

9744

Diagram No. 6450-2

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey .. Hydrographic

Field No. DA-10-3-78

Office No. H-9744

LOCALITY

State Washington

General Locality Puget Sound

Locality Vicinity of Pt. Jefferson

19 78-80

CHIEF OF PARTY

.... CDR. C. William Hayes. & CDR. Ned C. Austin

LIBRARY & ARCHIVES

DATE August 14, 1980

AREA 5

REF L-772 (82)

CHTS: 18445 A.

18446

18440

18441

18003 NC

☆ U.S. GOV. PRINTING OFFICE: 1978-868-172

80 applied 8-12-82-RCS

36 applied 7-5-82-RCS

100 applied 8-13-82-RCS

30 applied 8-10-82-RCS

736 Exam: No Conn

HYDROGRAPHIC TITLE SHEET

H-9744

INSTRUCTIONS - 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.

DA-10-3-78

State Washington

General locality Puget Sound

Locality Vicinity of Point Jefferson
~~Port Madison to President Point~~

See Other Title Sheet

Scale 1:10,000

Date of survey March-June, Nov. 1978

8 December 1978

Instructions dated 26 October 1978

Project No. OPR-N100(412)-DA-78
S-N926-DA-78

Vessel Launch DA-2(3132, DAVIDSON(3130))

Chief of party C. William Hayes, CDR NOAA

Surveyed by LCDR N. Bodner, LCDR J. Calebaugh, LTJG Greenawalt, LTJG L. Haas,
ENS E. McDougal, ENS T. Peasley, Ship's personnel

Soundings taken by echo sounder, hand lead, pole Echo Sounder, Ross Fineline 5000

Graphic record scaled by Ship's personnel

Graphic record checked by Ship's personnel

Positions Verification

Reduced by James L. Stringham Automated plot by PMC Xynetics Plotter

Verification by James L. Stringham

Soundings in ~~fathoms~~ feet at ~~MLLW~~ MLLW

REMARKS: Time Zone GMT

Comparison Survey run simultaneously with HYDROPLOT and

Bathymetric Swath Survey System.

STANDARDS CHECKED 7-28-82

C. Loy

DESCRIPTIVE REPORT

H-9744

PUGET SOUND, WASHINGTON

A. PROJECT:

This comparison survey, run simultaneously with the HYDROPLOT system and the Bathymetric Swath Survey System, was accomplished in accordance with the Project Instructions for OPR-N100-DA-78 dated 8 December 1977, and for S-N926-DA-78 dated 26 October 1978. The purpose of the survey was to compare the HYDROPLOT and Bathymetric Swath Survey Systems and is not a basic survey. The major portion of the work was thus conducted with the ship, utilizing a launch for a recon for test site selection. Main-scheme lines running north-south, east-west and paralleling contours were run with no development or shoreline delineation.

✓
Survey
completed
in
1980

B. AREA SURVEYED:

The area surveyed is in the approach area to Shilshole Marina and Seattle Harbor, extending from Port Madison to the eastern shore of Puget Sound. It is bounded on the north by latitude $47^{\circ}45'40''N$, on the south by latitude $47^{\circ}42'40''N$, on the west by longitude $122^{\circ}30'W$, and on the east by longitude $122^{\circ}25'30''W$. One day of launch hydrography was run on 3 March 1978, and all ship hydrography run from 13 to 16 June and 16 to 21 November 1978.

C. SOUNDING VESSELS:

One day of launch hydrography was run on 3 March 1978 using survey launch DA-2 (vessel no. 3132). It was used to select a site for the repetitive "Patch Test" to be conducted for BS³ calibration on the shoal near Point Jefferson at a scale of 1:2500. This area appears as an inset on the final field sheet. All comparison hydrography in June and November was run by the DAVIDSON, vessel #3130. The HYDROPLOT and BS³ systems were run simultaneously, and times and fix positions were synchronized for easier comparison.

D. SOUNDING EQUIPMENT:

The HYDROPLOT data on both the launch DA-2 and the Ship DAVIDSON were collected using Ross Fineline 5000 fathometers. The serial

numbers are as follows:

	<u>Ship (#3130)</u>	<u>DA-2 (#3132)</u>
Recorder	1077	1080
Digitizer	1048	1077
Transceiver	1081	1077

Hydrography run by DA-2 was collected in feet; soundings ranged from 50 to 105 feet. HYDROPLOT data run by the ship for the comparison were taken in fathoms and converted to feet for the PSO's and final field sheets. Soundings by the ship ranged from 5 to 160 fathoms. On both vessels, the initial was maintained at zero, and daily phase calibration checks were made on all four scales at midscale points. All fathograms were scanned for comparison between the analog trace and digitized depths. Any changes or additions were made on a separate corrector tape. On the ship, many missed depths occurred due to the steep sides of the Sound, floating kelp and debris, and the weakness of the transducer signals. Two hull transducers were used interchangeably, but even with manual gain on full, the signals were very weak. Many depths had to be corrected after the hydrography was run.

Soundings on the final HYDROPLOT field sheet of the June work have been corrected for predicted tides and for sound velocity; the November work has been corrected for tides only. Predicted tides were taken for Seattle, Washington and corrected to Edmonds, Washington (Station #914 in West Coast Tide Tables 1978). These heights were used at 0.2 fm intervals while running on Tine and at 0.5 ft intervals for smooth plotting. Three tide gages were installed at Edmonds, Meadow Point and Point Jefferson for the June work, but only the latter two for November. All June stations had bubbler gages operating throughout the survey period; Edmonds and Meadow Point also had ADR gages installed. November gages were a bubbler only at Point Jefferson and an ADR only at Meadow Point. See the appended Field Tide Note.

Transducer depth for the launch DA-2 was determined by a bar check from the one day of hydrography. In addition, the launch was used extensively in the shoreline survey of DA-10-2-78, H-9743; the values from these bar checks taken in the same general locality were identical. The TRA for the ship was determined by static draft readings and settlement and squat versus speed. Draft marks were checked during the January 1978 drydocking and settlement/squat tests were run on 15 March 1978. A large number of leadline comparisons were made in June and November to confirm the TRA. The ship draft was determined for each day and the TRA determined from the draft and running speeds.

Sound velocity correctors for the launch DA-2 were determined from a Martek cast taken 2 March 1978. Correctors for the ship DAVIDSON were computed from Nansen casts made 12 June and 14 November 1978. These were applied to the soundings in intervals specified in the Hydrographic Manual (Table 4-4, Section 4.9.5) for the final field sheet. Martek casts on 2 March, 25 April and 14 November 1978 confirmed the Nansen casts. ✓

Data for the Bathymetric Swath Survey System was collected by the multiple-transducer Bosun sonar array, installed on the DAVIDSON during drydocking in January 1978. The data was corrected on line for tides and sound velocity. Tide levels from the bubbler gages in the working area were continuously telemetered to the ship by NOS/Engineering Development Labs transmitting units, installed at each bubbler gage. The levels were "zoned," or weighted according to the relative distances from the ship, to provide a single tide corrector for each sounding taken. Sound velocities computed from Nansen casts taken 25 April and 14 November 1978, prior to the comparison survey work, were used in the BS³ software on line to correct for variations and their effects on sonar propagation. See the appended Correction to Echo Sounders Report. ✓

E. HYDROGRAPHIC SHEETS:

The area was run, with both systems operating, perpendicular to the depth curves and parallel to the curves. The east-west lines were run at the normal HYDROPLOT line spacing (200 meters on a 1:10,000 scale survey). All others were run at varying line spacing to provide 100 percent BS³ bottom coverage, the spacing depending on sonar beam angle and water depth. ✓

Boat sheets used while running in June were labeled A and B running east-west, C running north-south, and D running along courses 064°-224°T. The A and B sheets were combined for the smooth plot onto PSO 1 and the final field sheet of the survey; sheets C and D formed PSO 2 and were plotted as a final field sheet overlay. The June work data on sheets A, B, C and D are referenced as DA-10-3-78. ✓

Boat sheets and final field sheet overlays used in November were labeled E running north-south, F running east-west and G running north northwest-south southeast. The November work data on sheets E, F and G are referenced as DA-10-6-78. ✓

The launch hydrography was run as a separate boat sheet, DA-2.5-1-78, covering the area between latitudes 47°44'48"N and 47°45'33"N, and longitudes 122°26'52"W and 122°28'W. As it was an area included in the comparison survey and both systems were run simultaneously over the area, it was included as a 1:2500 inset in the final field sheet. ✓

All HYDROPLOT boat sheets, PSO's and final field sheets were prepared aboard the DAVIDSON. A PDP 8/e computer (S/N 10744) and a Complot DP3 plotter (S/N 5445-6) were used for computations and plotting. The BS⁵ software did not include its own position tracking subroutine at this point so all position control, line-spacing determination, etc. was done through the HYDROPLOT system. ✓

F. CONTROL STATIONS:

Thirteen existing triangulation stations in the survey area were recovered for electronic and visual control. In addition, one monumented and four temporary stations were located to third-order Class I specifications by ship personnel to supplement this control. These are as follows: ✓

Stations Recovered

INDI 1934
THOMAS 1921
JEFFERSON 1921
GULL 1941
GOOSE 1941
PARK 1934
POINT MONROE LIGHT 1965
CARAY 1978, red RAYDIST site (both periods) ✓
SEWRAY 1978
GANDER 1978
KALB 1978
PRESIDENT 2 1978
RIS 1978, green RAYDIST site (November)

New Stations

HIGHLANDS 1978
CAL 1 (temp)
CAL 2 (temp)
CAL 3 (temp)
WEST PT. RAYDIST TOWER (temp), green RAYDIST site (June) ✓

The new monumented station, HIGHLANDS 1978, was located by resection from six stations. The temporary calibration signals, CAL 1 and CAL 3, were located by traverse and CAL 2 by intersection. WEST PT. RAYDIST TOWER (temp) was an offset position from the third-order station, SEWRAY 1978. ✓

All computations were based on the 1927 North American Datum. See the appended Horizontal Control Note. For position computations, refer to the Horizontal Control Package for OPR-N100-DA-78 submitted in July 1978. ✓

The Master Signal Lists between the June and November surveys do not coincide; i.e., the same station may have different signal numbers on the two boat sheets. This was the result of the two periods of work being initially treated as separate surveys. See the appended Master Signal Lists for each period. ✓

G. HYDROGRAPHIC POSITION CONTROL:

The Motorola Mini-Ranger III electronic positioning system was used in the range-range mode for the single day of launch hydrography. The serial numbers are as follows: ✓

Vessel number	-	3132
range console	-	719
R/T unit	-	710
Transponders:		
code 3	-	772
code 4	-	773

The Mini-Ranger setup was calibrated before and after hydrography using visual sextant three-point fixes, and comparing the computed rates from the fix (using RK300, Utility Computations, function 7) with rates observed on the range console at the time of the fix. The differences between observed and computed rates were within five meters of the current baseline corrector. Baseline calibrations were conducted on 10 February and 17 March 1978, and the correctors from these were meant to give final correctors for plotting the final field sheet inset. ✓

A Hastings-RAYDIST medium-range electronic positioning system was used as the primary control system for all the ship hydrography on the survey. For the June work on DA-10-3-78 for OPR-N100-DA-78, a single setup was used. Serial numbers of the units are as follows: ✓

Station	-	CARAY 1978	WEST POINT RAYDIST	TOWER
Color	-	Red	Green	(temp)
S/N	-	234	15	
Antenna Ht above station	-	42 ft.	40 ft.	

Shipboard receiving equipment serial numbers were as follows: ✓

Transmitter	-	171
Navigator	-	26
Strip Chart	-	15
Panalogic interface	-	4
(HYDROPLOT)		
Hazlow interface	-	38
(BSSS)		

The system was calibrated twice daily using three-point sextant fixes near Point Jefferson. CAL1, CAL2 and CAL3 were temporary signals established and located for RAYDIST calibration north of President Point; their positions were chosen to provide an optimum fix for the calibrations. During the morning calibration, observed rates were slewed to within about ten lanes of the computed rates from the fix. Morning and evening pattern correctors were meaned to give daily correctors for preliminary and smooth plotting. ✓

On JD 165, five lanes were gained on the green pattern (from West Point RAYDIST tower) after the ship ran too close to the red station (CARAY 1978). The ship was still outside the normal restraining limits, a circle around the station of radius one-fifth the length of the baseline, but lanes were gained anyway. All data after fix #579 was rejected. Another lane jump occurred the same way on JD 196, with the green pattern losing three lanes. All this data was kept and appropriate pattern correctors were inserted on the corrector tape. ✓

For the November work on DA-10-6-78, the RAYDIST setup was changed to meet the requirements in the Project Instructions for S-N926-DA-78 for intersection angles of 60° to 120°. The stations were as follows: ✓

Station	-	CARAY 1978	RIS 1978
Color	-	Red	Green
S/N	-	234	15
Antenna Ht. over station	-	42 ft.	42 ft.

The shipboard equipment was the same as in June. Calibration was again by three-point sextant fix twice daily near Point Jefferson. The temporary calibration signals from June had been removed, so monumented stations on President Point and south were used. Again, observed rates were slewed to within a few lanes of those computed from the fix. No lane jump problems were encountered during the November running. ✓

H. SHORELINE:

No shoreline manuscripts were available. Shoreline on field sheets was derived from a 1:10,000 scale blow-up of Chart 18446. No inshore hydrography was conducted due to the nature and purpose of the survey. ✓

See Verifier's Report

I. CROSSLINES:

The comparison tests being conducted necessitated a redundancy of crosslines; thus a statement of percentage crosslines is considered meaningless. For the purposes of this survey, all lines are crosslines. ✓

Crossings on both the June work and the November work showed excellent agreement, generally within one or two feet in relatively flat areas and appropriate differences in the extremely steep areas. Since the June work has velocity correctors applied and the November plot does not, no direct comparison was made. In overlaying the two, however, the shoal soundings were in excellent agreement and the progressively larger differences moving to deeper soundings are appropriate to show similar agreement. ✓

J. JUNCTIONS:

This survey junctions with DA-10-2-78 (H-9743), done by the DAVIDSON in Spring 1978 for OPR-N100-DA-78, to the north. Junction evaluation is difficult as H-9744 is not a basic survey and includes no launch work on the inshore areas of the sheet. The intent of the survey is not to provide a new charting base, but to compare two systems; therefore, junction comparison was not made. *Superseded by OPR N100 (412) dated Dec 21, 1979.* ✓

K. COMPARISON WITH PRIOR SURVEYS:

No presurvey review items within the survey area were addressed or investigated. Again, the purpose of the survey was not to update existing charts, so no items were investigated. ✓

Soundings from two prior surveys have been transferred to the final field sheet for some comparison. H-5709 (1:20,000, ¹⁹³⁴1935) in violet, and H-5710 (1:20,000, 1934) in green, appear on the final field sheet of DA-10-3-78. Comparison in general is quite good, but an in-depth comparison was not made. ✓

L. COMPARISON WITH THE CHART:

Soundings from Chart 18446 (1:25,000, 8th ED, 1975) have been transferred to the final field sheet of DA-10-3-78 in blue. Once again, comparison was not made to any great extent as the survey will not be used for charting purposes. Generally, agreement is good between the chart and the present survey. ✓

See Verifier Report section 7.

See OAK 35x11tr June 15, 1979 attached to R79 report.

M. ADEQUACY OF SURVEY:

This survey is adequate for the purpose intended: the comparison of the HYDROLOT and BSSS systems. However, it is not a basic survey to be used for updating existing charts; it is not recommended to supersede prior surveys in the area. ✓

See See J, above. Superseded by OPR N100 (412) dated Dec 21, 1979.

N. AIDS TO NAVIGATION:

One nonfloating and three floating aids exist within the survey limits. Point Monroe Light is an established third-order station; its position was not redetermined. The floating aids were not located by detached position or visually as this was not a basic survey. ✓

O. STATISTICS:

DA-10-3-78 (June 1978)

* Total positions (ship)	720 -
Total positions (launch)	212 -
Nautical miles sndg lines (E-W)	74.6 -
Nautical miles cross lines (other)	41.4 - ✓
Nautical miles (launch)	11.5 - ✓
Square nautical miles	10.0
Nansen/Martek casts	5
Bottom samples	0
Tide stations	3

DA-10-6-78 (November 1978)

* Total positions	569 -
Nautical miles sndg lines (E-W)	21.0 - ✓
Nautical miles cross lines (other)	42.5 - ✓
Square nautical miles	3.7
Nansen/Martek casts	2
Bottom samples	0
Tide stations	2

P. MISCELLANEOUS:

Fix events were synchronized between the HYDROPLOT and BSSS systems to provide easier comparison. As the BSSS system has constraints on the fix interval (i.e., it will only mark a fix at multiples of 30 seconds), the fix interval on the HYDROPLOT system was kept at one minute with five inbetweens, one every ten seconds. No changes were made for changes in speed for traffic as would normally be done with the HYDROPLOT system. ✓

All east-west lines were run at the standard line spacing for the survey scale and as specified in the Project Instructions (200 meters). North-south lines and those parallel to the contours were run at such spacing as would provide 100 percent bottom coverage by the BSSS system. The spacing varied with bottom depth. ✓

For most of the June work, the HRP (heave-roll-pitch) sensor of the BSSS system was down. Mechanical problems prevented its integration into the system. All June BSSS data is therefore uncorrected for ship attitude. The working area was extremely calm during the survey work, so little change in ship position was noted; however, no quantitative verification of this was recorded. The November work did use the HRP sensor system as it had been corrected by that point. ✓

*Note: Fix numbers were repeated between June and November; as the two sheets were separated into separate data packages, although they covered the same area, both sheets start with fix #0001. ✓

Q. RECOMMENDATIONS:

This survey is not recommended for charting as it is not a complete basic survey.

*Superseded by OPR N100(412),
change 2; dated Jan 17, 1980.*

*Survey
Completed
in
1980*

R. AUTOMATED DATA PROCESSING:

The following programs were used for data collection and processing:

Raw

RK 111	Range-range Real Time HYDROPLOT	1/30/76
RK 201	Grid, Signal & Lattice Plot	4/18/75
RK 211	Range-range Plot	1/15/76
RK 300	Utility Computations	1/15/76
AM 500	Predicted Tides Generator	11/10/72
RK 530	Layer Corrections to Velocity	6/25/74
RK 561	Geodetic H/R Calibration	2/19/75
AM 602	Elinore (Line Oriented Editor)	5/21/75

S. REFERENCE TO REPORTS:

Horizontal Control Note & Addendum
Field Tide Note & Addendum
Correction to Echo Sounders Report & Addendum

Submitted by:

Linda F. Haas

Linda F. Haas
LTjg, NOAA

Approved and Forwarded by:

C. William Hayes
C. William Hayes
CDR, NOAA
Commanding Officer

SURVEY APPROVAL SHEET

H-9744

DA-10-3-78/OPR-N100-DA-78

DA-10-3-78/S-N926-DA-78

- A. Amount and degree of personal supervision of field work and frequency of record and sheet inspection:

DIRECT DAILY

- B. State whether the survey is complete and adequate or if additional field work is recommended:

SURVEY IS COMPLETE AND ADEQUATE FOR THE PURPOSE INTENDED, i.e. A COMPARISON TEST BETWEEN HYDRO PLOT AND BSS. IT IS NOT A BASIC SURVEY.

← Survey completed
in 1980
Dew

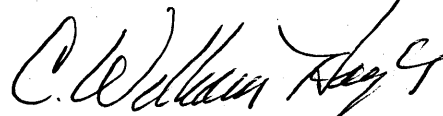
- C. Cite additional information or references that may be of assistance for verifying and reviewing the survey:

THE JUNE (DA-10-3-78) DATA AND THE NOVEMBER (DA-10-6-78) DATA SHOULD BE SMOOTHED PLOTTED SEPERATELY TO FACILITATE THE COMPARISON. THE JUNE BSS DATA IS QUESTIONABLE THUS ONLY THE NOVEMBER WORK CAN BE DIRECTLY COMPARED. THE JUNE DATA, IF PLOTTED AS AN OVERLAY WILL GIVE ADDITIONAL DEATIL FOR THE BSS EVALUATION.

- D. Signed statement of approval of the field sheet and all accompanying records:

DATE: 12/5/78

Approved and forwarded by:



C. William Hayes
CDR, NOAA
Commanding Officer



9
UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SURVEY
 Rockville, Md. 20852

June 15, 1979

OA/C35x1:RHC

—	CPM3x1	_____
—	CPM 31	_____
X	CPM 32	<u>Action</u>
—	CPM 33	_____
—	_____	_____
—	WEEKLY READING FILE	_____
—	NEED NOT RETURN	_____
—	RETURN TO _____	_____
—	FILE	_____

TO: OA/CPM3 - Glen R. Schaefer
 FROM: OA/C35x1 - *Raymond H. Carstens*
 SUBJECT: Completion of Processing, Survey H-9744

Survey H-9744, off Pt. Jefferson, Puget Sound, was forwarded to this office as partially processed for use in the BS³ comparison test. Although the hydrographer states in the Descriptive Report that the survey should not be considered as basic or adequate to supersede prior surveys for charting, an inspection of the survey reveals it to be adequate for charting within the area covered. In addition, the hydroplot soundings provide a good base for comparison with BS³ tests that might be made of equipment in the future. Therefore the survey should be considered as a normal quality controlled survey of the area covered and the processing completed.

The records for this survey are being returned under separate cover.

RECEIVED
 JUN 18 1979

PROCESSING DIVISION

RECEIVED
 JUN 18 1979

PROCESSING DIVISION



022	5	47	39	45398	122	25	52408	254	0000	330645	Used off s/s
WEST POINT RAYDIST TOWER											
023	3	47	45	59018	122	28	16536	243	0000	000000	on s/s
CAL 1											
024	3	47	46	51422	122	28	54907	243	0000	000000	used off s/s
CAL 3											
025	1	47	48	24795	122	23	39236	139	0004	000000	Not used
COED, 1968											
026	1	47	46	17745	122	23	31194	254	0000	330645	
RICHMOND RAYDIST TOWER											
027	1	47	48	34178	122	23	23442	139	0000	000000	
EDMONDS SMALL BOAT HARBOR ENTRANCE LIGHT #1, 1968											
028	6	47	48	32858	122	23	26465	139	0000	000000	
EDMONDS SMALL BOAT HARBOR ENTRANCE LIGHT #2, 1962											
030	1	47	45	17506	122	27	23896	243	0000	000000	
BS ³ TARGET #30											
031	1	47	45	17505	122	27	27305	243	0000	000000	
BS ³ TARGET #31											
032	1	47	45	15012	122	27	26967	243	0000	000000	
BS ³ TARGET #32											
033	1	47	45	15499	122	27	23463	243	0000	000000	
BS ³ TARGET #33											
034	0	47	47	59988	122	29	30532	139	0000	000000	
STAFF, 1951											
035	6	47	47	37489	122	29	50602	139	0000	000000	
KINGSTON BREAKWATER LIGHT, 1978											
036	1	47	44	37770	122	29	12154	139	0000	000000	used 1980
THOMAS, 1921											
037	7	47	39	43949	122	26	02974	139	0000	000000	
WEST POINT 2, 1956											
038	6	47	40	43071	122	24	40665	139	0000	000000	
KURV, 1978											
039	4	47	44	57095	122	22	51944	139	0000	000000	Not used used 1970
HIGHLANDS, 1978											
040	3	47	46	15249	122	28	40125	243	0000	000000	on s/s
CAL 2											
041	4	47	39	43724	122	26	04068	139	0000	000000	Not used
WEST POINT LIGHTHOUSE, 1921											
042	4	47	47	01348	122	23	35998	139	0000	000000	
POINT WELLS FORWARD RANGE LIGHT, 1978											
043	6	47	46	52583	122	23	28197	139	0000	000000	Not used
POINT WELLS REAR RANGE LIGHT, 1978											

S-N926-DA-78

DA 10-7-78

SIGNAL TAPE PRINTOUT

001	4	47	42	44477	122	22	42347	250	0000	330645	CARAY 1978	- 1 + 20 s/s
002	3	47	41	56706	122	30	16252	250	0000	330645	RIS 1978	off s/s
003	3	47	44	54503	122	28	19853	139	0000	000000	JEFFERSON 1921	ok used
004	3	47	45	25849	122	28	09756	139	0000	000000	GANDER 1978	used on s/s
005	3	47	45	59497	122	28	17886	139	0000	000000	PRESIDENT 2 1978	used on s/s
006	3	47	45	03352	122	28	17163	139	0000	000000	GULL 1941	used on s/s
007	4	47	45	48158	122	28	12269	139	0000	000000	KALB 1978	used on s/s

S-N926-DA-78

DA 10-6-78

VELOCITY TAPE PRINTOUT
(FEET)

000190 0 0000 0001 000 313000 010678 ✓
000320 0 0002
000440 0 0004
000550 0 0006
000660 0 0008
000870 0 0010
001160 0 0015
001440 0 0020
001710 0 0025
002160 0 0030
002780 0 0040
003370 0 0050
003960 0 0060
004540 0 0070
005100 0 0080
005650 0 0090
006220 0 0100
006780 0 0110
007350 0 0120
007910 0 0130
008470 0 0140
009030 0 0150
009600 0 0160
010200 0 0170

OPR-N100-DA-78
DA 10-3-78(H-9744)

VELOCITY TAPE PRINTOUT IN FEET
000190 0 0000 0004 000 313000 009744
000530 0 0005
000840 0 0010
001100 0 0015
001420 0 0020
001740 0 0025
002050 0 0030
002340 0 0035
002680 0 0040
002960 0 0045
003290 0 0050
003610 0 0055
003870 0 0060
004190 0 0065
004460 0 0070
004780 0 0075
005060 0 0080
005330 0 0085
005630 0 0090
005910 0 0095
006200 0 0100
006490 0 0105
006770 0 0110
007050 0 0115
007360 0 0120
007570 0 0125
007890 0 0130
008090 0 0135
008370 0 0140
008640 0 0145
008920 0 0150
009180 0 0155
009460 0 0160
009730 0 0165
010000 0 0170

OPR-N100-DA-78
DA 10-3-78(H-9744)

~~DA 10-3-78~~

VELOCITY TAPE PRINTOUT IN FEET

000078 0 0000 0005 000 313200 009744
000217 0 0002
000342 0 0004
000365 0 0006
000596 0 0008
000722 0 0010
000847 0 0012
000969 0 0014
001089 0 0016
001213 0 0018
001423 0 0020
001750 0 0025

TRANSDUCER CORRECTION ABSTRACT

TRA (TC/TI) TAPE: VESSEL 3130 SURVEY DA-10-3-78 FATHOMETER S/N 1077 YR 78 PAGE 1 OF 2

FROM TIME	TRA CORR.	DAY	VEL. TBL.	TRA CORR. INITIAL	SCALE-PHASE	DRAFT F. ARC	S. / SQUAT COMMENTS
193300	+2.0fms	164	4	0.0	0.0	+1.9fms 0.0	+0.1fm
193700	+2.2fms	164	4	0.0	0.0	+1.9fms 0.0	+0.3fm
194430	+2.0fms	164	4	0.0	0.0	+1.9fms 0.0	+0.1fm
195301	+2.2fms	164	4	0.0	0.0	+1.9fms 0.0	+0.3fm
202359	+2.0fms	164	4	0.0	0.0	+1.9fms 0.0	+0.1fm
202758	+2.2fms	164	4	0.0	0.0	+1.9fms 0.0	+0.3fm
220820	+2.0fms	164	4	0.0	0.0	+1.9fms 0.0	+0.1fm
222300	+2.2fms	164	4	0.0	0.0	+1.9fms 0.0	+0.3fm
225601	+2.0fms	164	4	0.0	0.0	+1.9fms 0.0	+0.1fm
225751	+2.2fms	164	4	0.0	0.0	+1.9fms 0.0	+0.3fm
014301	+2.2fms	165	4	0.0	0.0	+1.9fms 0.0	+0.3fm
014901	+2.0fms	165	4	0.0	0.0	+1.9fms 0.0	+0.1fm
015651	+2.2fms	165	4	0.0	0.0	+1.9fms 0.0	+0.3fm
022940	+2.0fms	165	4	0.0	0.0	+1.9fms 0.0	+0.1fm
023340	+2.2fms	165	4	0.0	0.0	+1.9fms 0.0	+0.3fm
201500	+2.0fms	165	4	0.0	0.0	+1.9fms 0.0	+0.1fm
201930	+2.1fms	165	4	0.0	0.0	+1.9fms 0.0	+0.2fm

CP

FIELD TIDE NOTE
OPR-N100-DA-78
Puget Sound, Washington

Field tide reduction of soundings was based on predicted tides from Seattle, Washington, corrected to Edmonds, Washington (station 914, Predicted Tide Tables). Tide tapes were generated using a PDP8/e computer utilizing program AM-500. All times of both predicted and recorded tides are Greenwich Mean Time.

Both Bristol Bubbler and, with the exception of Port Jefferson, Fischer-Porter ADR tide gages were installed at all sites for this project. Location and period of operation are as follows:

<u>SITE</u>	<u>LOCATION</u>	<u>PERIOD</u>
EDMONDS	47° 48' 48.6" N 122° 23' 03.2" W	28 February to 01 June 1978
PORT JEFFERSON	47° 45' 22.5" N 122° 28' 12.0" W	01 March to 19 June 1978
MEADOW POINT	47° 41' 14.2" N 122° 24' 12.0" W	27 February to 19 June 1978

Typical problems with marigram paper jumping sprockets and jamming were encountered with the bubbler gages. Silica-gel dessicants were placed directly under the feed roll of paper. The paper still became distorted and jumped sprockets. The marigrams have been scaled to reflect the correct time.

EDMONDS

Bristol Bubbler gage (s/n 72A226) and Fischer-Porter ADR gage (s/n 7404-A-0407M11) were installed and began operation on 28 February 1978. The existing staff had been installed 13 September 1977 by NOAA Ship McARTHUR. The staff was leveled on 01 March 1978 and again on 01 June 1978 just prior to gage and staff removal.

Gage zero corresponds to a reading of minus 1.10 feet on the staff.

PORT JEFFERSON

Bristol Bubbler gage (s/n 73A234) was installed and began operation on 01 March 1978. The orifice was relocated on 21 March, to ensure that the orifice would not go dry during the upcoming spring tides. Prior to 21 March, the staff readings were 7.8 feet greater than the gage. After 21 March, the staff read 6.1 feet greater than the gage.

The tide staff was installed on 01 March. It was leveled on 03 and 21 March, and on 19 June prior to gage removal.

MEADOW POINT

Two gages were installed and began operation at this site on 27 February 1978. The first gage, Fischer-Porter ADR (s/n 7504 A 2689 M 17), was mounted on the floatwell installed by the NOAA Ship McARTHUR on 07 September 1977. This gage ran relatively trouble free.

The 0-20 foot Bristol Bubbler gage (s/n 66 A 17554) was installed also on 27 February. This gage was the subject of frequent vandalism, resulting in a loss of data. The orifice was moved on 21 March and 23 March to ensure that it would not go dry during the spring tides. The staff was installed 08 September 1977 by NOAA Ship McARTHUR. It was leveled on 27 February 1978 and again on 19 June 1978 prior to gage removal. The staff and floatwell were left intact for future use.

Prior to 21 March 1978 the gage read 0.1 ft greater than the staff. After 23 March the gage read 5.7 ft greater than the staff.

LEVELS

In a comparison of level records, the only observed difference at a station was a 0.007-m fall in the staff at Port Jefferson. The Edmonds and Meadow Point gages showed no shift in the tide staffs.

Levels between bench marks were of third-order accuracy. Differences in elevations between historical bench marks compared well with the published differences, with the exception of BM N7 (1956) RESET at Edmonds. However, the levels agreed with the 2nd order levels done by NOAA Ship McARTHUR on 9/13/77 and 11/15/77.

ZONING RECOMMENDATIONS

The following recommendations are made for tidal zoning:

HYDROGRAPHIC SHEET

- H-9743 : Tide reducers should be applied as a ratio from EDMONDS and PORT JEFFERSON.
- H-9744 : Tide reducers should be applied as a ratio from PORT JEFFERSON and MEADOW POINT.

TELEMETERED TIDES SYSTEM

At all sites, telemetering transmitters were tied into the bubbler gages. The following problems were encountered:

- The shore units were found to be cumbersome. The additional space required for the antenna, transmitter and battery boxes will not always be available, especially in Alaska.

-Battery life averaged 25 days before recharging was necessary.

-Shipboard Equipment:

1. The digital and analog scales do not match. This difference varies with each scale change.
2. With our present equipment, there is no way to accurately set or check the time on the analog recorder.

Submitted by,

David MacFarland for

C. Brian Greenwalt
LTJG, NOAA

Approved and Forwarded by,

C. William Hayes

C. William Hayes
CDR, NOAA
Commanding Officer

~~After~~ ^{older} Work
Spring '78

U.S. DEPARTMENT OF COMMERCE
September 13, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for Form 362

Tide Station Used (NOAA Form 77-12):

944-5683 Point Jefferson

944-7265 Meadow Point

Period: March 3 - June 16, 1978

HYDROGRAPHIC SHEET: H-9744

OPR: N100

Locality: Puget Sound, Washington

Plane of reference (mean lower low water): 3.0 ft. - Point Jefferson
0.17 ft. - Meadow Point

Height of Mean High Water above Plane of Reference:
10.0 ft. - Point Jefferson; 10.3 ft. - Meadow Point

Remarks: Recommended zoning:

- (1). North of 47°43.5' zone direct on Point Jefferson.
- (2). South of 47°43.5' zone direct on Meadow Point.

James R. Hubbard
Chief, Tides Branch

New WORK
(fall) '78

U.S. DEPARTMENT OF COMMERCE
January 2, 1978 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for Form 362

Tide Station Used (NOAA Form 77-12):

944-7130 Seattle, Wa.

Period: November 16-18, 1978

HYDROGRAPHIC SHEET: H-9744

OPR:

N100

Locality: Puget Sound, Washington

Plane of reference (mean lower low water): 28.62 ft.

Height of Mean High Water above Plane of Reference:
10.0 ft. - Zone 1; 10.3 ft. - Zone 2

Remarks: Recommended zoning:

- (1) North of 47°43.5' apply range ratio x 0.94.
- (2) South of 47°43.5' apply range ratio x 0.98.

Don M. Spellman
85 Chief, Tides Branch

HYDROGRAPHIC TITLE SHEET

H-9744

INSTRUCTIONS - 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. DA-10-3-78
~~DA-10-1-80~~

State Washington

General locality Puget Sound

Locality Vicinity of Point Jefferson
~~Port Madison to President Point~~

Scale 1:10,000 Date of survey 20 February-19 April 1980

Instructions dated December 21, 1980 1979 Project No. OPR-N100-DA-80

Vessel Ship DAVIDSON(3130), Launch DA-1(3131), Launch DA-2(3132)

Chief of party CDR Ned C. Austin, Commanding Officer

Surveyed by CDR N. C. Austin, LCDR D. Seidel, LT C. Cavin, LTJG T. Peasely,
ENS D. Actor, ENS S. Konrad and Ship's personnel

Soundings taken by echo sounder, ~~XXXXXX~~ Ross Finline, Model 5000

Graphic record scaled by N/A

Graphic record checked by Ship's personnel

Positions Verifications

~~Reviewed~~ by Russ Davies Automated plot by DP-3

Soundings

Verification by Russ Davies

Soundings in ~~XXXX~~ feet at ~~NEW~~ MLLW

REMARKS: Survey Time Zone: GMT

This survey is a continuation of H-9744 started in 1978.

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-9744

Field No. DA-10-1-80)

Scale: 1: 10,000

Year: 1980

NOAA Ship DAVIDSON

Cdr. N. C. Austin, Commanding

A. PROJECT

This survey was conducted in accordance with Project Instructions OPR-N100(412)-FA/DA-80, Puget Sound, Washington, dated December 21, 1979, and with Change No. 1 dated December 26, 1979, Change No. 2, dated January 12, 1980, Change No. 3, dated January 21, 1980, and Change No. 4, dated February 22, 1980.

B. AREA SURVEYED

This survey is a continuation of work begun in Puget Sound in 1978 by the DAVIDSON. The area covered is bounded on the north by latitude 47°45'15"N, on the south by latitude 47°42'15"N, on the west by longitude 122°30'30"W, and on the east by the shoreline. (See sketch). The 1980 portion of the survey began on February 21, 1980, and concluded on April 18, 1980.

C. SOUNDING VESSEL

Vessels used on this survey included the DAVIDSON (3130), Launch DA-1 (3131) and Launch DA-2 (3132). In general, the Ross systems on the vessels worked well, with some problems encountered on the deepest portions of the survey (over 400 feet). For the work done by the ship, soundings were taken in fathoms, but plotted in feet. Digitizer problems (missed depths) on the ship resulted in scanning the fathogram for most of the soundings (see JD 088, pos. 033-069).

On JD 064, Launch DA-2 (3132) encountered an area where the trace on the fathogram became markedly "fuzzy". (See JD 064, Positions 4423 - 4426). It was thought that problems existed with the launch fathometer. The fathometer and digitizer were checked by electronics technicians, and the launch re-ran the line covered by positions 4423 - 4426 (see JD 066, positions 4437 - 4441), in the opposite direction. (The first line was run north to south, the second south to north.) The same "fuzzy" trace was noted. Later on JD 066, the launch was in equally deep water (see positions 4448 - 4449), and maintained a good trace. The conclusion is that the bottom in the area mentioned was very soft.

One recommendation the writer has regarding future surveys in Puget Sound is that the sounding unit in deeper areas be fathoms. It is extending the Ross system to and beyond its limits to try to gather data in 400 - 600 feet of water in the "foot" mode. (The pulse is too short in the "foot" mode to allow acquisition of high quality data.) If the desired unit to plot is feet, the hydroplot system can readily accommodate acquiring data in fathoms and plotting in feet.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

All vessels on this survey used Ross Finline Fathometers (Model #5000). Depths ranged from 3 to 650 feet (108.2 fathoms).

Serial numbers of the sounding equipment were as follows:

<u>Vessel #</u>	<u>Equipment</u>	<u>S/N</u>
3131 (DA-1)	Fathometer	1077
3131 (DA-1)	Digitizer	1081
3131 (DA-1)	Transceiver	1036
3132 (DA-2)	Fathometer	1080
3132 (DA-2)	Digitizer	1077
3132 (DA-2)	Transceiver	1077
3130 (DAVIDSON)	Fathometer	1077
3130 (DAVIDSON)	Digitizer	1048
3130 (DAVIDSON)	Transceiver	1081

Phase calibrations were made each morning from 0 to 200 feet (0 - 400 feet if the launch was to work in deep water) at 10-foot intervals. The phase was usually adjusted so that the trace initial was aligned with the fathogram "zero". This occasionally resulted in a discrepancy at deeper depths due to variations in paper size, but never exceeding 0.5 foot.

All fathograms were scanned daily for comparison with digitized depths. Corrections and additions of peaks or deeps were either edited in to the master tape or included on a separate corrector tape.

The soundings plotted on the final field sheet are reduced for predicted tides. Correctors were computed using Edmonds (No. 914) differences from the Seattle, Washington predicted tides.

ADR gages were installed at Pt. Jefferson and Meadow Point and were in operation during the entire time of hydrography and field edit. (See the appended Field Tide Note.)

Settlement and squat tests on Launches DA-1 (3131) and DA-2 (3132) were run on February 12 and 13, 1980 (JD 043, 044) in Lake Union. The results of these tests are included in the Appendix of this report. These corrections were not applied to the TC/TI tape during plotting of the final field sheet as they are virtually negligible at the launch speeds used during the course of the survey.

Velocity and instrument corrections were determined by daily bar checks and Nansen casts on JD 056 at 47°45.5'N, 122°24.4'W and JD 087 at 47°45'33"N, 122°24'16"W. A Martek cast was also taken on JD 056, but the cable was too short to provide data over the full depth range. It compared well with the Nansen cast, however.

The lengths of the lines on the bars were carefully marked prior to commencing the survey. Soundings on the final field sheet have been corrected for TRA and sound velocity.

A static draft determination for the ship was conducted on the DAVIDSON on JD 046 while she was moored at PMC. A series of ten leadline casts were made as close as possible to the transducer, then compared with the Ross digitizer and analog trace aboard the ship. The TRA determined was used in plotting the final field sheet for soundings obtained by the ship. When the ship returned to PMC, the draft was again read, and had not appreciably changed. (See the appended Corrections to Echo Soundings Report.)

Settlement and squat tests run on the ship in 1978 yielded a corrector of +0.95 foot for 10 knots, the speed the ship ran while collecting hydrographic data. This correction was applied to the TC/TI tape for the final field sheet. ✓

E. HYDROGRAPHIC SHEETS

The field sheets for this survey were prepared aboard the DAVIDSON using the ship's HYDROPLOT system. A PDP8/e computer (S/N 10756) and a Complot DP3 plotter (S/N 5445-6) were used for the smooth field sheet. The survey has been plotted as 2:1:10,000 scale field sheets. Main scheme hydrography, crosslines and bottom samples are plotted on the smooth field sheets while developments are plotted on separate "blow-ups". In addition, the range/visual work done by Launch DA-2 (3132) on JD 086 was plotted as 1:10,000 position plot overlays using the range-range and range/visual positions for comparison purposes. (For details on the work done on JD 086, see Section G of this report.) The "blow-ups" include a 1:5,000 and a 1:1,250 scale sheet of a development in search of a 54-foot charted sounding at 47°43'56"N, 122°29'24"W (See pos. 4648, ⁴⁶⁴⁷JD 086), and a deep investigation plotted on a 1:1,250 scale sheet (see pos. 4636 - 4647, JD 086). The "blow-ups" were not plotted with velocity corrections; the final field sheet was plotted with velocity corrections. ✓

F. CONTROL STATIONS

Two existing third-order triangulation stations were recovered in the survey area to control hydrography. In addition, one third-order monumented station was established by traverse by DAVIDSON personnel to control hydrography. Thirty-five second or third-order triangulation stations were recovered to provide signals for field edit and to calibrate the Raydist system. ✓

The stations recovered and established are listed by signal number from the master signal list:

1. Richmond, 1921
2. Ris 1978 (Raydist, red and green)
3. Jefferson, 1921
4. Gander, 1978
5. President 2, 1978
6. Pt. Wells South Tank
7. Goose, 1941
8. Seattle Radio Station KGDN Mast,, 1961
9. Radar Dome
10. Pt. Monroe Light, 1965
11. Indi, 1934
12. Squ, 1934
13. Thomas, 1931
14. Agate Pass Light, 1934
15. Ed 2, 1934
16. Mad 2, 1934
17. Kalb, 1978
18. Jefferson Shores Dolphin, 1975
19. Seattle, Golden Gardens Flagpole, 1973
20. Caray, 1978 (Destroyed by vandals before the end of the project)
21. Aib, 1934
22. Camp, 1980 (Raydist, green)
23. Green, 1916
24. Seattle Windjammer Restaurant, 1965 (Flagpole on top of tower)
25. Sewray, 1978 RMI, ~~1979~~ (Raydist, red)
26. Sewray, 1978 RMI ~~1979~~ (calibration station)
27. Shilshole Bay Breakwater Light, 1973

28. Shilshole Bay Boat Basin Light, 1973
29. Shilshole Bay Entrance Range Rear Light, 1953
30. Shilshole Bay Entrance Range Front Light, 1953
31. Trinity Methodist Church, 1934
32. Gull, 1941
33. Dog, 1980
38. Kurv, 1978
39. Highlands, 1978
40. Seattle Space Needle, 1962
41. West Pt. Lighthouse, 1921
45. KOMO Radio Tower, 1953

All field computations were based on the North American 1927 Datum. See the appended Horizontal Control Report.

G. HYDROGRAPHIC POSITION CONTROL

Position control for this survey was accomplished using the Hastings-Raydist medium range system operated in the range-range mode. The mean frequency of the system used is 3306.45 KHz with a lane width of 45.3 meters.

The shore transmitters were located as follows:

Station: SEWRAY 1978 RMI ~~1979~~
 Color: Red (left) paired with RIS 1978 (Pattern I)
 Transmitter: S/N 14
 Antenna Height: 35 feet (whip antenna atop telescoped sections)

Station: RIS 1978
 Color: Green (right) Pattern II until JD 084, when it was paired with CAMP 1980 and served as red (left) PATTERN I
 Transmitter: S/N 15
 Antenna Height: 35 feet

Station: CAMP 1980
 Color: Green (right) (Pattern II)
 Transmitter: S/N 234
 Antenna Height: 35 feet

Shore stations for the Raydist system were selected to cover the greatest amount of survey area. Arc intersections were maintained in excess of thirty degrees for all areas of the survey, with the exception of positions 4511 - 4512, JD 085, Launch DA-2 (3132) where the intersection angle was approximately twenty-eight degrees. These positions comprise approximately 0.2 nautical miles of hydrography.

Stations RIS and CAMP were approximately 3 meters above the water on flat ground covered with grass. Station CAMP was unobstructed to seaward. Station RIS had a fenced tennis court between it and the beach, but the antenna was tall enough to "see" over the court. It was set back from the beach approximately 200 meters.

Station SEWRAY was on a graveled area, with a high chain link fence between it and the beach. The ground plane was somewhat shorted at SEWRAY, as the area a short distance behind it was a lawn which was frequently mowed. The owners did not want the ground plane on the lawn, as it would make mowing impossible. In spite of the obvious weaknesses of the location, the station at SEWRAY performed well.

SEWRAY and RIS were powered by six 12-volt lead-acid storage batteries that were changed every five days. Station CAMP had power on the site, which was used to continuously charge two 12-volt lead-acid batteries.

A different frequency was used for each sounding vessel as provided in the following table that itemizes mobile equipment for the entire survey.

	<u>Ship (3130)</u>	<u>DA-1 (3131)</u>	<u>DA-2 (3132)</u>
Transmitter	20	171	172
Navigator	54	26	47
Strip Chart	15	116	9511
Panalogic Interface	4	13	33
Frequency	3306.400	3306.465	3306.520

The Raydist system operated satisfactorily for the duration of the project. Station "capture" of the distant shore station was a problem on the ship on a number of occasions prior to actually commencing hydrography. A number of difficulties common to the system were tolerated.

Launches would encounter difficulty with the signal of a shore station if the other launch was utilizing the same shore station's signal in close relation (approximately one mile) to the shore station. It proved impossible to operate a launch and the ship simultaneously. This difficulty was overcome by avoiding it logistically.

On JD 066 Launch DA-1 (3131) ran hydrography in the afternoon with calibration correctors of minus fourteen lanes for one rate. The lane losses occurred due to interference from Launch DA-2 (3132) after DA-1's morning's work was completed, and at a readily identifiable time. The total period of hydrography that has a minus fourteen lane corrector is bracketed by good calibrations. The Raydist was not, however, slewed to reduce the magnitude of the corrector to less than a lane.

The station "capture" problem experienced by the ship during the BS³ testing (prior to commencing hydrography) was initially solved by weakening the stronger signal (RIS) at the shore station. This proved unacceptable to the launches, as it made the signal too weak for launch work. The signal at RIS was brought up to its normal level for the launches. The "capture" problem on the ship was overcome by attenuating the signal from RIS on the ship's system. The launches did not experience any "capture" problems after station RIS was restored to its full signal strength.

Equipment malfunctions occurred on launch DA-1 (3131). The digital Hazlow Panalogic readout would at times drift from the mechanical lane counter. Calibrations verified that the mechanical lane counter was operating properly. This occurred on Julian Days 065 and 079. On JD 065, hydrography was run on the east side of the sheet. At the end of the hydrography, the Panalogic was still synchronized with the mechanical counter. The launch then calibrated the Raydist system and ran west to do more work on the other side of the sheet. As the launch was heading for the new working area, it was noticed that the Hazlow had stopped following the lane counters. It stopped following, then came on again and began following the lane counter, though it was then several lanes off. The launch did a static calibration, at which time the Hazlow was re-synchronized with the lane counter. It was carefully monitored for the remainder of the day, and worked well.

On JD 079, the Hazlow was noticed to be off by a fraction of a lane (less than 2/10) from the mechanical counter. The launch was stopped and the Hazlow re-synchronized with the mechanical counter. It was carefully monitored for the rest of the day, and worked well.

Electronic technicians examined the Hazlow, and could not find the source of the problem. However, no data was affected by the malfunction. The Raydist system was calibrated at least twice daily by standard sextant fix or by static calibration. When doing a static calibration, whole lane counts were set to within one lane of the known value, and the partial lane count correctors were determined and applied to the observed patterns.

When sextant fixes were used to calibrate the Raydist, correctors applied were often several lanes - the Raydist was not always slewed to within one lane.

Calibrations which showed a drift of more than 0.07 lane were interpolated linearly to apply a maximum correction of 0.07 lane. The equation on page 4-24 of the Hydrographic Manual, 4th Edition, was used to determine the maximum allowable drift to be applied, using a "worst case" arc intersection of 30°. Linear interpolations were applied in accordance with the Hydrographic Manual, 4th Edition, page 4-27. Both left and right (Pattern I and Pattern II) Raydist correctors were considered to determine the interval for each electronic control corrector so that the correctors for both rates could be applied at the same time. This procedure assumes a linear drift in the Raydist system, which may be erroneous. However, without knowing of a specific event which may have caused the variance, it is reasonable to assume the drift occurred gradually, and the correctors were applied accordingly.

Whole lane jump corrections were applied to the data if the calibrations indicated the jump and if the time of the lane jumps could be positively identified on the strip chart recorder.

On JD 086, Launch DA-2 (3132) worked in an area where one of the Raydist stations (Pattern II, CAMP 1980) was blocked from direct line-of-sight by land (Pt. Jefferson). (See JD 086 positions 4693 - 4743). The launch ran range-range computer-controlled hydrography on line to give the coxswain a needle by which to steer. An angle was taken each time the computer system took a fix. The positions obtained by the range-range and range-visual methods were then compared using Program RK-300, UTILITY COMPUTATIONS. A difference in positions was observed, so new rates were computed for station CAMP from the range-visual observation (Pattern II) using RK 300 and the master tape edited for these new rates. An electronic corrector tape was cut which applied the daily calibration corrector to Pattern I (station RIS), but applied no corrector to Pattern II (station CAMP), since these values were computed.

On one portion of the shoreline run on JD 086, the angle taken did not have signals on either side of Pattern I (RIS). No solution was possible in this case. After some consultation, it was decided to plot the range-range values for those positions (see positions 4698 - 4704, JD 086) and see how well they agreed with the rest of the hydrography run on that day. Positions 4701 - 4704 agreed very well and were therefore not rejected. (4699 - 4700 were rejected) Although some shift in the Raydist may have occurred in this area, the soundings obtained are reasonable.

The electronic corrector tape for the range-visual portion of hydrography run on JD 086 will therefore contain a correction for Pattern I, with no corrector for Pattern II except positions 4701 - 4704.

H. SHORELINE

Shoreline was transferred from Class I manuscript TP00696 which covers the area from the southeast corner of the boat sheet to latitude 47/44/00N. The remaining shoreline was transferred from Chart No. 18446 blown up to 1:10,000 scale. All shoreline detail on the boat sheet was field edited using Chart No. 18446 as a source except the area covered by Class I manuscript TP 00696. Features were located by 3-point sextant fix with check angle and by range-azimuth with check angle or check range from another station. Field edit was performed by LT(jg) Timothy Peasley, ENS David Actor, and ENS Stephen Konrad. No photographs or manuscripts (other than TP00696) were provided to support this survey. Days and times of field edit are listed in the Abstract of Times of Field Edit; all times are GMT. All fix information and related data were recorded in a sounding volume.

Problems were encountered using 3-point sextant fixes in the northwest area of the boat sheet, specifically when using signals 105, W. Edmonds Point Tank and 104, Point Wells Southmost Tank. The large surface area with an undefined center is possibly the reason for these objects producing poor results. Field edit north of latitude 47°45'15" is incomplete and should be ignored as it is north of the survey limit established for this season (junction of H-9743, 1978). *Do not concern, items located during survey are plotted on smooth sheet.*

Field edit did uncover discrepancies between charted positions and field verified positions. Specifically, the major discrepancies are as follows:

<u>Item</u>	<u>Charted Position</u>	<u>Field Verified Position</u>
Jefferson Beach Dolphin, 1975	47°44'42.2" 122°28'36.8"	47°44'41.9" 122°28'35.6" <i>use new position</i>
Jefferson Beach Pier (Seaward limit)	47°44'42.8" 122°28'36.8"	47°44'42.6" 122°28'35.6" <i>use new position</i>
Piles (by Station CAMP 1980)	47°44'41" 122°29'35"	Piles do not exist (See Section L) <i>remove from chart</i>
Piles (fish trap ruins) (Seaward limit)	Not charted	47°44'56.5" <i>chart at this location (see S/S)</i> 122°22'55"
Groin (in ruins) (Seaward limit)	Not charted	47°44'53.7" <i>chart at this location (see S/S)</i> 122°22'55"

Field edit positions 6040 thru 6045 JD 108 were controlled by range-azimuth from station KALB, 1978 and were intended to have a check range from station ED 2, 1931, but the signal was captured by RAINIER's transponder which was in the vicinity (see appended Electronics Control Report and Horizontal Control Report for specific details). Lack of time eliminated the possibility of relocating these items at a later date (position nos. 6040 thru 6045 JD 108 confirm rocks that were not located on Class I manuscript TP 00696). The position plotted on the overlay and boat sheet is the mean of the fix and check fix.

Agreement between the charted HWL and field edited HWL is adequate. Changes to charted items and new items are plotted in red ink on the boat sheet while verified charted items are plotted in black ink. A supplemental overlay is provided to describe field edit on the boat sheet.

CROSSLINES

Crosslines (in the 1980 work) comprise 19.4% of the total sounding lines. Agreement with main scheme hydrography (1978 and 1880 work) was very good. Crosslines are plotted in red on the final field sheet.

J. JUNCTIONS

This survey junctions with ~~prior~~ surveys H-9743 (1978), and the 1978 work on H-9744.

The junction with the 1978 work on H-9744 shows excellent agreement generally within one foot or less.

The junction with H-9743 also shows excellent agreement.

see verification Report - depth curves

K. COMPARISON WITH PRIOR SURVEYS

No presurvey review items lie within the survey limits. Representative soundings from prior surveys are inked on the preliminary plot sheets. These soundings do not appear on the final field sheets. Prior surveys covering all or a portion of the present survey include:

<u>SURVEY</u>	<u>YEAR</u>	<u>SCALE</u>
1338a	1875	1:40,000
H-3969 <i>WD</i>	1916-17	1:20,000 (wire drag)
H-5710 <i>+ Add WK</i>	1934-36	1:10,000
H-5709	1937-35	1:20,000
H-6756	1942	1:5,000

Comparison with H-5710 shows considerable change in the shoreline around and south of Pt. Monroe. Soundings agree within 2 feet in most areas. A notable exception is a 54-foot sounding at latitude 47°43'56"N, longitude 122°29'24"W. This survey is probably the source for the 54-foot charted sounding discussed in Section E of this report. A development of the area was made on JD 086 (positions 4648 - 4692), but the sounding was not found. The 54-foot sounding is an "in between" sounding, so its position was probably determined by time and course between the fixes on either side of it. The position is therefore possibly not accurate. However, with the narrowness of beam of the Ross echo sounder, it is very possible for the 1980 work to have missed the apparent peak. The 1980 work therefore has not disproven the existence of the 54-foot sounding.
From H-3969 WD
carried forward from H-3969 (1916-17) WD
see verification Report

Comparison with 1338a is difficult, because of the tidal datum used in 1875, it is not the same one used in 1980. Also, there are very few soundings in the area covered by the 1980 work on H-9744.

H-6756 appears to be a special survey of the area formerly used as a degaussing station by the Navy. The structures and buoys shown on the survey are no longer present, and are not on the current chart. Depth generally agrees well between the prior and current surveys, within 2 feet or less.

H-5709 was compared primarily by comparing depth curves. Allowing for the denser sounding scheme on the present survey, the depth curves agree well. The fish traps shown between latitude 47°42'N and 47°43'N on the eastern shoreline are no longer there, nor are they on the current chart..

H-3969 is a wire drag survey, and was not closely compared to the present survey. *Source of 54ft sounding mentioned above*

COMPARISON WITH THE CHART

Comparison of the present survey with Chart 18446 (formerly C&GS Chart ~~6445~~ ⁶⁴⁵⁰),

1:25,000 scale, 10th Edition, November 10, 1979, showed some disagreement and several inadequacies.

The 54-foot sounding charted at 47°43'56"N, 122°29'24"W (positions 4648 thru 4692, JD 086) was specifically searched for. The DAVIDSON found no evidence that the 54' sounding exists in the location charted. It is recommended that source data for the charted sounding be re-examined and if the source does not clearly indicate the feature exists, the sounding should be removed from future editions of the chart. *(See pg 8)*

The western half of the boat sheet agreed fairly well with charted soundings, with the exception of the following:

Charted Sounding <i>(from H-570)</i>	Location	(H-9744) Closest Contemporary Sounding <i>(from Smith sheet)</i>	Depth Difference (From nearest sounding)
a) 362	47°43'25" 123°30'04"	344 348	^{18'} 18' deeper <i>on prior</i>
b) 389	47°43'10" 122°29'54"	349 368	^{21'} 48' deeper <i>on prior</i>
c) 226	47°43'46" 122°30'09"	238 230	^{4'} 12' shaller <i>on prior</i>
d) 181	47°42'37" 122°29'46.5"	196 170	^{9'} 15' shaller <i>on prior</i>
e) 84	47°42'24" 122°30'12"	110 between 69' + 109'	^{26'}

Contemporary survey soundings in the vicinity of charted soundings c, d, and e can be considered to be in agreement because of the trend of the bottom configuration and their relative proximity. Contemporary survey soundings in the vicinity of charted soundings a and b are shaller and may possibly be accounted for by siltation. The zero foot curve delineated on the present survey has moved in closer to the HWL when compared to the chart.

Agreement between charted soundings and present survey soundings on the eastern half of the boat sheet was not as good. Present survey soundings south of latitude 47/43/40 are generally deeper than charted soundings. Present survey soundings north of latitude 47/43/40 are generally shaller than the charted soundings. The significant changes in depth may possibly be accounted for by siltation (Boeing and Piper Creeks) as well as scouring action (erosion and shifting) by the current in this sandy area. The deep investigation (positions 4636 thru 4647, JD 086) develops the hole indicated by the charted 118-foot sounding at 47°43'19"N, 122°22'40"W. The zero foot curve delineated on the present survey has moved in closer to the HWL when compared to the chart.

The black can buoy "IBC" charted at 47°44'59"N and 122°23'06"W is actually south of this location at 47°44'54.7"N and 122°23'04.3"W (position 2212 JD 079). The check fix for this detached position displaces the buoy 18 meters northward, but the check fix may involve a slight amount of error caused by the sea state at the time this D.P. was taken.

The pile ruins located southwest of Boeing Creek at 47°44'56.5"N and 122°22'55"W (positions 6024 thru 6025 JD 107) are not present on the latest edition of the chart. Consultation with a local resident revealed that these ruins are actually

remnants of a fish trap. See Section H, SHORELINE, for more information. *Chart as shown on smooth sheet.*
The groin ruins located south of the fish trap ruins at ~~47°45'33.7"N~~ ^{47°41'53} and 122°22'55"W (positions 6029 thru 6030, JDI07) are not present on the latest edition of the chart. See Section H, SHORELINE, for more information. *Chart as shown on smooth sheet*

The piles charted in the vicinity of 47°44'41"N and 122°29'35"W were searched for and not found, and after consultation with local resident George McCalliard, it was determined that the piles had been removed several years ago. *concur.*

On JD 087, a wire sweep was made to verify or disprove the existence of a piling charted at 47°42'51.8"N, 122°22'51"W. Six hundred feet of wire were used, pulled between launch DA-2 and Monarch 43. Three buoys were used to hold the wire off the bottom. Two hangs were experienced, but the wire pulled free before they could be investigated by divers. At the end of the day, the closing calibration indicated a loss of sixteen lanes in the Raydist green (right) rate (station CAMP, 1980). A hand plot using the good (red) rate (from station RIS 1978) and comparing depths indicated that the sweep had probably hung on a sewer outfall in the area of station CARAY 1978. The sweep passed over the area where the piling was charted, but did not hang. However, because of the Raydist problems experienced, the existence of the piling was not disproved. *(passed forward from H-5109 (129-35))*

The Jefferson Beach Dolphin, 1975, 47°44'41.9"N, 122°28'35.6"W, as well as the Jefferson Beach pier, 47°44'42.6"N, 122°28'35.6"W (positions 7041-7042, JD052) are located incorrectly on the chart. See Section H, SHORELINE, and the Horizontal Control Report for more information.

The St. Peters Catholic Church Spire, 1980, 47°43'48.7"N, 122°33'11.6"W is recommended to be removed from the chart as it is not of landmark value and is obscured from seaward by trees. See Horizontal Control Report and Form 76-40 for more information. *off sheet*

Numerous rocks and several foul areas were delineated during the completion of the present survey, many of which are not indicated on the chart. See Section H, SHORELINE, for more information.

The fish trap ruins and groin ruins should be included on the next edition of the chart. The Jefferson Beach (shores) Dolphin, 1975, and Jefferson Beach (shores) Pier should be positioned correctly on the next edition of the chart. The piles by Station CAMP 1980 should be removed on the next edition of the chart. The pile that was searched for by wire sweep should remain on the next edition of the chart as its existence, or lack of, has not been adequately determined. The numerous rocks and foul areas delineated in the present survey should be included, or at least referred to as rocky areas in the next edition of the chart.

The fish trap and groin ruins are not considered a serious hazard to navigation, as they are very close to the shoreline. The furthest offshore pilings are above water at high tide, and so are readily visible. No separate Dangers to Navigation was considered necessary.

M. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede prior surveys for charting. No further work is necessary. *see previous Report*

N. AIDS TO NAVIGATION

A comparison with the Light List, Volume III, Pacific Coast and Pacific Islands, 1980 shows one nonfloating and two floating aids to navigation within the limits

of this survey. The position of Pt. Monroe Light (Light List Nos. 2301 and 2435) was checked by third-order triangulation methods, and the position was verified. See the Horizontal Control Report. Buoys "SP" and "IBC" were located by Launch DA-2 (3132) (see JD 079 positions 2211 and 2212). These aids adequately serve the apparent purpose for which they were established, and no new aids are recommended.

No aids to navigation within the limits of H-9744 were located during the survey that are not shown in the Light List. However, two aids to navigation west of the survey limits were located by third-order means - Indianola Pier Light, and Agate Pass No. 2. See the Horizontal Control Report for details.

O. STATISTICS

Total number of positions (Ship)	70 ✓
Nautical miles of sounding line (Ship)	7.9 -
Nautical miles of crossline (Ship)	0
Total number of positions (DA-1)	233 ✓
Nautical miles of sounding line (DA-1)	21.0 -
Nautical miles of crossline (DA-1)	8.0
Total number of positions (DA-2)	906
Nautical miles of sounding line (DA-2)	83.7
Nautical miles of crossline (DA-2)	13.8
Duplicated positions (JD 067 and 085)	4517 - 4629
Total positions (Ship and Launches)	1209 ok
Total nautical miles of sounding line (Ship and launches)	112.6
Total nautical miles of crossline (Ship and launches)	21.8
Square nautical miles of hydrography	7.0
Bottom Samples	44
Nansen Casts	2
Tide Gages	2

P. MISCELLANEOUS - Not applicable

Q. RECOMMENDATIONS

It is recommended that next time the area is surveyed, it be done in fathoms for areas where the water depth exceeds 400 ft. We encountered difficulties using the Ross Fathometer in the "feet" mode at depths greater than 400 feet. In the "fathom" mode, the long pulse option enables the hydrographer to use a more powerful signal when sounding.

The next time a field unit surveys in Puget Sound, copies of the T-Sheets and manuscripts used to determine the charted shoreline should be supplied to the field unit. Field edit using 1:25,000 chart, to be applied to a 1:10,000 survey, is difficult at best. Somewhere there must exist manuscripts (and photos) which were used to apply the shoreline to the chart. These should be made available, as they would benefit the verifier as well as the hydrographer. *Consent, however, in this case no contemporary T-sheets were available.*

R. AUTOMATED DATA PROCESSING

All smooth sheets were produced with a PDP-8/e computer (S/N 10756) and a COMPILOT DP-3 plotter (S/N 10756) and a COMPILOT DP-3 plotter (S/N 5445-6). Programs used to process this survey were:

<u>PROGRAM NUMBER</u>	<u>PROGRAM NAME</u>	<u>VERSION</u>
RK 111	Range-Range Real Time Hydroplot	1-30-76
RK 211	Range-Range Non-Real Time Plot	1-15-80
RK 201	Grid, Signal, and Lattice Plot	4-18-75
RK 300	Utility Computations	2-10-76
RK 330	Reformat and Data Check	5-04-76
RK 407	Geodetic Direct and Inverse	10-23-75
RK 409	Geodetic Utility Package	9-05-73
RK 410	Geodetic 3-Point Fix	8-23-73
RK 561	Geodetic Calibration	2-19-75
AM 500	Predicted Tides Generator	11-10-72
AM 602	Elinore	5-21-75

REFERENCE TO REPORTS

Field Tide Report
 Electronic Control Report
 Corrections to Echo Soundings Report
 Horizontal Control Report
 Coast Pilot Report

Respectfully submitted,

Cheryl Gavin
 Cheryl Gavin
 LT, NOAA

Approved and forwarded,

N. C. Austin
 N. C. Austin
 CDR, NOAA

CC:jf



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA Ship DAVIDSON S331
FPO Seattle, Washington 98799

9 May 1980

Commander
Thirteenth Coast Guard District
915 Second Avenue
Seattle, Washington 98174

Dear Sir:

During the course of a recently completed hydrographic survey in Puget Sound, NOAA Ship DAVIDSON located can buoy "IBC". The position obtained ($47^{\circ}44'55''N$, $122^{\circ}23'04''W$)⁶ indicates the buoy has moved approximately one fifth of a mile south from the charted position. (Chart 18446, 10th Edition, November 10, 1979). The new position was determined on March 19. *concur*

Sincerely,

N. C. Austin
CDR, NOAA
Commanding Officer

NCA:jaf



SURVEY APPROVAL SHEET

- A. Amount and degree of personal supervision of field work and frequency of record and sheet inspection:

Supervision: Close supervision of personnel was exercised throughout this project.

Inspection: Sheets were inspected on a daily basis. Records were inspected periodically. Additionally, inspection of records, and sheets was made by XO, FOO, CST.

- B. State whether the survey is complete and adequate or if additional field work is recommended:

Survey is complete and adequate. No additional field work is recommended.

- C. Cite additional information or references that may be of assistance for verifying and reviewing the survey:

None

- D. Signed statement of approval of the field sheet and all accompanying records:

DATE: 5/18/80

Approved and forwarded by:

N. C. Austing

N. C. Austing
CDR, NOAA
Commanding Officer

001	4	47	46	17837	122	23	31210	139	0003	000000	
				Richmond 1921							
002	3	47	41	56706	122	30	16252	250	0000	330646	<i>used off s/s</i>
				Ris 1978 1975							
003	3	47	44	54503	122	28	19853	139	0001	000000	<i>used on s/s</i>
				Jefferson 1921							
004	3	47	45	25849	122	28	09756	139	0000	000000	" " "
				Gander 1978							
005	5	47	45	59497	122	28	17886	139	0000	000000	" " "
				President 2 1978							
006	4	47	46	42755	122	23	34128	243	0000	000000	<i>used off s/s</i>
				Pt Wells Southernmost Tank							
007	3	47	45	21572	122	28	12557	139	0003	000000	<i>used on s/s</i>
				Goose 1941							
008	3	47	46	05560	122	21	05575	139	0000	000000	<i>used off s/s</i>
				Seattle Radio Station KDCN Mast 1961							
009	3	47	39	28220	122	24	42516	243	0000	000000	<i>used off s/s</i>
				Radar Dome							
010	5	47	42	31277	122	30	36325	139	0001	000000	<i>used on s/s</i>
				Point Monroe Light 1965							
011	1	47	44	37293	122	30	47705	139	0001	000000	
				Indi 1934							
012	1	47	44	49972	122	32	30150	139	0001	000000	
				Seu 1934							
013	1	47	44	37770	122	29	12154	139	0000	000000	<i>used on s/s</i>
				Thomas 1931							
014	3	47	43	27341	122	33	17408	139	0000	000000	<i>used off s/s</i>
				Agate Pass Light 1934							
015	3	47	43	09225	122	32	37930	139	0000	000000	" " "
				Ed 2 1931							
016	3	47	42	27957	122	31	26674	139	0064	000000	
				Mad 1934							
017	3	47	45	48158	122	28	12269	139	0000	000000	<i>used on s/s</i>
				Kalb 1978							
018	3	47	44	41938	122	28	35600	139	0000	000000	<i>used on s/s</i>
				Jefferson Shores Dolphin 1975							
019	4	47	41	30971	122	24	10297	139	0000	000000	
				Seattle Golden Gardens Flagpole 1973							
020	4	47	42	44477	122	22	42347	139	0000	000000	<i>used on s/s</i>
				Caray 1978							
021	3	47	44	28628	122	32	56687	139	0000	000000	<i>used off s/s</i>
				Aib 1934							
022	1	47	44	42126	122	29	54191	250	0000	330646	<i>used on s/s</i>
				Camp 1980							

~~023 3 47 43 49852 122 32 58166 139 0000 000000~~
~~Green 1916~~

~~024 4 47 40 50005 122 24 15969 139 0000 000000~~
~~Seattle Windjammer Restrant FP 1965~~

025 4 47 39 45424 122 25 52403 254 0003 330646 *USED off s/s*
Sewray 1978, RM 1 1979

~~027 4 47 40 38522 122 24 38870 139 0000 000000~~
~~Shilshole Bay Breakwater Light 1973~~

~~028 4 47 41 16287 122 24 13234 139 0000 000000~~
~~Shilshole Bay Boat Basin Light 1973~~

~~029 5 47 39 54170 122 24 00428 139 0028 000000~~
~~Shilshole Bay Entrance Range Rear Lt 1953~~

~~030 6 47 40 00242 122 24 06239 139 0007 000000~~
~~Shilshole Bay Entrance Range Front Lt 1953~~

~~031 6 47 40 35682 122 23 02103 139 0000 000000~~
~~Trinity ME Church 1934~~

032 3 47 45 03352 122 28 17163 139 0000 000000 *USED on s/s*
Gull 1981 *also #6 & 8*

~~033 4 47 45 30153 122 28 13828 253 0000 000000~~
~~Dog 1980 (Supplemental Station)~~ *Not used to control any Hydrographic positions*

~~038 3 47 40 43071 122 24 40665 139 0000 000000~~
~~Kurv 1978~~

039 4 47 44 57095 122 22 51944 139 0000 000000 *USED on s/s*
Highlands 1978

040 6 47 37 14444 122 20 52976 139 0000 000000 *USED off s/s*
^{Seattle}
Worlds Fair, Space Needle 1962

041 4 47 39 43724 122 26 04068 139 0000 000000 *USED off s/s*
West Pt Lighthouse 1921

~~045 6 47 37 56378 122 21 09807 139 0000 000000~~
~~Kemo Radio Tower 1953~~

40 CAL 2 Hydro
104 Paint Wells Southernmost Tank
105 W. Edmonds Paint Tank

OPR-N100-DA-80
DA-10-1-80(H-9744)
VELOCITY TAPES PRINTOUT

TABLE 1: in FEET

LAUNCH 3131, 3132

000110	0	0000	0001	000	000000	009744
000330	0	0002				
000570	0	0004				
000780	0	0006				
001010	0	0008				
001230	0	0010				
002920	0	0020				
003870	0	0030				
004800	0	0040				
005720	0	0050				
006630	0	0060				

TABLE 2: in FEET

SHIP DAVIDSON 3130

000130	0	0000	0002	000	000000	009744
000430	0	0002				
000650	0	0004				
000880	0	0006				
001090	0	0008				
001320	0	0010				
003020	0	0020				
003970	0	0030				
004920	0	0040				
005820	0	0050				
006680	0	0060				
007560	0	0070				
008410	0	0080				



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY

15 February 1980
Lake Union - PMC

LEADLINE CASTS

VESSEL #3130 (DAVIDSON)

STARBOARD SIDE

(Starboard Transducer)

<u>Leadline</u>	<u>Ross Fathometer (Analog)</u>	<u>Ross Fathometer (Digital)</u>
28.7	17.2	17.2
28.6	17.2	17.2
29.0	17.2	17.2
28.6	17.2	17.2
28.6	17.2	17.2
29.0	17.2	17.2
29.0	17.2	17.2
29.0	17.2	17.2
28.9	17.2	17.2
<u>28.6</u>	<u>17.2</u>	<u>17.2</u>
Mean 28.8	17.2	17.2

Starboard Draft Amidships = 12.0

Mean leadline depth - mean digital depth = 11.6 = Δ

Draft - Δ = 0.4 ft.

Draft scaled from ship's plans = 0.5 ft.

The DAVIDSON'S (3130) TRA corrector was determined in fresh water (Lake Union), and the project's soundings were in salt water. The effect of the difference in velocity of sound on the TRA corrector determination was examined for the two bodies of water. The effect was insignificant (<0.25% of the depth) for the depths that the DAVIDSON operated in.



FIELD TIDE NOTE
OPR-N100 (412)-DA-80

February - March 1980

Tidal control for soundings and field edit in the Port Madison Puget Sound Hydrographic Survey Area (H-9744) was accomplished by Tertiary stations at Point Jefferson and Meadow Point using Seattle, Washington (944-7130) as the reference station.

Field tide reductions of soundings and field edit were based on predicted tides for Seattle, Washington (944-7130) corrected to Edmonds, Washington. These predicted tides were converted to GMT Tide Correctors by on board PDP8/e system using Predicted Tide Generator program (AM500). Gage observation and maintenance was performed by ship's personnel.

<u>Station</u>	<u>Location</u>	<u>Gage Type</u>	<u>Periods of Operation</u>
Jefferson Beach 944-5683	47°44.7'N 122°28.6'W	Fisher-Porter ADR	76 days 07 Feb - 23 Apr
Meadow Point 944-7265	47°41.2'N 122°24.1'W <i>off sheet</i>	Fisher-Porter ADR	78 days 05 Feb - 23 Apr

Point Jefferson

A Fisher Porter ADR tide gage S/N 7304A1380M18 was installed at the historical site on 7 February 1980 on the Jefferson Beach Pier at the south end of Jefferson Beach Road in Kingston, Washington. The staff from the October 1979 installation was present and in good condition so was used as found. The floatwell had been swept away, but the securing straps were in place, so a new floatwell of the same dimensions was securely banded in its place. The gage was mounted directly on the floatwell. On 12 March a punch jam occurred and the gage ceased functioning. Staff/gage comparisons varied from installation thru gage malfunction on 12 March. After close examination by ship personnel and Pacific Tide Party personnel it was determined that the gage was intermittently dropping the 1 and 2 foot punch holes. It is recommended that data from gage installation thru gage malfunction (Feb 7 thru Mar 12) be examined carefully for accuracy and reliability.

A new Fisher Porter ADR S/N 7304A1380M20 was installed on the existing floatwell, 13 March. The gage operated normally until it was field-checked on 27 March, and the new gage was down. The cause was determined to be a dead battery and gage operation had ceased on 27 March. A new battery was installed and the gage was again operational 28 March. The gage was field-checked on 1 April and found to be operating 21 minutes fast so gate time was reset correctly.

The gage was field-checked on 14 April and found to be 9 minutes fast and was reset incorrectly to read 12 minutes fast which was noted on the 15 April field check and gage again reset correctly. The gage was removed 23 April 1980; floatwell and staff were left in place.

Staff/gage comparison for the new gage (S/N 7304A1380M20) based on 8 of the most reliable observations indicates that the gage reads 9.2 feet higher than the staff. Installation levels were run on 16 January and removal levels were run on 23 April to 5 Tidal Bench Marks, and acceptable results were obtained.

Meadow Point

A Fisher Porter ADR S/N 7304A0407M3 was installed at the historical site on the Fishing Pier at the north end of Shilshole Bay Marina in Seattle, Washington. The existing staff was present and in good condition, so was used as found. The existing floatwell was modified to prevent vandalism by removing the upper 6 feet and constructing a platform for the observer to stand on (see diagram). The gage operated normally until 29 February (0112Z) when the punch tape jammed. The punch tape was replaced and the gage reset on 3 March. Due to an observation error on 12 March (2218Z) the gage was field checked and reset to read 2 full hours slower than actual GMT. The gage was again field checked and reset to GMT on 14 March. Other than the punch jam the gage functioned well throughout the project. Staff/gage comparisons, based on 17 reliable observations indicate that the gage reads 10.1 feet higher than the staff. The gage was removed 23 April; the floatwell and staff were left in place. Installation levels were run on 5 February and removal levels were run on 2 and 25 April to 5 tidal benchmarks and acceptable results were obtained. Comparison between installation levels, intermediate levels and removal levels indicates a trend that the staff has settled .004 M.

Recommendations

Due to the proximity of Point Jefferson to the constriction at Agate Pass it would be desirable to use this gage to reduce soundings on the western portion of the survey area, and use the Meadow Point gage to reduce soundings on the eastern portion of the survey area. Problems encountered with the Point Jefferson gage such as swell action during staff observation, a questionable 21 minute time increase from 28 March to 1 April, and the intermittent punch problem observed on the first gage installation indicate that reduction of soundings by gage proximity to survey area should not be used, unless Rockville smooth tides can eliminate the problems associated with the Point Jefferson gage. It is recommended the sounding data be reduced with emphasis on the Meadow Point gage.

Respectfully submitted:



David I. Actor, ENS, NOAA

Approved by:



Ned C. Austin, CDR, NOAA
Commanding Officer
NOAA Ship DAVIDSON

DIA:jaf

August 14, 1980 U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 944-7130 Seattle, WA

Period: February 20-April 18, 1980

HYDROGRAPHIC SHEET: H-9744

OPR: N100

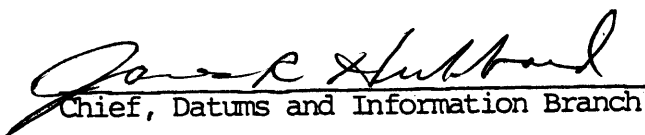
Locality: Puget Sound, Washington

Plane of reference (mean lower low water): 7.63 ft.

Height of Mean High Water above Plane of Reference is
10.0 ft. -zone 1; 10.3 ft.-zone 2

REMARKS: Recommended zoning:

- (1) North of 47°43.5' apply range ratio x0.94.
- (2) South of 47°43.5' apply range ratio x0.98.


Chief, Datums and Information Branch

GEOGRAPHIC NAMES

H-9744

Name on Survey	Source of Information											
	A	B	C	D	E	F	G	H	K			
	ON CHART NO. 18446	ON PREVIOUS SURVEY NO.	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
BAINBRIDGE ISLAND	X											1
BOEING CREEK	X											2
Boeing Bay	X											3
PIPER CREEK	X											4
PT. JEFFERSON	X											5
PT. MONROE	X											6
PORT MADISON	X											7
PORT MADISON INDIAN RESERVATION	X											8
PRESIDENT POINT	X											9
PUGET SOUND	X											10
SPRING CREEK BEACH	X											11
RICHMOND BEACH (locality)												12
THE HIGHLANDS (locality)												13
												14
												15
												16
												17
												18
												19
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Approved:

Chas. E. Harrington
Chief Geographer - C3x5

12 March 1982

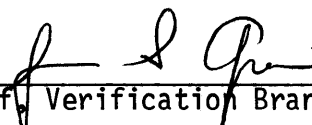
APPROVAL SHEET

FOR

SURVEY H-9744

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position print-out has been made. A new final sounding print-out has been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the verifier's report.

Date: 3/27/31


Chief, Verification Branch

HYDROGRAPHIC SURVEY STATISTICS

H-9744

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION	AMOUNT		
SMOOTH SHEET			BOAT SHEETS & PRELIMINARY OVERLAYS	10 & 13		
DESCRIPTIVE REPORT			SMOOTH OVERLAYS: POS. ARC, EXCESS	10		
DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	3 - with raw printouts & misc. data					
VOLUMES	3					
BOXES			1 - Smooth & Tides			

T-SHEET PRINTS (List) TP-00696, chart enlargements

SPECIAL REPORTS (List) Chrt. mark-up, Tide plot, contour plot, Sndg analysis plot

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET	1501, + 1209		27107
POSITIONS CHECKED		2392	
POSITIONS REVISED		141	
SOUNDINGS REVISED		245	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	14		
VERIFICATION OF CONTROL		21	
VERIFICATION OF POSITIONS		53	
VERIFICATION OF SOUNDINGS		263	
COMPILATION OF SMOOTH SHEET		56	
APPLICATION OF TOPOGRAPHY		2	
APPLICATION OF PHOTOBATHYMETRY		0	
JUNCTIONS		2	
COMPARISON WITH PRIOR SURVEYS & CHARTS		18	
VERIFIER'S REPORT		28	
OTHER Field Edit Verification		43	
TOTALS	14	486	500
Pre-Verification by James S. Green	Beginning Date 12/13/78	Ending Date 12/13/78	
Verification by James L. Stringham, Russ Davies	Beginning Date 12/27/78	Ending Date 3/6/81	
Verification Check by James S. Green and James L. Stringham	Time (Hours) 24	Date 3/16/81	
Marine Center Inspection by - HIT	Time (Hours) 15	Date 5/13/81	
Quality Control Inspection by LISA Quintan	Time (Hours) 46	Date 11/15/81	
Requirements Evaluation by [Signature]	Time (Hours) 2	Date 5/3/82	

By Myers 31 Nov 2/15/82

REGISTRY NO. #-9744

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

PACIFIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO: H-9744

FIELD NO: DA-10-3-78

Washington, Puget Sound, ~~Port Madison to President Point~~
Vicinity of Point Jefferson

SURVEYED: March - June, November 1978, February - April 1980

SCALE: 1:10,000

PROJECT NO: OPR-N100(412)

SOUNDINGS: Ross Fineline Fathometer
Model 5000

CONTROL: Raydist, Mini
Ranger, Range-Range Mode,
Range/Azimuth Mode

Chief of Party.....CDR C. William Hayes and
CDR Ned C. Austin

Surveyed by.....LCDR N. Bodner, LCDR J.
Calebaugh, LCDR D. Seidel,
LT C. Cavin, LTJG C.
Greenawalt, LTJG L. Haas,
LTJG T. Peasely, ENS D.
Actor, ENS E. McDougal, ENS
S. Konrad

Automated Plot by.....PMC Xynetics Plotter

Verified by.....Russ Davies

1. INTRODUCTION

H-9744 (DA-10-3-78, DA-10-6-78 and DA-10-1-80) is a basic hydrographic survey which includes HYDROPLOT data acquired for a comparison with the previous^{ly} submitted Bathymetric Swath Survey System^{test}. It was conducted in accordance with the Project Instructions, OPR-N100-DA-78, dated December 8, 1977, with Change No. 1, dated January 30, 1978; S-N926-DA-78 dated October 26, 1978 and OPR-N100-DA-80, dated December 21, 1979; Change No. 1, dated December 27, 1979; Change No. 2, dated January 17, 1980; Change No. 3, dated January 23, 1980 and Change No. 4, dated February 14, 1980.

Projection parameters used to prepare the boatsheet have been revised to center the hydrography on the smooth sheet. Parameters used by the Pacific Marine Center are appended in the smooth printout.

During the Spring of 1978 work, the predicted tides from Seattle, Washington were corrected to Edmonds, Washington and were used to reduce smooth field sheet soundings by a PDP 8/e computer utilizing program AM 500. Approved tides from Point Jefferson and Meadow Point gages were used for final reduction of the smooth soundings with the recommended zoning applied:

- (1) North of 47°43.5' zone direct on Point Jefferson

(2) South of 47°43.5' zone direct on Meadow Point

During the Fall of 1978 and 1980 work, the predicted tides from Seattle, Washington were corrected to Edmonds, Washington and were used to reduce smooth field sheet soundings using the same computer and program which is listed above. Approved tides from ~~Point Jefferson and Meadow Point gages~~ ^{MS} were used for final reduction of the smooth ~~Seattle~~ soundings with the recommended zoning applied:

(1) North of 47°43.5' apply range ratio x 0.94

(2) South of 47°43.5' apply range ratio x 0.98

The final smooth sheet is in excellent agreement with the boatsheet.

2. CONTROL AND SHORELINE

Section F of the ships' Descriptive Report describes the horizontal control adequately for 1978 and 1980 work. Calibration procedures and electronic control systems are explained in Section G of the ships' report for both years.

Shoreline was transferred from Class I unreviewed manuscript TP-00696 10,000 scale, date of Photography - August 77 and field edit - August 78. This covers the area from the southeast corner of the smooth sheet to latitude 47°44.0'N. The remaining smooth sheet highwater line was transferred to the smooth sheet from chart enlargement 18446, 10th edition, November 10, 1979 in brown ink. The nautical chart scale of 1:25,000 was enlarged 2.5 times to equal the scale of the smooth sheet. Because the scale difference of 2.5, some distortion is apparent when overlaying the smooth sheet grid. The brown highwater line is considered approximate and should be used for orientation purposes only. Further information can be found in Section H of the ships' report.

3. HYDROGRAPHY

Crossline soundings were found to be in good agreement. The development of the bottom configuration, determination of least depths, and depth curves are adequate.

Standard depth curves were adequately drawn with the exception of:

a. The southwestern limits of the sheet at Latitude 47°42'25"N, Longitude 122°30'30"W, the zero curve was not developed. *Not required hydrographer "squared off" survey*

b. The northeast limit of the sheet, the zero curve could not be developed because of the steepness of the bottom and railroad rip-rap.

c. A deep or hole at Latitude 47°44'33"N and Longitude 122°22'53"W caused a distorted inshore depth curve. *CONCUR*

Possibly dredged for fill.

A zero sounding at 47°44'45"N and 122°28'35"W on the west side of the Jefferson Shores Pier is displaced for clarity.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements as stated in the Hydrographic Manual with the exception of:

a. Foul areas, dashed lines were added during verification delineating the areas where the field edited portions did not conform to the Hydrographic Manual accuracy standards. The following areas are listed below:

~~(1) Latitude 47°45'17"N Longitude 122°28'15"W~~

~~(2) Latitude 47°44'43"N Longitude 122°28'40"W~~

~~(3) Latitude 47°44'37"N Longitude 122°30'20"W~~

(4) Latitude 47°43'20"N Longitude 122°22'32"W

(5) Latitude 47°44'00"N Longitude 122°22'25"W

*No descriptions
or positions for
limits of foul
areas in survey
records.*

b. The field number of DA-10-3-78 should have been used throughout this project, 1978 and 1980, according to Section 2.4.3.1 in the Hydrographic Manual. In 1980 it was changed to DA-10-1-80. This number (DA-10-1-80) was left unchanged in the ships' Descriptive Report but was changed on the cover sheet.

5. JUNCTION

H-9744, DA-10-3-78 is bordered by one contemporary survey:

a. H-9743 (DA-10-2-78) This sheet junctions the northern limits of the present survey. Soundings and depth curves are in good agreement and junction note is inked accordingly with the exception of the following:

(1) The 600 foot depth curve at 47°45'30"N, 122°26'30"W

(2) The 300 foot depth curve at 47°45'45"N, 122°27'20"W

(3) The end of the depth curves at 47°45'10"N, 122°23'15"W

The above curves need to be adjusted on H-9743 (1978). *Junction completed during QC.*

b. Soundings were transferred from H-9743(1978), 1:10,000 to H-9744, they are listed below:

Sounding	Latitude	Longitude
(1) 0 ⁵	47°15'13"N	122°28'14"W
(2) 0	47°45'15"N	122°28'05"W
(3) 48	47°45'15"N	122°28'02"W
(4) 66	47°45'15"N	122°27'41"W
(5) 74	47°45'15"N	122°27'45"W
(6) 88	47°45'15"N	122°27'54"W
(7) 85	47°45'15"N	122°27'57"W
(8) 48	47°45'21"N	122°27'19"W
(9) 301	47°45'36"N	122°27'01"W

6. COMPARISON WITH PRIOR SURVEYS

Survey	Year	Scale
1338a	1875	1:40,000
H-3969 ND	1916-1917	1:20,000 (wire drag)
H-5710 ^{± Add. dk.}	1934-1936	1:10,000
H-5709	1885 1934-1935	1:20,000
H-6756	1942	1:5,000

H-6756, H-5709, H-5710 and ^H1338a are in good agreement with H-9744, what difference there is in depths can be attributed to the difference in survey methods used in the past.

H-3969 ^{is} was a wire drag survey and ^{one} ~~two~~ soundings ^{was} were transferred to H-9744. ~~The first is a 21 foot sounding at Latitude 47°44'18"N and Longitude 122°29'20"W.~~ The other is a 54 foot sounding at Latitude 47°43'53"N and Longitude 122°29'25"W. Although there was an ^{present survey depths} investigation to find the 54 foot sounding, it was not found. ^{are left in this area.}

Unless justification can be found to disapprove ^{this} ~~these two~~ soundings, ^{they} should be retained on the current edition of the chart.

One rock awash symbol was transferred from H-5710 ^{± Add'l Work} 1:10,000, 1934 ⁻¹⁹³⁶ to H-9744 and is listed below:

^{discovers} Rock ~~bars~~ 1 foot at MLLW at Latitude 47°44'33"N and Longitude 122°30'34"W.

There are no pre-survey review items within the survey area. H-9744 is adequate to supersede all prior survey soundings within the area of common hydrography except for the two wire drag soundings brought forward from H-3969WD.

7. COMPARISON WITH THE CHART

a. Hydrography

A chart comparison was made with chart 18446, 1:25,000 scale, 10th edition, November 10, 1979. The charted hydrography originates primarily with the previously discussed prior surveys. The present survey is adequate to supersede the charted hydrography, except for the following two charted features:

Pile	Lat. 47°42'52"	Long. 122°22'51.5"	<i>cht as shown on pres survey.</i>
Pile <i>(from misc source)</i>	Lat. 47°42'47.5"	Long. 122°22'47.5"	

It is recommended that these two features be carried forward. *Pile from misc source referred to compiler for evaluation.*

The Jefferson Shores Pier located at Latitude 47°44'45"N and Longitude 122°28'35"W is shown in red because the field positions for the pier differed from the pier's* location on chart 18446.

b. Aids to Navigation

(1) Point Monroe Light was located by third order Class I survey methods and a form ~~7640~~⁷⁶⁻⁴⁰ is submitted with the report.

(2) The mid-channel buoy, W CR "SG" Fl 4 sec. ¹³⁰light, at Latitude 47°44.5'N and Longitude 122°25.7'W has shifted ~~18~~ meters to the northeast to Latitude 47°44'34.5"N and Longitude 122°25'35.9"W.

(3) The C "1 BC" ¹²⁰buoy at Latitude 47°45.0'N and Longitude 122°23.1'W has shifted ~~12~~ meters to the Southeast to Latitude 47°44'55.8"N and Longitude 122°23'05.4"W.

^{charted}The above aids adequately mark the intended features.

8. COMPLIANCE WITH INSTRUCTIONS

H-9744 complies with the Project Instructions OPR-N100-DA-78 dated December 8, 1977 and OPR-N100(412)-FA/DA-80, Puget Sound, Washington, dated December 21, 1979.

9. ADDITIONAL FIELD WORK

The survey is adequate and no additional field work is necessary unless the chart compiler feels it necessary for further investigation of the two wire drag soundings mentioned in Section 6.

Respectfully Submitted,

Russ Davies

Russ Davies
Cartographic Technician
March 18, 1981

Examined and Approved,

J S Green

James S. Green
Chief, Verification Branch



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Pacific Marine Center
1801 Fairview Avenue East
Seattle, WA 98102

RECEIVED
MAY 10 1981
PACIFIC MARINE CENTER

May 15, 1981

OA/CPM3/JWC

TO: OA/CPM - Charles K. Townsend

FROM: OA/CPM3 - John W. Carpenter *JWC*

SUBJECT: PMC Hydrographic Inspection Team Report for Survey H-9744

This survey is a basic hydrographic survey of Port Madison to President Point, Puget Sound, Washington. This survey was conducted by NOAA Ship DAVIDSON in 1978 and 1980 in accordance with Project Instructions OPR-N100-DA-~~80~~⁷⁸, dated December 8, 1977; Change No. 1, dated January 30, 1978; S-N926-DA-78, dated October 26, 1978; and OPR-N100-DA-80, dated December 21, 1979; Change No. 1, dated December 27, 1979; Change No. 2, dated January 17, 1980; Change No. 3, dated January 23, 1980; and Change No. 4, dated February 14, 1980.

The inspection team finds H-9744 to be a basic survey adequate to supersede common areas of prior surveys and charted hydrography. Administrative approval is recommended.

John W. Carpenter

John W. Carpenter

James M. Wintermyre

James M. Wintermyre

James W. Steensland

James W. Steensland

Stanley H. Otsubo

Stanley H. Otsubo

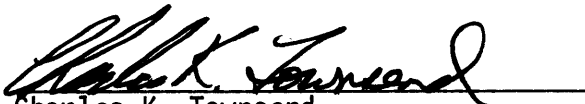


10TH ANNIVERSARY 1970-1980
National Oceanic and Atmospheric Administration

A young agency with a historic
tradition of service to the Nation

ADMINISTRATIVE APPROVAL
H-9744

The smooth sheet and reports of this survey have been examined and the survey is adequate for charting and to supersede common areas of prior surveys.



Charles K. Townsend
Director
Pacific Marine Center

15 May 1981
Date



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

OA/C352:LQ

November 3, 1981

TO: Glen R. Schaefer *GS*
Chief, Hydrographic Surveys Division

THRU: Chief, Quality Control Branch *gm*

FROM: *Lisa Quinlan*
Lisa Quinlan
Quality Evaluator

SUBJECT: Quality Control Report for H-9744 (1978-1980), Washington, Puget Sound, Vicinity of Point Jefferson

A quality control inspection of H-9744 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, shoreline transfer, decisions made and actions taken by the verifier, and the cartographic presentation of data. Revisions and additions to the smooth sheet, plus helpful comments made to the verifier, are identified on a one-half scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to the National Ocean Survey's standards and requirements except as stated in the Verifier's Report and the HIT Report.

cc:
OA/C351





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

JUN 28 1982
....

OA/C351:SVJ

TO: OA/CPM - Charles K. Townsend
FROM: OA/C3 - C. William Hayes *C. William Hayes*
SUBJECT: H-9744 (1978-1980), Washington, Puget Sound, Vicinity of Point
Jefferson, Report of Compliance with Project Instructions

The smooth sheet and Descriptive Report for the subject survey have been examined. This survey, except as noted in the Quality Control Report, dated November 3, 1981 (copy attached), and the Hydrographic Survey Inspection Team Report, dated May 15, 1981, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-N100(412)-DA-78, S-N926-DA-78, and OPR-N100(412)-DA-80, dated December 8, 1977, October 26, 1978, and December 21, 1979, respectively.

Attachment

cc:
OA/C352 w/o att.



RESPONSIBLE PERSONNEL		ORIGINATOR
TYPE OF ACTION	NAME	
OBJECTS INSPECTED FROM SEAWARD	CDR Ned G. Austin, Commanding Officer NOAA Ship DAVIDSON	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	David L. Actor, Ensign NOAA Ship DAVIDSON	FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		OFFICE ACTIVITY REPRESENTATIVE <input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'
 (Consult Photogrammetric Instructions No. 64.)

OFFICE	FIELD (Cont'd)
<p>1. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75</p> <p>FIELD</p> <p>I. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection</p> <p>A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75</p> <p>*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.</p>	<p>B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982</p> <p>II. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75</p> <p>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75</p> <p>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</p>

