4503a
4503b

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. ..... Office No. 4503a 4503b

LOCALITY

State Oregon.

General locality Pacific Coast

Locality Off Shore.

1925

CHIEF OF PARTY

J. J. Maher

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DATE .....

B-1870-1 (1)++

4503a
4503b

D E P A R T M E N T O F C O M M E R C E

U.S. COAST AND GEODETIC SURVEY

Col. E. Lester Jones, Director.

4503a (D)

Descriptive report to accompany hydrographic sheet "D", covered area to the westward and southwestward of Port Orford, Oregon.

Steamer GUIDE
1925

Thos. J. Maher
Commanding Officer

Descriptive Report to Accompany Hydrographic Field
Sheet " D "

Authority. Field Work on this sheet was done in accordance with Directors instructions dated May 6 1925.

Area covered. The area covered in this sheet is that area lying betweenLat. 42-05 N and Lat. 43 - 45 N and Long. 124 -30 W and Long. 125 - 20 W. Soundings were taken with the sonic depth finder on an average of every three minutes, approximately three eighths of a mile apart. Actual sounding was started in Ju June 1925 and completed in October 1925. Soundings were carried from inside the 100 fathom curve to well beyond the 1000fm. curve.

Dangers and Shoals.

No dangers to navigation were found and the soundings were very regular.

Control. Control was established by identifying prominent mountain peaks and rocks previously located by triangulation. Two hydrophone stations were also located for the R. A. R. work.

Methods employed.

The greatest part of the sounding was fixed position work. X day inked in green is aline of sounding controlled by bomb fixes from Hunter Cove and Port Orford hydrophone stations.All soundings were taken with the sonic depth finder and checked with the vertical cast. Where a vertical cast and a sonic sounding both appear on the same position preference was given the vertical cast.

Tides. For the greatest portion of the work no tidal reducers wer neccesary. For the few days which required tidal reducers, they were obtained from data of an automatic tide guage at Port Orford the marigrams of which have been forwarded to the office.

Note. Positions of A day inked in blue should have been inked in red. Positions of X day are inked in green to show the Radio Acoustic Range Finding positions obtained.

Sheet plotted by I. Rittenburg

Report submitted by I. Rittenburg.

I. Rittenburg

During the early part of the season, the weather was very clear and visibility was such hydrography could have been carried much further off shore under the control of visual fixes. During this time, northwest winds prevailed, often reaching a velocity of 45 miles per hour by wind gauge. At times, the ship could not make over three miles per hour on account of wind and choppy seas. The vessel is nominally a fourteen knot boat, but piston rings and cylinders of ship's engines were in such shape that eight knots was just about her maximum speed. These winds usually sprang up about 10:00 A.M., increasing in strength until about 3:00 P.M., when afterwards they gradually moderated to general breezes about 8:00 P.M. or 9:00 P.M. The leeway, due to wind was such that it was difficult to form any idea as to what actual currents prevailed in this section. No measurements were taken, as we do not have equipment for anchoring the vessel in the depths which prevailed offshore. I estimate that the current flows to the southward with velocity of from one-half to one knot per hour. Lumber schooners engaged in coastwise trade hug the coast very closely, in fact too close for safe navigation. Passenger vessels run further off shore, while and oil tankers as have been seen along this coast give the shore a very wide berth. Nothing unusual was noted during the survey.

The Sonic Apparatus was used to great extent in taking soundings. It may not give depths as accurately as up and down soundings, but the closeness with which soundings may be taken makes it possible to cover an area more thoroughly, so that the possibility of missing shoal areas is very slight.

(continued)

The accuracy with which different observers get depths varies greatly. Anyone can get soundings on the Sonic Apparatus, but to get them accurately requires a good ear. Carelessness on the part of the operator in noting the stage on which the machine is operating may cause considerable extra work. Attention is called to the section of the line which lies between positions 43 N. and 47 N. There is every reason to believe that the observer was operating on one stage of the Sonic Machine and tabulating results as they would be obtained on the second stage. The depths as furnished by him are one-half what they should be. Part of the section of the line was re-run and the soundings obtained between positions 49 N. and 62 N. show that the first line was wrong. There are no dangers to navigation in this vicinity, but as the vessel will operate during the next season in the adjoining areas, a few more lines will be run in that section.

Thos Drake
Ensign U.S.C.G.S.

TABLE OF STATISTICS.
For Hydrographic Sheet D1.

Date 1925	Letter	Vo.	Pos.	Sdgs.	Miles Stat.	Vessel
August 12	S day	4	26	78	45.6	GUIDE
12	S	5	29	90	64.0	GUIDE
13	T	5	55	197	112.5	GUIDE
14	U	5	61	245	136.0	GUIDE
15	V	6	73	323	170.0	GUIDE
TOTAL			244	933	528.1	

STATISTICS FOR "D" SHEET

1925	Letter	Vol	Pos	Sdgs.	Miles Stat.	Vessel
June 9th	A	1	66	120	59.0	Guide
" 10th	B	1	47	199	91.0	"
" 11th	C	1	53	208	110.3	"
" 12th	D	1	17	53	17.0	"
	D	2	28	61	35.0	"
" 16th	E	2	20	55	27.0	"
" 17th	F	2	65	293	117.0	"
" 18th	G	2	46	199	72.0	"
" 22nd	H	3	48	168	72.5	"
" 23rd	J	3	37	132	52.0	"
" 30th	L	3	52	120	54.0	"
July 16th	M	3	28	94	37.0	"
" 24th	N	3	20	48	10.	"
" 24th	N	4	67	102	23.5	"
" 25th	P	4	63	168	62.0	"
" 28th	Q	4	40	74	22.7	"
" 29th	R	4	65	133	32.5	"
Sept 26th	W	6	43	87	32.0	"
" 28th	X	6	18	44	20.5	"
Oct. 14th	Z	6	5	11	2.7	"
" 28th	AA	6	16	24	5.0	"
" 28th	AA	7	23	36	8.0	"
" 29th	BB	7	79	161	47.0	"
" 30th	CC	7	19	42	12.8	"
TOTALS			965	2632	1023	

Report on Verification and Inking H. 4503a

The records were well kept and with sufficient notes. The sounding was done principally with the sonic depth finder, with a little tube sounding and some wire check soundings.

In checking the protracting, a constant shift was found in the positions. This may be due to distortion of the sheet or a protractor out of adjustment or both. To eliminate protractor errors, considerable care was taken to put two protractors in adjustment and checked by another cartographer. When the same positions were plotted with these two protractors, they differed not only from the field plotting but also somewhat between themselves. This indicated that slight deviations in the protractor arms might cause these differences. It should be noted that signals were from 25 to 40 or more miles away in many positions and this would tend to make the angles small and the positions correspondingly weak. It was therefore found necessary to replot about half the work.

The soundings and positions are ~~left on pencil from 1 to 11 and 58 to 65~~. The corrected distances do not agree with plotted positions as recorded and it is difficult to adjust them without making any radical changes to the record. Additional work may be conveniently done here to fill the gap when further work is continued south of this sheet.

Regarding the shoal soundings at 66 and vicinity (Lat 42°05' and Long. 124°43') a note in volume 2 p.48 might raise a question as to their accuracy. Question raised Orwell 6-20-67

It will be noted that sonic sounding was carried to depths as low as 650 or 70 fathoms. A note in the record mentions the use of a 10 foot cam for this and theoretically the soundings should be good, although an oral statement from Mr. J. H. Service was that sonic soundings taken with existing apparatus under 12 fathoms are weak. However, since most of the soundings on this sheet are sonic, it was decided to ink the shoal sonic soundings and, by a note on the sheet, state that under a certain depth they are not as reliable as in deep water. A detailed study on an enlargement of the most closely developed area of this sheet showed that sonic might be deeper or shoaler or check, wire and tube soundings.

Inasmuch as all soundings are over 50 or 60 fathoms there is no danger to navigation involved.

The tube soundings from 38 to 47 AA were rejected since by comparison with other soundings and the inshore sheet (H4505) they are seen to be too shoal.

At the time this sheet was inked no boat sheet was in the office. If it is sent in later, it should be scanned and compared with the smooth sheet.

F. M. Albert, Cartographer
Section of Field Records.

attach to Descriptive Report 4503

December 10, 1929

Hyd. Sheet 4503

In conference (F.R. Detrin A.M. Robinstaki, F.D. Borden, E.P. Ellis) it was decided to supercede the sonic depth finder soundings on sheet 4503 by soundings in the same area on sheet H. 4876, from pt. 33 BB to one sounding beyond position 72 BB; from three soundings preceding position 8 CC to position 19 CC (end of line); from 13 to 5 S. and from 36 W. to 43 W.

The rejection of these soundings is in accordance with the rule, adopted subsequent to the verification of this sheet, eliminating all sonic soundings under 100 fathoms in depth.

H.E. MacEwan

E.05.

ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY

AND REFER TO No. 11-DRM

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
WASHINGTON September 21, 1926.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4503[a]

Offshore, Chetko River to Port Orford, Oregon

Surveyed in 1925

Instructions dated April 29, 1924 (GUIDE)

Chief of Party, T. J. Maher.

Surveyed by T. J. M.

Protracted and soundings plotted by I. Rittenberg.

Verified and inked by F. M. Albert.

1. The records conform to the requirements of the General Instructions.

2. The plan and extent of development satisfy the specific instructions except as follows:

a. Lines were run generally north and south instead of true east and west as called for in Paragraph 11 of the specific instructions.

b. In depths from 100 to 300 fathoms lines were spaced approximately 1 mile apart instead of two miles.

c. In depths from 300 to 1000 fathoms the lines were spaced approximately 2 miles apart instead of 4 miles as called for.

d. In the northern half of the sheet the work was carried to about 10 miles beyond the 1000 fathom curve to approximately 1700 fathoms. The instructions call for work to the 1000 fathom curve.

3. The sounding line crossings are adequate, except where the line (7 = 17 X) located by the radio acoustic method crosses other lines located by the visual fix method. The differences here vary from about 20 to 40 fathoms in approximately 350 fathom depths. The radio acoustic line seems to be misplaced, possibly due to an error in one of the hydrophone distances.

4. The usual depth curves could be drawn with the exception of the 1000 fathom curve at the southwestern end of the sheet. The work was not carried far enough to the westward to develop this curve.

5. The field plotting was completed to the extent prescribed in the specific instructions. Many of the positions were found to be considerably out -- possibly due to an unadjusted protractor (See verifier's report.)

6. The junction with H. 4505 (primarily tube soundings) on the east is acceptable. Attention is called to the fact that where the sonic soundings on H. 4503[a] overlap the tube soundings on H. 4505 the sonics are generally deeper, the average difference being about 7 fathoms, with some isolated differences of 15 and 19 fathoms. These are all in depths under 100 fathoms. While some of these discrepancies may be accounted for by the irregularity of the bottom it is believed that many may be due to the lesser accuracy of the sonic method in shoal depths notwithstanding the use of a 10 tooth cam.

As for the junction with H. 4503[b] on the west, the lines on that sheet are spaced too far apart to afford a proper junction with this sheet.

The junction with H. 4489 is unsatisfactory. There is about a four mile gap with depths of 50 to 80 fathoms between the 2 sheets that should be filled in.

The junction with H. 4479 is satisfactory.

The junction with H. 4531 will be taken up in the review for that sheet.

7. Whenever work is extended southward of this sheet, the following additional work is to be considered with reference to this sheet.

a. The work is to be extended westward on this sheet to include at least a development of the 1000 fathom curve. It is to be noted that by extending the work for about 10 miles beyond the 1000 fathom curve and probably within the limits of visibility of shore signals, Chart 5702 will be complete to its western limit.

b. An adequate junction to be effected with H. 4489 to fill the gap as noted in Paragraph 6 of this report.

c. The 132 fathom (sonic) sounding in Lat. 42° 05 1/2', Long. 124° 38' should be verified.

8. This sheet is primarily a sonic survey. The use of a 10 tooth cam enabled the taking of soundings in much shoaler water than heretofore possible. A comparison with wire soundings or tube soundings shows a generally good agreement. On the whole it may be said that

the survey is a satisfactory one from the standpoint of both accuracy and economy. No marked discrepancies were encountered between the wire and the sonic soundings in deep water, and a far greater number of soundings was possible to be taken in a given time than would have been had the ordinary wire method been exclusively employed.

9. Character and scope of the surveying - very good.
Field drafting - good.

10. Reviewed by A. L. Shalowitz, August, 1926.

Approved
L.O.C.

D E P A R T M E N T O F C O M M E R C E

U. S. COAST AND GEODETIC SURVEY

Col. E. Lester Jones, Director.

4503b (D-1)

Descriptive report to accompany off-shore hydrographic sheet D-1 to the southwestward of Port Orford; control by radio acoustic ranging.

Steamer GUIDE
1925

Thos. J. Maher
Commanding Officer

Descriptive Report to Accompany Hydrographic Sheet D, Off-shore Hydrographic Sheet of the Coast of Oregon.

AUTHORITY: Field work on this sheet was started in accordance with Director's instructions of May 6, 1925.

AREA COVERED: From an approximate position of Lat. 42 -13' N, long. 124 - 55'W a sounding line was run out to Lat. 41 -47'N long. 128 -50'W, an approximate distance of 230 statute miles offshore, and then carried back to Lat. 43 -08'N-long.124 -54'W. Soundings were taken on an average of every 3 minutes with the sonic depth finder, approximately $\frac{1}{2}$ mile apart, with the ship underway on standard speed. Actual sounding was started on Aug. 12 and was completed on Aug. 15.

CURRENTS: At the end of "S" day, Aug. 12, the ship was stopped and allowed to drift until the start of "T" day. From 8:00 PM of Aug.12 to 6:15 AM Aug. 13, the drift was found to be approximately 9 mi. in almost a true south direction. This drift corresponds to a set of 8° while the ship is underway, or.9 Kn per hour. Again, at the end of"T" day on Aug. 13 at 7:30 PM until the beginning of'U' day at 7:30 AM on Aug. 14 an approximate drift of 12 mi. was found. This corresponds to a set of 9° while the ship is underway. This drift was found to be almost due south, true. Consequently in plotting dead reckoning and checking courses between fixes a southerly set of 10° should be used with a log factor of 1.07. log factor

DANGERS AND SHOALS: No dangers to navigation were found, and the soundings were very regular. A gradual increase or decrease of depth was found with no shoaling of any great extent.

PLOTTING OF SOUNDINGS: Soundings were not plotted in accordance with paragraph 341 of the instructions since more than half the soundings obtained would have had to be omitted due to crowding.

CONTROL: The only control necessary for the greater portion of this work was the locating of 3 hydrophone stations, which were located by a round of angles and plotted on a 1:40000 projection and then transferred to the small scale projection by D. M.'s and D. P.'s. Four triangulation stations were used to tie in the hydrographic work at the end of the sheet.

METHODS EMPLOYED: All soundings obtained were by means of the sonic depth finder. Control of lines was obtained by Radio Acoustic Range finding. For this purpose, 3 hydrophone stations were set up on shore along the coast and bomb fixes were obtained, with sufficient frequency for a good control of the hydrography. Tests were made, to find out the velocity of sound through water, which was found to be 1481 meters per sec., determined by plotting fixed positions on a 1:40000 proj. and scaling distance off. This velocity was used throughout the work, and checks the computed velocity exactly. The bomb fixes obtained, in most cases, checked the dead reckoning almost exactly. These bomb fixes are shown on the smooth sheet by small red arcs. As soon as possible after the projection was made, arcs were swung from the shore stations, each station with a single color, at 30,000 meter intervals so that distortion of the sheet would be provided for and an ~~accurate~~ accurate scaling of the distances from the various shore stations could be made. Position 36 U. at a distance off shore of 217 statute miles gave an exact check with the dead reckoning. Beyond that point at position 42 U. 225 mi. offshore a good check was obtained with one arc swung from Hunter Cove. At this point the bombs failed and could not be fixed. Position 49 U is considered fixed and from this point a line of dead reckoning was run to join with the first bomb fix of V day, 43 V., which is a correct location checked both by bomb fix and dead reckoning. The closing error of this line which is 140 statute miles long, was approximately 1-½ miles in direction and 7 mi. in distance. This error was adjusted by compensating the line in accordance with time between changes of course.

Bomb fixes were then carried to position 52 V and checked. At position 62 V only one station was received, so that considering position 52 V as fixed and plotting by dead reckoning, position 62 V was found to check exactly with distance from Hunter Cove. Carrying this dead reckoning to position 68 V which is a visual fix obtained, no closing error was found, a perfect check.

REFERENCES: Location of hydrophone stations are in volume marked "Location of Hydrophone Stations", and submitted with other volumes.

Positions for computation of velocity of sound are positions number 55 to 86 BB day in volume 7 - F sheet. 25 good determinations were obtained and a table of the results is attached to this report.

No tidal reductions are necessary.

Sheet plotted by I. Rittenberg.

Report submitted by I. Rittenberg.

I. Rittenberg, Jr. H. & G. E.

Approved.
P. R. Baker
Commdr. U.S.C.G.S.

W.W.B.

February 15, 1926.

~~Division of Hydrography and Topography:~~

Division of Charts:

Tide reducers are approved in
7 volumes of sounding records for

HYDROGRAPHIC SHEET NOS. 4503A and B

Locality: Oregon Coast

Chief of Party: T. J. Maher in 1925

Plane of reference is MLLW
2.4 ft. on tide staff at Port Orford.

For reduction of soundings, 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 each 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.

G Rude

Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 582

REDUCTION TO CENTER

Eccentric Station:

$d =$

$\log d =$

Colog sin 1″ = 5.3 1 4 4 3

Sum =

STATIONS	D/M ° ′	T/SEC	Log D.	log T	Logarithm of Reduction in Seconds Log D−Log T	V/M/SEC Reduction
BROOKINGS						
	25291	17.04				1484
	25499	17.18				1484
	38016	26.27				
	24124	16.57				1490
	26160	17.61				1486

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The required reduction to center is, in seconds, $c = \frac{d \sin a}{s \sin 1''}$, in which d is the distance from the eccentric station to the true station, and s is the length in meters of the line between the true stations involved, and, therefore, log s is taken directly from the computation of triangle sides. a is the direction of the distant station involved, reckoned in a clockwise direction as usual, but referred to the direction from the eccentric to the true station, or center, taken as zero. This definition of a is true for the case in which the object pointed upon is eccentric, as well as for the case in which the instrument is eccentric.

Carry a to minutes only and all logarithms to five decimal places only. Do not in any case carry the derived reductions to more than two decimal places. There is no advantage in carrying them to more decimal places than the directions to which they are to be applied are carried on Form 24 A.

The preceding paragraph fixed the maximum number of decimal places to be used. In some cases a smaller number may be used as indicated in the following table:

IF LOGARITHM OF SHORTEST LINE CONCERNED IS MORE THAN—	AND d IS LESS THAN VALUE STATED BELOW IN METERS—			
	Use Logarithms to Four Decimal Places and a to Minutes		Use Logarithms to Three Decimal Places and a to Degrees	
	Primary Triangulation	Secondary or Tertiary Triangulation	Primary Triangulation	Secondary or Tertiary Triangulation
2.5		0.6		0.02
3.0		2		0.06
3.5	0.6	6	0.02	0.2
4.0	2	20	0.06	0.6
4.5	6		0.2	2
5.0	20		0.6	6

REDUCTIONS FOR AN ECCENTRIC INSTRUMENT.

If the instrument is eccentric the first column of this form should contain the names of the stations observed from that eccentric position of the instrument.

The values in the fifth column are derived by subtracting those in the fourth column from those in the third. The values in the fourth column may need to be derived by successive approximations from the triangle side computations if the eccentric reductions are large. The values in the sixth column are obtained from those in the fifth by adding log $\frac{d}{\sin 1''}$ derived as indicated in the heading of the form, if d is expressed in meters. If d is expressed in feet, to the other two logarithms add also 9.48402 to convert to meters. To obtain a direction as shown on Form 24 A, subtract the reduction c for the station which is the initial on Form 24 A from the reduction c for the required direction and apply the difference to the observed direction. Similarly, the correction to any angle is the difference of the reductions on this form to the two directions involved in that angle.

REDUCTIONS FOR AN ECCENTRIC OBJECT OBSERVED.

If the object observed is eccentric the heading "Eccentric Station ——" should be changed to "Eccentric Observed Object at Station ——," the first column should contain the names of the stations from which this eccentric object was observed, and in each case a is the direction from the eccentric object to the distant station involved, reckoned in a clockwise direction as usual, but referred to the direction from the eccentric object to the true station, or center, taken as zero. (No distinction need be made between the direction from the eccentric object to the distant station and the direction from the true station to the distant station except when the eccentric reduction is more than one minute.) The remainder of the computation on this form is made in the manner indicated above with reference to an eccentric instrument. The reductions to directions are, however, to be applied to observed directions, at the stations named in the first column, to the eccentric object at the station named in the heading. The directions to which these reductions are to be applied are therefore found in various of the lists of directions on Form 24 A, not all in one list as is the case when the instrument is eccentric.

Compare the following example with that given on Form 24 A.

REDUCTION TO CENTER.

Eccentric Station: Chase.

$d = 10.987$ meters.

Log d = 1.04088
Colog sin $1'' = \underline{5.31443}$
Sum 6.35531

STATIONS	a ° ′	Log sin a	Log s	Log $\frac{\sin a}{s}$	Logarithms of Reduction in Seconds	Reduction $= c$ ″
Center	0 00					
Central	224 27	9.84528	4.40254	5.44274	1.79805	− 62.81
Little River	242 47	9.94904	4.51928	5.42976	1.78507	− 60.96
Lyons, salt works	240 02	9.97025	4.30616	5.66409	2.01940	−104.57
Bossing	179 18	8.08696	4.49198	3.59498	9.95029	+ 0.89

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 582

REDUCTION TO CENTER

Eccentric Station:

$d =$

Log $d =$

Colog sin 1" = 5.3 1 4 4 3

Sum =

STATIONS HUNTER COVE	D/M	~~Log sin c~~ T/SEC	Log D	Log $\frac{\sin c}{\sin T}$ LOG	~~Logarithm of Reduction in Seconds~~ Log-D Log-T	~~Reduction~~ V/M/SEC
	11980	8.00				1498
	8480	5.74				1478
	10240	6.86				1493
	11600	7.82				1483
	12168	8.23				1479
	11280	7.62				1480
	10612	7.18				1478
	8784	5.91				1486

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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 382

REDUCTION TO CENTER

Eccentric Station:

$d =$

Log $d =$

Colog sin 1" = 5.3144 3

Sum =

STATIONS PORT ORFORD	D/M	~~Log sin t~~ T/SEC	Log D	~~Log sin t~~ LOG-T	~~Logarithm of Reduction to Center~~ Log D Log-T	~~Reduction~~ V/M/SEC
	77123	51.90				1486
	51168	34.47				1484
	45996	31.23				1470
	46200	31.12				1485
	71880	48.89				1470
	74112	50.25				1475
	76872	52.45				1465
	42980	29.09				1477
	41924	28.24				1485
	42076	28.38				1483
	42088	28.34				1486
	42104	28.56				1474
	41688	28.27				1475

$\Sigma V = 37034$ (25 tests)

$V = 1481$ m/sec

11-684

Report on Verification and Inking H 4503b

The plotting of sndgs. and positions was well done. The field drafting was completed to the extent required by the General Instructions. Soundings are plotted normal to the course in order to be able to show more soundings than would have been possible by the standard method of plotting.

The plotting of 26 V to 49 V was changed in the office. The field plotting showed a double bend in the line, one at pos. 26 and another at pos. 30. As there is but one change of course (this is at pos. 26) the line was plotted by dead reckoning and found to check pos. 36 and 42. This indicates that one of the acoustic ranging distances at pos. 30 is in error.

A very desirable feature, namely a check from a third R.A.R* station, could not be had due to failure of the Brookings Station. As a few cases where distances were obtained before the station failed, the three arcs did not give a good intersection and usually one of the distances is rejected or questioned.

In future surveying by this method an effort should be made to obtain the maximum distance between R.A.R. stations to provide an adequate base for swinging arcs. This will give less acute arc intersections with resulting increase in accuracy.

The scheme of plotting arcs at uniform intervals immediately after making the projection is very good. It eliminates large errors due to distortion of the paper and greatly facilitates plotting.

An interesting comparison can be made with A. 4187 which covers the area just south of 4503b. On 4187 about 5 days were spent in sounding by the wire

* R.A.R. = radio acoustic ranging

method and several dozen soundings obtained. But by the sonic method over 900 soundings were obtained in about 4 days work.

That the sonic method is accurate, is seen by tracing out the ridge which lies approximately in a NNW direction in longitude 127°15'–127°30'. On H4187 two sounding 1119 and 1146 fathoms check approximately the 996 fathoms from chart 5052 while on H5032 the 1019 fms near 16V and the 995 fms. near 15V pick up the ridge again. That the line near 1D on H4187 failed to pick up the ridge again is not at all unusual when soundings are spaced about 15 miles apart.

An interesting point is that where a check cast is taken by wire it is invariably deeper than the sonic sounding, which indicates that vertical wire casts are not quite vertical.

In order to check the graphic plotting by swinging arcs, pos 30V was computed by the Division of Geodesy, using the latitudes and longitudes of the the R.A.R. stations as scaled from a 1:40,000 sheet. The resulting computation placed the position about 5 miles in a NNW direction from the plotted position, but about midway between the two position arcs. However, the geometric conditions for computation were so weak that the computer, Mr. Sutherland, stated that a very small change in one of the given parts would cause a large change in the location of the position, so the graphic plotting was used. It would seem then that if the triangle is weak, no increased accuracy is obtained by computation. The solution is to use longer bases between R.A.R. stations.

In closing it can be said that sonic soundings open a new era in hydrographic surveying. A vessel running full speed can more adequately survey, in a fraction of the time by the old methods, large areas and do it accurately.

February 27, 1926

F. M. Albert, Cartographer
Section of Field Records

E.D.

ADDRESS THE DIRECTOR
U.S. COAST AND GEODETIC SURVEY

AND REFER TO No. 11-DRM

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
WASHINGTON August 21, 1926.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4503[b]

Offshore Cape Sebastian, Oregon

Surveyed in 1925

Instructions dated April 29, 1924 (GUIDE)

Chief of Party, T. J. Maher.

Surveyed by T. J. M., G. D. Cowie, E. H. Bernstein, W. F. Malmate.

Protracted and soundings plotted by I. Rittenberg.

Verified and inked by F. M. Albert.

1. This survey embraces two phases of acoustic surveying - positions by the radio acoustic method and depths by the sonic depth finder. It represents an innovation in hydrographic surveying when it is considered that a line of soundings controlled by the radio acoustic method was carried over 200 miles offshore.

2. There are no specific instructions for this sheet, the work being experimental in testing the radio acoustic method of position location.

3. The field drafting was completed to the extent required by the General Instructions. A portion of the work was replotted by the office cartographer. (See verification report.)

4. The lines on this sheet are spaced too far apart to afford a proper junction with H. 4503 [a] on the east.

   On the south the junction with H. 4187 is adequate.

5. If it is the intention to make a complete survey beyond the 1000 fathom curve, then additional lines should be run between the limiting lines on this sheet and especially in the vicinity of the 1000 fathom curve in Long. 127- 30'.

6. Inasmuch as this sheet demonstrates the feasibility of sending signals strong enough to be detected by a hydrophone 200 and more miles away, it is suggested that if similar work is again undertaken, the hydrophones be spaced a greater distance apart in order to obtain a better intersection. It is very desirable that a check distance be also obtained from a third hydrophone station.

7. Attention is called to the several soundings on the records that are questioned by the field party without adding any explanatory note. This is bad practice. Such cases should be settled by the field party. It is only in exceptional cases that the office is in a better position to settle such doubtful points and even then an explanatory note is helpful.

8. Character and scope of field operations - excellent.
Field drafting - very good.

9. Reviewed by A. L. Shalowitz, August, 1926.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 26

POSITION COMPUTATION, PRIMARY TRIANGULATION.

a		to	
$\angle$		&	
a	**3.**	to **1.**	
Δa			180
a'	**1.**	to **3.**	

Do not write in this margin

φ	° ′ ″	**3.**	λ	° ′ ″	
$\Delta\varphi$		$s=$	$\Delta\lambda$		
φ'		**1.**	λ'		

s		s^2		$-\mathrm{h}$	
$\cos a$		$\sin^2 a$	$(\delta\varphi)^2$	$s^2 \sin^2 a$	
B		C	D	E	
h					
1st term.	″	3d term.	″	$(\Delta\lambda)^2$	
2d term.		4th term.		F	
3d and 4th terms.		s	Arg.	$\Delta\lambda$	
$-\Delta\varphi$		$\sin a$	s	$\sin\frac{1}{2}(\varphi+\varphi')$	
$\frac{1}{2}(\varphi+\varphi')$		A′	$\Delta\lambda$	$\sec\frac{1}{2}(\Delta\varphi)$	
		$\sec\varphi'$	Corr.	″	
11—026		$\Delta\lambda$		$-\Delta a$	

Computation for pos. 30 U
(Graphic plotting accepted, however)

POSITION COMPUTATION, PRIMARY TRIANGULATION.

			°	′	″
α		to			
$\angle$		&	+		
α	2.	to 1.	351	32	05
α				+3	22
			180		
α'	1.	to 2.	171	35	27

First Angle of Triangle

	°	′	″			°	′	″
φ	42	44	06.6	2. Port Orford	λ	124	31	00.0
$\Delta\varphi$	—	24	50.0	s=	$\Delta\lambda$	—	4	58.8
φ'	42	19	16.6	1. Hunter Cove	λ'	124	26	01.2

s	4.66249 61	s^2	7.67038			$-h$	3.1732
$\cos^2\alpha$		$\sin^2\alpha$		$(\delta\varphi)^2$	6.3464	$s^2\sin^2\alpha$	7.6704
B	8.5106424	C	1.36987	D	2.3911	E	6.1626
h	3.173138 S		9.04025		8.7375		7.0062
1st term.	+ 1489.836	3d term.	+0.0546			$(\Delta\lambda)^2$	
2d term.	+ 1.110	4th term.	0.010			F	
	+1490.946						
3d and 4th terms.	1.054	s	3.8851897				
$-\Delta\varphi$	+1490.0	$\sin\varphi$		Arg.		$\Delta\lambda$	2.47538
$\frac{1}{2}(\varphi+\varphi')$	42 31 41.6	A'	8.5090593	s		$\sin\frac{1}{2}(\varphi+\varphi')$	9.8299 2
		$\sec\varphi'$	0.1311316	$\Delta\lambda$		$\sec\frac{1}{2}(\Delta\varphi)$	
			2.47538 06	Corr.			2.30 38
		$\Delta\lambda$	-298.8			$-\Delta\alpha$	202

11—626

3.1732

3.8351897 n
4.6624961 n
9.1726936 n

351 32 05

4.6624961
9.9952 43
4.6677253

3.8351897
9.1679 31
4.6677253

Do not write in this margin.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 26

POSITION COMPUTATION, PRIMARY TRIANGULATION.

			°	'	"
α		to	351	32	05
∠		&	+80	59	08
α	3.	to 1.	352	31	13
Δα			2	20	45
			180		
α'	1.	to 3.	170	10	28
			8	48	38

	°	'	"			°	'	"
φ	42	44	06.6	3. Port Orford	λ	124	31	00.0
Δφ		-52	27.0	s=	Δλ	3	29	123
φ'	41	51	39.6	1. X	λ'	128	00	123

s	5482109	s²	0.96422			-h	3.470
cos α	9.477654	sin² α	8.95894	(δφ)²	6.996	s² sin² α	0.923
B	8.510642	C	1.37000	D	2.391	E	6.163
h	3.470405		2.29316		9.387		0.556

1st term.	+2959.96	3d term.	+0.24"	(Δλ)²	
2d term.	196.41	4th term.	-3.60	F	
+	~~2756.37~~ ~~2757.55~~		-		
3d and 4th terms.	-3.36				
-Δφ	3140.01				

s	5.482109				
sin α	9.979468	Arg.		Δλ	4.0986
A'	0.127981	s	-163	sin ½(φ+φ')	9.8280
sec φ'	8.509071	Δλ	268	sec ½(Δφ)	
	4098629	Corr.	+105		3.9266
Δλ	105			-Δα	8445
	4.098734				

125523

11—626

POSITION COMPUTATION, PRIMARY TRIANGULATION.

			°	′	″
α		to	171	28	27
$\angle$		&	+90	12	20
α	2.	to 1.	81	23	07
$\Delta\alpha$			2	23	38
			180		
α'	1.	to 2.	78	59	29

First Angle of Triangle

φ	42°	19′	16.6″	2. Hunter Cut	λ	124°	26′	01.2″
$\Delta\varphi$	—	27	42.8	s=	$\Delta\lambda$	+3	34	11.7
φ'	41	51	33.8	1. X	λ'	128	00	12.9

s	5.476715	s''	0.952843			$-h$	3.163
$\cos\alpha$	9.175481	$\sin^2\alpha$	9.990 14	$(\delta\varphi)''$	6.442	$s^2\sin^2\alpha$	0.944
B	8.510674	C	1.856370	D	2.391	E	6.654
h	3.162870		2.30727		8.833		0.261
1st term	+45.02	3d term.	0.08″			$(\Delta\lambda)''$	
2d term.	2.02	4th term.	1.82			F	
	+47.04						
3d and 4th terms.	1.74						
$-\Delta\varphi$	+45.30	s	5.476715				
$\frac{1}{2}(\varphi+\varphi')$		$\sin\alpha$	9.995072	Arg.		$\Delta\lambda$	4.10.88
		A′	0.127 981	s	−15.9	$\sin\frac{1}{2}(\varphi+\varphi')$	9.8264
		$\sec\varphi'$	8.509 071	$\Delta\lambda$	+281	$\sec\frac{1}{2}(\Delta\varphi)$	
			4.108 899	Corr.	+1.24		3.9356
		$\Delta\lambda$	4.108 901			$-\Delta\alpha$	8618″

11—626

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DEPARTMENT OF COMMERCE
U. S. Coast and Geodetic Survey
Form 612

HYDROGRAPHIC SHEET No. 4103 b

PRECISE DEAD RECKONING

(Locality) (Date) Day

U. S. C. and G. Survey Ship ....., ..., Commanding

LOG FACTORS
LOG No. 3
Full speed 1.09
Sounding speed .....
Full and stop .....
(Log dist. × log factor = true dist.)

Pos.	Time	Elapsed Time	DISTANCE: Log Reading	Log Dist.	True Dist.	Log Loss	Total Run	COURSE: P. S. C.	Dev.	Var'n	True	CURRENT: Set	Drift	Corr'n	LEEWAY: Dir'n of Wind	Vel.	Corr'n	TRANSFER: Dir'n / Am't	REMARKS
63	2:59		96.25	59.73			63.9	42			61								
73	5:05:30		16.80	20.55			21.7	—			—								
		Line	52-68	V															1:6 Closure
52	1:47:30		66.5					58			77								
62	2:26		91.32	24.82			26.57	58			77								
63	2:57		96.25	4.93			5.28	42			59								
68	4:23		10.03	13.78			14.75	42			59								

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 612

PRECISE DEAD RECKONING

LOG FACTORS
LOG No. [illegible]
Full speed 1.07
Sounding speed
Full and stop
(Log dist. × log factor = true dist.)

HYDROGRAPHIC SHEET No. 4503 b

Coast of Oregon (Locality)   Aug. 14 (Date)   U Day

U. S. C. and G. Survey Ship Guide, J. J. Maher, Commanding

Pos.	Time	Elapsed Time Hrs.	DISTANCE Log Reading	Log Dist.	True Dist.	Log Loss	Total Run	COURSE P. S. C.	Dev.	Var'n	True	CURRENT Set	Drift	Corr'n	LEEWAY Dir'n of Wind	Vel.	Corr'n	TRANSFER Dir'n Am't	REMARKS
																			Closure = [illegible] / 125.86
42V	6:07		6.40					260	-1°18	+20½°	279								
																			Closures
49V	7:57		21.27	14.87			15.9												.69
---	8:00		(21.68)	.41 (interpolated)			.44	c.c. 58	(see p. 56)		79								.02 .71
51V	8:29:30		26.20	4.52			4.84	c.c. 37	psc		56								.21 .92
1V	12:07:55		59.70	33.50			35.85	40	psc		59								1.55 2.47
31V	7:32		27.1	67.4			72.1	58	psc		77								3.12 5.59
35V	8:18		33.85	6.75			7.22	50			69								.31 5.90
37V	8:36		36.52	2.67			2.86	58			77								.13 6.03
49V	11:03:30		59.61	[illegible]			([illegible])	Interpolated (56½)		psc									1.07 7.10

DEPARTMENT OF COMMERCE
U. S. Coast and Geodetic Survey
Form 615

PRECISE DEAD RECKONING.

LOG FACTORS
LOG No. 3

HYDROGRAPHIC SHEET No. 4503

7 Day

Full speed
Sounding speed
Full and stop
(Log dist. × log factor = true dist.)

(Locality) (Date)

U. S. C. and G. Survey Ship ____, ____, Commanding

Pos.	Time	Elapsed Time	DISTANCE					COURSE				CURRENT			LEEWAY			TRANSFER	REMARKS
			Log Reading	Log Dist.	True Dist.	Log Loss	Total Run	P. S. C.	Dev.	Var'n	True	Set	Drift	Corr'n	Dir'n of Wind	Vel.	Corr'n	Dir'n / Am't	
—	6:27		22.64					160			174								
—	7:08	41'	38.25	5.61			6.00	70			89								
5	8:24	1h16'	48.25	10.00			10.10	70			87								
6	9:36	1h12'	58.90	9.65			10.33	70			87								

Form 537
11—3812

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 4503a

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. D

REGISTER NO. 4503a

State Oregon

General locality Pacific Coast ~~of Southern Oregon~~

Locality Chetko River to Port Orford — Offshore ~~Cape Blanco to Cape Sebastian~~

Scale 1:120000 Date of survey June 9 to ~~Nov.~~ Oct. 30, 192 5

Vessel Steamer Guide

Chief of Party T.J.Maher

Surveyed by T.J.Maher

Protracted by I. Rittenburg

Soundings penciled by I. Rittenburg

Soundings in fathoms ~~xxfeetxx~~

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by FMA

Verified by FMA

Instructions dated May 6 1925, 192

Remarks:

GPO

Form 537
11—5812

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 4503b

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. D 1

REGISTER NO. 4503b

State Oregon

General locality Pacific Coast ~~of Southern Oregon~~

Locality ~~Coquille River~~ C.Sebastian to Coquille R. — Offshore ~~Cape Blanco to Brookings~~

Scale 1: 300000 Date of survey August 12-15, 192 5

Vessel Steamer Guide

Chief of Party T. J. Maher

Surveyed by T. J. Maher ,G.D.Covie,E.H.Bernstein,W.F.Kalnate

Protracted by I. Rittenburg

Soundings penciled by I. Rittenburg

Soundings in fathoms ~~feet~~

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by F.M.A.

Verified by F.M.A.

Instructions dated May 6, 1925, 192

Remarks: ~~Offshore Radio Acoustic Range Finding Sheet~~/

GPO

N. 45036 applied partially to Cht. 5021 Mar. 4, 1947 R.