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4987

Diag. Ch. No. 5502-2

Form 504 Ed. June, 1928 DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY <i>R.S. Patton</i> , Director	
<div style="border: 1px solid black; padding: 2px;"> C. & G. SURVEY L APR 11 1930 Acc. No. </div>	
State: <u>CALIFORNIA</u>	
DESCRIPTIVE REPORT	
Topographic Hydrographic	Sheet No. 43 4987
LOCALITY Pt. Arena POINT ARENA TO ROBINSON POINT Horse shoe Pt. to Pt. Arena NORTHERN COAST	
<hr/> 19.29. <hr/>	
CHIEF OF PARTY <u>F.B.T. Siems, H. & G. Engr.</u> Commanding	

4987

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REG. NO. 4987

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. 43

REGISTER NO. 4987

State California

General locality Pt. Arena to Robinson Point

Locality Horseshoe Pt. to Pt. Arena
~~Northern Coast~~

Scale 1-40,000 Date of survey Aug. 13 to Nov. 14, 19 29

Vessel DISCOVERER

Chief of Party F. B. T. Siems

Surveyed by F. B. T. Siems

Protracted by Curtis Le Fever

Soundings penciled by P. L. Bernstein

Soundings in fathoms ~~333~~

Plane of reference Mean lower low water

Subdivision of wire dragged areas by _____

Inked by _____

Verified by _____

Instructions dated March 25, 19 29

Remarks: _____

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET # 43

Scale 1 - 40,000

Coast of Northern California
Point Arena to Horseshoe Point

Instructions dated March 25, 1929

U.S.S. DISCOVERER

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

LIMITS:

The hydrography on this sheet extends from a junction with sheet No. 42 on the north, approximate latitude $38^{\circ} 54'$ to a junction with sheet No. 44 on the south, approximate latitude $38^{\circ} 29'$. It is joined on the east by launch sheet No. 25. Launch sheet No. 25 extends from Point Arena south to Robinson Point. South of Robinson Point there is a narrow strip of water from the eastern limits of this sheet to the surf line which has not been surveyed. This sheet is joined on the west by sheets 122 & ~~123~~. * There is an area between sheets 122 & 123 and this sheet, which is not surveyed but will probably be completed by the party taking over the work in this area. The western limit of sheet No. 43 is an approximate line drawn from a point latitude $38^{\circ} 54'$, longitude $123^{\circ} 58'$ to a point in latitude $38^{\circ} 26'$, longitude $133^{\circ} 36'$.

CONTROL:

The control for this survey is the original triangulation. Most all of the triangulation stations along the western edge of the old scheme were recovered and re-marked by the personnel of the DISCOVERER in 1929.

METHODS:

From the inshore limits of the sheet to the limits of visibility the regular method of sextant angles taken between points was used for obtaining the location. The objects observed on shore were large whitewashed tripods constructed over the recovered triangulation stations along the coast. It was necessary to use objects cut in from the ship for fixes in a few instances.

From the limits of visibility westward to the limits of the sheet radio acoustic ranging was used for determining the position of the ship on the sounding line. The same two locations were used for the R.A.R. shore stations for the entire sheet. The most northerly station was at Havens Neck. A hydrophone, No. 1, was used at this station the location of which was latitude $38^{\circ} 47' 32.04''$ 988 meters,

* See page 6

longitude $123^{\circ} 25' 18.85''$ 445 meters. On November 13th it was necessary to drop a second hydrophone numbered 2 at this station. The location of No.2 was slightly different from that of No.1. Its location was latitude $38^{\circ} 47' 31.29''$ 965 meters, longitude $123^{\circ} 35' 18.23''$ 440 meters. Hydrophone No.2 was used on November 14th, the last days work on this sheet. On September 21st in making velocity tests a lag of 0.17 of a second was first noted in this station. This lag was removed October 14th by adjustments made at the station. All positions on this sheet determined previous to October 14th were corrected for this lag before they were plotted. The south R.A.R. shore station was at Duncans Landing. There was both a hydrophone and a magneto phone installed at this station both having the same position. This position was latitude $38^{\circ} 23' 21.70''$ 669 meters, longitude $123^{\circ} 05' 49.70''$ 1206 meters.

The method of obtaining soundings on this sheet was by the fathometer. The red light method was used in all depths where possible. In most cases in depths 200 fathoms or more it was necessary to use the white light method.

Vertical wire casts were taken to check the fathometer soundings and to obtain bottom specimens. At the same time water samples were taken to determine the salinity and serial temperatures were taken to aid in the determination of the velocity of sound in salt water. The ^{sa}slaves were tested before and after the season. The results are entered on page No.4 of sounding volume No.1 for this sheet. The corrections in each case are less than 1 percent.

VELOCITY:

The base velocity and actual velocity of sound in salt water for this sheet were determined to be 1490 meters per second. *No corrections were therefore necessary to be applied to observed elapsed times*

VELOCITY CORRECTIONS:

A constant correction for the fathometer red light was applied in addition to the temperature correction. It was arrived at by tabulating comparative readings, applying the temperature correction to the fathometer sounding and taking a mean of the differences. This correction was determined as -0.6 fathoms. A list of corrections to red light soundings is included in this report.

A table of velocity corrections to white light soundings is also included in this report.

SLOPE CORRECTIONS:

No slope corrections were made on this sheet.

LAND MARKS:

No land marks were noted in this area.

COMPARISON WITH OTHER SURVEYS OF THIS AREA:

There were no previous surveys in this area. *H. 2221 is in this area*

The junction of the inshore limits of this sheet with the launch hydrography was compared by plotting all launch soundings on this sheet in blue which fell within the area surveyed by the ship.

* *The base velocity is the velocity on which the time circles on smooth sheet are based*

DISCREPENCIES:

Slight differences in the bomb positions on the boat sheet and smooth sheet are due to either different velocities being used on the two sheets or to the 0.17 lag correction for Haven hydrophone not being applied on the boat sheet.

In plotting the soundings from the launch sheets joining this sheet on the east there is a discrepancy between the wire soundings taken by the launch and the fathometer soundings taken by the ship. This discrepancy is on two ship sounding lines and is 4 to 5 fathoms. The depths in these areas are between 20 and 30 fathoms. At times in this depth the fathometer soundings were not satisfactory. Two flashes appeared on the dial 4 or 5 meters apart and it was difficult to determine which was the correct sounding. The soundings between 23 and 32 C and 1 to 14 H of the ship work are rejected for this reason. The average error in line crossings is much under 1 fathom. There is a discrepancy in a crossing between 23-K and 24-K of five fathoms, in depths of 109 to 115 fms.

The discrepancy in crossing with 23K + 24K was corrected by replotting
PLOTTING: *adys. bet. nos. 3S + 4S. Field plotting apparently in error.*

In plotting the R.A.R. positions time circles were drawn on the sheet rather than distance circles. From Haven hydrophone radial lines were drawn west and south. Positions were computed on these lines for every 5 seconds of time using the velocity of 1490 meters per second. These 5 second intervals were divided into 5 equal parts. Circles were constructed using Haven hydrophone as center and passing through these points. This made a circle for every 1490 meters from the station. These circles were drawn only where they fell inside the area surveyed by the R.A.R. method.

From Duncan hydrophone two azimuths were selected 30° apart and radial lines drawn from the station in these directions. These azimuths were selected so they pass through the center of the work on this sheet. Points at 5 second intervals were computed on these lines and these intervals were divided into 5 equal parts the same as for the other station. Circles were drawn around Duncan the same as for Haven. The difference in positions of hydrophones No. s 1 & 2 at Haven was so slight that the work for Nov. 14 was plotted using hydrophone No. 1 as center.

LOG:

Difficulties were experienced in trying to check the run by patent log with the time between fixes. In plotting, the time between positions was always favored. The logs have been returned to the office for inspection.

SHOALS:

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

CORRECTIONS TO FATHOMETER SOUNDINGS:

RED LIGHT

Depth fms.	Temp. correction for max. depth fms.	Initial correction fms.	Total correction fms.	Correction used fms.
0 - 15	+ 0.3	-0.6	-0.3	- $\frac{1}{2}$
15 - 45	+ 0.8	-0.6	+0.2	0

45 - 75	- 1.3	-0.6	-0.7	- $\frac{1}{2}$
75 - 125	- 2.0	-0.6	-1.4	- 1
125 - 250	- 3.2	-0.6	-2.6	- 2
250 - 375	- 4.3	-0.6	-3.7	- 3
375 - 450	- 4.5	-0.6	-3.9	- 4

WHITE LIGHT

Depth fms.	Correction fms.
100 - 200	-2
200 - 340	-3
340 - 440	-4

ADDITIONAL DISCREPENCIES

The small shoal area of 18 fathoms, 55e, latitude 38° 56.5' longitude 134° 45.3' obtained on sheet 24 was not picked up by the fathometer on sheet 43, positions 4 to 5 D. If it was it might have been considered as a stray. H.4985

Some of the soundings on sheet 43, line 3D to 4D do agree with hand machine soundings on line rerun on sheet 24, 46e to 55e. The fathometer soundings should be rejected and the hand machine soundings accepted as the fathometer did not function entirely satisfactory at that time. *

** evidently meant don't* Q

Curtis Le Fever
Curtis Le Fever
Ensign, C. & G. Survey.

Approved and forwarded:

F. B. T. Siems

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

TIDAL NOTE:

Auto portable tide gauge number 211 at Arena Cove, latitude 38° 55', longitude 123° 43' was used to reduce the soundings on this sheet.

STATISTICS, SHEET NO. 43.

DATE	LETTER	VOL.	POSITION	VERTICLE	SOUNDINGS		TOTAL	MILES
					CAST	Fth. Fth.		
1929					R.L.	W.L.		
Aug. 13	A	1	72	0	540		540	46.0
14	B	1	179	1	1344		1345	124.5
15	C	2	74	0	524		524	42.0
21	D	2	139	0	871		871	80.0
27	E	2	100	0	729		729	72.0
27	E	3	52	0	440		440	42.9
Sept 21	F	3	122	3	813		816	67.4
22	G	3	61	2	515		517	84.6
23	H	4	110	11	774		785	72.0
24	J	4	10	0	45	7	52	11.8
25	K	4	46	2	332	17	351	76.0
26	L	4	26	0	153	15	168	48.3
Oct. 4	M	4	5	0	30	5	35	7.3
6	N	4	14	0	121	0	121	24.2
7	P	4	31	5	146	0	151	16.0
7	P	5	15	0	113	0	113	28.0
17	Q	5	31	0	179	0	179	22.0
18	R	5	115	15	501	6	522	78.0
23	S	5	25	2	151	0	193	41.3
24	T	5	53	3	327	8	338	82.3
29	U	5	26	0	144	0	144	18.0
Nov. 12	V	5	4	0	25	0	25	2.3
14	W	6	31	0	254	0	254	51.7
		Total	1338	44	9111	58	9203	1138.6

Position designations on smooth sheet:

Positions dependent on two distances from R*A*R stations are shown by a blue dot and blue position number.

Positions dependent on one distance from R-A-R station are shown by an arc colored to correspond to respective time circle and also by a blue position number.

Positions dependent on visual fix are shown by a red dot and red position number.

Positions dependent on dead reckoning are shown by a green dot and green position number.

APPROVAL OF CHIEF OF PARTY

Sheet number 43 and accompanying records have been inspected and approved by me. Both the field and office work were done under my supervision. The unfinished lines of soundings indicated in red on both the smooth sheet and boat sheet constitute visual work. The party waited for clear weather for nearly three months to do this work. Information received from officers familiar with the climate was to the effect that favorable seeing conditions would be had during October and November, after the end of the dry season in California. The unprecedented prolonged dry season accompanied by haze and forest fire smoke, however lasted to December.

On the off-shore unfinished lines the following fix can be conveniently used after 10 A.M. Cone, High Bluff, & Point Arena Light House, necessitating the rebuilding of one signal, or the sun may be used with simply stations Cone and Point Arena Light House. Station Cone should be definitely identified.

As there is little change in the tide along various parts of this coast, the tidal station established for the work south of this sheet could be used for the reducing of soundings.

It is recommended that the boat sheet and a copy of this note concerning fixes and tides be furnished the party assigned to complete this work.

Unfinished areas at the southern limits of this sheet are also indicated on the smooth sheet and boat sheet.



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

Section of Field Records.

April 23, 1930.

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in
6 volumes of sounding records for

HYDROGRAPHIC SHEET 4987

Locality: California (Vicinity of Qualala)

Chief of Party: F. B. T. Siems, in 1929
Plane of reference is mean lower low water, reading
0.0 ft. on tide staff at Point Arena
ft. below B. M.

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.

Paul Schureman
Acting Chief, Division of Tides and Currents.

Section of Field Records
Report on Hydrographic Sheet No. 4987.
Horseshoe Pt. to Pt. Arena, California.
Surveyed in 1929.
Instructions dated March 25, 1929 (Discoverer).

Chief of Party - F. B. T. Siems.
Surveyed by F. B. T. Siems.
Protracted by C. Le Fever.
Soundings plotted by P. L. Bernstein.
Verified and inked by G. Risegari.

1. The records conform to and the plan and character of development fulfill the requirements of the General Instructions.

Exceptions: Failure to note in records the rejections made by the field party as per Descriptive Report on pages 3 and 4, and the reason for the omission of soundings from 71 c to end of C day.

2. The plan and extent of development satisfy the Specific Instructions. Exception: Failure to develop area between lat. $38^{\circ}46'$ and $38^{\circ}50'$ and approximate long. $123^{\circ}50'$ in the vicinity of the 100 fathom curve. The soundings from the adjoining contemporary work (H.4992), however, appear sufficient in number to show in a general way that there are no indications of abnormalities in the depths concerning this area.
3. The sounding line crossings are adequate. Exceptions: The area between lat. $38^{\circ}46'$ and lat. $38^{\circ}54'$, vicinity of long. $123^{\circ}48'$ is inadequate. Though there is a lack of crossings in this area, it is believed that the same quality of work exists here, comparing the close agreement of adjacent soundings of this sheet and H. 4992, as well as the excellent crossings shown over the sheet in general.
4. The junction with H. 4985 (N. E.) is satisfactory.
" " " H. 4986 (East) is satisfactory.
" " " H. 4988 (South) is satisfactory.
" " " H. 4993 (S. W.) is not yet completed.
" " " H. 4992 (N. W.) is satisfactory
" " " H. 4990 (North) is satisfactory
5. (a) Attention is called to pages 3 and 4, Descriptive Report, regarding several sections of sounding lines rejected by the field party due to difficulty experienced with the fathometer. The soundings rejected are at the eastern edge of the sheet joining H. 4986 and another sheet not yet received by the Office.
It appears that the fathometer in these cases was working badly and where rejections occur at the junction of H. 4986 the soundings of that sheet sufficiently cover the areas affected.

(b) The field party failed to mention in the Descriptive Report or in the sounding volume, the reason for the omission of 45 soundings from 71c to end of day. By careful replotting and reprotracting it was found that the soundings between pos. 71 and 73c (10 soundings), west of Pt. Arena, long. $123^{\circ}46'$, could be retained and which agreed with 4 percent of other soundings on this sheet and were accepted.

The remaining soundings from pos. 73c to end of day (35 soundings) show bad disagreement with work on this and adjacent sheets using the original angles for pos. 74c. The sounding at this position is 43 fathoms which plots on a 39 fathom sounding, also the location of the plotted position doesn't accord with time and courses as mentioned in the remarks column of the sounding volume.

By changing the left angle from $54^{\circ}12'$ to $45^{\circ}12'$ the plotted position agrees well with log distance, time, courses and the soundings make excellent agreement with adjacent soundings on this sheet and H. 4990.

These soundings have been retained, there being no reason for omitting them as the left angle was evidently erroneous.

(c) Comparison with work on H. 3224 covering this area shows numerous discrepancies with soundings on H. 4987. The work on H. 3224 was plotted on Chart No. 5600, scale 1:200,000, and includes for signals, mountain peaks and shore objects. The sheet itself shows considerable distortion.

Comparison of the bottoms of both sheets shows inconsistent differences. In two areas selected at random, about the 70 fathom depth contour, there were found discrepancies greater by as much as 10 fathoms and lesser by as much as 5 fathoms than the depths of the later survey.

The work on H. 4987 shows very good crossings, of which there are many, and the agreement between the numerous vertical casts and fathometer soundings is very good. The bottom of this survey slopes uniformly and seems to be a characteristic of the bottom as far as the western limit of the sheet.

In view of the fact that the work on H. 4987 is governed by excellent control, whereas that of H. 3224 is weak and the sheet badly distorted that it shows excellent agreement with work of adjacent sheets, that it has good crossings, and shows excellent agreement between vertical casts and fathometer soundings, it is recommended that the work on H. 4987 supersede the work on H. 3224 where it affects the later survey.

(d) A 26 fathom sounding, pos. 23Q, was questioned in the sounding record and plots near lat. 38°44', long. 123°32'. The sounding is at the eastern edge of the sheet and it is probable that the adjacent work will cover this area and should be looked into when that sheet is submitted to the Office.

There are no explanatory notes regarding this sounding (which usually accompany questionable conditions) in the sounding records nor the initials of the party who questioned it.

While it is probable that the sounding is incorrect, yet there is no authority on hand to discredit it, and it is recommended that the sounding be retained.

6. With the exception stated in paragraph 2, the area covered by the survey appears sufficiently surveyed.
7. Attention is called to the note by Chief of Party in Descriptive Report, page 6, regarding several signals and suggestions.
8. Character and scope of surveying - good.
Field drafting - good.

Reviewed by G. Risegari, February 12, 1931.

Inspected: E. P. Ellis.

App.
A. M. Sobieralski