

8400

Diag. Cht. No. 6380-2.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. PA-1357 Office No. H-8400

LOCALITY

State Washington

General locality San Juan Islands

Locality President Channel

1957

CHIEF OF PARTY

W. C. Russell

LIBRARY & ARCHIVES

DATE December 1960

USCOMM-DC 37022-P66

8400

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-8400 ✓

Field No. PA-1357

State WASHINGTON

General locality SAN JUAN ISLANDS

Locality President's Channel
~~NORTH OREGON ISLAND~~

Scale 1:10,000 ✓ Date of survey July 25 - Oct 17
~~APRIL TO OCTOBER 1957~~

Instructions dated 1 OCTOBER 1956 (and prior instructions referred to therein)

Vessel USC&GSS PATTON & LAUNCH 87

Chief of party WILLIAM C. RUSSELL

Surveyed by W. C. RUSSELL, W. E. RANDALL, & T. E. SIMKIN

Soundings taken by ~~fathometer~~; graphic recorder, hand lead, wire

Fathograms scaled by PATTON PERSONNEL

Fathograms checked by PATTON PERSONNEL

Protracted by C. A. J. PAUW

Soundings penciled by C. A. J. PAUW

Soundings in fathoms ~~feet~~* at MLW MLLW and are true depths

REMARKS:

.....
.....
.....
.....
.....

Handwritten initials/signature

H-8400

DESCRIPTIVE REPORT

TO ACCOMPANY

HYDROGRAPHIC SURVEYS NOS:

- H-8398(PA-1157)
- H-8399(PA-1257)
- H-8400(PA-1357)

NORTHWEST WASHINGTON, HARO STRAIT
(North of Lat. 40° and West of Pt. Doughty, Orcas Id.)

SHIP PATTON - W. C. RUSSELL, CMDG.

SCALE 1:10000 - DATE: 1957

SURVEYED BY:

W. C. RUSSELL, W. E. RANDALL & T. E. SIMKIN

###

A. PROJECT:

This survey was executed under Supplemental Instructions-
Project 12410, Coast of Washington, North of Anacortes, dated 1 October 1956,
and the prior instructions referred to therein.

B. SURVEY LIMITS AND DATES:

The three boat sheets cover United States waters north
of Latitude 48° 40' and extend eastward from the vicinity of Turn Point,
(Stuart Island) along the United States - Canadian boundary to Latitude 48°
46.5', thence eastward to Longitude 122° 59.5'; thence southward to Lati-
tude 48° 44'; thence eastward to Longitude 122° 57'; thence southward to
Point Doughty; and thence southward along Orcas Island to Latitude 48° 40'.
Haro Strait and President Channel are included.

Field work was begun on 18 April and concluded on 17
October 1957.

C. VESSEL AND EQUIPMENT:

The survey was accomplished using the Ship PATTON and Launch 87. Turning radii were about 150 meters for the ship and about 25 meters for the launch. Sounding speeds were about seven knots; the ship's speed was generally limited by the allowable maximum spacing between positions on the boat sheet.

Soundings were obtained with 808 type depth recorders calibrated for velocities of 800 fathoms per second. The ship's recorder was No. 74; the launch's No. 51. Bottom samples and vertical casts were obtained with handlead or wire sounding machine.

D. TIDE AND CURRENT STATIONS:

Tide reducers were obtained from a portable automatic gage maintained at Echo Bay, Sucia I. No current stations were observed within the area of this survey.

E. SMOOTH SHEET:

Smooth sheet construction and plotting will be covered in an addendum report.

F. CONTROL STATIONS:

Signals on all three sheets were located photogrammetrically in the majority of cases. Such location was obtained by selecting pass points for signals; by holding to pass points and pricking nearby objects; or by intersection from different photographs. Other signals were located by traverse, theodolite (PATT 1957), sextant, or planetable^{PATT-A-57} (northeast section of Orcas I., on H-8400 (PA-1357)). Triangulation stations were utilized where available.

In some cases a signal was located by reference to a photogrammetrically-located point which was not used as a signal. Such points were located by standard methods and are shown on the blackline impressions, labeled "Pt. A", "Pt. B", etc. Reference data used to locate signals from these points is shown in the sounding volumes and/or blackline impressions.

Final positions of photo signals are on blackline impressions of final manuscripts T-5588 S, T-5589 N, and T-5589 S.

F. CONTROL STATIONS (CONTIN.):

Alphabetical lists of control stations, compiled on a hydrographic sheet basis, are appended to this report and attached to the fly-leaves of the pertinent sounding volumes.

G. SHORELINE AND TOPOGRAPHY:

Most of the shoreline was taken from final prints of photogrammetrically-compiled manuscripts Nos. ~~T-5588~~ and ~~5589^N~~ ^{5589S} ₁₉₄₉₋₅₄. The northern portion of Orcas Island, as shown on Sheet H-8400 (PA-1357) was not covered by recent surveys. Shoreline in this area was from Topographic Sheet T-2192 (date 1894) and T-2229 (1895). It was checked by reference to adjacent sounding lines and, at the northern end, by frequent measurements on graphic control Sheet PA-A-57.

Sheet H-8398 (PA-1157): Discrepancies noted in red on boat sheet in vicinity of Lat. $48^{\circ}40'.7$ at ~~west~~ ^{east} entrance to Prevost Harbor. Adequate notes in the sounding records will permit smooth plotting of the revised shoreline.

Not applicable to H-8400

Sheet H-8399 (PA-1257): Discrepancy noted in red on boat sheet at Lat. $48^{\circ}41.25'$ near Signal HAG.

Sheet H-8400 (PA-1357): Discrepancies noted in red on boat sheet at north entrance of Mail Bay, in vicinity of Signal GUY; at Signal MIS; reef ~~150~~ ¹⁰⁰ meters west of Signal END; and reef ~~150~~ ¹⁰⁰ meters south of Signal SUB. Additional discrepancies are shown on graphic control sheet PA-A-57. (See also under "L").
Resolved through adequate notes in sounding volumes

It was impracticable in most places to delineate the low waterline due to foul or steeply-sloping bottom conditions.

H. SOUNDINGS:

Soundings were taken with 808-type depth recorders operated on the fathom scale. Exceptions to this were in areas where heavy grass obscured the bottom. Such areas were not recognized until late in the season when handlead soundings were taken to obtain bottom samples. Thereafter, soundings in grass were taken on the foot scale with frequent, simultaneous handlead soundings. The final, reduced soundings are shown in fathoms. ✓

Vertical casts were taken with wire sounding machines on the ship and the launch to obtain corrections for echo soundings. Because of severe currents and jagged or steep bottom, agreement generally was poor. Consequently, wire soundings were not considered for echo corrections except in the case of shoal-water launch soundings. ✓

Corrections to echo soundings were obtained entirely from temperature and salinity observations for the ship. Launch corrections were the result of combining bar checks, vertical cast comparisons, and temperature and salinity observations. Variations in initial are recorded as a separate correction. Phase differences are included in the echo corrections. Abstracts of Phase and Echo Corrections follow text. ✓

An exception to the above method of including phase differences as part of the echo correction is found in the sounding volumes of Launch 87 for Sheet H-8398 (PA-1157). Because the phase differences were so large, it was decided early in the season to include this correction with the tide reducers when reducing soundings in order to obtain more reasonable soundings on the boat sheet. Thus the two major corrections were combined to provide one easily handled number for reduction of soundings. This method of combining the corrections was considered too unique to warrant its continued use on the other sheets.

Ship: The initial of the recorder was set at 1.5 fathoms, the draft of the transmitter and receiver units. Frequent checks of ship's

H. SOUNDINGS (Contin.):

draft revealed no consequential variations due to fuel load or sounding speed. ✓

Launch: The initial of the launch was determined by bar check to be 0.3 fathom. (Actually 0.35 is probably better, since 0.3 or 0.4 would satisfy the bar checks, but 0.3 was selected for recording in the sounding records.)

I. CONTROL OF HYDROGRAPHY:

Hydrography was controlled by three-point sextant fixes using signals ashore. In some places, as along beachlines, positions consisted of estimated distances from signals. No substandard methods were used. ✓

J. ADEQUACY OF SURVEY:

This survey is complete and adequate to supersede prior surveys. Junctions of these contemporary sheets are satisfactory and no holidays exist. Depth curves at the junctions were compared by tracings and found to be in good agreement. ✓ Junctions are adequate with Sheets H-8115 and H-8116 along Lat. $48^{\circ} 40'$, ~~the southern limit of hydrography.~~ ^{Not compared on smooth sheet} No other recent surveys exist adjacent to these present surveys except those of Canadian origin. None of these were available to this party. Soundings from Canadian surveys shown on the published chart, No. 6380, agree with the present survey. ✓

K. CROSSLINES:

Approximately 10 percent. of all sounding lines are crosslines. The soundings are in adequate agreement. ✓

L. COMPARISON WITH PRIOR SURVEYS:

Sheet H-8398 (PA-1157): This survey covered parts of prior surveys H-405 (1853; 1:200,000); H-2113 (1891; 1:20,000); and H-2215 (1894; 1:10,000). No large discrepancies were noted. In general, the

Not applicable to H-8400

L. COMPARISON WITH PRIOR SURVEYS (Contin.):

soundings agree within one fathom. In a few instances, as at Position 100m NW of Latitude 48° 42', Longitude 123° 11', and at 200m, WNW of Latitude 48° 42', Longitude 123° 09', it appears an error of 10 fathoms was made in H-2215.

Sheet H-8399 (PA-1257): This survey covered part of prior survey H-2113. The soundings on the two surveys generally agree. The following exceptions are to be noted:

Lat.	Long.	New Depth	Old Depth	Remarks
48° 41.09'	123° 02.70'	0.5 Fm.	9½ Ft.	Mouatt Reef
48° 40.18 ² '	123° 02.20'	28 ⁹	40 Fm.	On Prelim. Review
48° 40.45'	123° 01.02'	27	22 "	smooth sheet agrees.
48° 43.47'	122° 59.90'	87 ⁹	1½ Ft.	No. 8 on Prelim. Review
48° 45.8 ⁵ '	123° 00.73'	69 ⁸	14 Fm.	No. 7 on Prelim. Review Later Canadian Surveys agree

Not applicable to H-8400

A deep channel extends northward from Pt. Disney east of Mouatt Reef as indicated on H-2113

On Prelim. Review

Sheet 8400 (PA-1357): This survey covers part of prior survey H-2113. The soundings generally agree. The following exceptions are to be noted:

48° 41.48' λ 122° 59.37' sds plotted in error on H-2113
The 36 and 40 fathom soundings of No. 9, Prelim. Review, are in 100 fathoms. *No evidence of 36 and 44fm soundings from H-2113 (1891) on present survey. Note # 9 from 1953 Preliminary Review explains erroneous positions.*

The shoal area immediately west of Signal END, No. 10, Preliminary Review, is developed more completely on the new survey. Currents run violently through this area making handlead soundings impracticable except for a few minutes each day. Kelp is so profuse that the bottom is obscured in most places except when the current streams the kelp in a towed-under condition. Soundings eventually were obtained by echo sounder with personnel stationed on each side of the launch wisely verifying all shoal soundings announced by the echo sounder operator. The bow wave of the launch

L. COMPARISON WITH PRIOR SURVEYS (Contin.):

moved aside the kelp sufficiently to enable viewers to see the bottom where it was less than three fathoms below the launch. Several bare rock symbols were shown on the old topographic survey T-2192. There are no bare rocks in this area.

$\phi 48^{\circ} 43.1' \lambda 122^{\circ} 57.2'$

The 43-fathom sounding of No. 11, Preliminary Review, *position a "swinger"*
Disregard 43 fm. sounding from H-2113 (1891). See review.

is in 82 fathoms.

$\phi 48^{\circ} 42.51' \lambda 122^{\circ} 56.8'$

The reef ¹⁰⁰ ~~150~~ meters south of Signal SUB, mentioned

under "G", also was shown on the old topographic sheet T-2192 as a bare rock. It appears there may have been a different meaning for the bare rock symbol when T-2192 was done. The present hydrographic survey and graphic control sheet should be accepted where discrepancies exist.

M. COMPARISON WITH CHART:

The three surveys were compared with Chart No. 6380, 8th Edition, Revised 11/26/56, scale 1:80,000. The difference in scale prevented any accurate comparison, but generally agreement was good. Notable exceptions were listed under "L" above. Another difference, an omission on the chart, is the shoal sounding of 0.5 fathoms about 120 meters NE of Signal RAS on Sheet H-8398 (PA-1157). This was found in an area unsurveyed on prior Survey H-2215.

N. DANGERS AND SHOALS:

Most dangers consist of shoals extending off points of land and are adequately delineated by the depth curves. Additional dangers are: (from boat sheet and subject to adjustment).

Location	Depth(MLLW)	Position	Remarks
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Lat. $48^{\circ} 41' + 632$ m.	(1) 0 Ft.	SHEET H-8398 (PA-1157) <i>not 117f but located by several unnumbered positions taken after pos 117f.</i>	Awash portion of rock ridge extending offshore from Turn Pt. The ridge drops rapidly offshore of a $\frac{1}{2}$ Ft. sounding which is 50 meters NW of this 0 Ft. sounding.
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Not applicable

N. DANGERS AND SHOALS (Contin.):

Location	Depth (MLLW)	Position	Remarks
Lat. 48° 41' + 397 m. Long. 123° 12' + 51 m.	3 Ft. ✓	162 e	Reported on Form 786 (U.S.C.G. notified)

SHEET H-8399 (PA-1257)

Lat. 48° 41' + 162 m. Long. 123° 02' + 852 m.	3.1 Ft.	42 g ✓	Mouatt Reef; reported on Form 786 (U.S.C.G. notified)
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Lat. 48° 43' + ¹⁵⁷⁰ 2495 m. Long. 123° 01' + 268 m.	unCOVERS 1 Ft.	8/8/57	This area was already shown to be foul on Chart No. 6380.
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Lat. 48° 43' + ¹⁵³⁸ 2470 m. Long. 123° 01' + 242 m.	unCOVERS 1/2 Ft.	"	-do-
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Lat. 48° 43' + ¹⁴⁹⁰ 2424 m. Long. 123° 01' + 244 m.	COVERS 1/2 Ft.	"	-do-
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SHEET H-8400 (PA-1357)

No new dangers have been found on this sheet. The area west of Signal END,

shown foul on the chart, was investigated. Smooth sheet plotting may reveal

some changes in this area. *A part of 23 fm shoal was found in Lat. 48° 42' 65" Long 122° 57' 66"*
A charted 37 fm shoal is found in the same area. The 23 fm sounding is charted on Chart 6380 16th ed., Feb 17/49 thru partial application before verification and review in Nautical Chart Branch in (1961).

O. COAST PILOT INFORMATION

Additions and Corrections to Coast Pilot 7, Pacific Coast,

California, Oregon and Washington - Seventh (1951) Edition & Supplement of 12

January 1957.

Page 416, Line 46: Add - In the northwestern part of the harbor, a landing float is maintained by the state for the use of small craft. Fresh water is available at a hand pump located in the state-maintained parkway connecting this harbor with PREVOST HARBOR to the north. (Note to Editor: The floats and park between are all maintained by the Washington State Parks and Recreation Commission, as referred to in the Supplement for Page 417, Line 4.)

Page 417, Line 2: Read - (after "shelter and anchorage") **W** wharf with 11 feet depth at the face is maintained at the west shore for summer residents and USCG personnel stationed at Turn Point Light. A mail boat operates between Prevost Harbor and Friday Harbor. The Washington State Parks and Recreation Commission maintains a landing float for the use of small craft in the harbor. Depth at the float is 9 feet.

applicable

Not

O. COAST PILOT INFORMATION (Contin.):

Page 417 Line 25 - 28: read - (after "depth of") three feet and is marked by kelp, lies 600 yards offshore and 0.5 mile northward of Pt. Disney. A wharf with ten feet depth is on the shore northeast of Mouatt Reef. A mail boat operates between Waldron I., and Friday Harbor. The post office is near the wharf.

Page 417 Line 35 - 36: after "Bare Island.", delete remainder of paragraph. (Note to Editor: Thorough search failed to reveal rock or kelp).

Page 417 Line 39: read - 261° to 347°. (Note to Editor: This is from NM-21/1972/57).

Page 429 Line 43 -44: Delete sentence beginning "A mooring buoy.."

Page 435 Line 35 - 37: read: (after "Burroughs Bay") contains ruins of a sawmill, wharf and lumberyard.

Currents encountered in the area varied considerably. In many places there seemed to be no period of slack water; the currents resulted in whirlpools and rips that seemed to continue throughout the day. As determined from launch "ground speeds" the current maximums were about three knots in the more confined channels; such as, President Channel, Boundary Pass, the area between Skipjack Island and Waldron Island, and the area west and north of Turn Pt. A specific example of current occurred on 14 August when the launch broke down and drifted from Position 1 to Position 2 t-day. The average speed was 1.7 knots (no wind) and the direction toward Haro Strait rather than toward San Juan Channel as would be expected. This occurred from one hour after low water to two hours after low water.

P. AIDS TO NAVIGATION:

No floating aids are in the area. The fixed aids are correct as published in the Light List and shown on the chart. ✓

Q. LANDMARKS FOR CHARTS:

None are recommended. ✓

R. GEOGRAPHIC NAMES:

gwb

See special report on geographic names.

S. SILTED AREAS:

Most of the deep, flat-bottomed areas are covered with silt.

For specific depths and area limits, see fathograms.

T. BY-PRODUCT INFORMATION:

No significant by-product information was noted.

U. MARKED TOPOGRAPHIC STATION:

PATT 1957 -- data and computations

PATT 1957 is a standard topo mark set as close to the position of DOUGHTY 4, 1940 as was possible from the description. DOUGHTY 4 has been removed and there were no reference marks. It is felt that the location of PATT 1957 is within four feet of the position of DOUGHTY 4.

Location of PATT 1957 was by theodolite (Wild T-2). All stations in the vicinity that would furnish strong 3-point fixes were observed with four D & R. The signals were all plumb within one inch except for SLANT 1894 which was eccentric. (The target was six inches northwest of the station mark). Heat waves were fairly bad during the observations.

The position computed for PATT 1957 varies with the 3-point fix selected. For this reason, three different 3-point problems were computed; the accepted (field) position of PATT-1957 is a mean of the three solutions. This position was used on graphic control Sheet PA-A-57 as well as on hydrographic sheet H-8400 (PA-1357).

Analysis of computations.

Latitude	Longitude	3-point fix	G. P. Triangle
48 42 + 1340.7 m.	122 56 + 1110.7 m.	FRE - AKE - HAM	PATT - FRE - HAM
+ 1343.9	+ 1109.9	FRE - SAT - PUF	PATT - SAT - PUF
+1336.9*	+ 1108.7)	ALL - HAM - SAT	(PATT - ALL - HAM
+ 1336.9*	+1108.7)		(PATT - ALL - SAT

U. MARKED TOPOGRAPHIC STATION (Contin.): ✓

Latitude	Longitude	3-point fix	G. P. Triangle
43.396"	54.288"		
48 42 + 1340.5 m.	122 56 + 1109.8 m.	Accepted (field mean) position of PATT 1957	
48 42 + 1340.4 m.	122 56 + 1109.0 m.	Position of lost station DOUGHTY 4, 1940	

*These two sets of values are combined as one in the final meaning because they are from the same 3-point fix.

FRE is FREEMAN 1894 HAM is HAMMOND 3, 1940 PUF is PUFFIN I. LT. 1940
 ALL is SMALL 1894 SAT is SATURNA I. LT. 1909

The record book and computation data for this station should accompany the smooth sheet until the smooth sheet is completed.

V. TRAVERSE:

Signals from SANDY 1940, RM 2, along the west coast of Waldron Island to DRY 1942 were located by traverse, using a 300-ft. steel tape and measuring angles (D & R) with a Wild T-2 theodolite. The initial was on Skipjack Light, 1950, at each setup because the backsights were too short to provide good azimuths. The positions on the smooth sheet were obtained graphically; no adjustment was necessary. The record book "Observations of Horizontal Directions" should accompany this sheet until it is completed.

Z. TABULATION OF APPLICABLE DATA:

- Geographic Names Report.
- Observations of Horizontal Directions and computations for Station PATT 1957.
- Observations of Horizontal Directions for traverse from SANDY RM 2 1940 to DRY 1942.
- Temperature and Salinity Report.

Respectfully submitted,

William E. Randall
 William E. Randall
 LCDR C&GS
 Cmdg., Ship PATTON

ABSTRACT OF ECHO CORRECTIONS

Sheet No. Final Echo Correction (Velocity Only)

H-8398 (PA-1157)	0.0 to 17.5 Fm.	0.0
	27.0	+ 0.1
	46.5	+ 0.2
	65.5	+ 0.4
	85.0	+ 0.6
	100.5	+ 0.8
	145	+ 1.0
	193	+ 1.5
	241	+ 2.0

Not Applicable

Comp. W.E.R.

H-8399 (PA-1257) & H-8400 (PA-1357) Velocity Correction (See curve - T&S, + Barchaks)

0.0 to 9.5	0.0
19.0	+ 0.1
33.5	+ 0.2
48.0	+ 0.4
63.0	+ 0.6
75.0	+ 0.8
114.0	+ 1.0
150+	+ 1.5

Final Echo Correction (Velocity & Phase)

Depth (Fms)

A Scale

0 - 9.5	0.0
- 19.0	+ 0.1
33.5	+ 0.2
48.0	+ 0.4
63.0	+ 0.6
75.0	
114.0	
150 +	

B Scale

+ 0.1
+ 0.3
+ 0.5
+ 0.7

C Scale

+ 2.2
+ 2.4
+ 2.9

D scale

+ 4.8
+ 5.3

Comp. E. E. S.

ABSTRACT OF PHASE COMPARISONS

DATE	A - B	B - C	C - D
7 MAY	(20) - 0.27		
8 "	(20) - 0.33	(7) + 1.67	
20 "		{25} + 1.69	(20) + 2.43
10 AUGUST		{ (15) } { + 2.10 } _R	
Arith. Means	- 0.30	+ 1.69	+ 2.43
		- 0.30	+ 1.39
	- 0.30	+ 1.39	+ 3.82
Final corr'n to scale	A = 0	B = - 0.3	C = + 1.4 D = + 3.8

Applicable to H-8400

PHASE COMPARISONS USED H-8398 (PA-1157)*

Means	A - B = -0.22;	B - C = +1.65;	C - D = +2.45
Final Corr'n to Scale	A = 0	B = -0.2	C = +1.4 D = +3.9

Not applicable

*Fathometer No. 51 (Launch) soundings for Sheet H-8398 (PA-1157) were reduced using erroneous A - B phase comparison of -0.22 fms. This was discovered after check scanning phase comparisons, but the error of 0.1 fathom (in depths no less than 35 fathoms) was not considered large enough to change the reducers - which had already been entered and checked. As noted in Descriptive Report, phase comparisons were combined with tide reducers for Sheet H-8398 (PA-1157). In Sheets H-8399 (PA-1257) and H-8400 (PA-1357), phase was combined with velocity correction in the conventional manner.

ABSTRACT OF ECHO CORRECTIONS

(Temperature & Salinity and Phase Differences)

Period: 18 April - 7 May 1957 applies to Sheet H-8398 (PA-1157)

DEPTH (fm)	CORRECTION (fm)				
	A-scale	B-scale	C-scale	D-scale	E-scale
0 to 8	0.0				
21	+ 0.1				
42	0.2				
64	0.4	+ 1.2			
87		1.4	+ 0.9		
100.5		1.6	1.1		*
157			1.3	- 1.2	+ 1.9
over				0.7	2.4
					*

Applicable

On A-day (Ship) the corrections for E-scale are -0/1 to 157' fms and + 0.4 for deeper depths. As explained in Vol. 1 of Sheet H-8398 (PA-1157), this is because the range of E-scale was changed after sounding on A-day.

Period: 8 May - 2 June 1957 applies to Sheet H-8398 (PA-1157)

0 to 7	0.0				
15	+ 0.1				
24	0.2				
33	0.3	+ 1.1			
52	0.4	1.2			
70		1.4			
88		1.6	+ 1.1		
127		1.8	1.3	- 1.2	
174			1.8	0.7	+ 2.4
over					2.9

Not

Period: covers all work on Sheets H-8399 (PA-1257 and H-8400 (PA-1357)

0 to 5	0.0				
12.5	+ 0.1				
20	0.2				
27.5	0.3				
42.5	0.4	+ 1.2			
57.5	0.6	1.4			
73		1.6	+ 1.1		
90		1.8	1.3		
106			1.5	- 1.0	
152			1.8	0.7	+ 2.4
over				0.2	2.9

ABSTRACT OF PHASE COMPARISONS

Date & Day Letter	A - B	B - C	C - D	D - E	Remarks
<u>(PA-1157)</u>					
19 Apr/B	+ 0.68 (9)	<u>- 0.73 (6) R</u>			Sloping
20 Apr/C	+ 0.91 (10)				
24 Apr/extra			- 2.57 (34)		
25 Apr/D	+ 0.76 (10)				
4 May/G		- 0.57 (10)		+ 3.18 (9)	
5 May/H		- 0.44 (10)			
6 May/J	+0.61 (14)				
1 Jun/M	^{Pos.} 65,87 +0.50 (4) R				Too few
<u>(PA-1257)</u>					
31 Jul/B	pos. 3	<u>- 1.2 (1) R</u>			Too few
1 Aug/C		- 0.52 (10)			
20 Sep/J	+ 1.08 (12)	- 0.45 (10)			
23 Sep/extra	+ 0.98 (30)				
<u>(PA-1357)</u>					
24 Sep/D		- 0.55 (22)			
<hr/>					
Arith. Means..	+ 0.84	- 0.51	- 2.57	+ 3.18	
	<hr/>	+ 0.84	+ 0.33	- 2.24	
	+ 0.84	+ 0.33	- 2.24	+ 0.94	

Not Applicable

Applicable

FINAL CORR'NS

A-scale 0.0 B-scale + 0.8 C-scale + 0.3 D-scale - 2.2 E-scale + 0.9

STATISTICS

SHEET H-8400 (PA-1357) ✓

Ship PATTON:

<u>VOL.</u>	<u>DAY</u>	<u>DATE</u>	<u>NO. OF POS.</u>	<u>NAUT. MILES</u>	<u>H.L. & WIRE SNDGS.</u>
1	A	July 25	207	33.2	1
1 & 2	B	26	279	45.5	1
2 & 3	C	28	227	33.2	0
3	D	Sept. 24	209	29.3	0
3	E	Oct. 17	<u>5</u>	<u>0.0</u>	<u>5</u>
Totals:			927	141.2	7

Launch 87:

4	a	Aug. 23	117	8.9	2
4	b	24	80	5.4	8
4	c	25	115	8.2	8
5	d	26	137	13.1	5
5	e	27	166	12.6	6
6	f	Sep. 11	160	12.5	6
6 & 7	g	21	150	11.1	95
7	h	22	141	9.1	101
7	j	23	<u>166</u>	<u>14.9</u>	<u>10</u>
Totals:			1232	95.8	241

SHEET TOTALS: 2159 237.0 248

AREA: 6.9 sq. naut. mi.

TIDE NOTE ✓

SHEETS H-8398 (PA-1157); H-8399 (PA-1257); and H-8400 (PA-1357)

A portable automatic tide gage at Echo Bay, Sucia Island, Washington, furnished tide reducers for the entire season. Its position was:

Lat. 48° 45.3'
Long. 122° 53.7'

Midway through the season, on 10 July, the gage was moved a few yards to the west into deeper water to obtain minus tides.

MLLW on the staff (5 April to 10 July)	2.40 ft.
(10 July to 17 Oct.)	3.87 ft.

PROCESSING OFFICE NOTES - H-8400 ✓

SMOOTH SHEET

The smooth sheet was hand constructed by personnel of the Seattle Hydrographic Processing Unit, using standard methods of construction and checking. The control data and shoreline are from the same sources as shown in the field report.

ADEQUACY OF SURVEY

The survey is complete and adequate for charting. The junction with H-8399 has been compared and found satisfactory on the south part of the sheet. The junction on the northern part shows an apparent 2 fathom difference with soundings of "B" day on this sheet. Both "A" and "B" days on this survey appear to be too deep by approximately the amount of the combined phase and velocity correction. "A" and "B" days are also generally deeper than adjoining launch day soundings. "C" and "D" days are in agreement with each other and also with the launch soundings on this sheet and the junction soundings with H-8399. The fathograms were checked for the various things that may cause differences in depth but the only thing found was a vertical cast on position 1A which had a wire sounding of 88 fms. and a fathometer sounding of 87.9 fms. After correcting for tide, the wire sounding is 88.3 fms. and after correcting for phase, velocity and tide, the fathometer sounding becomes 89.5 fms. By eliminating the phase and velocity correction on "A" and "B" days, the agreement with the other days, by the Ship and the launch, would be satisfactory.

Crossings and junctions are generally in adequate agreement

COMPARISON WITH CHART

This survey has been compared with Chart 6380, 9th Ed., 8 August 1960. Every sounding on the Chart, in the area covered by the smooth sheet, has been compared. See section of chart attached to this report for comparison.

Respectfully submitted,

William M. Martin

WILLIAM M. MARTIN
SUPERVISORY CARTOGRAPHER

Approved and forwarded:

M. E. Wennermark

M. E. WENNERMARK
CAPTAIN, C&GS
SEATTLE DISTRICT OFFICER

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8400....

Records accompanying survey: Smooth sheets .1....;
 boat sheets .1....; sounding vols. 7....; wire drag vols.;
 Descriptive Reports .1....; graphic recorder envelopes .3....;
 special reports, etc.

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

Number of positions on sheet	.....	2159
Number of positions checked	.....	84
Number of positions revised	.....	17
Number of soundings revised (refers to depth only)	.....
Number of soundings erroneously spaced	.....
Number of signals erroneously plotted or transferred	.....
Topographic details	Time	..... 10
Junctions	Time	.....
Verification of soundings from graphic record	Time	..... 4 hours
Special adjustments	Time	.....

Verification by *Alvin Schugart* Total time *106 hours* Date *11/6/64*
Cosgrove - Shorelines *32 hrs* *11/5/68*

Reviewed by *George A. Kowaczak* Time *117* Date *18 July 69*
Carleton *119*

OFFICE OF HYDROGRAPHY AND OCEANOGRAPHY

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8400

FIELD NO. PA-1357

Washington, San Juan Islands, President Channel

SURVEYED: July 25, 1957, through October 17, 1957

SCALE: 1:10,000

SOUNDINGS: 808 Fathometer,
Hand Lead, Wire
Sounding Machine

CONTROL: Sextant fixes
on shore signals

Chief of Party.....	W. C. Russell
Surveyed by.....	W. C. Russell
.....	W. E. Randall
.....	T. E. Simkin
Protracted by.....	C. A. J. Pauw (PMC)
Soundings Plotted by.....	C. A. J. Pauw
Verified and Inked by.....	A. K. Schugeld (AMC)
Reviewed by.....	G. A. Kozemczak
.....	Date: August 18, 1969
Inspected by.....	R. H. Carstens

1. Description of the Area

The area covered by this survey is President Channel between Waldron and Orcas Islands. The channel is about five miles long and one point five miles wide. The major portion of the area is gently sloping and deep. Depths through the natural channel range from 90 to 105 fathoms. Ledges, rocks awash, and reefs fringe much of the shoreline on the east.

In general, two prominent rocky shoals rise sharply from deep water--one in the vicinity of lat. $48^{\circ}41.6'$, long. $122^{\circ}57.9'$ approximately 500 meters off Orcas Island and the other in lat. $48^{\circ}42.6'$, long. $122^{\circ}57.6'$ approximately 900 meters off the same island. Bottom characteristics are predominantly green mud and broken shells.

2. Control and Shoreline

The source of control is given in the Descriptive Report. The shoreline originates with T-5589 and T-5589S of 1949-54, T-2192 of 1894, and T-2229 of 1895.

3. Hydrography

A. Depths at crossings are in satisfactory agreement after closer scanning of the fathograms. The remaining minor differences at crossings are considered negligible in this deep water area and do not affect the depth curves.

B. The usual depth curves were adequately delineated.

C. The development of the bottom configuration and the determination of least depths are considered adequate.

4. Condition of the Survey

The field plotting, sounding records, and the Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual.

5. Junctions

Adequate junctions were effected with H-8520 (1960) to the north and northeast, H-8399 (1957) to the west, and H-8115 (1954) to the south.

6. Comparison With Prior Surveys

A. H-708 (1858) 1:20,000
H-709 (1858-59) 1:100,000

These prior surveys plotted from the same date cover the northern portion of the present survey. The present survey reveals a general deepening of four to five fathoms compared to the few soundings on the early reconnaissance surveys.

B. H-2113 (1891) 1:20,000

This prior survey covers the area of the present survey. There is in general only minor differences between the prior and present survey depths. A few erratic differences of about four fathoms were noted in some of the deeper areas.

The following should be noted:

1. The 43-fathom sounding on H-2113 in lat. $48^{\circ}43.1'$, long. $122^{\circ}57.2'$ falls on the present survey in 82 fathoms. The present development is considered adequate to disprove this sounding which is one of two whose positions are determined by swinger fixes..

2. The 16 foot on H-2113 in lat. $48^{\circ}41.4'$, long. $122^{\circ}57.77'$ falls in present depths of about six fathoms. An angle of the sextant fix controlling the position of the 16 foot is questioned in the original records and is apparently in error. The line has been replotted on H-2113, bringing the soundings into agreement with the bottom configuration of the present survey.

Several soundings have been carried forward from H-2113 to supplement present depths. With these additions, the larger scale present survey adequately reveals the bottom configuration and supersedes the prior surveys in the common area.

7. Comparison With Charts

Chart 6380 1:80,000 (latest print date 16 Ed., 2/17/69)
Chart 184-SC 1:80,000 (latest print date 9th Ed.,
corrected through N.M. 11, 3/15/69)

A. Hydrography

The charted hydrography originates with the previously discussed surveys which require no further consideration, supplemented by the partial application of depths from the boat sheet of the present survey. Only minor differences were noted between charted depths and present survey depths.

Attention is directed to the following:

1. The pier charted in lat. $48^{\circ}41.3'$, long. $122^{\circ}57.4'$ is based on Chart Letter 1072 (1961) subsequent to the date of the present survey and therefore should be retained on the chart.

2. The rock awash symbol charted in lat. $48^{\circ}41.46'$, long. $122^{\circ}57.75'$ represents a rock less than 2 feet below mean lower low water on the present survey and should therefore be charted as awash at MLLW or a sounding 0^3 Rk.

4.

3. The rock awash symbol charted in lat. $48^{\circ} 41.55'$, long. $122^{\circ} 57.72'$ represents a rock more than 2 feet below mean lower low water on the present survey and should therefore be charted as 0° Rk.

The present survey is adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

There are no aids to navigation within the area of the survey.

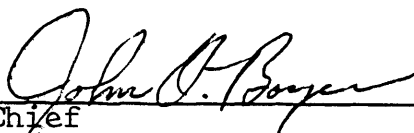
8. Compliance With Instructions

The survey adequately complies with the Project Instructions.

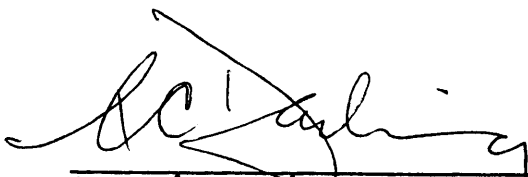
9. Additional Field Work

This is a very good basic survey and no additional hydrography is recommended.

Examined and Approved:



Chief
Marine Chart Division



Associate Director
Office of Hydrography
and Oceanography

ZHC

TIDE NOTE FOR HYDROGRAPHIC SHEET ✓

~~DIVISION OF COASTAL SURVEYS~~

19 January 1961

Division of Charts: R.H. Carstens

Plane of reference approved in
7 volumes of sounding records for

HYDROGRAPHIC SHEET 8400

Locality San Juan Island, Washington

Chief of Party: W.C. Russell (1957)

Plane of reference is mean lower low water reading.

3.9ft. on tide staff at Echo Bay, Washington

10.3ft. below B. M. 1 (1956)

Height of mean high water above plane of reference is: 7.9ft.

Condition of records satisfactory except as noted below:


Acting Chief, Tides and Currents Branch

~~Chief, Division of Tides and Currents.~~

GEOGRAPHIC NAMES

Survey No. H-8400 ✓

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
Bare Island	x											1
Freeman Island	x											2
Mail Bay	x											3
Orcas Island	x											4
President Channel	x									x		5
Point Disney	x											6
Point Doughty	x											7
Point Hammond	x											8
Waldron Island	x											9
												10
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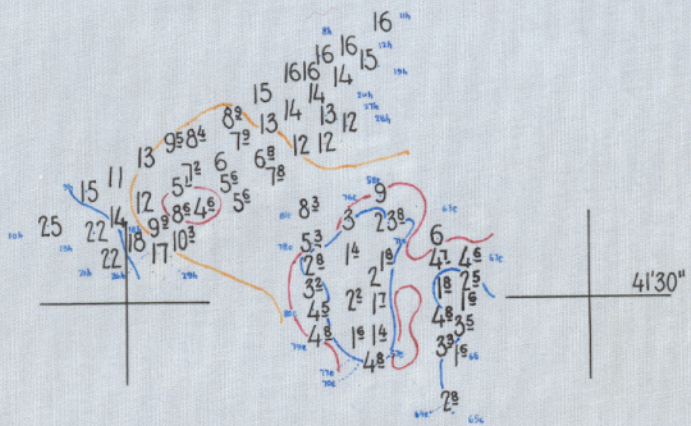
George M. Bales
 GEOGRAPHIC NAMES SECTION
 16 JANUARY 1961

58'30"

122° 58'00"

57'30"

48°42'00"



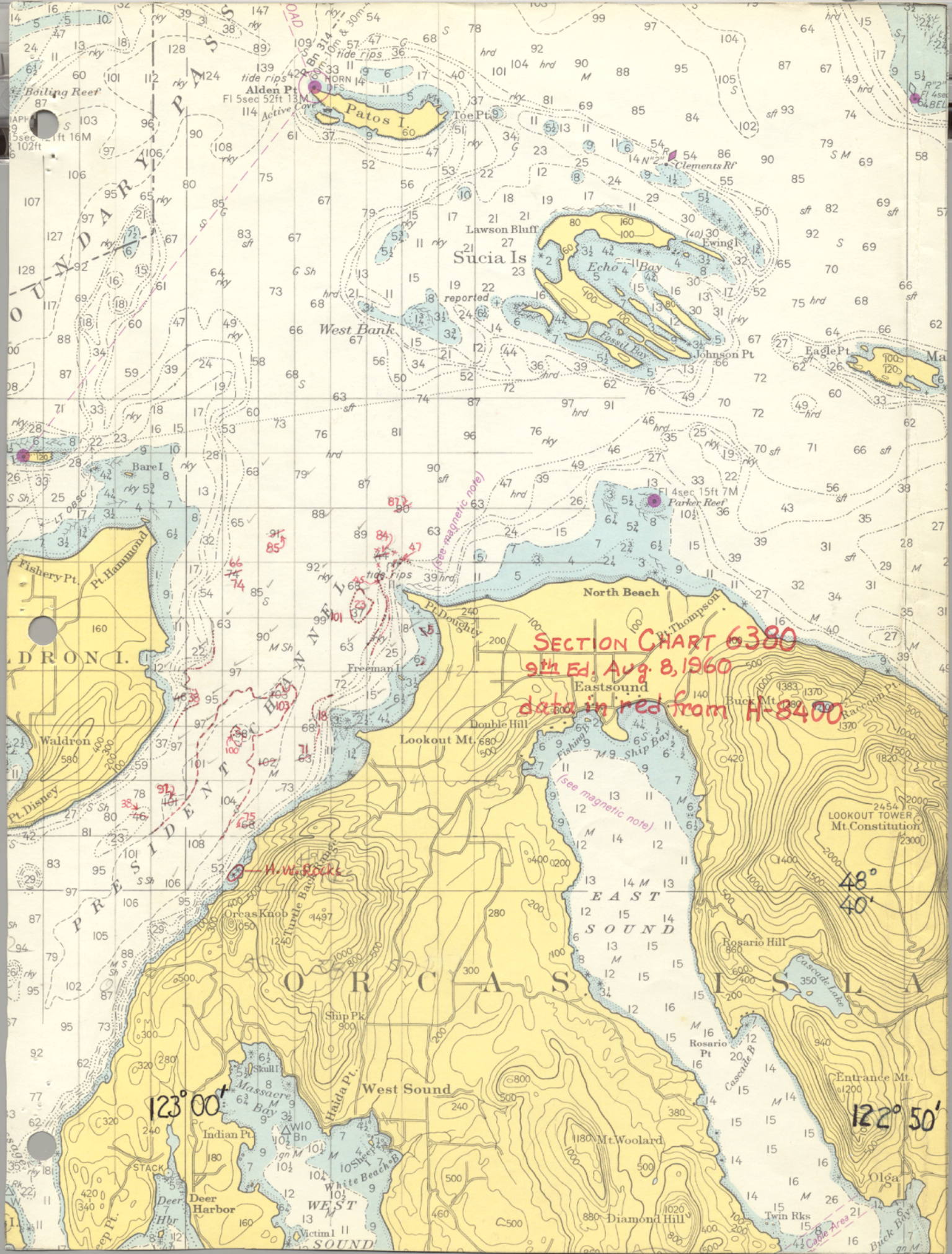
OVERLAY To ACCOMPANY

PA-1357

H-8400

Positions 57^e-58^e; 63^e thru 67^e; 70^e-71^e; 76^e thru 81^e Lch. 87 Vol. 5 27 Aug. 1957

Positions 8^h thru 13^h; 18^h thru 21^h; 26^h thru 29^h Lch. 87 Vol. 7 22 Sept. 1957

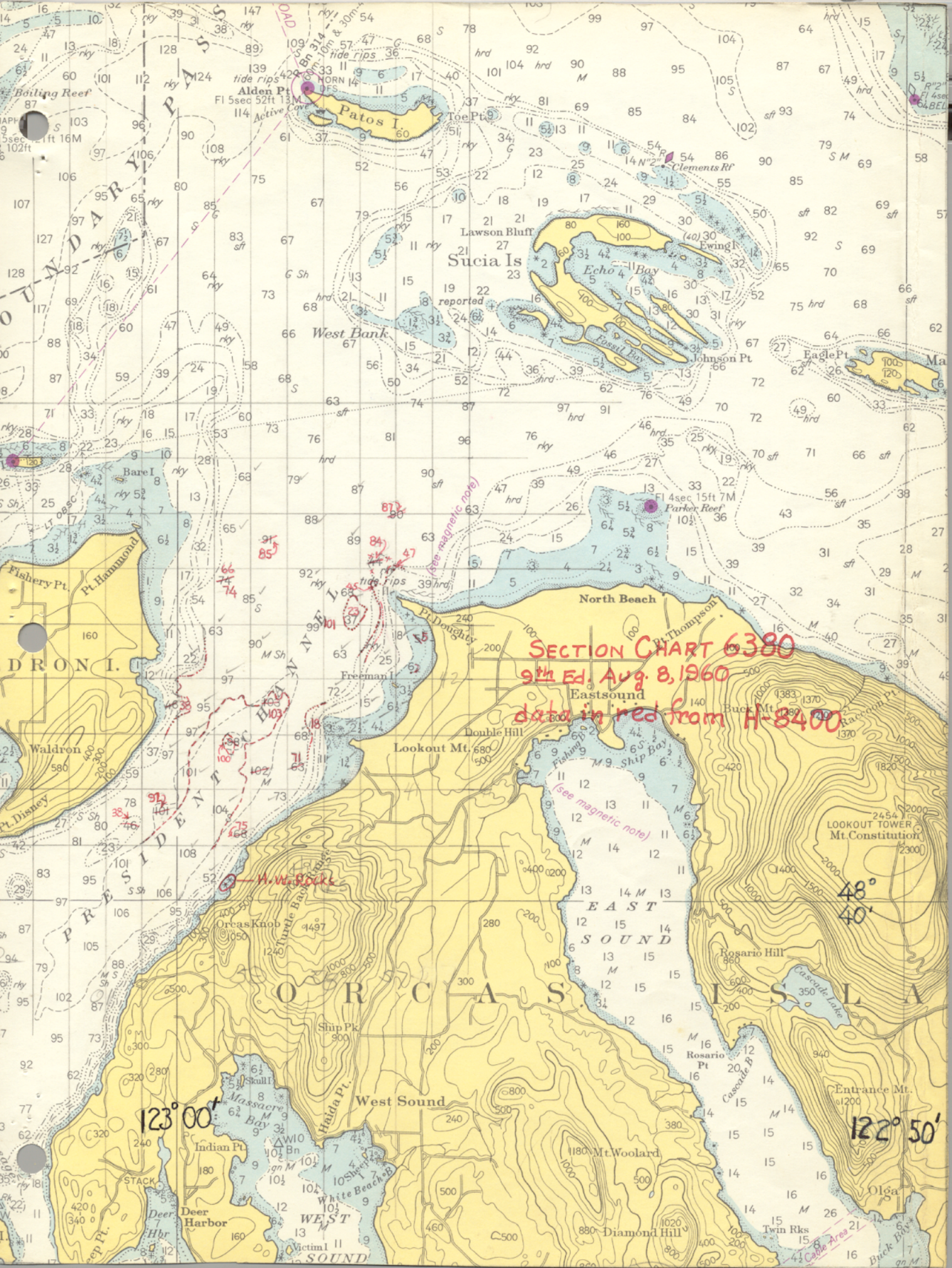


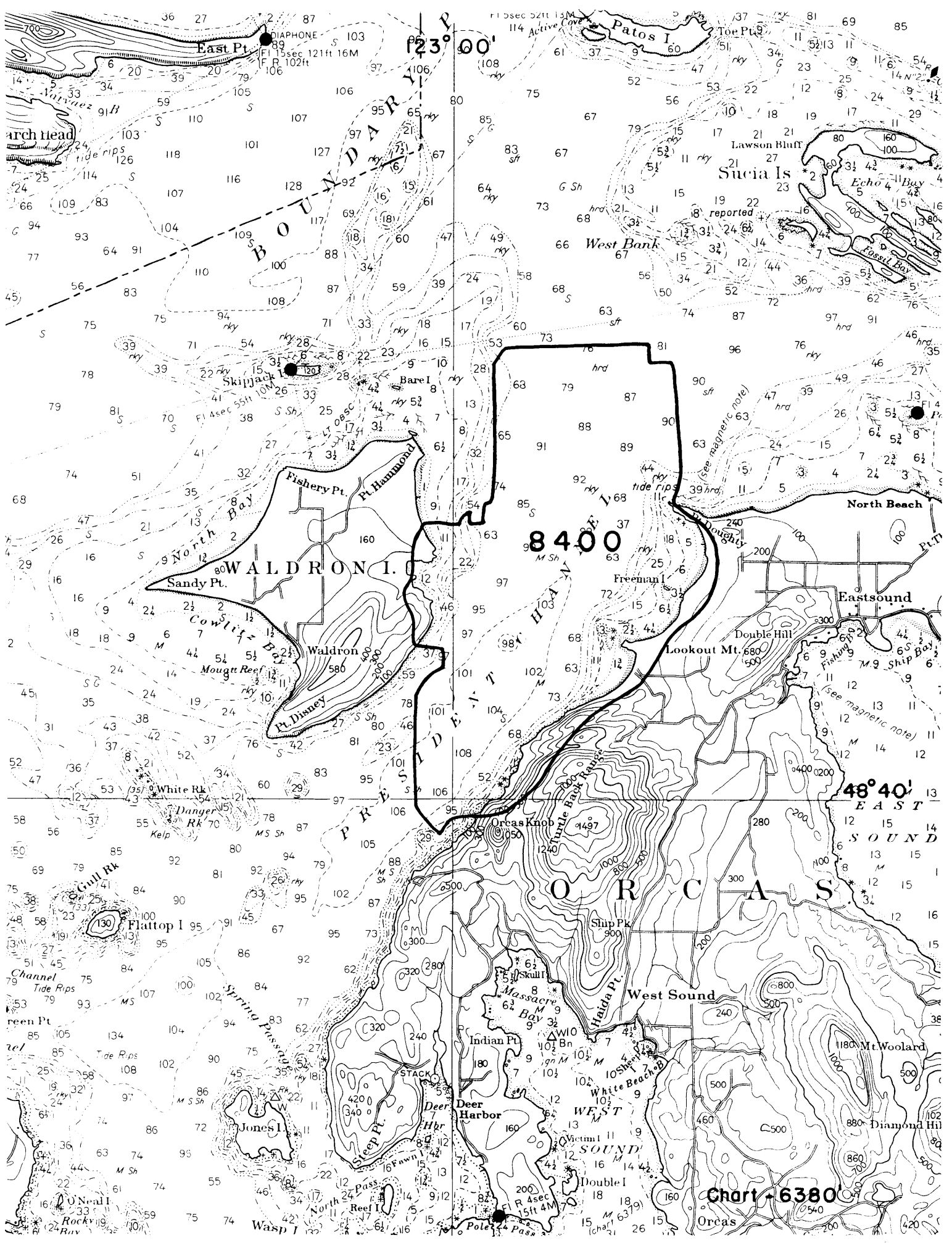
SECTION CHART 6380
9th Ed. Aug. 8, 1960
data in red from H-8400

H.W. SOCK

123° 00'

122° 50'





123° 00'

48° 40'

8400

Chart 6380

