

8520

Diag. Cht. No. 6380-3.

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. LJ-10-3-60 Office No. H-8520

LOCALITY

State Washington

General locality San Juan Islands

Locality Vicinity of Sucia Islands

1960

CHIEF OF PARTY

N. E. Taylor

LIBRARY & ARCHIVES

DATE July 17, 1962

USCOMM-DC 37022-P66

8520

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-8520

Field No. LJ-10-3-60

State WASHINGTON

General locality SAN JUAN ISLANDS

Locality Vicinity of SUCIA ISLANDS

Scale 1:10,000 Date of survey 6/5/60 - 7/16/60

Instructions dated 28 October 1958 & 20 January 1960

Vessel Ship LESTER JONES & Launch No. 88

Chief of party N. E. Taylor

Surveyed by N. E. Taylor and D. Cummings

Soundings taken by fathometer, graphic recorder, hand lead, etc

Fathograms scaled by Ship Personnel

Fathograms checked by Ship Personnel

Protracted by C. R. Lehman

Soundings penciled by C. R. Lehman

Soundings in fathoms feet at MLLW/ MLLW and are true depths

REMARKS:

[Handwritten mark]

DESCRIPTIVE REPORT

TO ACCOMPANY

HYDROGRAPHIC SURVEY H-8520
(Field No. LJ-10-3-60)

SAN JUAN ISLANDS, WASHINGTON

Scale 1:10,000
USC&GSS LESTER JONES

1960
Chief of Party N. E. Taylor

A. PROJECT

This survey was performed as a part of Project CS-²⁴¹~~412~~, in accordance with Revised Instructions dated 28 October 1958 and modified by Supplemental Instructions 20 January 1960.

B. AREA SURVEYED

The limits of this survey are indicated on the index of hydrographic sheets. The area lies west of Sucia Island to the Canadian boundary and from Orcas Island and the north end of President Channel on the south to about a mile north of Patos Island. Dates of starting and ending of survey 5 June 1960 and 16 July 1960, respectively.

This survey makes junctions with H-8478 (1959) scale 1:30,000 to the north, H-8519 (1960) scale 1:10,000 to the east, H-8400 (1957) scale 1:10,000 to the south, and H-8399 (1957) scale 1:10,000 on the west, and covers part of the area covered by prior surveys H-405 (1853) scale 1:200,000, H-708 (1858) scale 1:20,000, H-2080 (1891) scale 1:20,000 and H-2113 (1891) scale 1:20,000.

C. SOUNDING VESSEL

The hydrography was accomplished by the Ship LESTER JONES and Launch No. 88 operating from the ship. Generally, the ship operated in depths greater than 40 fathoms, identified by the red color and capitalized day letters, and the remaining inshore areas by the launch, identified by the blue color and lower case day letters.

D. SOUNDING EQUIPMENT

The soundings on this survey were obtained by 808 type fathometers. The ship used No. 75s throughout the survey. Launch No. 88 used No. 107s on a, b, j, k and l days, No. 148s for the first 40 positions on c day and No. 125s for the balance of c day and for d, e, f, g and h days.

E. SMOOTH SHEET

The smooth sheet was hand constructed by the Seattle Hydrographic Processing Unit, using standard methods of construction, checking and transferring. ✓

F. CONTROL

The hydrography on this survey was controlled by sextant angles measured on triangulation stations and hydrographic signals located on Graphic Control Sheets LJ-B-60 and LJ-C-60. ✓

G. SHORELINE

The shoreline for this survey comes from T-1870 (1888), T-2192 (1894) and photo manuscript T-5589N(1949-54). ✓

The transfer of the shoreline has been verified. ✓

The low water line was not delineated because steep and generally foul character of the inshore areas. ✓

H. CROSSLINES

Approximately 7% of the sounding lines are crosslines. In two areas there are unresolved crossing discrepancies. At Lat. $48^{\circ} 45' .7$, Long $122^{\circ} 58' .3$ pos. 74-75G and 228-229C, C day deep by about 2 fms. Lat. $48^{\circ} 44' .3$, Long. $122^{\circ} 59' .0$, pos. 78-79B and 123-124F. B day appears a little over one fathom deeper. ✓

There is evidence that the deeper scales are not consistent with the corrections as derived from the phase comparisons. ✓

Not significant - discrepancies reduced during verification

I. JUNCTIONS

Junctions with H-8399 and H-8478 have been compared. No copies of H-8400 or H-8519 are available in the processing office for comparison. ✓

Soundings on H-8399 that are deeper than 50 fathoms are 1 to 3 fathoms shoaler than H-8520. The copy of H-8399 is from the boatsheet of that survey. These differences bear out the suspicion that something is wrong with the corrections as applied to the deep scales. ✓

Phasing differences erratic. Revisions attempted during verification

Soundings on H-8478 are in good agreement for the most part, except for about 7 soundings which appear to be in error on H-8478. The 81 fathom and 98 fathom soundings pos. 130-131T, Lat. $48^{\circ} 47' .9$, Long $122^{\circ} 59' .7$ both appear too deep. Four soundings pos. 101-102U (95, 86, 71 and 96) appear too shoal by a considerable amount, Lat. $48^{\circ} 47' .7$, Long. $122^{\circ} 58' .9$. The 107 fathom sounding pos. 105-106U, Lat. $48^{\circ} 47' .8$, Long. $122^{\circ} 59' .3$, ~~appears to be about 60 fathoms too deep.~~ ✓

was corrected to read 47 fathoms on A-scale (60 fathoms shoaler)

Position 130T was misplotted. Verifier rescanned, replotted and corrected all above soundings which made satisfactory agreement in junctional area.

J. PRIOR SURVEYS

This survey has been compared with H-2113 (1891) and found to be in good agreement, considering that the present survey is much more detailed and that a better representation of the bottom has now been obtained. Had the old survey been as complete in coverage there would have been little or no reason for doing the area at this time. ✓

K. COMPARISON WITH CHART

This survey has been compared with Chart 6380, 10th Ed., July 31/61 and found in reasonable agreements, though a number of shoaler soundings were found on the new survey. ✓

The charted sunken rock symbol at Lat. 48° 45'.4, Long. 122° 55'.7 falls in about ~~20~~ fathoms of water, and probably should be about 200 meters to the east. ✓

There is a 40 fathom channel just east of Patos Island that goes all the way through between Toe Point and the charted 9 fathom shoal to the east. ✓

The configuration of West Bank is different on the smooth sheet. ✓

See section of Chart 6380 attached to this report. ✓

L. ADEQUACY OF SURVEY

The ship work on this survey is questionable. Soundings taken with fathometer No. 75s appear erratic on the deep scales and do not make good junctions with the launch, except where the soundings were taken on "A" scale. The discrepancies show up at the changes from one scale, or phase, to another while the work was in progress. For example, the phase shifts for the seven days worked by the ship vary from -1.8 fathoms to +2.4 fathoms on the A to B shift, -2.4 to +1.6 on B to C and -3.8 to +3.4 on C-D scales. The scale shifts that could be read with reasonable accuracy have been tabulated and are attached to this report. There are many more scale changes that were not tabulated because of the very steep slopes or because the trace was off the fathogram either at the top or bottom. The variation in depths between scales indicates a badly worn phasing switch which gave very erratic results. ✓

Because of the work and time that now appears necessary to resolve the differences in soundings on the various days and scales, the sheet and records are being sent to Washington for review and possible suggestions for solution of the above mentioned problems. This is at the suggestion of Commander Paulson, who was approached while in Seattle last spring.

see ✓
Inspection Report
part by
Washington
ton Office

I believe that any solution would be of questionable accuracy because of

the erratic differences that show as the scale changes. At the same time, I feel that most of the discrepancies could be resolved, at least to a reasonable degree, by a comparison process.

The trouble on this sheet appears to me to be the result of too much field work and not enough processings or effort toward accuracy. This party completed six surveys and part of a seventh, only two of which had the preliminary processing completed and reports in rough pencil form. The other four surveys had little or no preliminary processing and no reports written at all, this sheet is one of the latter four. The seventh survey was turned over to the Ship PATTON for completion in 1961.

M. AIDS TO NAVIGATION

There is only one fixed aid to navigation, Patos Island Light, in the area covered by this survey and no floating aids. Also there are no special landmarks or cable areas.

N. STATISTICS

There are a total of 2736 positions and 399.5 nautical miles of sounding lines on this survey. The Ship LESTER JONES had 1205 positions and 216.4 nautical miles and Launch No. 88 had 1531 positions and 189.1 nautical miles. The area covered is 15.4 square nautical miles.

P. RECOMMENDATIONS

Because of the difficulty that will be met in trying to solve the problem of phase corrections on this survey, it is recommended that the Ship BOWIE be requested to run a system of widely spaced sounding lines over the area of the ship work on this survey. This, I believe, would be of considerable help in determining corrections for the present survey. Precautions should, of course, be taken to see accurate corrections are obtained and that care is used in switching from one scale to another.

See inspection Report by Klasing-Hen Office

I understand that the Ship BOWIE is scheduled to do some work in Flounder Bay, Fidalgo Island, which is only about 25 miles from the area of this survey and thought that it might be possible to do the two jobs consecutively. There are enough natural objects in the area so that control should not be a problem. That only leaves the question of tide, which probably could be taken from Friday Harbor.

Respectfully submitted,

William M. Martin

William M. Martin
Supervisory Cartographer

Approved and forwarded

M. E. Wennemark
M. E. Wennemark
Captain, C&GS
SEATTLE DISTRICT OFFICER

-5-

TIDAL NOTE
TO ACCOMPANY
HYDROGRAPHIC SURVEY
H-8520 (LJ-10-3-60)

A portable tide gage was maintained at Echo Bay, Sucia Island, Latitude $48^{\circ} 45'.6$, Longitude $122^{\circ} 53'.8$, for the reduction of soundings. A staff reading of 4.2 feet corresponds to MLLW. Reducers were applied with no corrections for time or height.

VELOCITY CORRECTION ABSTRACT ✓

1960 Field Season

PROJECT CS-241 (Applicable to H-8518, H-8519, H-8520)

<u>DEPTH (Fathoms)</u>	<u>CORRECTION (Fathoms)</u>
0 - 7	+ 0.0
7.1 - 15	+ 0.1
15.1 - 24	+ 0.2
24.1 - 32	+ 0.3
32.1 - 40	+ 0.4
40.1 - 49	+ 0.5
49.1 - 57	+ 0.6
57.1 - 66	+ 0.7
66.1 - 74	+ 0.8
74.1 - 83	+ 0.9
83.1 - 92	+ 1.0
92.1 - 100	+ 1.1
100.1 - 109	+ 1.2
109.1 - 118	+ 1.3
118.1 - 126	+ 1.4
126.1 - 135	+ 1.5
135.1 - 144	+ 1.6
144.1 - 150	+ 1.7

PROJECT CS-412 (Applicable to H-8542, H-8543, H-8544, LJ-10-7-60)

<u>DEPTH (Fathoms)</u>	<u>CORRECTION (Fathoms)</u>
0.0 - 4.0	+ 0.0
4.1 - 12	+ 0.1
12.1 - 19	+ 0.2
19.1 - 26	+ 0.3
26.1 - 40	+ 0.4
40.1 - 53	+ 0.6
53.1 - 68	+ 0.8
68.1 - 81	+ 1.0

REFERENCE:

Data and Computations included in Special Fathometer Report for 1960 Field Season.

INDEX AND PHASE CORRECTION
FOR
SHIP LESTER JONES

H-8520

Phase Correction

A	:	B	:	C	:	D	:	
0.0	:	+ 1.2	:	+ 1.4	:	+ 2.1	:	(see Vol 1, p 9.3)

Draft Correction

+ 0.3 fathom when index is
at 1.0 fathom.

Notes:

These are the corrections used by the
Field Party and are the ones used in
the smooth plot.

*Revisions to corrections made
during verification in accordance
with attached Inspection Report.*

*Revisions improved crossings and
junctions but did not resolve all
disagreements.*

See Inspection Report for revisions used.

-7-

The following is a tabulated list of changes of phase during the ship work on H-8520 by day letter, showing the position numbers on the fathograms, the direction of change (ie. whether from A scale to B or B to A, etc.), depths read and the differences.

These are not, by any means, all of the changes of scale but are the ones that could be read with, what was believed, a reasonable degree of accuracy.

It will be noted that there is considerable variation in all scales and seldom any agreement with the scale, or phase, corrections as shown in Vol. I of this survey or the Fathometer Report.

B day H-8520 June 6, 1960 (808 - #74)

<u>Position</u>	<u>Direction</u>	<u>A-B = Corr'n.</u>	<u>B-C = Corr'n.</u>	<u>C-D = Corr'n.</u>
3-4	B-C		85.4 - 87.0 = -1.6	
5-6	C-B		75.0 - 76.4 = -1.4	
12-13	B-A	35.0 - 36.8 = -1.8		
16	A-B	33.2 - 34.2 = -1.0		
22-23	B-C		77.7 - 77.3 = +0.4	
27-28	C-D			109.8 - 108.7 = +1.1
40	C-B		67.8 - 67.8 = 0.0	
43-44	B-A	36.7 - 37.3 = -0.6		
47-48	A-B	49.8 - 50.0 = -0.2		
60-61	B-C		80.7 - 80.3 = +0.4	
70-71	C-B		76.3 - 75.3 = +1.0	
100-101	C-B		78.0 - 76.7 = +1.3	
107-108	B-A	37.7 - 38.4 = -0.7		
109-110	A-B	58.2 - 58.8 = -0.6		
126-127	B-C		89.0 - 89.0 = 0.0	
133-134	D-C			112.3 - 110.0 = +2.3
137-138	C-B		70.9 - 72.6 = -1.7	
151-152	C-B		74.9 - 75.4 = -0.5	
163-164	D-C			105.0 - 107.0 = -2.0*
167-168	C-D			111.3 - 109.3 = +2.0
169-170	D-C			108.9 - 107.0 = +1.9
170-171	C-D			120.5 - 118.5 = +2.0
173-174	C-D			121.4 - 119.4 = +2.0
177-178	D-C			105.8 - 104.0 = +1.8
184-185	C-D			120.8 - 118.2 = +2.6

C day H-8520 June 7, 1960 (808 - #74)

3-4	B-C		86.2 - 85.7 = +0.7
5	C-B		73.6 - 72.8 = +0.8
21	B-C		81.6 - 81.2 = +0.4
23	C-B	2.6 fm. drop in "B" scale initial trace	76.6 - 74.4 = +2.2

* - Too much time between scales.

<u>Position</u>	<u>Direction</u>	<u>A-B = Corr'n.</u>	<u>B-C = Corr'n.</u>	<u>C-D = Corr'n</u>
31-32	D-C			106.0 - 108.6 = -2.6
40-41	C-D			117.0 - 116.8 = +0.2
42-43	D-C			105.8 - 107.0 = -1.2
54-55	C-D			121.0 - 123.0 = -2.0
56-57	D-C			106.0 - 109.2 = -3.2
61-62	C-B		76.6 - 74.0 = +2.6	
63-64	B-C		81.8 - 79.2 = +2.6	
68-69	C-D			124.6 - 124.4 = +0.2
70-71	D-C			110.0 - 109.0 = +1.0
75-76	C-B	2.6 fm. rise in "B" scale initial trace	70.2 - 70.8 = -0.6	
77-78	B-C		84.0 - 83.9 = +0.1	
85-86	D-C			106.0 - 107.8 = -1.8
89-90	C-B		71.0 - 72.7 = -1.7	
90-91	B-C		83.5 - 81.3 = +2.2	
98-99	D-C			116.8 - 115.2 = +1.6
103-104	C-B		67.5 - 70.0 = -2.5	
114-115	D-C			108.2 - 104.8 = +3.4
120-121	C-B		73.0 - 73.4 = -0.4	
128-129	C-B		72.8 - 73.2 = -0.4	

D day H-8520 June 8, 1960 (808 - #75)

58-59	A-B	36.3 - 35.6 = +0.7		
78-79	C-D			117.3 - 117.5 = -0.2
94-95	C-D			121.8 - 123.5 = -1.7
95-96	D-C			109.8 - 111.8 = -2.0
100-101	C-B		75.8 - 75.8 = 0.0	
102-103	B-C		82.4 - 83.0 = -0.6	
115-116	D-C			114.7 - 114.7 = 0.0
122	C-B		72.6 - 72.3 = +0.3	

E day H-8520 June 10, 1960 (808 - #75)

12-13	B-C		81.1 - 81.5 = -0.4	
17-18	C-B		72.0 - 70.4 = +1.6	
27-28	C-B		77.4 - 77.9 = -0.5	
33-34	B-C		85.5 - 86.5 = -1.0	
44-45	C-B		72.0 - 72.2 = -0.2	
54-55	B-C		81.6 - 81.8 = -0.2	
58-59	B-C		88.0 - 88.5 = -0.5	
60-61	C-B		68.2 - 70.8 = -2.6	
82-83	B-A	32.0 - 33.3 = -1.3		
86-87	A-B	39.7 - 41.0 = -1.3		
95-96	B-A	36.0 - 37.8 = -1.8		
106	B-C		86.2 - 85.7 = +0.5	
129-130	C-B		75.7 - 75.0 = +0.7	
143-144	B-C		84.8 - 84.9 = -0.1	
152	C-B		71.8 - 72.0 = -0.2	
174-175	B-A	32.0 - 32.6 = -0.6		
176-177	B-C		87.6 - 87.6 = 0.0	

F day H-8520 June 11, 1960 (808-#75)

<u>Position</u>	<u>Direction</u>	<u>A-B = Corr'n.</u>	<u>B-C = Corr'n.</u>	<u>C-D = Corr'n.</u>
7-8	C-B		76.4 - 76.0 = +0.4	
27-28	B-C		88.5 - 88.3 = +0.2	
42-43	B-C	B scale initial trace 3 fms. Lwr. than before.	87.6 - 90.0 = -2.4	
57-58	C-B		69.4 - 71.7 = -2.3	
60-61	B-C		82.4 - 84.0 = -1.6	
65-66	C-D			124.8 - 128.6 = -3.8
76-77	D-C			104.0 - 107.8 = -3.8
90-91	D-C			104.8 - 108.6 = -3.8
99-100	B-A	42.0 - 41.6 = +0.4		101.0
111-112	D-C			100.0 - 104.6 = -4.6
118-119	C-B		68.5 - 70.2 = -1.7	
124-125	B-C		80.8 - 82.4 = -1.6	
125-126	C-B		71.0 - 73.6 = -2.6	
126-127	A-B	54.3 - 51.9 = +2.4		
131-132	A-B	44.0 - 41.6 = +2.4		
139-140	B-A	42.0 - 41.6 = +0.4		
140-141	A-B	34.2 - 34.1 = +0.1		
144-145	B-C		85.9 - 87.7 = -1.8	
156-157	B-C	85.4 - 87.3 = -1.9	85.4 - 87.3 = -1.9	
162-163	C-B		70.0 - 71.6 = -1.6	
163-164	B-A	36.6 - 37.5 = -0.9		
170-171	B-C		87.2 - 88.6 = -1.4	
175-176	C-B		71.6 - 74.0 = -2.4	
177-178	B-A	36.7 - 37.9 = -1.2		
180-181	A-B	51.3 - 50.8 = +0.5		
186-187	B-C		86.4 - 87.8 = -1.4	
189-190	C-B		70.5 - 71.2 = -0.7	
191-192	B-A	41.6 - 40.8 = +0.8		

G day H-8520 July 13, 1960 (808-#75)

1 Before Pos.	B-A	50.3 - 49.0 = +1.3
2-3	A-B	54.8 - 54.6 = +0.2
45	B-A	37.4 - 38.2 = -0.8
45-46	A-B	50.3 - 51.4 = -1.1

H day H-8520 July 14, 1960 (808-#75)

Before Start of Day	B-A	44.2 - 43.3 = +0.9
"	A-B	54.0 - 53.1 = +0.9
"	B-A	50.3 - 49.4 = +0.9
17-18	B-A	43.2 - 42.3 = +0.9
After end of Day	B-A	42.0 - 40.8 = +1.2

The bottom was so steep and fathogram so dirty that it is almost impossible to read changes on other scales.

LIST OF STATIONS ON H-8520 (LJ-10-3-60)

ADO	- LJ-B-60	LEG	- LJ-B-60
AIM	- LJ-B-60	LIG	- PATOS ISLAND LIGHT, 1940
AJAX	- ADJX, 1940	LOV	- LJ-B-60
AND	- LJ-C-60 and Vol. I	MAN	- LJ-B-60
ARK	- LJ-C-60 and Vol. I	MOB	- LJ-C-60
BARE	- BARE, 1942	MOO	- LJ-C-60
CAT	- LJ-C-60 and Vol. I	MOP	- LJ-B-60
COP	- LJ-B-60	NON	- LJ-C-60
DUO	- LJ-C-60	NOR	- LJ-C-60
DIF	- LJ-C-60	OHM	- LJ-C-60
EAR	- LJ-C-60	PAT	- PATOS, 1853
ELL	- LJ-C-60 and Vol. I	PATT	(Marked) LJ-B-60
ELM	- LJ-C-60	PIX	- LJ-C-60
END	- LJ-B-60	RIO	- LJ-C-60
FEZ	- LJ-C-60 and Vol. I	RUB	- LJ-B-60
GEE	- LJ-C-60	SAL	- LJ-13-60
GEM	- LJ-B-60	SAT	- SATURNA ISLAND LIGHT, 1909
HAM	- HAMMOND, 1940	SIN	- LJ-C-60
HIS	- LJ-C-60	SIS	- LJ-C-60
HOE	- LJ-B-60	SKI	- SKIPJACK ISLAND LIGHT, 1950
IDA	- LJ-B-60	STEP	- STEP, 1888-1960
IKK	- LJ-C-60	TEX	- LJ-C-60
JOB	- LJ-C-60	TRI	- TRIDENT, 1857
KED	- LJ-C-60	WAY	- LJ-C-60 and Vol. I.
KEN	- LJ-C-60	WEE	- LJ-B-60
LAW	- LAWSON BLUFF, 1940	WES	- LJ-B-60
LEE	- LJ-C-60		

Inspection Report

H-8520

This survey covers an area of a very irregular bottom with steep slopes. An examination of the penciled soundings on the smooth sheet indicates depths in the area covered by the launch to be in good agreement, while that falling in the area covered by the ship Lester Jones showed discrepancies of 1-3 fms. at crossings or contiguous hydrography. These discrepancies in depths are attributed to a malfunctioning phasing head on the ship's fathometer, and the fact that the comparison of depths at phase shifts occurred on steep slopes where the differences in depths on adjacent scales could not always be accurately determined.

It was decided not to make any corrections to the ship's hydrography obtained on the C and D scales, because of the depth of water (80-125 fms.) and the bottom irregularity. Depths on H-8520 originating with the A scale of the ship's depth recorder were found to be in good agreement with the launch hydrography, and therefore, no revisions to the ship's A scale depths are necessary. The only depths to which revisions are to be made are those obtained on the B scale of the ship's depth recorder. The amount of these revisions were obtained by determining the correctors to the ship's hydrography required to bring it into agreement with the launch's hydrography at their junctions, by the mean of the phase comparisons of the A and B scales for some days, or by adding the corrector necessary to bring crosslines obtained on the B scale of the ship's depth recorder into agreement. The following list shows the amount and locations of the correctors to be applied to the smooth sheet penciled soundings in order to bring the depths obtained on the B scale of the ship's depth recorder into better agreement:

<u>Day</u>	<u>Positions</u>	<u>Amount</u>
B	All day-----	deduct 0.6 fms. ✓
C	1-22-----	no correction ✓
	23+1-63+1 (222)-----	deduct 2.0 fms. ✓
	76-121-----	no correction ✓
	128+3-258-----	deduct 2.0 fms. ✓
D	All day-----	no corrections ✓
E	All day-----	deduct 1.0 fm. ✓ (some A)
F	1-27-----	deduct 1.0 fm. ✓
	37 to end of day(192F)---	add 1.0 fm. ✓ (Some A)
G	1-92-----	no correction ✓
H	All day-----	no corrections ✓

correctors were inadvertently applied to deeper scales as well.

H-8520

In conclusion, it is recommended that the ship's work after the above-mentioned revisions are made be accepted, and that no further work be done on this survey. This recommendation is made because of the irregularity of the bottom, the depth of water which varies from 31 fms. to 180 fms., no dangers to navigation fall within the area covered by the ship's hydrography, the improvement in agreement of depths caused by the aforementioned depth revisions, and the fact that the junctions of H-8520 with contemporary surveys is in adequate agreement.

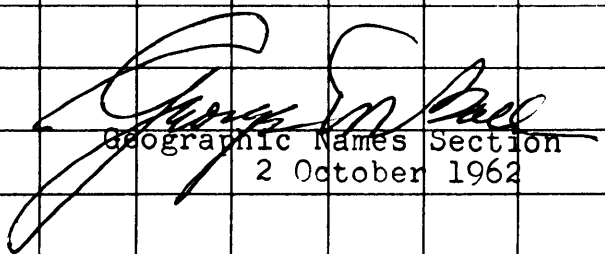
Although it is realized that the ship's work is not of standard quality for classifying it as a basic survey, it is considered to be adequate for charting purposes.

I. M. Zeskind
August 22, 1962

GEOGRAPHIC NAMES

Survey No. H-8520 ✓

Name on Survey	<div style="display: flex; justify-content: space-between; font-size: small;"> On Chart No. 6380 On previous survey No. On U. S. Maps From local information On local Maps P. O. Guide or Map Rand McNally Atlas U. S. Light List </div>										
	A	B	C	D	E	F	G	H	K		
Active Cove	x										1
Alden Point	x										2
Bare Island	x										3
Boundary Pass	x										4
Lawson Bluff	x										5
Orcas Island	x										6
Patos Island	x										7
President Channel	x								x		8
Point Doughty	x										9
Point Hammond	x										10
Shallow Bay	✱			x					✱		11
Strait of Georgia	x								x		12
Sucia Islands	x										13
Toe Point	x										14
Waldron Island	x										15
West Bank	x										16
											17
											18
											19
											20
											21
											22
											23
											24
											25
											26
											27


 Geographic Names Section
 2 October 1962

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. *8520*.....

Records accompanying survey: Smooth sheets *...1..*;
 boat sheets *.1...*; sounding vols. *..11..*; wire drag vols.;
 Descriptive Reports *..1..*; graphic recorder envelopes *..7..*;
 special reports, etc.

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

Number of positions on sheet	.....	<i>2736</i>
Number of positions checked	.....	<i>398</i>
Number of positions revised	.....	<i>5</i>
Number of soundings revised (refers to depth only)	.....	<i>30 plus all those in Inspection Report</i>
Number of soundings erroneously spaced	.....	<i>—</i>
Number of signals erroneously plotted or transferred	.....	<i>—</i>
Topographic details	Time	<i>20</i>
Junctions	Time	<i>64</i>
Verification of soundings from graphic record	Time	<i>8</i>
Special adjustments	Time	<i>11</i> <i>correcting volumes</i>

Verification by *Frank Pawlat* Total time *321 hrs.* Date *10/5/64* *per Inspection Report*

Reviewed by *George A. Korumpak* Time *128* Date *12/3/69*

ms

OFFICE OF HYDROGRAPHY AND OCEANOGRAPHY
MARINE CHART DIVISION
HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8520

FIELD NO. LJ-10-3-60

Washington, San Juan Islands, Vicinity of Sucia Islands

SURVEYED: June 5, 1960, through August 16, 1960

SCALE: 1:10,000

PROJECT NO.: CS-²⁴¹~~412~~

SOUNDINGS: 808 Depth Recorder CONTROL: Sextant fixes
on shore signals

Chief of Party.....	N. E. Taylor
Surveyed by.....	N. E. Taylor
.....	D. Cummings
.....	W. L. Mobley
.....	J. E. McKee
.....	L. L. Wilkerson
.....	C. Kimball
Protracted by.....	C. R. Lehman
Soundings Plotted by.....	C. R. Lehman (PMC)
Verified and Inked by.....	F. J. Pavlat
Reviewed by.....	G. A. Kozemczak
.....	Date: 12/3/69
Inspected by.....	R. H. Carstens

1. Description of the Area

The area covered by this survey is along the western coast of Sucia Islands to the Canadian boundary and from Orcas Island and the north end of President Channel to about a mile north of Patos Island.

Reefs extended about one and one-half miles westward of Sucia Island to West Bank, which has a minimum depth of one and one-quarter fathom. The area between Patos Is. and Sucia Islands has numerous rocky shoals and pinnacle rocks rising sharply from deep water.

This survey covers an area of a very irregular bottom with steep slopes. The bottom consist of rocks, broken shells, pebbles, gravel, sand, and mud.

2. Control and Shoreline

The source of the control is given in the Descriptive Report. The shoreline originates with planetable surveys T-1870 (1888), T-2192 (1894), and photogrammetric survey T-5589N (1949-54), the latter survey covering a portion of Waldron Island.

3. Hydrography

- A. Depths at crossings are in good agreement.
- B. Very little mean lower low-water line was delineated by soundings because of steep and generally foul character of the inshore areas. The usual depth curves were adequately delineated.
- C. The development of bottom configuration and the investigation of least depths are considered adequate.

4. Condition of the Survey

The field work, sounding records, smooth plotting, and Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual except that special adjustments had to be made in this office by the verifier pertaining to work done by the ship LESTER JONES showing discrepancies of one to three fathoms at crossings. The discrepancies were attributed to a malfunctioning phasing head on the ships' fathometer. Of necessity, many of the adjustments are arbitrary and their application results in an "office survey". However, inasmuch as the soundings affected are on B-phase or deeper no dangers to navigation are involved. A detailed explanation is covered in the Inspection Report, pages 10 and 11 of this Descriptive Report.

5. Junctions

An adequate junction was effected with H-8478 (1959) on the north, H-8519 (1960) on the east, H-8400 (1957) on the south, and H-8399 (1957) on the west.

6. Comparison With Prior Surveys

- A. H-405 (1853) 1:200,000
- H-708 (1858) 1:20,000
- H-709 (1858-59) 1:100,000

These surveys cover the entire area of the present survey. A comparison with H-708 reveals no significant changes in depths. The other surveys of this group consist of reconnaissance lines and afford no adequate basis for comparison.

B. H-2080 (1891) 1:20,000
H-2113 (1891) 1:20,000

H-2080 covers a small area in the northern portion of the present survey and H-2113 covers the entire area of the present survey. No significant change in the bottom has taken place. Only minor differences in depths are noted. The larger scale present survey delineates the bottom in greater detail and is adequate to supersede all the above mentioned prior surveys within the common area.

7. Comparison With Chart 6380, 1:80,000 (latest print date 16th Ed., February 17, 1969)
Chart 184-SC, 1:80,000 (latest print date, 9th Ed., March 15, 1969)

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 and verified smooth sheet of the present survey. Only minor differences were noted between the charted depths and the present survey depths.

Attention is directed to the following:

1. The sunken rock (reported) charted in lat. $48^{\circ}45.41'$, long. $122^{\circ}55.69'$ originates with Chart Letter No. 662 (1948) and falls in 20 fathoms of water on the present survey. A rock uncovering four feet above MLLW was found on the present survey 300 meters southeasterly of the charted sunken rock. The present development is adequate to discredit the charted sunken rock and is recommended that the sunken rock symbol be deleted from the chart and the rock awash, four feet above MLLW be charted.
2. The one fathom charted in lat. $48^{\circ}45.16'$, long. $122^{\circ}56.40'$ from the verified smooth sheet of the present survey is a sounding read on grass and should be disregarded.

3. The five and one-half fathom charted in lat. $48^{\circ}45.27'$, long. $122^{\circ}55.94'$ from the verified smooth sheet was scanned in error and should be revised to agree with the reviewed survey.

B. Aids to Navigation

Patos Island Light, the only aid to navigation within the area of this survey, is in substantial agreement with its charted position and adequately marks the feature intended.

8. Compliance With Instructions

This survey adequately complies with the Project Instructions.

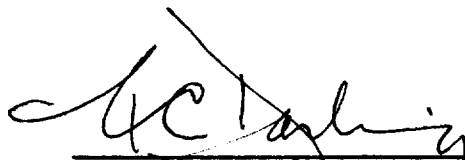
9. Additional Field Work

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

Examined and Approved:

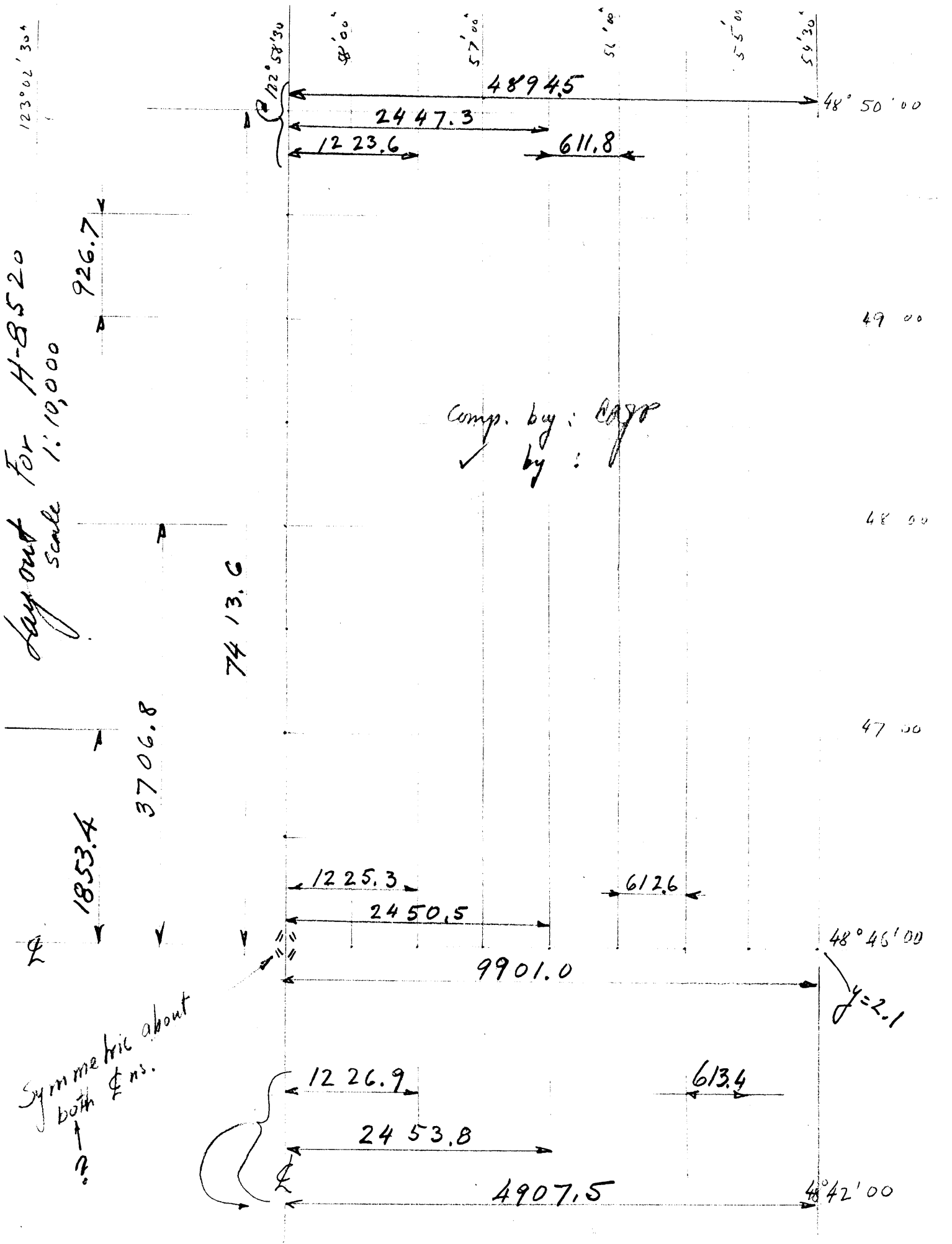


Chief
Marine Chart Division



Associate Director
Office of Hydrography
and Oceanography

Layout For H-8520
 Scale 1:10,000



Comp. by: *Bojo*
 by: *[Signature]*

Symmetric about
 both ϕ 's.

49 00
 48 00
 47 00

123° 02' 30"

8' 00"
 57' 00"
 56' 00"
 55' 00"
 54' 30"

48° 50' 00"

122° 58' 30"

2447.3

4894.5

1223.6

611.8

926.7

7413.6

48 00

3706.8

47 00

1853.4

1225.3

612.6

2450.5

48° 46' 00"

9901.0

$\phi = 2.1$

1226.9

613.4

2453.8

4907.5

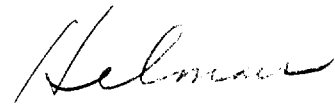
48° 42' 00"

RHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

11/6/62

Nautical Chart Division: R. H. Carstens



Plane of reference approved in
11 volumes of sounding records for

HYDROGRAPHIC SHEET 8520

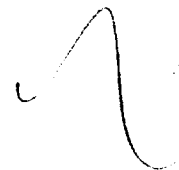
Locality San Juan Islands, Washington

Chief of Party: N. E. Taylor (1960)

Plane of reference is mean lower low water reading
4.2' ft. on tide staff at Echo Bay, Washington
10.3 ft. below B. M. 1 (1956)

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

Condition of records satisfactory except as noted below:




Chief, Tides and Currents Branch

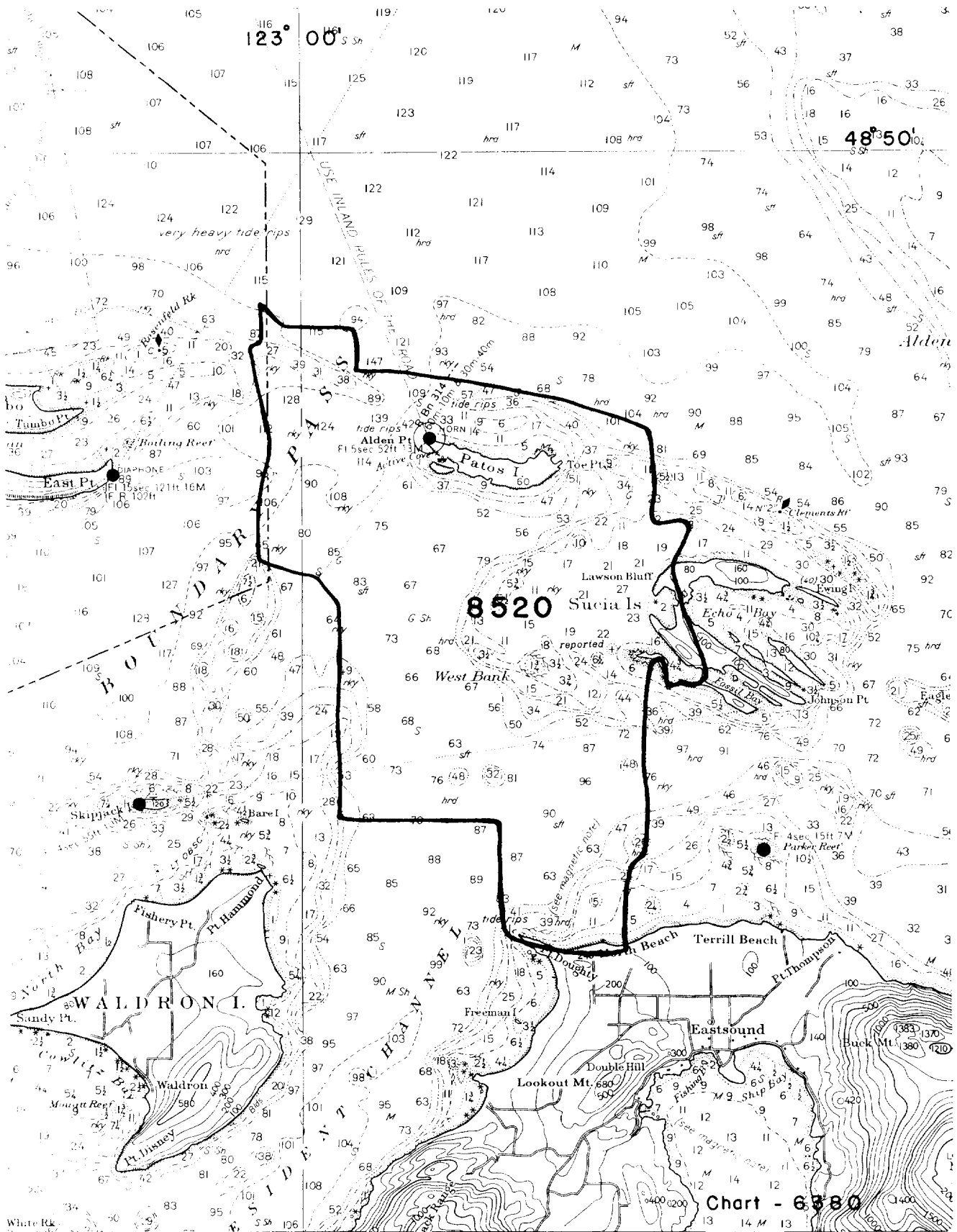


Chart - 6380

NAUTICAL CHARTS BRANCH

SURVEY NO. H-8520

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
11/9/62	6380	Helmert	Before After Verification and Review Revised critical slps & curves using corrections in Report, 11/29/62
	Dwg 28		
6-11-63	6300	J.B. McMillan	Before After Verification and Review Revised Critical slps & Curves thru Cht 6380 Dwg #29
1/2/69	6380	Helen Quinley	Before After Verification and Review , examined, no corrections at this time HQ
7/24/69	6300	J.M. McMillan	Before After Verification and ^{before} Review Part applied, Dwg #32
9-9-70	6300 ^{#33}	J.T. Gallahan	Before After Verification and Review Part appld per full appl. to Cht 6380 - revised some hydro thru ^{of 6380} inspection
11/23/70	6380	J.S. Stuart	Before After Verification and Review Inspection Partly Applied
11-23-70	184 SC	J. Bailey	Before After Verification and Review + INSPECTION PART. Appl. Revised hydro thru Dwg 6380 #36
Aug 1977	18431	Roland Hamilton	Full Before After Verification and Review (New chart)
10-10-79	18421 (6380)	R.A. Lillis RCS	Fully Applied Before After Verification and Review & Insp. Dwg #46
10-10-79	18423 (1845C)	R.A. Lillis RCS	Fully Applied Before After Verification and Review & Insp. Dwg #20 page C
1979	18432	Coritto	Dwg. #1, Fully applied thru 18431 After Verification & Review & Insp.
6/24/80	18400	Coritto 6-30-80-RCS	After Verification, Review & Insp. Dwg. #45 Fully applied (thru 18421)
7/80	18430	Coritto	Dwg #1 Fully applied (thru 18431)

M-2168-1

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.