

8416

Dist. Ont. Nos. 5902-2 & 6002-2.

Form 504

U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey **HYDROGRAPHIC**

Field No. **30-2158** Office No. **H-8416**

LOCALITY

State **Washington**

General locality **South of the Columbia River**

Locality **Lat. $46^{\circ}10'00''$ to $46^{\circ}25'00''$**

Long. **$124^{\circ}00'00''$ to $124^{\circ}16'00''$**

1958

CHIEF OF PARTY

Fred Matella

LIBRARY & ARCHIVES

DATE **APR 20 1959**

USCOMM-DC 5087

8416

Larsen

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.

REGISTER NO. H-8416

Field No. BO-2158

State ~~Washington~~ Washington

General locality Mouth of the Columbia River Entrance

Locality North Head to Oceanside
Latitude 46 10'00" to 46 26'00", Long. 124 00'00" to 124 16'00"

Scale 1:20,000 Date of survey 9 June 1958 to 14 Aug. 1958

Instructions dated 14 November 1957

Vessel Coast Survey Ship BORIE and Launch 92 184

Chief of party CDR Fred Natalla

Surveyed by Ship by CDR Fred Natalla, Launch by LTJg Sainsbury

Soundings taken by fathometer, graphic recorder, hand lead, wire 808 J Fathometer

Fathograms scaled by ILP and RFM

Fathograms checked by RL AND RBL

Protracted by ENS James B. Allen

Soundings penciled by ENS James B. Allen

Soundings in ~~XXXXXX~~ feet at MLLW MLLW

REMARKS:

DESCRIPTIVE REPORT
HYDROGRAPHIC SURVEY

H-8416
(BO-2158 & ~~BO-2258~~)

A-PROJECT:

Authority for this project is contained in instructions, Project C.S. 404, Columbia River entrance and estuary, dated 14 November, 1957.

B-SURVEY LIMITS AND DATES:

The Washington Coast Survey, BO-2158, extends from latitude 46 10' 00" N to 46 26' 00" N and from longitude 124 00' 00" to 124 16' 00". This survey was initiated 9 June, 1958 and completed 14 August, 1958.

Survey BO-2258 was started 10 July, 1958 and finished 13 August 1958. This survey covers an area of the northern Oregon Coast from latitude 46 03' 00" N to 46 17' 00" N and from longitude 123 54' 00" to 124 10' 00".

C-VESSELS AND EQUIPMENT:

Coast Survey Ship Bowie and Launch 184 performed the work on sheet BO-2158 while the Ship Bowie and Launch 92 did the work on BO-2258. Survey Ship Bowie was equipped with a five scale 808-J fathometer and a deep sea EDO unit for sounding work. It was also equipped with a shoran position determining unit which was used extensively. Both launches were equipped with standard 808-J sounding units.

D-TIDES AND CURRENTS:

Tide reducers for both of these surveys were obtained from a portable tide gage installed on the Columbia River North Entrance Jetty at approximately 46° 16.40' N latitude and 124° 04.17 longitude. The 0.0 foot mark of the staff coincided with the plane of mean lower low water; therefore, the gage readings were used as obtained for smooth sounding reduction.

Tide reducers applied to the boat sheets were those obtained from the predicted tidal data for Columbia River Entrance, North Jetty. No correctors for time or range difference were applied to either of the sheets.

No current stations were observed.

E-SMOOTH SHEET:

Both smooth sheets were hand ruled by ships base processing personnel. No unusual or substandard methods were employed in either shore line transfer or control plotting.

F-CONTROL STATIONS:

Basic control for these surveys is triangulation that was established in 1873, 1909, 1926, 1935, 1942, 1956, 1957, and 1958. Of the three shoran stations located, two, "NORTH" and "LUCAS", were located by triangulation while the third, "KORN", was located by a short tape traverse from triangulation station "BONNIE", 1926. Supplementary control for visual work was obtained by photogram-metric means or by use of the three point and check angle fix. Photo support was provided by Photo Field Party Number 722. Photo signal locations for sheet BO-2158^{H-8416} are shown on manuscripts 10340, 10344, and 10649 while signal locations for sheet BO-2258^{H-8417} are shown on manuscripts 10344, 10353, 10359, and 10650. Refer to "List of Signals" appended to this report for additional information.

G-SHORELINE:

Boatsheet shoreline for both BO-2158^{H-8416} and 2258^{H-8417} was indirectly obtained by transfer and reduction from 1:10,000 incomplete manuscripts. The sections of inked shoreline found on the smooth sheets were obtained through use of 1:20,000 reproductions of 1:10,000 manuscripts. Those sections of shoreline found in pencil were drawn by means of indirect point transfer from 1:10,000 manuscripts.

H-SOUNDINGS:

Soundings on inshore work were obtained through use of 808 J fathometers equipped with 800 fathom per second reeds. These fathometers were also equipped with an additional "E" scale giving a total sounding range of from 0 to 195 feet or fathoms. When sounding in depths greater than 180 feet the UQW-1B EDO deep sea sounding unit was also employed. Fathometer corrections for ship work were limited to phase corrections (refer to page 22 of this report) an eight foot draft correction which was kept on the initial set of the fathometer. No correction was applied to the "EDO" sounding work. Fathometer corrections for launch units were obtained from bar check data. (refer to page 15 of this report)

^{#57-25}
Bar check data obtained from survey made up river east of Astoria (H8418-19-20). Two bar checks made on H-8416 disregarded, altho 0.5 ft. difference is indicated
Benson

Ship versus launch slogs and H.L. comparisons
warrant a -2.10 ft instrumental corr. to
Ship 808 slogs. RHC 11/9/70 with H-8423

H-SOUNDINGS (2158)

8414

8417

Discrepancies were found on both 2158 and 2258 where ever ship lines crossed launch lines. This error amounts to about three feet with the ship lines being the deeper. Fathograms were re-scanned and correctors for tide and initial checked. Both fathometers appeared to be operating at nearly the correct speed. In checking the initial it was discovered that the NMC striker unit had been used rather than the 808-J keel mounted unit. This means that the draft correction on the initial set should have been seven feet rather than eight feet. Therefore, all ship soundings should be reduced in depth by one foot.

The error is widely spread over the sheet so it would seem unlikely to be control difficulty. Numerous signals were used for visual control.

No checks of ship sounding data are available in the form of bar checks. However, analysis of comparisons between vertical casts and 808 soundings on "F" day (BO-2158) indicated a tendency toward shoaler sounding on the vertical casts than on the fathometer. These results create suspicion of the accuracy of the ship hydrographic field procedures. The lack of field data for correcting ship soundings limits the ability of the smooth plotter to resolve this discrepancy further.

possibly NJ9
according to Hickey

I-CONTROL OF HYDROGRAPHY

All launch hydrography was controlled by means of the visual three-point fix method. Ship hydrography was controlled by the use of both shoran and the visual three-point fix method. A shoran report under separate cover will be submitted along with this report.

J-ADEQUACY OF SURVEY

Both surveys are felt to be complete and adequate. Depth curves make a very good junction at the intersection of the two sheets. The adjacent smooth sheet to the east (WOPF-1958) has already been sent to Washington so no comparison was made.

K-CROSSLINES

Twelve per cent of all hydrography accomplished on sheet BO-2158 was made up of cross lines while ten per cent of sheet BO-2258 consisted of crosslines.

On BO-2158 a number of discrepancies were found due largely to two reasons: (1) The seas were rough throughout the period of the survey, and practically all the fathograms show an extremely jagged profile difficult to interpret. (2) The fathograms had not been properly check-scanned, and as a result most of them had to be re-scanned. Also, discrepancies due to

K-CROSSLINES (CONTINUED)

an undetermined cause exist between ship lines and launch lines, as explained in sec. H.

The following discrepancies were noted:

BO-2158 H-8416	Position	Crossing	Difference	Depth
	1-2B	81-82G	6'	54'
	69K	112-113d	5'	36'
	125-126K	19-20a	4'	39'
	88-89K	12-13b	5'	32'

Discrepancies in crossing inside the 18' curve are due largely to the extremely rough seas and to the uneven profile of the bottom. Line 1-4B is approximately 2' shoal.

BO-2258 H-8417
"G" day (ship) crosses badly with launch work.

L-COMPARISON WITH PRIOR SURVEYS

BO-2158 H-8416
The available prior survey was made in 1926-27 and consists of sheets H-4634, H-4619, and H-4618. The following changes were noted:

- (1) Changes in curves--There has been little change in the 180' and 120' curve. The 60' curve had moved westward in the region from lat. 46° 14.0' to 46° 18.0', reaching a maximum of 0.8 miles at lat. 46° 16'. The 18' curve shifted westward an average of 0.3 miles.
- (2) The present shoreline is generally outside the 1926-27 6' curve. At lat 46° 17.3', the shoreline intersects the 1926 18' curve. Between North Jetty and North Head Lighthouse, the shoreline has moved westward over 0.3 mile, while from the lighthouse north it has moved west an average of 0.25 mile.

BO-2258 H-8417
This sheet was compared to sheets H-4611, H-4634, and H-4635. The following changes were noted:

- (1) Changes in curves--The 60' curve has shifted eastward between lat. 46° 04' and 46° 11'. Maximum shift is approximately 0.6 mile at 46° 11'.
- (2) The shoreline has shifted westward between lat. 46° 03' and 46° 11', reaching a maximum displacement of 0.2 mile at lat. 46° 06.5'. Above lat. 46° 11' the shoreline has shifted slightly to the east.
- (3) The 9 1/4 fathomm shoal area at 46° 10.8', 124° 03.7' and the 10 fathomm shoal at 46° 10.3', 124° 02.9' are not seen on the smooth sheet.
- (4) The 60-66' readings near 46° 14', 124° 06' on the previous survey do not correspond with the 48-50' readings on the smooth sheet.

M-COMPARISON WITH CHARTS

BO-2158 H-8416

Comparison was made with charts 6002 and 6151. The following changes were noted:

- (1) The 120' shoal at lat. $46^{\circ}19.5'N$, long. $124^{\circ}12.8'W$ was not revealed by lines running close by it. Present depth is 150'.
- (2) At the wreck at lat. $46^{\circ}19.7'N$, long. $124^{\circ}09.5'W$, shown to be in 90' of water, the actual depth is now 87'.
- (3) The 9 fathomn shoal at lat. $46^{\circ}20.5'N$, long. $124^{\circ}06.9'W$, once an isolated shoal, is now inside the 10 fathomn curve.

BO-2258 H-8417

Comparison was made with charts 6151 and 5902. Changes are described under section L.

N-DANGERS AND SHOALS

BO-2258 H-8417

The only rocks within the limits of the surveyed area are those in the vicinity and north of Horth Head Lighthouse. They could not be approached by the launch, and could not be accurately located with our copy of the manuscript (T-10344) because it was in poor condition. They should be transferred off a copy of T-10344.

Individual offshore shoals of less than 18' exist at:

- | | | |
|-----|--|---------------|
| (1) | Lat. $46^{\circ}17.3'N$, Long. $124^{\circ}04.35'W$ | --16' |
| (2) | " 18.9' | " 04.7' --17' |
| (3) | " 19.5' | " 04.6' --17' |
| (4) | " 21.3' | " 04.4' --16' |
| (5) | " 22.3' | " 04.0' --18' |
| (6) | " 22.9' | " 04.3' --18' |

A long shoal of less than 18' extends from position (6) above to the northern limit of the sheet. Its minimum depth is 14' at lat. $46^{\circ}23.55'N$, long. $124^{\circ}04.3'W$.

The shoal (108') at lat. $46^{\circ}12.5'$, long. $124^{\circ}10.7'$ was searched for from position 42J to 65J, making a total of 5.3 miles of sounding lines. The shallowest depth found was 140'.

The shoal (59') at lat $46^{\circ}24.3'$, long. $124^{\circ}06.6'$ was not developed. Position line 271-272F passes over it, revealing a depth of 64'.

The 60' shoal at lat. $46^{\circ}19.6'$, long. $124^{\circ}07.3'$ has disappeared.

O-COAST PILOT INFORMATION

Present information is considered adequate.

P-AIDS TO NAVIGATION

BO-2258

H-8423

The adjacent smooth sheet to the north (WCFP 1358) shows the floating aids to navigation in this area.

P-AIDS TO NAVIGATION (CONTINUED)

BO-2158 H 8416

H-8423

The adjacent smooth sheet to the south (WCFP-1358) shows the floating aids to navigation in this area with the exception of bell bouy "1" fl 4 sec, which is located at lat. $46^{\circ}14' 610$ meters N, long. $124^{\circ}09' 870$ meters W. The location is from position 104H. The present charts show all the aids to navigation in the area.

Q-LANDMARKS

Present charts show an adequate selection of landmarks.

R-GEOGRAPHIC NAMES

A report on geographic names will be submitted by the photogrammetric unit working in the area.

S-SILTED AREAS

No silted areas.

STATISTICAL RECORD

FOR

FIELD SHEET NO. 2158

HYDROGRAPHIC SURVEYS

REGISTRY SHEET NO. 2416

SURVEYED BY COM: SHIP BOWIE
 LOCALITY: WASHINGTON COAST

DATE	DAY	POSITIONS		MILES OF SOUNDINGS				NAUT. MILES		NO. BOTTOM SAMP.	
		Vol.	Total	Nautical		Statute		To & From	Misc		
6/9/58	A	1	44		44		15.2				
6/10/58	B	1	230		230		96.0				
	B		99	329		24.0	120.0	25.0	5.0		
6/6/58	C	2		67		25.9		23.0	3.0		
6/25/58	D	2		92		34.0	34.0	27.9	2.0		
6/30/58	E	3	152	152		55.0	55.0	25.0	10.0		
7/1/58	F	3	141			46.2					
	F	4	137	278		50.2	96.4	31.0	24.0	21.0	
7/14/58	G	5		265			75.0	20.0	5.0		
7/15/58	H	6		125			33.0	20.0	5.0		
7/17/58	J	6		79			21.0	0	5.0	11.0	
8/1/58	K	6		129			45.0	20.0	0.0		
8/5/58	L	6		7			474	20.0	3.0	7.0	
				1567							

LIST OF SIGNALS

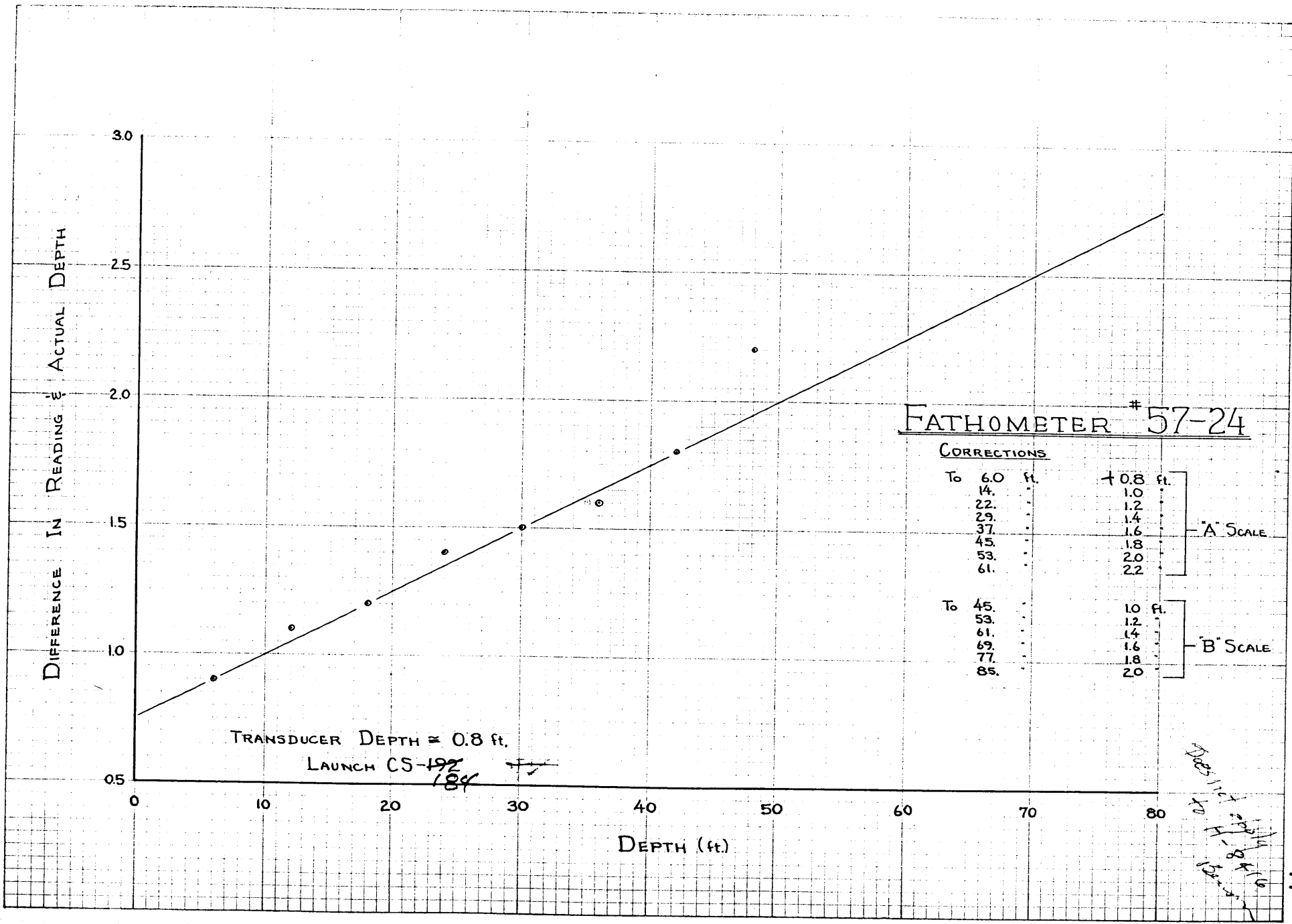
BO-2158 H. 84/6

<u>SIGNAL</u>	<u>TYPE</u>	<u>MANUSCRIPT OR SOURCE</u>
Big	Photo	10340
BONNIE, 1926	Triangulation	10649
Brown	Photo	10649
BURNT, 1956	Triangulation	
<u>CAPE DISAPPOINTMENT</u> <u>LIGHTHOUSE, 1873</u>	Triangulation	
Chim	Photo	10340
Deck	Photo	10340
End	Hydrographic	10649
Flag	Photo	10649 10340
Flat	Photo	10649
Gray	Photo	10649
GREEN, 1926	Triangulation	10649
Man	Hydrographic	
NORTH, 1958 (Shoran)	Triangulation	
NORTH <u>HEAD</u> LIGHT, 1909	Triangulation	
OUTER TANK, 1942	Triangulation	
Pink	Photo	10340
Red	Photo	10649
<u>DRIFT</u> 2, R. M. 2, 1956	Triangulation	
Roc	Photo	
Tank	Photo	10340
TIOGA, 1926	Triangulation	10340
Top	Photo	10340

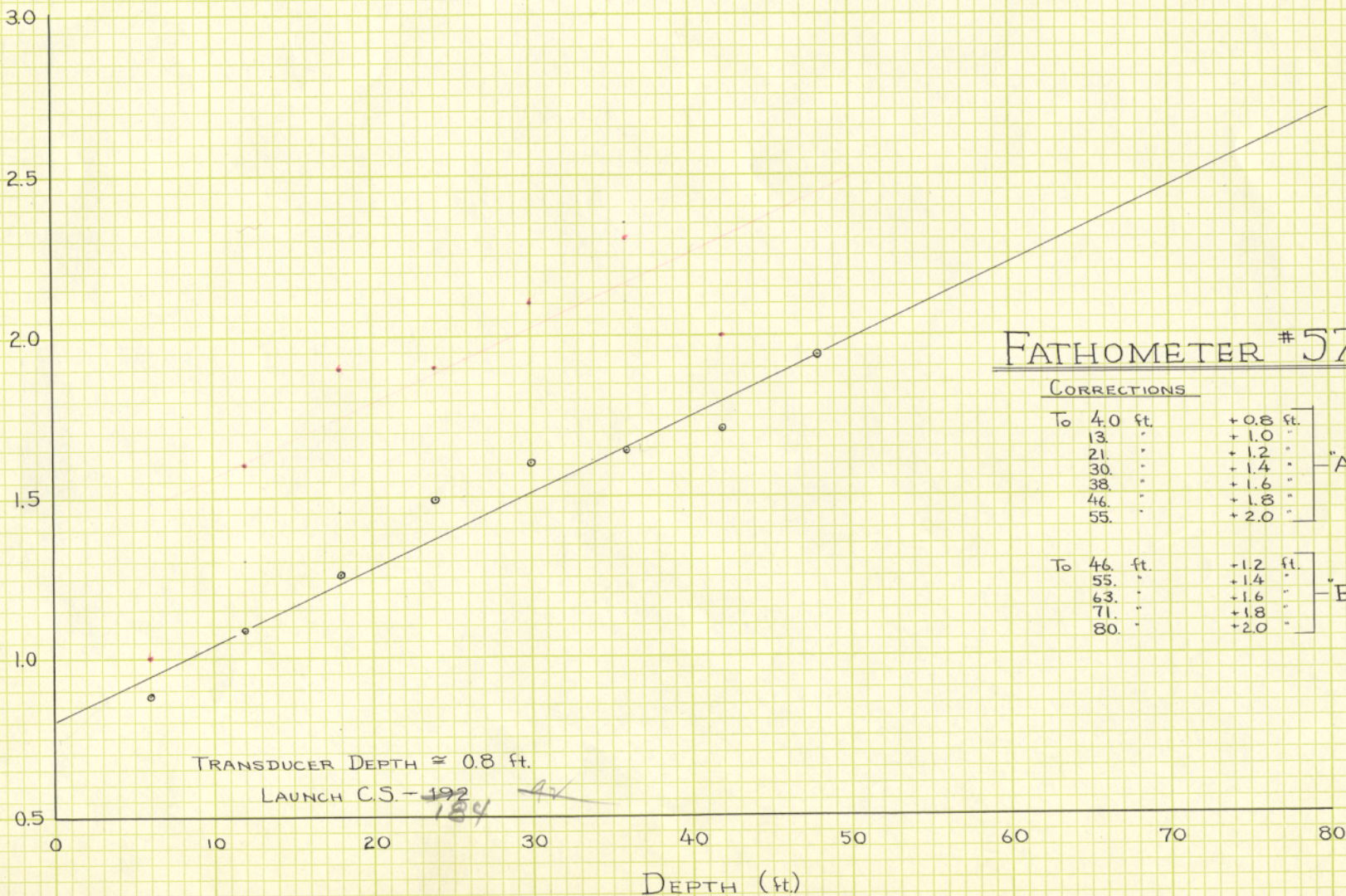
4-8416

LIST OF SIGNALS, BO-2158 (CONTINUED)

<u>SIGNAL</u>	<u>TYPE</u>	<u>MANUSCRIPT OR SOURCE</u>
Tree	Photo	10344
TRESTLE 2, 1942	Triangulation	
Wow	Photo	10649
KORN (Shoran)	Triangulation	



DIFFERENCE IN READING & ACTUAL DEPTH



FATHOMETER #5725

CORRECTIONS

To 4.0 ft.	+0.8 ft.
13. "	+1.0 "
21. "	+1.2 "
30. "	+1.4 "
38. "	+1.6 "
46. "	+1.8 "
55. "	+2.0 "

- "A" SCALE

To 46. ft.	+1.2 ft.
55. "	+1.4 "
63. "	+1.6 "
71. "	+1.8 "
80. "	+2.0 "

- "B" SCALE

FRASH COMPARISONS

*Does not apply to H-8416
this fathometer not
used on H-8416*

FATHOMETER #

5724

VOL.	DATE	DAY	A SCALE	B SCALE	DIFFERENCE
8	5/7	h	40.0	40.0	0.0
10	5/13	m	41.0	41.5	0.5
11	5/15	n	40.7	41.9	1.2
			48.4	47.2	0.8
			40.4	40.8	0.4
12	5/16	p	40.0	40.5	0.5
			45.9	46/6	0.7
12	5/19	q	40.0	41.0	1.0
			46.0	46.9	0.9
			40.2	41.0	0.8
13	5/20	r	46.0	46.9	0.9
			40.2	41.0	0.8
14	5/21	s	39.6	40.8	1.2
			45.6	47.0	1.4
15	5/23	t	39.8	41.5	(1.7)R
			45.5	47.2	(1.7)R
			40.0	41.2	1.2
15	5/26	u	40.3	41.0	0.7
			46.2	47.0	0.8
			40.3	41.2	0.9
15	5/27	v	40.0	41.0	1.0
			45.8	46.8	1.0
			40.0	41.8	(1.8)R
16	6/3	w	39.8	40.6	0.8
			45.2	46.0	0.8
			39.8	40.5	0.7
16	6/4	x	40.2	41.0	0.8
TOTAL					19.8
MEAN					0.825
					0.
CORRECTION AND					- 0.8

from H-8418 data (East of Asteric) 21
 Conditioned Ball
 prior to work on H-8416

PHASE COMPARISONS

FATHOMETER #

5725

VOL	DAY	DATE	A Scale	B Scale	DIFFERENCE
1	b	5/27	39.8	40.6	0.8
			39.8	40.6	0.4
1&2	c	5/28	40.0	40.2	0.2
			40.0	40.8	0.8
3&4	e	6/2	40.2	41.2	1.0
			40.2	---	---
4	e	6/2	40.0	40.4	0.4
			40.0	---	---
4	f	6/5	40.2	41.2	1.0
			40.4	41.2	0.8
5	h	6/13	40.8	41.0	0.2
			40.6		

 TOTAL 5.6
 MEAN 0.62

CORRECTION APPLIED A-B SCALE - 0.6

ABSTRACT OF PHASE COMPARISONS
 HYDROGRAPHIC SURVEY H- 8416
 Field No. BO-2158 & BO-2258

	SCALE B	SCALE C	SCALE D	SCALE E
Fathometer No. 57-24 <i>Not used on H-8416</i>	-1.7	-3.0	-3.3	-3.8
Fathometer No. 57-25 <i>Launcher</i>	-0.5	-1.5	-2.1	-2.7
Fathometer No. 57-28 } <i>ship 'Bowie</i>	-0.2	-0.2	0.8	1.4
Fathometer No. 57-30	-0.5	-1.1	-1.1	-1.1

TIDAL NOTE

BO-2158 & ~~BO-2258~~
8416

Tidal control for both Survey BO-2158 and Survey BO-2258 was taken from a portable tide gage installed on the Columbia River entrance North Jetty at Latitude $46^{\circ} 16.40' N$, Longitude $124^{\circ} 04.17' W$.

The zero mark of the staff corresponded exactly to the reference plane of mean lower low water.

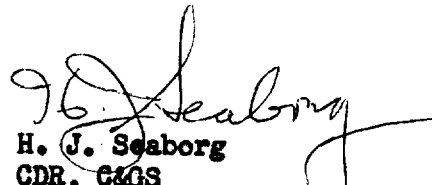
APPROVAL SHEET

Surveys BO-2158 and ~~BO-2258~~

During field operations the Chief ^{of} Party, Captain Fred Natella, exercised personal supervision of survey work. He examined the boat sheet frequently. It would appear that the surveys are complete and adequate with no additional work required.

LTJG James C. Sainsbury executed the launch work on Sheet BO-2158 and supervised the protracting and plotting of soundings on both survey sheets. Ensign James B. Allen smooth plotted Sheet BO-2158 and Ensign Will Connell smooth plotted Sheet BO-2258.

Ship's personnel completed work on these surveys with BOWIE.


H. J. Seaborg
CDR, USN
Commanding Ship BOWIE

RHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

Chart Division: R. H. Carstens

4 Sept. 1959

Plane of reference approved in
11 volumes of sounding records for

HYDROGRAPHIC SHEET 8416

Locality Columbia River Mouth, Washington

Chief of Party: F. Natella in 1958

Plane of reference is mean lower low water, reading

0.0 ft. on tide staff at North Jetty

19.7 ft. below B.M. 1 (1958)

Height of mean high water above plane of reference is 7.0 feet,

Condition of records satisfactory except as noted below:


Signature

Chief, Tides Branch

GEOGRAPHIC NAMES
Survey No. H-8416

Name on Survey											
	On Chart No.	On previous survey No.	On U. S. quadrangle Maps	From local information	On local Maps	P. O. Guide or Map	Rand McNally Atlas	U. S. Light List			
	A	B	C	D	E	F	G	H	K		
CAPE DISAPPOINTMENT	✓										1
NORTH HEAD	✓										2
PEACOCK SPIT	✓										3
COLUMBIA RIVER *	/										4
MCKENZIE HEAD *	/										5
											6
											7
* USGB DECISION											8
											9
											10
											11
											12
											13
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											21
											22
											23
											24
											25
											26
											27

5-20-59
George M. Ball

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. ...8416...

Records accompanying survey:

Boat sheets ...2.; sounding vols. ...11.; wire drag vols.;
bomb vols.; graphic recorder rolls .11-Envelopes
special reports, etc. .1-Smooth sheet, .1-Descriptive report....
.and .1-Paper overlay, .1-Special Report (Shoran Calibration Ship.
BOWIE 1958). 1 Cahier - Shoran Plotting Abstracts.

The following statistics will be submitted with the cartog-
rapher's report on the sheet:

Number of positions on sheet	.....
Number of positions checked	.....
Number of positions revised	.....
Number of soundings revised (refers to depth only)	.....
Number of soundings erroneously spaced	.....
Number of signals erroneously plotted or transferred	.....
Topographic details	Time	.....
Junctions	Time	.....
Verification of soundings from graphic record	Time	.....
Verification by.....	Total time	..... Date
Reviewed by.....	Time	..... Date

VERIFIER'S REPORT OF HYDROGRAPHIC SURVEY NO. H- 8416

The verifier should deal with the present hydrographic survey only, as the reviewer considers its relation to previous surveys and published charts. He should be thoroughly familiar with Chapters 3, 7 and 9 of the Hydrographic Manual.

1. The descriptive report was consulted and appropriate notes were made in soft pencil regarding action taken.
2. Soundings originating with the survey and mentioned in the descriptive report have been verified, including latitude and longitude.
3. All reference to survey sheets mentioned in the descriptive report include the registry number and year.
4. Geographic names of hydrographic features if on sheet are in slanting lettering and of topographic features in vertical lettering.
5. All items affecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken.
6. All positions verified instrumentally were check marked in the sounding records.
7. All critical soundings are clear and legible and are a little larger than the adjacent soundings.
8. The metal protractor has been checked within the last three months.
9. The protracting and plotting of all bad crossings were verified.
10. All detached positions locating critical soundings, rocks or buoys were verified.
11. The boat sheet was compared with the smooth sheet.

12. The spacing of soundings as recorded in the records was closely followed.
13. The bottom characteristics were shown on outstanding shoals.
14. The reduction and plotting of doubtful soundings were checked.
15. The transfer of contemporary topographic information was carefully examined.
16. All junctions were transferred and overlapping curves made identical.
17. The notation "JOINS H- (19--)" was added in ink for all contemporary adjoining or overlapping sheets now registered. Those not verified are shown in pencil.
18. The depth curves have been inspected before inking.
19. All triangulation stations and transfer of topographic and hydrographic signals were checked.
20. Heights of rocks were checked against range of tide.
21. Rocks transferred from topographic surveys have a dotted curve where shown thereon. Rocks located accurately by hydrographer are encircled by dotted red curve.
22. Unnecessary pencil notes have been removed.
23. Objects on which signals are located and which fall outside of the low water line have been described on the sheet.
24. The low water line and delineation of shoal areas have been properly shown.
25. Degree and minutes values and symbols have been checked.
26. Questionable soundings have been checked on the fathograms.

27. Source of shoreline and signals (when not given in report).
28. All notes on sheet are in accordance with figure 171 in the Hydrographic Manual.
29. All aids located, with those on contemporary topographic sheets, have been shown on survey.
30. Depth curves were satisfactory except as follows:
31. Sounding line crossings were satisfactory except as follows:
32. Junctions with contemporary surveys were satisfactory except as follows:
33. Condition of sounding records was satisfactory except as follows:
34. The protracting was satisfactory except as follows:
35. The field plotting of soundings was satisfactory except as follows:
36. Notes to reviewer:

Verified by

Date

NAUTICAL CHARTS BRANCH

SURVEY NO. H-8416

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
Sept 59	5052	G.A.K.	Before Exam ^{EXAM no corr. at this scale} Verification and Review
Apr 61	5022	W.P.S.	Before Exam ^{EXAM. - No corr. at this scale} Verification and Review
Nov. 61	6151	hjk	Before Exam Verification and Review Exam - No corrs.
Nov. 61	5902	hjk	Before Exam Verification and Review Exam - No corrs.
June 74	6002	D.C. Larson/RIS	Before Exam Verification and Review <i>Critical corr only</i>
JAN 79	¹⁸⁵²¹ 6151	P. SHUMAR/RCS	Before Exam Verification and Review <i>ADDED NORTH EXTENSION</i>
12-3-79	18521 (6151)	Gregory B. Norris	Before Exam Verification and Review Revised several sndgs & 60' curve. Survey considered adequately applied.
12-4-79	18504 (6185)	Gregory B. Norris	Before Exam Verification and Review Revised several sndgs. Survey considered adequately applied.
12-5-79	18500 (6052) (18510 (5902)) →	Gregory B. Norris	Before Exam Verification and Review Revised (3) sndgs and 10 fathom curve. Survey considered adequately applied.
12-11-79	18003 (5022)	Gregory B. Norris	Before Exam Verification and Review Exam; No corr Survey considered adequately applied.
12-11-79	18007 (5052)	Gregory B. Norris	Before Verification and Review - Exam; No corr Survey considered adequately applied.

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A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.