904 | | -22 | | -22.8 |
| 1922 | | 1.8 | 16.9 | 92.8 | 1920 | 1944 | | -22 | | -22.8 |
| 1962 | | 1.7 | 18.2 | 93.3 | 1960 | 1984 | | -22 | | -22.8 |
| 2002 | | 1.7 | 19.4 | 93.8 | 2000 | 2023 | | -21 | | -21.8 |
| 2042 | | 1.7 | 20.6 | 94.3 | 2040 | 2063 | | -21 | | -21.8 |
| 2082 | .70 | 1.7 | 21.9 | 94.9 | 2080 | 2103 | | -21 | | -21.8 |
| 2122 | | 1.7 | 23.2 | 95.4 | 2120 | 2143 | | -21 | | -21.8 |

No. 2 Hydrophone, Small Oscillator

| Columns 1, 2, 3, 4, & 5 same as No. 3 Hyd. Big Osc. | Headings same as above. | | | | | | |
|--|-------------------------|------|-------|-------|------|------|------|
| | 12 | 13 | 14 | 15 | 16 | 17 | |
| 2 | | | | | | | |
| 4 | | 2.8 | 2.8 | 2.4 | 1.6 | -1.7 | -0.1 |
| 6 | | 4.5 | 4.6 | 4.0 | 2.0 | | 0.3 |
| 8 | | 6.3 | 6.4 | 5.8 | 2.2 | | 0.5 |
| 10 | | 8.2 | 8.3 | 8.0 | 2.0 | | 0.3 |
| 12 | | 10.2 | 10.3 | 10.1 | 1.9 | | 0.2 |
| 14 | | 12.2 | 12.3 | 12.1 | 1.9 | | 0.2 |
| 16 | | 14.1 | 14.3 | 14.2 | 1.8 | | 0.1 |
| 18 | | 16.1 | 16.3 | 16.2 | 1.8 | | 0.1 |
| 20 | | 18.1 | 18.3 | 18.2 | 1.8 | | 0.1 |
| 24 | | 22.1 | 22.3 | | 1.7 | | 0.0 |
| 28 | | 26.1 | 26.4 | | 1.6 | | -0.1 |
| 32 | | 30.1 | 30.5 | | 1.5 | | -0.2 |
| 42 | | 40.1 | 40.6 | | 1.4 | | -0.3 |
| 52 | | 50.1 | 50.7 | | 1.3 | | -0.4 |
| 62 | | 60.1 | 60.9 | | 1.1 | | -0.6 |
| 72 | | 70.1 | 71.0 | | 1.0 | | -0.7 |
| 82 | | 80.1 | 81.2 | | 0.8 | | -0.9 |
| 92 | | 90.0 | 91.3 | | 0.7 | | -1.0 |
| 102 | | 100 | 101.5 | 101.3 | 0.7 | | -1.0 |
| 112 | | 110 | 111.7 | 111.5 | 0.5 | | -1.2 |
| 122 | | 120 | 121.9 | | 0.1 | | -1.6 |
| 142 | | 140 | 142.3 | | -0.3 | | -2.0 |
| 162 | | 160 | 162.6 | | -0.6 | | -2.3 |
| 182 | | 180 | 183.0 | | -1.0 | | -2.7 |

TABLE A Continued No. 2 Hydro. Small Osc.

| 1 | 12 | 13 | 14 | 15 | 16 | 17 |
|------|------|-------|-------|-------|------|-------|
| 202 | 200 | 203.3 | 203.0 | -1.0 | -1.7 | -2.7 |
| 242 | 240 | 244.2 | | -2.2 | | -3.9 |
| 282 | 280 | 285.2 | | -3.2 | | -4.9 |
| 322 | 320 | 326.0 | | -4.0 | | -5.7 |
| 362 | 360 | 367.0 | | -5.0 | | -6.7 |
| 402 | 400 | 407.7 | 407.4 | -5.4 | | -7.1 |
| 442 | 440 | 448.5 | | -6.5 | | -8.2 |
| 482 | 480 | 489.2 | | -7.2 | | -8.9 |
| 522 | 520 | 530 | | -8.0 | | -9.8 |
| 562 | 560 | 571 | | -9.0 | | -10.7 |
| 602 | 600 | 612 | | -10.0 | | -11.7 |
| 642 | 640 | 652 | | -10.0 | | -11.7 |
| 682 | 680 | 693 | | -11.0 | | -12.7 |
| 722 | 720 | 734 | | -12.0 | | -13.7 |
| 762 | 760 | 775 | | -13 | | -14.7 |
| 802 | 800 | 815 | | -13 | | -14.7 |
| 842 | 840 | 856 | | -14 | | -15.7 |
| 882 | 880 | 897 | | -15 | | -16.7 |
| 922 | 920 | 937 | | -15 | | -16.7 |
| 962 | 960 | 978 | | -16 | | -17.7 |
| 1002 | 1000 | 1019 | | -17 | | -18.7 |
| 1042 | 1040 | 1060 | | -18 | | -19.7 |
| 1082 | 1080 | 1101 | | -19 | | -20.7 |
| 1122 | 1120 | 1141 | | -19 | | -20.7 |
| 1162 | 1160 | 1181 | | -19 | | -20.7 |
| 1202 | 1200 | 1222 | | -20 | | -21.7 |
| 1242 | 1240 | 1262 | | -20 | | -21.7 |
| 1282 | 1280 | 1303 | | -21 | | -22.7 |
| 1322 | 1320 | 1343 | | -21 | | -22.7 |
| 1362 | 1360 | 1383 | | -21 | | -22.7 |
| 1402 | 1400 | 1423 | | -21 | | -22.7 |
| 1442 | 1440 | 1464 | | -22 | | -23.7 |
| 1482 | 1480 | 1504 | | -22 | | -23.7 |
| 1522 | 1520 | 1544 | | -22 | | -23.7 |
| 1562 | 1560 | 1584 | | -22 | | -23.7 |
| 1602 | 1600 | 1624 | | -22 | | -23.7 |
| 1642 | 1640 | 1664 | | -22 | | -23.7 |
| 1682 | 1680 | 1704 | | -22 | | -23.7 |
| 1722 | 1720 | 1744 | | -22 | | -23.7 |
| 1762 | 1760 | 1784 | | -22 | | -23.7 |
| 1802 | 1800 | 1824 | | -22 | | -23.7 |
| 1842 | 1840 | 1864 | | -22 | | -23.7 |
| 1882 | 1880 | 1904 | | -22 | | -23.7 |
| 1922 | 1920 | 1944 | | -22 | | -23.7 |
| 1962 | 1960 | 1984 | | -22 | | -23.7 |
| 2002 | 2000 | 2023 | | -21 | | -22.7 |
| 2042 | 2040 | 2063 | | -21 | | -22.7 |
| 2082 | 2080 | 2103 | | -21 | | -22.7 |
| 2122 | 2120 | 2143 | | -21 | | -22.7 |

In order to simplify the entering of the final corrections in the Sounding Volumes these corrections were plotted on a curve with an ordinate of final corrections and an abscissa of Fathometer Readings. A Copy of the corrections as taken from the curves is enclosed.

TABLE B No. 3 Hydro. Big Oscillator
COMPARISON OF FATHOMETER READING WITH VERTICAL CAST

| Fath. Rdg. | Theor. Corn. | Th. Cr. Fath. | V.C. | Diff. | Fath. Rdg. | Theor. Corn. | Th. Cr. Fath. | V.C. | Diff. |
|--------------------------------|--------------|---------------|-------|--------|------------|--------------|---------------|-------|-------|
| 17.5 | 0.1 | 17.6 | 16.9 | -0.7 | 113 | 0.0 | 113.00 | 114.3 | +1.3 |
| 17.7 | 0.1 | 17.8 | 17.2 | -0.6 | 238 | -2.4 | 235.6 | 230.0 | -5.6 |
| 18.0 | 0.1 | 18.1 | 17.0 | -1.1 | 238 | -2.4 | 235.6 | 230.0 | -5.6 |
| 22.2 | 0.3 | 22.5 | 22.0 | -0.5 | 333 | -4.0 | 329.0 | 329.0 | 0.0 |
| 26.2 | 0.6 | 26.8 | 25.9 | -0.9 | 628 | -10 | 618 | 636 | +18 |
| 26.9 | 0.6 | 27.5 | 26.4 | -1.1 | 645 | -10 | 635 | 636 | +1 |
| 28.2 | 0.6 | 28.8 | 27.0 | -1.8 | 927 | -15 | 912 | 910 | -2 |
| 28.5 | 0.6 | 29.1 | 28.2 | -0.9 | *1460 | -22 | 1438 | 1451 | +13 |
| 28.8 | 0.6 | 29.4 | 29.0 | -0.4 | *1435 | -21 | 1414 | 1451 | +37 |
| 29.0 | 0.6 | 29.6 | 28.8 | -0.8 | *1425 | -21 | 1404 | 1451 | +47 |
| 28.5 | 0.6 | 29.1 | 28.4 | -0.7 | 1875 | -22 | 1853 | 1863 | +10 |
| 27.5 | 0.6 | 28.1 | 27.4 | -0.7 | 1940 | -22 | 1918 | 1922 | +4 |
| 29.8 | 0.6 | 30.4 | 29.2 | -1.2 | 1935 | -22 | 1913 | 1922 | +9 |
| 29.5 | 0.6 | 30.1 | 30.4 | 0.3 | | | | | |
| 30.0 | 0.6 | 30.6 | 32.0 | 1.4 | | | | | |
| 31.0 | 0.6 | 31.6 | 30.5 | -1.1 | | | | | |
| 31.0 | 0.6 | 31.6 | 31.0 | -0.6 | | | | | |
| 31.3 | 0.6 | 31.9 | 31.2 | -0.7 | | | | | |
| 32.0 | 0.6 | 32.6 | 32.0 | -0.6 | | | | | |
| 32.0 | 0.6 | 32.6 | 31.5 | -1.1 | | | | | |
| 32.3 | 0.7 | 33.0 | 32.7 | -0.3 | 70.5 | 0.6 | 71.1 | 69.0 | -2.1 |
| 34.2 | 0.7 | 34.9 | 34.8 | -0.1 | 76.0 | 0.6 | 76.6 | 72.2 | -4.4 |
| 35.0 | 0.7 | 35.7 | 33.8 | -1.9 | 111 | 0.0 | 111 | 109.4 | -1.6 |
| 37.0 | 0.7 | 37.7 | 36.2 | -1.5 | | | | | |
| 37.5 | 0.7 | 38.2 | 37.4 | -0.8 | | | | | |
| 41.8 | 0.8 | 42.6 | 41.8 | -0.8 | | | | | |
| 42.0 | 0.8 | 42.8 | 42.0 | -0.8 | | | | | |
| 42.8 | 0.8 | 43.6 | 43.8 | 0.2 | | | | | |
| 43.2 | 0.8 | 44.0 | 45.5 | 1.5 | | | | | |
| 47.5 | 0.8 | 48.3 | 41.6 | (-6.7) | | | | | |
| 48.4 | 0.8 | 49.2 | 48.7 | -0.5 | | | | | |
| 49.0 | 0.8 | 49.8 | 48.5 | -1.3 | | | | | |
| 49.0 | 0.8 | 49.8 | 47.2 | -2.6 | | | | | |
| 49.8 | 0.8 | 50.6 | 49.7 | -0.9 | | | | | |
| 50.5 | 0.8 | 51.3 | 49.8 | -1.5 | | | | | |
| 52.5 | 0.8 | 53.3 | 52.4 | -0.9 | | | | | |
| 52.7 | 0.8 | 53.5 | 51.6 | -1.9 | | | | | |
| 54.0 | 0.8 | 54.8 | 52.5 | -2.3 | | | | | |
| 57.5 | 0.7 | 58.2 | 56.0 | -2.2 | | | | | |
| 63.5 | 0.7 | 64.2 | 58.7 | (-5.5) | | | | | |
| 64.1 | 0.7 | 64.8 | 63.2 | -1.6 | | | | | |
| 65.0 | 0.7 | 65.7 | 64.6 | -1.1 | | | | | |
| 70.0 | 0.6 | 70.6 | 69.5 | -1.1 | | | | | |
| 71.5 | 0.6 | 72.1 | 72.5 | 0.4 | | | | | |
| 70.8 | 0.6 | 71.4 | 72.0 | 0.6 | | | | | |
| 72.8 | 0.6 | 73.4 | 72.2 | -1.2 | | | | | |
| 82.0 | 0.5 | 82.5 | 81.0 | -1.5 | | | | | |
| 30.5 | 0.6 | 31.1 | 30.0 | -1.1 | | | | | |
| 181.0 | -1.3 | 179.7 | 179.1 | -0.6 | | | | | |
| 18.2 | 0.1 | 18.3 | 18.5 | 0.2 | | | | | |
| 52.5 | 0.8 | 53.3 | 52.4 | -0.9 | | | | | |
| Mean for Index Correction -0.8 | | | | | | | | | |

LONG DASH

*White light

COMPARISON OF FATHOMETER WITH
VERTICAL CASTS.

Sheet No. 41.

U.S.C. & G.S.S. PIONEER.

| Date 1933 | Day | Vertical Cast | #2 Hyd. Sm. Osc. | #3 Hyd. Big Osc. | Cor. for ^{used} #3 Big. | Crd. Fath. Reading |
|--------------|------|------------------|---------------------|---------------------|--|-----------------------|
| 12/7 | 72A | 49.7 | 50.5 | | | |
| 12/9 | 26C | 30.4 | 29.5 | 29.5 | 0 | 29.5 |
| | | 30.1 | - - - | | | |
| | 27C | 34.8 | | 34.2 | 0 | 34.2 |
| | 113C | 32.7 | | 32.3 | 0 | 32.3 |
| 12/14 | 48E | 28.2 | | 28.5 | - $\frac{1}{2}$ | 28.0 |
| | | 28.4 | 28.0 | | | |
| | | 29.2 | | 29.8 | 0 | 29.8 |
| | | 29.0 | | 28.8 | 0 | 28.8 |
| | | 28.8 | | 29.0 | 0 | 29.0 |
| | 76E | 32.0 | | 32.0 | 0 | 32.0 |
| | 77E | 31.0 | | 31.0 | 0 | 31.0 |
| | | 31.5 | | 32.0 | 0 | 32.0 |
| | | 31.2 | | 31.3 | 0 | 31.3 |
| | 85E | 31.0 | | 30.5 | 0 | 30.5 |
| | 161E | 27.4 | | 27.5 | - $\frac{1}{2}$ | 27.0 |
| | | 28.4 | | 28.5 | 0 | 28.5 |
| 12/15 | 127F | 22.0 | | 22.2 | - $\frac{1}{2}$ | 21.7 |
| 1/8/33 | 1L | 18.5 | | 18.2 | - $\frac{1}{2}$ | 17.7 |
| | 10L | 49.8 | 50.7 | 50.5 | 0 | 50.5 |
| | 18L | 64.6 | | 65.0 | 0 | 65.0 |
| 1/25 | 1Q | 179.1 | | 181.0 | -2 | 179.0 |
| 2/8 | 1T | 52.4 | | 52.5 | 0 | 52.5 |

TABLE C No. 2 Hydro. Small Oscillator.
 COMPARISON OF FATHOMETER READINGS WITH VERTICAL CASTS (All sheets)

| Fath. Rdg. | Theor. Cor'n. | Th.Cr. Fath. | V.C. | Diff. | Fath. Rdg. | Theor. Cor'n. | Th.Cr. Fath. | V.C. | Diff. |
|------------|---------------|--------------|-------|--------|------------|---------------|--------------|------|-------|
| 29.0 | 1.5 | 30.5 | 28.3 | -2.2 | | | | | |
| 28.0 | 1.5 | 29.5 | 28.4 | -1.1 | | | | | |
| 41.5 | 1.4 | 42.9 | 41.8 | -1.1 | | | | | |
| 46.5 | 1.3 | 47.8 | 46.1 | -1.7 | | | | | |
| 49.0 | 1.3 | 50.3 | 48.6 | -1.7 | | | | | |
| 49.5 | 1.3 | 50.8 | 48.5 | -2.3 | | | | | |
| 50.1 | 1.3 | 51.4 | 50.0 | -1.4 | | | | | |
| 50.5 | 1.3 | 51.8 | 49.7 | -2.1 | | | | | |
| 50.7 | 1.3 | 52.0 | 49.8 | -2.2 | | | | | |
| 52.3 | 1.3 | 53.6 | 51.6 | -2.0 | | | | | |
| 70.5 | 1.0 | 71.5 | 69.5 | -2.0 | | | | | |
| 72.0 | 1.0 | 73.0 | 70.0 | -3.0 | | | | | |
| 82.5 | 0.8 | 83.3 | 81.0 | -2.3 | | | | | |
| 103.0 | 0.5 | 103.5 | 101.5 | -2.0 | | | | | |
| 107.5 | 0.4 | 107.9 | 108.0 | 0.1 | | | | | |
| 113.0 | 0.3 | 113.3 | 114.0 | 0.7 | | | | | |
| 113.5 | 0.3 | 113.8 | 114.3 | 0.5 | | | | | |
| 123.0 | 0.1 | 123.1 | 122.3 | -0.8 | | | | | |
| 127.5 | 0.1 | 127.6 | 126.0 | -1.6 6 | | | | | |
| 234 | -2 | 232 | 230 | 02 | | | | | |
| 235 | -2 | 233 | 230 | -3 | | | | | |
| 274 | -3 | 271 | 268 | -3 | | | | | |
| 274 | -3 | 271 | 268 | -3 | | | | | |
| 286 | -3 | 283 | 289.5 | (6.5) | | | | | |
| 244 | -2 | 242 | 243 | 1 | | | | | |
| 305 | -4 | 301 | 297 | -4 | | | | | |
| 367 | -5 | 362 | 359 | -3 | | | | | |
| 369 | -5 | 364 | 359 | -5 | | | | | |
| 353 | -5 | 348 | 348 | 0 | | | | | |
| 353 | 05 | 348 | 348 | 0 | | | | | |
| 520 | -8 | 512 | 508 | -4 | | | | | |
| 516 | -8 | 508 | 508 | 0 | | | | | |
| 545 | -8 | 537 | 550 | 13 | | | | | |
| 546 | -8 | 538 | 539 | 1 | | | | | |
| 924 | -15 | 909 | 910 | 1 | | | | | |
| 930 | -15 | 915 | 910 | -5 | | | | | |
| 1056 | -18 | 1038 | 1030 | -8 | | | | | |
| 975 | -16 | 959 | 961 | 2 | | | | | |
| 2215 | -20 | 2195 | 2178 | -17 | | | | | |

LONG DASH

| | | | | |
|--------------------|----|-----|-------|------|
| 235 | -2 | 233 | 230 | -3 |
| 371 | -5 | 366 | 359 | -7 |
| 370 | -5 | 365 | 361.2 | -3.8 |
| 369 | -5 | 364 | 361.2 | -2.8 |
| Mean for LONG DASH | | | | -4.2 |

4.2 - 1.7 = -2.5

Mean Index Correction 0 to 200 fms. = -1.5
 do 200 to 2215 = -1.9
 do 0 to 2215 = -1.7
 Mean Index Correction used = -1.7

TABLE D
FATHOMETER CORRECTIONS

Project No. 120 - All but Santa Monica.
Up to end of September, 1933.

| #3 Hyd. Big Osc. | | #2 Hyd. Small Osc. | |
|--------------------------------------|------------------|--------------------------------|-----------------|
| (Fathometer) Depth (Fms) | Correction | (Fathometer) Depth (Fms) | Correction |
| 10 - 10 $\frac{1}{2}$ | -2 $\frac{1}{2}$ | 10 - 40 | 0 |
| 11 - 12 | -2 | 40 $\frac{1}{2}$ - 76 | - $\frac{1}{2}$ |
| 12 $\frac{1}{2}$ - 14 $\frac{1}{2}$ | -1 $\frac{1}{2}$ | 76 $\frac{1}{2}$ - 102 | -1 |
| 15 - 18 $\frac{1}{2}$ | -1 | 102 $\frac{1}{2}$ - 106 | - $\frac{1}{2}$ |
| 19 - 27 $\frac{1}{2}$ | - $\frac{1}{2}$ | 106 $\frac{1}{2}$ - 112 | -1 |
| 28 - 80 | 0 | 113 - 165 | -2 |
| 80 $\frac{1}{2}$ - 101 $\frac{1}{2}$ | - $\frac{1}{2}$ | 166 - 215 | -3 |
| 102 - 107 $\frac{1}{2}$ | 0 | 216 - 260 | -4 |
| 108 - 140 | -1 | 261 - 305 | -5 |
| 141 - 194 | -2 | 306 - 350 | -6 |
| 195 - 240 | -3 | 351 - 400 | -7 |
| 241 - 285 | -4 | 401 - 450 | -8 |
| 286 - 335 | -5 | 451 - 500 | -9 |
| 336 - 390 | -6 | 501 - 560 | -10 |
| 391 - 440 | -7 | 561 - 610 | -11 |
| 441 - 495 | -8 | 611 - 670 | -12 |
| 496 - 550 | -9 | 671 - 725 | -13 |
| 551 - 600 | -10 | 726 - 780 | -14 |
| 601 - 660 | -11 | 781 - 835 | -15 |
| 661 - 715 | -12 | 836-885 | -16 |
| 716 - 765 | -13 | 886 - 935 | -17 |
| 766 - 820 | -14 | 936 - 990 | -18 |
| 821 - 875 | -15 | 991 - 1050 | -19 |
| 876 - 930 | -16 | 1051 - 1100 | -20 |
| 931 - 980 | -17 | 1101 - 1160 | -21 |
| 981 - 1030 | -18 | 1161 - 1270 | -22 |
| 1031 - 1080 | -19 | 1271 - 1420 | -23 |
| 1081 - 1140 | -20 | 1421 - 2000 | -24 |
| 1141 - 1250 | -21 | 2001 - 2100 | -23 |
| 1251 - 1400 | -22 | | |
| 1401 - 2000 | -23 | | |
| 2000 - 2100 | -22 | | |

For FRx6 soundings on all but Sheet 41, add algebraically 7 fms to above corrections.

For Long Dash soundings subtract algebraically 3 fms. from above corrections.

LAC

April 11, 1935

Fairly Diff

Division of Hydrography and Topography:

✓ Division of Charts: Attention Mr. E. P. Ellis

Gurnee

Tide Reducers are approved in
5 volumes of sounding records for

HYDROGRAPHIC SHEET 5646

Locality Offshore San Nicholas Island, Coast of California.

Chief of Party: O. W. Swainson in 1933
Plane of reference is mean lower low water, reading
3.6 ft. on tide staff at Santa Barbara
16.6 - ft. below B.M. 1

2.9 ft. on tide staff at Hueneme
12.7 ft. below B.M. 1

Height of mean higher high water above plane of reference is 5.4 feet.

Condition of records satisfactory except as noted below:

W. J. Ham
Chief, Division of Tides and Currents.

Report of Verification H-5646 (1932-33)

I Conformity to Hydrographic Manual

Satisfactory, except that only one bottom characteristic appears in the records for the entire sheet (Para. 50 + 71, Hydro Manual) ✓

II Depth Curves

The usual depth curves (50, 100, and 200 fathoms) are drawn. ✓

III Field and Office Plotting

The field platter apparently used, for signal ○ KEY, a point approximately fifty meters to the NNE of the position as it appears on the sheet. The position as it appears on the smooth sheet checks perfectly with the Topographic Sheet, T 4775. For all positions lying EAST of ○ KEY, for the location of which ○ KEY was used, the discrepancy due to the use of the incorrect position of ○ KEY increases as the distance from ○ KEY increases. As a result, it was found necessary to replot portions of A and B days, and practically all of C, D, and E and F days. This was done by the verifier. In the case of F day, the first 77 positions were not replotted, inasmuch as they were all "no-bottom" soundings in an area already well developed and of greater depth. ✓

The location of ○ KEY also affected the location of Hydrographic signals NAVY and SHIP. These signals were replotted. ✓

The smooth sheet as originally submitted showed that the easterly of the two positions of both hydrographic signals ABE and BOY were, in each case, used for plotting E day. However, on page 66, Volume I, at the beginning of E day, a note appears as follows: "Use original position of ABE for this day. O.W.S. (SWANTON)" Upon checking the plotting of this day, it was found that the original positions of both ○ BOY and ○ ABE (i.e., the most westerly in each case) had been used by the field platter. It was therefore assumed that the original locations of ○ BOY and ○ ABE (i.e., the most westerly) were the correct ones for this day, and the notation on the smooth sheet was changed accordingly. ✓

The two field overlays, as originally plotted, have been numbered one and two, number one covering portions of C and E days, and number two covering F day. Overlay #3 was plotted by the verifier, and shows the corrected positions 78-160 E, and 78-126 F. All positions shown on overlays #1 and #2, and not shown on overlay #3, have been plotted by the verifier directly on the smooth sheet. Also, all critical soundings on overlay #3, as well as all soundings shown thereon in areas not already fully developed on the smooth sheet, have been transferred to the smooth sheet. Hence, overlays #1 and #2 are of interest only as they show the original field plotting (in the verifier's opinion incorrect) of the positions concerned, and are retained on file merely as a matter of record.

IV Junctions

Junctions have been made with H 5304 (1932) (on H 5646), and H 5332 (1932) (on H 5332). Agreement is satisfactory.

Sheets H-44447 (1925-26), H 550 (1926-28) and H 4559 (1926-28) were not considered contemporary surveys, no junctions with these sheets being effected.

V Remarks

1. Bezz Rock was added by the verifier from T-1523. Its elevation was added from the chart 5202, with origin from the Coast Pilot in 1930. The under rocks have not been added.

2. The shoreline of San Nicholas Island has not been inked due to immediate need of the sheet for charting. T-4775 may be reduced to this scale (1:40,000) and applied later if advisable.

3. Crossings are, generally, good. The worst of these are discussed on page 4 of the Descriptive Report, and the conclusions arrived at are concurred in. There are other crossings not in perfect agreement, but of no consequential error, due ^{probably} to weak paper.

Respectfully submitted,
Mark A. Gurnee

May 1, 1935

VERIFIER

Inked - 5-16-35 - paragraph transfer - High water line only.
MAG

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5646 (1932-33)

Offshore San Nicolas Island, Southern California Coast, California
Surveyed December, 1932, to March, 1933
Instructions dated November 18, 1932 (PIONEER)

Fathometer Soundings

R A R Control and

3 point fixes on shore and buoy signals

Chief of Party - O. W. Swainson.

Surveyed by - O. W. Swainson.

Protracted and soundings penciled by - J. R. Jahn.

Verified and inked by - M. S. Gurnee.

1. Condition of Records.

The records conform to the requirements of the Hydrographic Manual.

2. Compliance with Instructions for the Project.

The plan and extent of development are in accordance with the instructions except that not enough bottom characteristics were determined, only one being recorded for the entire area of this survey.

3. Sounding Line Crossings.

Sounding line crossings are satisfactory, the differences in depth exceeds 5% in only a few places.

4. Depth Curves.

Within the limits of the survey the usual depth curves may be satisfactorily drawn.

5. Junction with Contemporary Surveys.

The junctions with the inshore sheets at San Nicolas Island, H-5304 (1933) and H-5332 (1932), are adequate.

The deep sea R A R survey joining this survey at the outer limits has not yet been received. This survey also joins and overlaps H-4447 (1925-28), H-4550 (1926-28), and H-4559 (1925-6). These surveys are considered under paragraph 6 below.

6. Comparison with Prior Surveys.

a. H-289 (1851).

This is a reconnaissance survey showing a single line of soundings around San Nicolas Island and Begg Rock. A few of the soundings fall within the area of the present survey. They need not be considered in future charting, as later surveys cover the area in greater detail.

b. H-1459b (1879).

This is an inshore survey of San Nicolas Island on a scale of 1-20,000. Within the area of the present survey the soundings are widely spaced but are in good depth agreement. The bottom characteristics from this survey have been retained as the present survey does not show any. The sunken rocks charted immediately adjacent to Begg Rock are shown on this sheet but actually originate with T-1523 (1879). They do not appear to be definitely located rocks. The hydrophone used on the present survey was located in about the position of the southern one and it is felt that they would have been located if existent. The sunken rock symbols should be discontinued on the chart.

c. H-4447 (1925-28).

This survey is on a scale of 1-120,000. The agreement in depth is fair considering the steep slopes and irregular bottom directly south of San Nicolas Island. For charting purposes it should be superseded by the present survey because of its larger scale and better control.

- (1) One line of soundings from the above survey has been retained because of the wide space between lines of the 1933 survey and is shown on H-5646 (1932-33) in color.
- (2) A 42 fathom sounding (charted) in lat. $33^{\circ}12.1'$, long. $119^{\circ}19.1'$ is a sonic sounding on a dead reckoning line and falls on a steep bank in depths of between 56 and 83 fathoms on the present survey. In view of the uncertainty of position and the unreliable character of the sonic soundings, the 42 fathom sounding should be disregarded in future charting.

d. H-4550 (1926-28), H-4559 (1925-26).

These surveys are on a scale of 1-120,000. The agreement in depth is good. Because of the larger scale and closer development on the present survey, it should supersede the above surveys in charting. A few bottom characteristics are shown on the above sheets. These have been retained and were added to the present survey in color.

- (1) A 49 fathom sounding (charted) in lat. $33^{\circ}23.1'$, long. $119^{\circ}38.9'$ originates with H-4559 (1925-6). It is a tube sounding taken underway and is 5 fathoms less than other tube soundings in the vicinity. The present survey shows depths of 55 to 58 fathoms in this locality. Because of the possible inaccuracy of the tube sounding, the 49 should be discontinued on the chart.

7. Comparison with Chart No. 5202.

a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs and contains no additional information that needs consideration in this review.

The 11 fathom shoal reported by the U. S. S. Oklahoma (Letter 104, 1932) in approximate lat. 33°13', long. 119°22' was not found. The area was closely developed and the least depth found was 26 fathoms. (See descriptive report p. 3). The 11 fathom sounding (reported) has been removed from the chart.

b. Aids to Navigation.

The only floating aid to navigation within this area is the buoy at Begg Rock, which was located close to its charted position.

8. Field Plotting.

The position of signal Key on the sheet apparently was changed after the field plotting was completed but sounding line positions depending on it were not corrected. The verifier in the office found it necessary to replot about 4 days' work.

The plotting of soundings in other parts of the sheet was satisfactory.

9. Additional Field Work Recommended.

This survey is complete and satisfactory and no additional work is required.

10. Superseding Old Surveys.

Within the area covered, the present survey, with the indicated additions from previous surveys, supersedes the following surveys for charting purposes:

| | |
|------------------|--------------------------------------|
| H- 289 (1851) | In part. |
| H-1459b (1879) | " " (except bottom characteristics). |
| H-4447 (1925-28) | " " (" " "). |
| H-4550 (1926-28) | " " (" " "). |
| H-4559 (1925-26) | " " (" " "). |

11. Reviewed by - R. J. Christman and R. L. Johnston, May, 1935.

Supervised by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

K. B. Bond
Chief, Section of Field Work.

L. O. Polout
Chief, Division of Charts.

W. H. de
Chief, Division of H. & T.

25 Jan 9, 1936

Applied to drawing of Chart 5202 - Mar 1936 R.M.Z.
" " " " 5101 - May 1936 R.M.Z.