4991

Diag. Cht. No. 5602-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

# DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. ..... Office No. 4991

LOCALITY

State California

General locality Cape Viscaino

Locality .....

1929

CHIEF OF PARTY

F. G. Engle

LIBRARY & ARCHIVES

DATE .....

8:870-1 (1)++

4991

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 121

SCALE 1: 120 000

COAST OF NORTHERN CALIFORNIA

SHELTER COVE TO POINT CABRILLO

U.S.C.& G.S.S. DICOOVERER

INSTRUCTIONS DATED MARCH 25, 1929

F. G. Engle,
H.& G.Engineer,
Commanding

LIMITS: The work covered by this sheet extends from a junction with inshore ship sheets 41 and 42 of the present season, westward to approximate longitude 125° 18', and from a junction with sheet No.4136, surveyed by the party on the Ship LYDONIA in 1921, in latitude 40° 04', southward to a junction with the northern limits of sheet 122 in approximate latitude 39° 16'.

SOUNDING METHODS: The general scheme of sounding lines runs E and W, the spacing depending on the depth and complying with paragraph 23 of the Instructions for this work. Inside the 400 fathom curve the cross-lines were run parallel to the shore line, and approximately at right angles to the general scheme of lines. Outside this limit cross-lines were run only where necessary to give additional control for locating the depth curves.

Additional work was done within the area covered by the LYDONIA'S sheet No. 4136, and carried as far north as latitude 41° 04'. The old soundings were transferred to the boat sheet, and the new lines run in between these soundings, both to verify them and to furnish additional information to accurately develop the depth curves.

The 702 fathom sounding on sheet 4136, in latitude 40° 06', longitude 125° 00' was investigated, and a fathometer sounding of 684 fathoms found alongside it. The fathometer sounding gives the depth curves a more natural appearance, and it is therefore recommended that this be used in preference to the old sounding, which was probably located by dead reckoning.

Bomb positions were usually taken at intervals of ten to thirty minutes, depending on the spacing of the sounding lines. Occasionally however, in extreme cases, when the supply of TNT was low, the interval was allowed to increase somewhat beyond this amount.

Tin can bombs containing the desired amount of TNT were used for the greater part of this sheet. Whenever the explosions from the quart bombs could not be picked up by the shore stations, it was necessary to fire larger bombs. For this purpose, cast iron bombs, similar to anarchist bombs, were used, and found to be very satisfactory. Two different sizes of these were used, the smaller containing three pounds of T.N.T, and the larger five pounds. Generally speaking, half pint bombs were good for distances up to about 40 sound seconds, pints for about 10 seconds further, and quarts for about 10 or 15 seconds more. Outside of these distances it was usually necessary to fire cast iron bombs. Under unusually favorable conditions one of the shore stations picked up the report from a ½ pint bomb at a distance equal to 100 sound seconds.

Probably the most important factor affecting the reception of the bomb signals is the presence of banks and shoals between the ship and shore station. The bomb signals seen to come in best

when the slope is gentle and there are no obstructions in the path of the sound wave propagated by the bomb explosion.

In connection with the R A R work, log and counter readings were taken at all bomb positions and important changes in course, and the exact time and amount of each change in course noted in the record. This information was used to verify the distances between bombs. In some instances, where there was a marked discrepancy between the D. R. and the bomb positions, and the D. R. agreed closely with the speed and changes in course, one and sometimes both bomb distances were rejected, and the D. R. used in plotting the line. Care was taken to see all information, necessary to check these sections of dead reckoning, was shown in the record.

Soundings on this sheet were obtained by means of the fathometer. The red light method was used to as great a depth as possible. In general, the limiting depth for the red light soundings was reached around 300 to 350 fathoms, although occasionally red light soundings were obtained in 400 to 450 fathoms. Beyond these depths the white light method was used. The disc speed was kept constant by adjusting the rheostat to keep the middle reed of the tachometer vibrating. This adjustment was usually necessary only when the ship was stopped for vertical casts, when the change in steam pressure would cause a variation in the generator voltage. Repeated tests in the field failed to indicate any appreciable change in the fathometer soundings on account of moderate variations in the disc speed. Accordingly no corrections were entered in the sounding records on this account.

Whenever the personnel was available white light soundings were taken by two officers simultaneously, and both readings entered

in the sounding record. The name of the officers taking the soundings are also recorded in the sounding volumes. When only one officer was available for this duty, his readings were roughly checked by the recorder on watch.

Vertical casts were taken at suitable intervals over the entire area of the sheet in order to obtain comparisons with the fathometer soundings, bottom specimens and temperatures, water samples and surface temperatures, and serial temperatures. At all vertical casts, the ship was handled by the commanding officer, who exercised great care in keeping the wire vertical. In a few cases ~~Whenever~~ weather conditions made it impossible to keep the wire vertical, and the amount of slant was carefully estimated and noted in the record.

The sheaves were tested at the beginning and end of the field work, and the results entered in the record. Although the corrections in each case are less than the 1% allowed, the actual corrections in the greater depths were sometimes as large as 10 fathoms. Since the white light soundings are ordinarily read to within 5 fathoms, it was decided to apply the sheave corrections to the vertical cast soundings.

Red light soundings were taken at $\frac{1}{2}$ minute intervals, while white light soundings were taken at intervals of 2 to 5 minutes, depending on the depth.

METHOD OF PLOTTING: Tracings of boat sheet positions were made and these were used as a check and guide in plotting the bomb positions on the smooth sheet. Distance circles were used on the boat sheet whereas on the smooth sheet time circles were used. Beginning from arbitrary points on these tracings, the dead reckoning of sounding

lines were plotted with respect to north and south lines. These tracings are attached to the bomb records. Comparison between the dead reckoning relationship of positions and smooth sheet bomb positions were made in all cases. Dead reckoning adjustment, made on account of lack of bomb positions, are indicated on the tracings.

From an inspection of the smooth sheet it can readily be seen what part of the plotting is dependent on (1) bombs from two stations checked by dead reckoning--shown by a blue dot and blue position number, (2) bombs from one station checked by dead reckoning--shown by an arc and a blue position number, (3) dead reckoning shown by a green dot and green position number, (4) visual fix shown by a red dot and red position number, (5) bomb from one station and single angle--shown by arc and red position number (Q day only).

The dead reckoning along one general course was plotted according to time and speed of vessel when the bomb positions were obtained regularly. In cases where the bomb positions were irregular and appreciable adjustment was found necessary, the log data was used in addition to the time, and in some cases the revolutions were also used to establish the most probable locations.

VELOCITY CORRECTIONS: The index error to the fathometer red light soundings was practically constant, and was determined by comparing the vertical casts with the corresponding fathometer soundings already corrected for temperature. This correction amounted to 0.6 fathom. Attached to this report is a table showing temperature and velocity corrections for both the red and white light soundings.

SLOPE CORRECTIONS: Slope corrections were computed in the usual manner, except that the slopes were determined by scaling the distances

USAL and one diagonal from CASPAR. The ten second intervals were then subdivided equally, thereby obtaining positions of points on the five second circles. Using the distance from the R A R station to the computed position of a point on one of the circles as a radius, and shifting the position of the center from the hydrophone location where necessary, the time circles were made to pass through the respective positions of the computed points. The amount that the center must be shifted from the true location of the hydrophone is in a way a measure of the accuracy of the projection. A check on the computing and plotting of the points through which the circles are drawn is obtained by testing the alignment and spacing of the points on any one radial line. By using a sufficient number of radial lines from each R A R station, the positions of the time circles can be determined with practically the same degree of accuracy as the plotting of triangulation stations.

Time circles sheets possess the following advantages over distance circle sheets:

(1) The plotting of a position requires only a small fraction of the time required with the old method. This results from the combination of the plotting scale and type of sheet, rather than from the use of each one independently. With a little practise in manipulating the plotting scale, a bomb position can be plotted in from ten to thirty seconds. This is a decided advantage when plotting on the boat sheet.

(2) All errors incident to converting units of time into distance are done away with in the elimination of this step.

(3) The speed and accuracy with which positions can be plotted by this method are practically independent of the vibration of the ship when under way.

(4) The new method, which consists essentially in making the circles on the scale tangent to the circles on the sheet, is remarkably accurate in plotting what would ordinarily be considered a weak fix.

(5) The common error of one or more whole seconds in scaling the tape or calculating the net time can be detected at once by comparison with the dead reckoning position scaled from the boat sheet in terms of units of time.

(6) The work incident to computing the final distances, after the final velocities have been adopted, consists only in applying a percentage correction to the net scaled time on account of the difference between the actual and assumed velocities. This correction in hundredths of a second is readily obtained from a table constructed for that purpose. The saving in office work on this one operation is considerable.

(7) Inasmuch as the plotting scale has on it the correct spacing of the time circles, there is a constant check on the distortion of the sheet. This distortion can be readily corrected for by measuring on the scale from both the center and the outside circle at the same time, and making the proper adjustment when plotting a position. The operation corresponds to scaling from both parallels and meridians when plotting a triangulation station.

PLOTTING SCALE: The plotting scale is made of transparent material (celluloid), and consists of a series of concentric circles

spaced at regular intervals, corresponding to tenths of a sound second, in distance, from zero at the center to five seconds at the outside. Circles representing whole and half seconds can be distinguished from the rest by colors or other characteristic markings.

In making the scale, dividers were set for the distances used as radii for the circles, and the settings tested by marking off diameters on a spare piece of celluloid. This piece of celluloid was then placed over a metric scale and the diameter accurately measured to see if any adjustment was necessary. Using this method of testing the radii before scratching the circles on the scale, no difficulty was experienced in making the scales accurately. A small piece of very thin brass was glued to the celluloid to provide a center that would not enlarge as the circles were being inscribed.

In use, the scale is manipulated until the desired arcs thereon are made tangent to the circles drawn on the sheet. The radius of the arc on the scale in each case equals the residual between the net time to each R A R station and the time circle nearest the bomb position. The scale is subdivided into tenths of sound seconds. The hundredths are easily interpolated.

VELOCITIES: For the purpose of laying down the time circles on the sheet, it was necessary to adopt some base velocity, equal to that value which was found to be correct over the greater portion of the sheet. Since the actual velocities, as determined by tests made in various parts of the sheet, were found to bear a definite relationship to the depth, it was necessary, before plotting pos-

itions on the sheet, to convert each bomb distance into the units for which the time circles were drawn. For example, when the actual velocity is 1485 meters per second and the net scaled time 40 seconds, the distance in sound seconds must be multiplied by the ratio 1485:1481, before plotting on this sheet, on which the time circles are drawn for a base velocity of 1481 meters per second. This conversion amounts to applying a percentage correction to the net times as scaled from the chronograph tapes. The amount of the correction is readily obtained from a table constructed for that purpose. In the above case 0.11 sec. would be added to the net time scaled from the chronograph tape. Incidentally, this operation corresponds to the computing of the final distances and requires only a small fraction of the time necessary with the old method.

The following tabulation gives the velocities used on sheet No. 121:

| Depth in fathoms | Velocity in meters / sec. |
|---|---|
| 0-300 | 1480 |
| 300-1000 | 1479 |
| 1000-2000 | 1478 |

The table of corrections, a copy of which is included in this report, gives corrections in hundredths of a second, to be applied to the net times scaled from the chronograph tapes, to convert from units of actual velocity into units of 1481 meters/sec, for which the circles were drawn. The arguments in the table are act-

ual velocity in meters per second, and net distances in sound seconds as scaled from the chronograph tapes. The corrections are added or subtracted, depending on whether the actual velocity is greater or less than the base velocity used in laying out the time circles.

The following procedure was followed in computing the final distances and entering them in the bomb record: In the columns headed "Velocity of sound in meters per second" are shown both the assumed velocity, in this case 1481, and the actual velocity as determined from tests. The column headed "Distance in meters" has been changed to read "Distance in units of 1481 meters each". In this division, in the column headed "Assumed", appears the net scaled times, and underneath, the correction on account of the difference between the actual and base velocities. In the column headed "final" is the distance in units of 1481 meters each. These are the distances used in plotting the smooth sheet.

At times, when the bomb signals did not come in strongly enough to trip the relay at the shore stations, the operators would be instructed to listen for the bomb signal and trip the relay by hand. Tests were made frequently to determine the lag between the "hand and ear" of each shore station operator, and the correction so determined applied to the scaled time to get the net distance. This correction was 0.33 second for Darton, the operator at Haven, and 0.25 second for Allam, the operator at Duncan.

The method of determining the velocities for the area covered by this sheet is fully covered in a special report on velocities accompanying this season's descriptive reports.

DISCREPANCIES BETWEEN BOAT AND SMOOTH SHEET: There are slight discrepancies between the positions plotted on the boat sheet and the corresponding positions plotted on the smooth sheet. These differences are due to the fact that a constant velocity was assumed in determining the bomb distances for plotting on the boat sheet, whereas the actual velocities were used in getting the smooth sheet distances.

The differences between the soundings on the two sheets is due to the fact that velocity corrections applied to the soundings on the boat sheet were determined from the table used during the previous season, whereas smooth sheet soundings result from velocity corrections based on the current season's velocity tests. Slope corrections were applied to soundings before plotting on the smooth sheet but not before plotting on the boat sheet.

JUNCTION AND COMPARISON WITH PREVIOUS SURVEYS: A satisfactory junction was made with sheet no. 4136, surveyed by the party on the Ship LYDONIA in 1921, to the northward of this sheet. Near the junction of the two sheets, the soundings on sheet no. 4136 were transferred to the boat sheet, and additional sounding lines run between them, both to verify the old sounding and to furnish additional information to locate the depth curves accurately.

CROSSINGS: The average of 19 red light crossings on this sheet is 24 fathoms, with a maximum of 7 fathoms.

The average of 106 white light crossings on this sheet is 12.4 fathoms, with a maximum of 70 fathoms. There was only one crossing of more than 50 fathoms.

In each case where there was a large discrepancy, the correct sounding was indicated on the smooth sheet.

SHOALS: There are no shoals in the area covered by this sheet.

ANCHORAGES: There are no anchorages in the area covered by this sheet.

LANDMARKS: The landmarks within the area of this sheet are listed on form 567, attached to this report.

Herman Odessey

Herman Odessey,
H. & G. Engineer,
U. S. C. & G. S. S. DISCOVERER.

Approved and forwarded:

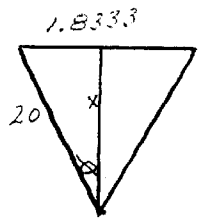
F. B. T. Siems

F. B. T. Siems,
Chief of Party,
Commanding DISCOVERER.

## OSCILLATOR AND HYDROPHONE LOCATION

The distance between the location of the oscillator and hydrophone, which was used in obtaining red light soundings, was 22 feet. The altitude of the isosceles triangle produced by the sound traveling from the oscillator to the bottom and hence to the hydrophone would be the correct depth while the fathometer reading would be equal to the sides of the triangle. In the solution for the altitude of the triangle for various depths obtained by the fathometer, it was determined that the difference between the altitude (correct depth) and the fathometer reading was so small that no correction need be applied to the soundings.

With the white light method the distance between the location of the oscillator and hydrophone was 6 feet. In considering the correction to soundings due to the ships run, it was determined that for the maximum depth obtained that no correction was necessary. The ships run in this instance is used as the base of the isosceles triangle and the computation would be the same as mentioned above.




22 ft. distance between hydrophone and oscillator (redlight)

$\sin \theta = \frac{1.8333}{20} = .09166$

$\theta = 5^{\circ}-15'.37$ or 22'

$\tan \theta = .0920 = \frac{1.8333}{x}$

$x = \frac{1.8333}{.0920} = 19.92$

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WHITE LIGHT (Tuned)

6 ft. = distance hydrophone and oscillator -- no correction for such distance.

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For ships run - - 10 knots or 14.6'/ seconds. Maximum depth during season 2130 fathoms 800 fms./ sec./ fath. calibrated.

2130 x 2 = 4260 fms. sound travels thru.

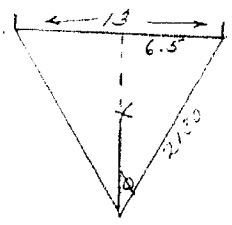
$\frac{4260}{800} = 5.325$ sec. of time

14.6 x 5.325 = 77.7 ft. ship runs. 13 fms. approx.

$\sin \theta = \frac{6.5}{2130} = .00305$

$\theta$ = 15' approx.

tan $\theta$ = same.



CORRECTIONS ON ACCOUNT OF DIFFERENCE BETWEEN BASE AND ACTUAL VELOCITIES.
FOR BASE VELOCITY OF 1481 METERS PER SECOND.

| Net Time in Seconds | Actual Velocity in Meters Per Second. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1482<br>1480 | 1483<br>1479 | 1484<br>1478 | 1485 | 1486 | 1487 | 1488 | 1489 | 1490 |
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| 2 | | | | | 0.01 | 0.01 | 0.01 | | |
| 3 | | | .01 | .01 | | | | .02 | .02 |
| 4 | | .01 | | | | .02 | .02 | | |
| 5 | | | | | .02 | | | .03 | .03 |
| 6 | | | | .02 | | | .03 | | .04 |
| 7 | | | | | | .03 | | .04 | |
| 8 | .01 | | .02 | | .03 | | .04 | | .05 |
| 9 | | | | | | .04 | | .05 | |
| 10 | | | | .03 | | | .05 | | .06 |
| 11 | | | | | .04 | | | .06 | .07 |
| 12 | | .02 | | | | .05 | .06 | | |
| 13 | | | .03 | .04 | | | | .07 | .08 |
| 14 | | | | | .05 | .06 | .07 | .08 | .09 |
| 15 | | | | | | | | | |
| 16 | | | | | | | .08 | .09 | .10 |
| 17 | | | | .05 | .06 | .07 | | | |
| 18 | | | .04 | | | | .09 | .10 | .11 |
| 19 | | .03 | | | | .08 | | | .12 |
| 20 | | | | | .07 | | | .11 | |
| 21 | | | | .06 | | .09 | .10 | | .13 |
| 22 | | | | | | | | .12 | |
| 23 | .02 | | .05 | | .08 | | .11 | | .14 |
| 24 | | | | | | .10 | | .13 | .15 |
| 25 | | | | .07 | | | .12 | .14 | |
| 26 | | | | | .09 | .11 | | | .16 |
| 27 | | .04 | | | | | .13 | .15 | |
| 28 | | | .06 | .08 | | | | | .17 |
| 29 | | | | | .10 | .12 | .14 | .16 | .18 |
| 30 | | | | | | | | | |
| 31 | | | | | | .13 | .15 | .17 | .19 |
| 32 | | | | .09 | .11 | | | | |
| 33 | | | .07 | | | | .16 | .18 | .20 |
| 34 | | .05 | | | | .14 | | | .21 |
| 35 | | | | | .12 | | .17 | .19 | |
| 36 | | | | | | .15 | | | .22 |
| 37 | | | | .10 | | | | .20 | |
| 38 | .03 | | .08 | | .13 | | .18 | .21 | .23 |
| 39 | | | | .11 | | .16 | | | .24 |
| 40 | | | | | .14 | | .19 | .22 | |
| 41 | | | | | | .17 | | | .25 |
| 42 | | .06 | .09 | | | | .20 | .23 | .26 |
| 43 | | | | .12 | .15 | | | | |
| 44 | | | | | | .18 | .21 | .24 | .27 |
| 45 | | | | | | | | | |
| 46 | | | | | .16 | .19 | .22 | .25 | .28 |
| 47 | | | .10 | .13 | | | | | .29 |

CORRECTIONS ON ACCOUNT OF DIFFERENCE BETWEEN BASE AND ACTUAL VELOCITIES.
FOR BASE VELOCITY OF 1481 METERS PER SECOND.

| Net Time in Seconds | Actual Velocity in Meters Per Second. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1482<br>1480 | 1483<br>1479 | 1484<br>1478 | 1485 | 1486 | 1487 | 1488 | 1489 | 1490 |
| 48 | | | .10 | .13 | | | .23 | .26 | |
| 49 | | .07 | | | .17 | .20 | | | .30 |
| 50 | | | | .14 | | | .24 | .27 | |
| 51 | .03 | .07 | .10 | .14 | .17 | .21 | .24 | .28 | .31 |
| 52 | | | .11 | | .18 | | .25 | | .32 |
| 53 | .04 | | | | | | | .29 | |
| 54 | | | | .15 | | .22 | .26 | | .33 |
| 55 | | | | | .19 | | | .30 | |
| 56 | | .08 | | | | .23 | | | .34 |
| 57 | | | .12 | | | | .27 | .31 | .35 |
| 58 | | | | .16 | .20 | | | | |
| 59 | | | | | | .24 | .28 | .32 | .36 |
| 60 | | | | | | | | | |
| 61 | | | | | .21 | .25 | .29 | .33 | .37 |
| 62 | | | .13 | .17 | | | | | .38 |
| 63 | | .09 | | | | .26 | .30 | .34 | |
| 64 | | | | | .22 | | | | .39 |
| 65 | | | | .18 | | | .31 | .35 | .40 |
| 66 | | | | | | .27 | | | |
| 67 | .05 | | .14 | | .23 | | .32 | .36 | .41 |
| 68 | | | | | | .28 | | | |
| 69 | | | | .19 | | | .33 | .37 | .42 |
| 70 | | | | | .24 | | | .38 | .43 |
| 71 | | .10 | | | | .29 | .34 | | |
| 72 | | | .15 | | | | | .39 | .44 |
| 73 | | | | .20 | .25 | .30 | .35 | | |
| 74 | | | | | | | | .40 | .45 |
| 75 | | | | | | | | .41 | .46 |
| 76 | | | | .21 | .26 | .31 | .36 | | |
| 77 | | | .15 | | | | | .42 | .47 |
| 78 | | .11 | | | | .32 | .37 | | |
| 79 | | | | | .27 | | | .43 | .48 |
| 80 | | | | .22 | | | .38 | | .49 |
| 81 | | | | | | .33 | | .44 | |
| 82 | | | .17 | | .28 | | .39 | | .50 |
| 83 | .06 | | | | | .34 | | .45 | .51 |
| 84 | | | | .23 | | | .40 | | |
| 85 | | | | | .29 | | | .46 | .52 |
| 86 | | .12 | | | | .35 | .41 | | |
| 87 | | | .19 | | | | | .47 | .53 |
| 88 | | | | .24 | .30 | .36 | .42 | .48 | |
| 89 | | | | | | | | | .54 |
| 90 | | | | | | | .43 | .49 | .55 |
| 91 | | | | .25 | .31 | .37 | | | |
| 92 | | | .19 | | | | | .50 | .56 |
| 93 | | .13 | | | | .38 | .44 | | .57 |
| 94 | | | | | .32 | | | .51 | |
| 95 | | | | .26 | | | .45 | | .58 |
| 96 | | | | | | .39 | | .52 | |
| 97 | | | .20 | | .33 | | .46 | | .59 |
| 98 | | | | | | .40 | | .53 | .60 |
| 99 | | | | .27 | | | .47 | | |
| 100 | | .14 | | | .34 | .41 | | .54 | .61 |

TIDAL NOTE - - - - SHEET 121.

Portable automatic tide gauge No. 133 at Mendocino Bay, California, in latitude 39° 18', longitude 123° 48', was used in reducing the soundings on this sheet. The Director's letter of January 3, 1930 permits this gauge to be used without correction. The tabulations for lowest and highest tides observed have not been made.

STATISTICS, SHEET NO. 121

| DATE 1929 | LETTER | STAT. MI. SDG. LINES | SOUNDINGS | POSITIONS |
|---|---|---|---|---|
| MAY | | | | |
| 21 | A | 122.5 | 274 | 44 |
| 22 | B | 145.9 | 239 | 52 |
| 29 | C | 113.5 | 424 | 57 |
| 30 | D | 134.9 | 486 | 62 |
| 31 | E | 169.6 | 255 | 61 |
| JUNE | | | | |
| 1 | F | 172.0 | 292 | 78 |
| 2 | G | 135.0 | 208 | 60 |
| 3 | H | 148.6 | 334 | 56 |
| 4 | J | 105.2 | 392 | 49 |
| 5 | K | 61.6 | 179 | 16 |
| 7 | L | 163.0 | 225 | 47 |
| 17 | M | 31.0 | 148 | 35 |
| 18 | N | 167.72 | 283 | 58 |
| 19 | P | 136.11 | 196 | 43 |
| | TOTALS | 1806.63 | 3935 | 718 |

APPROVAL OF CHIEF OF PARTY

Sheet number 121 and records accompanying have been inspected and approved by me. The field work was done under the supervision of Captain, F. G. Engle. The office work was done under my supervision. No additional work is considered necessary.

F. B. T. Siems,
H. & G. Engineer,
Commanding.

ecm

(FOR THE FILES OF THE FIELD RECORDS SECTION)

April 26, 1930.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
4 volumes of sounding records for

HYDROGRAPHIC SHEET 4991

Locality: California (Shelter Cove to Saddle Point)

Chief of Party: F. G. Engle in 1939
Plane of reference is
1.6 ft. on tide staff at mean lower low water, reading
ft. below B. M. Mendocino City.

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

H. A. Marmer
Chief, Division of Tides and Currents.

# Section of Field Records

## Report on Hydrographic Sheet No. H-4991

March - 1931.

Surveyed in - May & June 1929.
Chief of Party - F.G. Engle
Surveyed By - F.G. Engle
Protracted by - F.B.T. Siems
Soundings plotted by - C. J. Wagner
Verified & Inked by - W. H. Bamford

1./ The records were found to conform to the requirements of the General Instructions for Field Work except that numerous mistakes were found in the sounding volumes in the reduced soundings.

2./ The plotting of the positions was fine, only 2.5 % of the positions checked, being changed.

3./ The spacing of soundings was excellent throughout the sheet.

4/ The sounding line crossings were found to be adequate

5/ Approximately in Latitude 39°-53' and Longitude 125°-03' a submarine valley exists. The development of this valley is not as complete as could be desired

6/ It was possible to draw the usual depth curves.

7/ The sheet was fairly clean - and the work was found to be legible.

8. The field plotting was completed to the extent prescribed in the Hydrographic Manual.

9/ When fathometer readings were taken simultaneously, by two or more observers, the mean reading was plotted on this sheet.

Notes reccomending use of mean soundings at crossings were disregarded. If both soundings could not be plotted - the shoalest sounding was plotted and the other mitted.

Numerous gaps were found to exist in the sounding lines. The maximum distance between soundings being approximately five (5) nautical miles -

The work on "Q" day between positions 60 and 120 seems to be somewhat shoal. The crossings with lines run on other days are poor, disagreeing from thirty (30) to sixty (60) fathoms. As the positions on Q day are located by one bomb distance and one visual angle, they are well fixed and therefore it was not thought advisable to question the soundings. The

disagreement probably lies in the reading of the white light of the fathometer.

A B C D E and F day - pos 1-66 incl. and N day pos. 13-58 incl. were plotted using the slope corrections as applied in the records, except where the slope correction was 10 fathoms or more - then the rules stated in Special Publication #165 (Slope Corrections for Echo Soundings) were applied. The balance of the work on this sheet was plotted without the use of slope corrections except as to comply with rules stated in Special Publication #165

10./ The junctions with the adjacent sheets were found to be satisfactory.

Respectfully Submitted.

Warren H Bamford

Section of Field Records
Review of Hydrographic Sheet No. 4991
Point Cabrillo to Point Delgada, Northern California.
Surveyed in 1929.
Instructions dated March 25, 1929 (Discoverer)
Chief of Party - F. G. Engle.
Surveyed by F. G. Engle.
Protracted by F. B. T. Siems.
Soundings plotted by C. J. Wagner.
Verified and inked by W. H. Bamford.

1. The records in general conform to the requirements in the Instructions for Field Work. This is fathometer work controlled by R. A. R. positions. A departure from former methods was the use of time arcs instead of distance arcs.

2. Specific Instructions. The Instructions called for the supplementing of a previous season's work that had been done mainly by dead reckoning methods. The present seasons work fills in the gaps but does not give sufficient information to warrant a readjustment of the previous work.

3. Soundings. The soundings are mostly controlled by R. A. R. positions. The crossings are good to fair, in most cases both depths at the crossings are shown on the sheet. In latitude 39°16'.5 longitude 124°12' there are two soundings, 692 and 677, in an area having approximately a depth of 620 fathoms. As the reading of the fathometer was checked at the time they were not rejected but they should not be used on the chart. About 3 miles northwest of these two soundings there is a 569 sounding in much deeper area, the reading of fathometer was not functioning properly and this sounding should not be used on the charts unless confirmed by some future investigation. Depths curves can be drawn satisfactorily. A few irregularities show up in intermediate curves probably due to the two different methods of position locations employed in the surveying. See Par. 2. The 1000 fathom curve has a rather mechanical appearance in several places but as it has already been used in the published chart 5602 the writer did not make any changes in this curve.

4. The junction with H. 4992 to the south and with the inshore hydrography is satisfactory.

The north half of the sheet supplements the work on H. 4136 surveyed in 1919 to 1921. Where the work on the earlier survey was controlled by 3 point fixes the agreement is fair. In latitude 40°03' longitude 124°30' a sounding of 573, introduces an irregularity into the 500 fathom curve that looks improbable. In latitude 39°44' longitude 124°57' a sounding of 1114 located by a rather weak fix on mountain peaks shows a discrepancy of approximately 150 fathoms. These two soundings are the exceptions.

In soundings located by D. R. the discrepancy varies between -76 and + 50, the later survey generally showing the deeper soundings. The curves as inked on H. 4991 are based on the combined hydrography. These curves should be used in preference to those drawn on H. 4136.

5. Recommendations.- No further surveys are deemed necessary. In the overlapping area, the surveys are supplementary but the later survey (H. 4991) should be given preference in compiling the charts.

6. Reviewed by A. L. Shallowitz and R. J. Christman, April 1932.

Approved: A. M. Sobieralski, (Signed)
Chief Field Records Section.

Chief Section Field Work.

Form 537

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

REG. NO. 4991

# 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. 121

REGISTER NO. 4991

State California

General locality Offshore, ~~south of Cape Mendocino~~ Cape Vizcaino

Locality ~~Shelter Cove to~~ Point Cabrillo to Pt. Delgada

Scale 1:120,000 Date of survey May 21 to June 19, 1929

Vessel U. S. C. & G. S. Str. DISCOVERER

Chief of Party F. G. Engle

Surveyed by F. G. Engle

Protracted by F. B. T. Siems

Soundings penciled by C. J. Wagner

Soundings in fathoms ~~feet~~

Plane of reference Mean lower low water

Subdivision of wire dragged areas by None.

Inked by Warren H. Bamford

Verified by WHB.

Instructions dated March 25, 1929.

Remarks:

U. S. GOVERNMENT PRINTING OFFICE

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 4991

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

| | |
|---|---|
| Number of positions on sheet | 718 |
| Number of positions checked | 367 |
| Number of positions revised | 9 |
| Number of soundings recorded | 3935 |
| Number of soundings revised | 206 |
| Number of signals erroneously plotted or transferred | NONE |

Date: March 21 - 1931

Cartographer: C. Warren H. Bamford