

H10602

NOAA FORM 78-35A

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

## DESCRIPTIVE REPORT

Type of Survey . Hydrographic .....  
Field No. . RA-10-5-95 .....  
Registry No. . H-10602 .....

### LOCALITY

State . Alaska .....  
General Locality . Southern Stephens Passage .....  
Sublocality . False Pybus Point and Vicinity .....

19 95

### CHIEF OF PARTY

CAPT D. R. Seidel .....

### LIBRARY & ARCHIVES

DATE . JUN 12 1996 .....

**HYDROGRAPHIC TITLE SHEET**

H-10602

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.

RA-10-5-95

State Alaska

General locality Southern Stephens Passage

Locality False Pybus Point and Vicinity

Scale 1:10,000 Date of survey May 1-13, 1995

Instructions dated 2/13/95, Change #1-3/28/95 Project No. OPR-0136-RA

Vessel NOAA Ship RAINIER, Launches (2122), (2123), (2124), (2125), (2126)

Chief of party CAPT Dean R. Seidel, NOAA

Surveyed by LT D.Haines, LT M.Larsen, ENS S.Maenner, ENS E.Christensen,  
ENS N. Bennett, CST F.Paranada, ST B.Roraback, ST R.Baum

Soundings taken by echo sounder, ~~beam lead, pole~~ Diver Depths DSE-6000N, Pneumatic gauge, MOD III depth gauge

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: R. Davies Automated plot by HP Design Jet 650C

Verification by R. Davies

Soundings in ~~feet~~ meters & decimeters at MLW MLLW

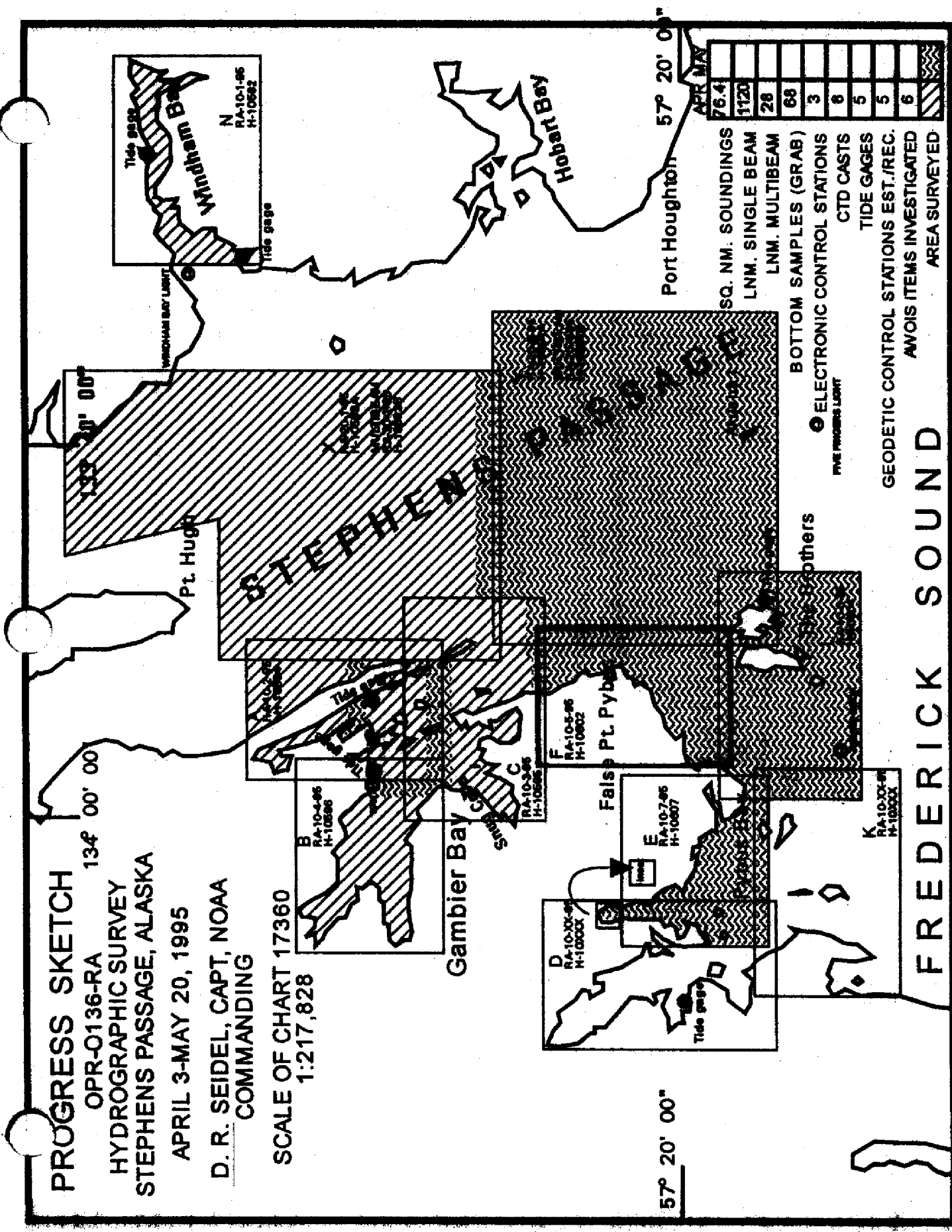
REMARKS: Time in UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.  
All depths listed in this report are referenced to mean lower low water unless otherwise noted.

JUN 12 1996 *sc*

*AWOIS + SURF ✓ RUD 6/96*

**PROGRESS SKETCH**  
 OPR-0136-RA 134° 00' 00"  
 HYDROGRAPHIC SURVEY  
 STEPHENS PASSAGE, ALASKA  
 APRIL 3-MAY 20, 1995  
 D. R. SEIDEL, CAPT, NOAA  
 COMMANDING

SCALE OF CHART 17360  
 1:217,828



57° 20' 00"

Port Houghton 57° 20' 00"

APR MAY	76.4								
SQ. NM. SOUNDINGS	1120								
LN.M. SINGLE BEAM	28								
LN.M. MULTIBEAM	68								
BOTTOM SAMPLES (GRAB)	3								
ELECTRONIC CONTROL STATIONS	8								
CTD CASTS	5								
TIDE GAGES	5								
GEODETIC CONTROL STATIONS EST./REC.	5								
AVOIS ITEMS INVESTIGATED	6								
AREA SURVEYED									

**FREDERICK SOUND**

# Descriptive Report to Accompany Hydrographic Survey H-10602

Field Number RA-10-5-95

Scale 1:10,000

May 1995

NOAA Ship RAINIER

Chief of Party: Captain Dean R. Seidel

## A. PROJECT ✓

This basic hydrographic survey was completed in Southern Stephens Passage, Alaska, as specified by Project Instructions OPR-O136-RA dated February 13, 1995, and change # 1 dated March 28, 1995.

Survey H-10602 corresponds to "sheet F" as defined in the Project Instructions.

This survey will provide contemporary hydrographic survey data for updating existing nautical charts. Requests for hydrographic surveys and updated charts have been received from the United States Coast Guard (USCG), the Southeast Alaska Pilot's Association, the Alaska Department of Transportation, and private interests such as cruise ship lines and local logging and fishing industries.

## B. AREA SURVEYED ✓ See Eval Rpt., section 8

The survey area is located in Southern Stephens Passage. The survey's eastern limit is bounded by 133° 50.0'W, and the western limit bounded by 133° 57.0'W. The northern limit is bounded by 57° 24.0'N, and the southern limit is 57° 19.0'N.

## C. SURVEY VESSELS ✓

Data were acquired by the five survey launches and the RAINIER as noted below:

Vessel	EDP #	Operation
RAINIER	2120	Bottom Samples Sound Velocity Casts
RA-2	2122	Hydrography
RA-3	2123	Hydrography Shoreline Verification

Vessel	EDP #	Operation
RA-4	2124	Hydrography Shoreline Verification
RA-5	2125	Hydrography Bottom Samples
RA-6	2126	Hydrography Shoreline Verification

#### D. AUTOMATED DATA ACQUISITION AND PROCESSING

Data were acquired and processed using HDAPS Programs. A complete listing is included in Appendix VI. \*

Data were acquired on RA-2 using Coastal Oceanographics' HYPACK, v. 5.2, with the following program updates.

Program Name	Version	Date Installed
HYSPEED.EXE	3/24/95	1 April, 1995
IOTEST.EXE	3/17/95	1 April, 1995

Processing was conducted using the HDAPS HP system. HYPACK (DOS) files were translated to a PC-DAS format using a Virtual Basic program HYPMENU version B1.5, and B1.6 (installed 5/3/95), provided by N/CG24. The files were then loaded into HDAPS and processed in the same manner as PC-DAS data.

In addition GPSINIT.BAT (5/19/94), was used to initialize the Ashtech GPS receiver.

Velocity corrections were determined using:

Program Name	Version	Date Installed
VELOCITY	2.11	5 Mar 1995

#### E. SONAR EQUIPMENT ✓

Sonar equipment was not used on sheet F. *Concur*

\* Filed with the hydrographic data.

## F. SOUNDING EQUIPMENT ✓

The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. Serial numbers are included on the headers of the daily Raw Master Printouts. No problems which affect survey data were encountered. All DSF-6000N soundings were acquired using the High + Low, high frequency digitized setting or the low frequency digitized setting, depending on water depth.

## G. CORRECTIONS TO ECHO SOUNDINGS ✓

Correctors for the velocity of sound through water were determined from the casts listed below.

Velocity Table #	Cast #	DN	Cast Position	Deepest Depth (m)	Applicable DN
5	6	122	57° 22.6' N ** 133° 44.4' W	500	121-132
7	8	133	57° 21.2' N ** 133° 44.5' W	561	133-135

\*\*  
outside survey  
area.

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 811), calibrated 03/31/95. Velocity correctors were computed using the PC program VELOCITY in accordance with Hydrographic Survey Guideline (HSG) No. 69.

A printout of the Sound Velocity Corrector Table used in the HDAPS Post Survey program is included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections". \*

### Static Draft ✓

A transducer depth was determined using FPM Fig 2.2 for RAINIER and vessels 2122-2126 in the spring of 1995. These values were entered into the offset tables for each survey platform.

### Settlement and Squat

Correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2., using FPM Fig. 2.3, and are included with project data for OPR-O136-RA. The data for 2122-2126 was collected in Shilshole Bay, Washington in the Spring of 1995. The data for RAINIER was determined during the Southern Alaska Peninsula project (OPR-P180) in the Summer of 1994.

\* Filed with the hydrographic data

### Offset Tables ✓

Offset tables contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 2-6 correspond to the number of the vessel, offset table 1 is used for RAINIER. The offset tables were compiled with new measurements in the spring of 1995 and are contained in the "Separates to be Included with Survey Data". \*

### Heave ✓

The launches are not equipped with heave, pitch and roll sensors. RAINIER is equipped with a HRP sensor, however the ship was not used for dual beam hydrography on this survey.

### Bar Check and Lead Lines ✓

Bar check lines were calibrated by RAINIER personnel during the winter inport 1994-1995. Calibration forms are included with project data for OPR-O136-RA. Bar checks were performed weekly and served as a functional check of the DSF-6000N.

### Tide Correctors ✓

Juneau, Alaska tide station (945-2210) served as control for datum for determination at all subordinate stations for this project.

Predicted tides for the project were provided on diskette by N/CG241 for the Juneau, Alaska reference station (945-2210).

Tidal correctors were obtained from the 1995 Tide Tables for West Coast of North and South America, Table 2 in accordance with the project instructions. The correctors for this sheet are:

		Time Correction		Height Correction	
Number	Position	High	Low	High	Low
1673	57/18 N 133/28 W	-0:21	-0:17	-0.8	-0.1

HDAPS listings of the data used in generating tide corrector tables are included in Appendix V \* of this report.

RAINIER personnel installed 8200 digital gages at The Brothers (945-1785) on April 11, 1995 and Cannery Cove (945-1781) on May 2, 1995. The staff was connected to five benchmarks at each station during all level runs. Opening levels were completed at The Brothers on April 12, 1995 and Cannery Wharf on May 2, 1995. Both tide gages operated continuously during data acquisition.

\* Filed with the hydrographic data.

Closing levels were completed at The Brothers and Cannery Cove on May 17, 1994. During closing levels at Cannery Cove, the difference in elevation agreed to within 0.001m. The difference between opening and closing levels was 0.006m. The section that exceeded 0.003m between opening and closing levels, staff to 1781B, was re-run and closed to within 0.001m. During closing levels at The Brothers, the difference in elevation agreed to within 0.002m. The difference between opening and closing levels was 0.006m. The sections that exceeded 0.003m between opening and closing levels, staff to 1785B and 1785D to 1785E, were re-run and closed to within 0.000m.

The Cannery Cove tide gage was not installed until the second day of the survey, May 2, 1995 (DN 122). The gage was not available until the second day of the survey. The hydrographer recommends that the data from the Good Island tide gage be used during the period that Cannery Cove was not installed. This is based on the fact that the tide gage at Good Island is significantly closer to the North part of this survey than Cannery Cove. As a result of this delay in the installation, the gage did not operate for the full 30 days. *The Cannery Cove tide gage was not used on this survey.*

The station descriptions, field tide records, and Final Field Tide Notes (Appendix V) have been forwarded to N/OES212 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded to N/OES2 in accordance with FPM 4.2.3. *Approved Tide Note dated August 28, 1995 is attached.*

#### H. CONTROL STATIONS ✓ *See Eval Rpt., Section II.*

A listing of the geodetic stations used to control this survey is included in Appendix III of this report. The horizontal datum for this project is NAD83.

DGPS stations were installed on existing stations INDX, KAN and ROUND ROCK. Station INDX is located on top of Five Fingers Light House, station KAN is located on a prominent point in the northern section of Gambier Bay, and station ROUND ROCK is located on a small islet southwest of The Brothers. These stations were recovered in accordance with methods stated in Section 5.2.4 of the FPM.

For further information see the "Spring 1995 Horizontal Control Report" that will be submitted at the end of the project.

#### I. HYDROGRAPHIC POSITION CONTROL ✓ *See Eval Rpt., Section I.*

##### Method of Position Control

All soundings and features were positioned using differential GPS. Serial numbers for Ashtech GPS equipment are annotated on the data printouts.\*

\* Filed with the hydrographic data



## Ashtech GPS ✓

VHF differential shore stations were established at stations INDX, KAN and ROUND ROCK. The difference between the computed location and the published positions at station KAN and ROUND ROCK were recorded by the MONITOR 3.0 program on a PC. Data from a 24-hour period were recorded and examined for signs of multi-path signal reflection, which was not evident at any station. Scatterplot results are included in the "Project related data for OPR-0136-RA". The scatterplot results for station INDX were obtained in the Spring 1993 Project. The area around station INDX remains undeveloped, and the geography unchanged.

## Calibrations & Systems Check Methods ✓

System checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two independent DGPS base stations. One ship to launch calibration with offsets was performed. The results were transferred to forms which are included in the project data for OPR-0136-RA. An abstract of the system checks is included in the "Separates to be Included with Survey Data, III. Horizontal Position Control and Corrections to Position Data" \*X

## Problems ✓

None

## J. SHORELINE *See Final Report, section J*

Shoreline maps DM-10029 and DM-10030 were supplied by N/CG24 in paper and Standard Digital Data Exchange Format (SDDEF). The digital files were projected using OPR-0136 geodetic parameters using program Shore (update 2/6/95), provided by N/CG24, and stored in HYPACK (\*.DIG) format. Shoreline was plotted at survey scale on boat sheets and processing sheets.

## Method of Shoreline Verification

Shoreline verification was conducted near predicted lower low water in accordance with FPM 7.1.

Shoreline verification was accomplished by assigning sequential reference numbers and taking detached positions (DPs), as explained later in this section.

Shoreline and DM features verified via visual inspection were assigned sequential reference numbers, described, and recorded in the field using reference forms and corresponding 1:10,000 photocopies of the DM. Reference numbers, descriptions, and heights corrected to MLLW using predicted tides are recorded on the reference form.

\* Filed with the hydrographic data.

Corresponding notes were annotated on the photocopies of the DM when deemed necessary. The annotated photocopies of the DM and the reference forms are included with the survey data.

Detailed 1:10,000 "Bottom Sample and Detached Position Plots" are provided showing all reference numbers, and notes relating to each feature. The information from these plots was transferred to a final field plot where possible. Verified DM features were retained and shown in black. Field cartographic codes were assigned using the HDAPS DP editor. Heights are recorded in meters and are corrected to predicted MLLW. *Field values have been changed after application of spring tides and shown on the smooth sheet. There was one minor revision to the chart high water line.*  
Changes and New Features ✓

There were numerous changes and some new features found during shoreline verification. Most of the rocks on the digital maps are high points of ledges or reefs. *Concur*

#### Disprovals ✓

None.

#### Recommendations ✓

The hydrographer recommends that the shoreline changes from the survey be used to supersede prior shoreline information compiled on DM-10029 and DM-10030. *Concur*

#### Charted Features ✓

Charted rocks were either identified as new rocks, high points or extensions of DM ledges and reefs, with the following exception:

The charted rock at latitude 57/19/46 N and longitude 133/56/27 W was not located during hydrographic operations. The water depths in the area were on the order of 3 meters in the shallow bay where the charted rock is located. The water visibility was four meters. This rock was not located during shoreline verification that was conducted at or near predicted MLLW.

*This rock is considered to be disproved. A large reef is located 80 meters to the northeast of the charted rock. This is most likely the charted rock. Delta charted rock and chart reef central at lat. 57/19/50 N, long. 133/56/18 W.*

#### Landmarks ✓

One landmark exists within the survey limits. It is a natural scar on the side of a tree covered cliff that resembles the number 7 at 57/21/34.9 N and 133/52/52.8 W. This feature was observed by RAINIER personnel on numerous occasions during the project. The landmark should remain as charted. *Concur*

## K. **CROSSLINES** ✓

Crosslines are within 1-2 meter parameter agreement with mainscheme hydrography except in areas of complex bathymetry. Total mileage was 21.6 nautical miles or 11.6 % of total mainscheme hydrography.

## L. **JUNCTIONS** ✓ *See Eval Rpt., section L*

This survey junctions with surveys H-10601B (1:20,000, 1995, HydroChart II) at the eastern limit, H-10595 (1:10,000, 1995) at the northern limit, H-10604 (1:10,000, 1995) at the southern limit and H-10607 (1:10,000, 1995) at the extreme southwest corner of the survey. Soundings were found to be in general agreement. Final comparison will be made at the Pacific Hydrographic Section (PHS). *All junctions are complete.*

## M. **COMPARISON WITH PRIOR SURVEYS** *See Eval Rpt., section M.*

Three prior surveys were compared: H-1996 (1:80,000, 1889, USC&GS), H-4143 WD AD.WK (1:40,000, 1922) and H-4512A (1:20,000, 1925-1926). Due to a higher density of sounding data, many least depths were found to be shoaler. Preliminary comparisons revealed no prior least depths shoaler than the current survey. Final comparisons will be done at PHS.

## N. **ITEM INVESTIGATIONS**

One AWOIS item was assigned to H-10602.

### **AWOIS Item 51818** ✓

#### **1. Area of Investigation**

State: Alaska

Locality: Stephens Passage

Reported Latitude: 57/22/55.00 N

Reported Longitude: 133/52/00.00 W

Datum: NAD83

Feature: Obstruction

#### **2. Description and Source of Item**

Item is a rock awash scaled from the chart the rock originated from a USGS quad (SUMDUM B-6, 1948). The rock was not shown on the DM.

### 3. Survey Requirements

Verify or disprove, determine least depth and position. Techniques to be used are, visual search, bottom drag or dive investigation.

### 4. Method of Investigation

The area was investigated by visual search during shoreline verification.

### 5. Results of Investigation

Date: DN 122  
Time (UTC): 16:44  
Depth: -6.4 m  
Position #: R4-1  
Vessel: 2124

A ledge was located during shoreline verification within the 50 meter search radius. The rock awash is part of the ledge described in R4-1. <sup>islet</sup>

### 6. Comparison with Prior Surveys

The item was compared to H-1996, 1:80,000, 1889, USC&GS and H-4512A 1:20,000, 1925 USCGS. This item did not originate with either prior survey.

### 7. Comparison with the Chart and Charting Recommendations

The item was compared to NOS chart 17362, 9th Edition, May 5, 1990 (NAD83). The item is shown as a rock awash.

This item was not submitted as a danger to navigation.

### Recommendation

The hydrographer recommends that the shoreline information from the field sheet be used to supersede the existing chart. *Delete charted rock and chart ledge and islet centered at 57°22'57N and long. 133°52'00W.*

### O. COMPARISON WITH THE CHART *See Eval Rpt., section L.*

This survey was compared to NOS charts 17360, 29th Edition, July 9, 1994, 1:217,828, (NAD83), 17362, 9th Edition, May 5, 1990 (NAD83) and 17363, 11th Edition, April 27, 1991 (NAD83). With the following exceptions, charted soundings were found to be in general agreement.

A ten fathom shoal in the vicinity of latitude 57/23/33 N longitude 133/52/00 W was not found during mainscheme hydrography, the area was developed with 25 meter line spacing which did not reveal any features, soundings within the area were around 20 fathoms. However, a 8 1/4 (155m) fathom shoal was located approximately 150 meters southeast of the charted shoal. This shoal was reported as a Danger to Navigation.

In the small bay at latitude 57/20/00 N longitude 133/56/30 W, the shoreline verification and hydrography depicted the area considerably different from the chart. The chart showed two rocks and a pair of islets surrounded by a ledge. The shoreline and hydrography depicted the area as a ledge extending northeast from the shore, a reef and a submerged rock. The hydrographer recommends that the area be charted as shown on the field sheet and smooth sheet.

Non-sounding charted features are discussed in Section J, Shoreline. Final comparisons to be made at PHS.

Dangers to Navigation ✓ See Eval Rpt., Section O.

Twelve dangers to navigation within the limits of H-10602 were reported to the Seventeenth Coast Guard District, June 2, 1995. Copies of the correspondence can be found in Appendix I of this report.

#### P. ADEQUACY OF SURVEY ✓

Survey H-10602 is complete and adequate to supersede charted depths and features in their common areas. CONCUR

#### Q. AIDS TO NAVIGATION ✓

One Aid to Navigation exists within the survey area, it is False Point Pybus daybeacon. This mark was positioned using a portable DGPS setup on DN 135. Positions were obtained using two different stations. The position is the same as published in the light list. A summary is provided in Appendix VI, this report.

## R. STATISTICS ✓

NM Hydrography	199.4
Velocity Casts	2
Detached Positions	52
Selected Soundings	12635
Bottom Samples	26
Tide Stations	2
NM <sup>2</sup> Hydrography	10.4

## S. MISCELLANEOUS ✓

Bottom samples were collected in accordance with Project Instructions. Samples have been stored and shipped to the Smithsonian Institution in accordance with Section 4.7.1 of the Hydrographic Manual.

RAINIER personnel observed currents in excess of two knots between The Brothers, generally in a Southerly direction. Tide rips were typically noticed at the North end of the passes between the islands.

No unusual magnetic variations were noted.

## T. RECOMMENDATIONS ✓

None

## U. REFERRAL TO REPORTS ✓

The following supplemental reports contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Spring 1995 Horizontal Control Report for OPR-O136-RA.	May 1995	N/CG245
Spring 1995 Coast Pilot Report for OPR-O136-RA.	May 1995	N/CG245
Project related data for OPR-O136-RA.	Incremental	N/CG245

**Title**  
Secchi Disk Observations for  
OPR-0136

**Date Sent**  
June, 1995

**Office**  
N/CG311

Respectfully Submitted,



Mark S. Larsen  
Lieutenant, NOAA

Approved and Forwarded,



Dean R. Seidel  
Captain, NOAA  
Commanding Officer

CONTROL STATIONS as of 29 Nov 1995 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
<del>100</del>	F	<del>057:33:42.067</del>	<del>133:32:35.041</del>	<del>19</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>	<del>0.0</del>	<del>04/03/95</del>	<del>WINDHAM BAY LIGHT(GPS STATION)</del>
101	F	057:16:13.398	133:37:53.480	30	250	0.0	0.0	0.0	04/03/95	INDX(GPS STATION), 1993
102	F	057:28:37.836	133:58:16.968	6	250	0.0	0.0	0.0	04/12/95	KAN 1924(GPS STATION), 1994
103	F	057:15:35.178	133:56:12.978	21	250	0.0	0.0	0.0	05/09/95	ROUND ROCK(GPS STATION), 1997



**Section Q: Descriptive Report Insert**

Name of Aid: False Point Pybus

Daybeacon

Light List #: 23585

Method of Positioning: DGPS

**Positioning Info**

	Latitude N	Longitude W
Charted Pos.	57°21.1	133°52.5
Survey Pos.	57°21.1	133°52.5
	Easting	Northing
Charted Pos.	42475.4	39168.8
Survey Pos.	42523.2	39226.2

Difference between Survey/Charted position: 75 m 220 deg T  
Note: Positions round to same value with Light List significant digits.

**Characteristics**

Do Characteristics Match Light List? (y/n) y

If NO, what are the characteristics?

New/Uncharted Aids (if info is known or easily obtained)

Date Established:

Maintained By: USCG Private (n)

Frequency of Maintenance:

Purpose:



RESPONSIBLE PERSONNEL		ORIGINATOR
TYPE OF ACTION	NAME	
OBJECTS INSPECTED FROM SEAWARD	CAPT D.R. Seidel	<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	CAPT D.R. Seidel	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
<b>INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'</b> (Consult Photogrammetric Instructions No. 64.)		
<b>OFFICE</b> <b>I. OFFICE IDENTIFIED AND LOCATED OBJECTS</b> 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		
<b>FIELD (Cont'd)</b> <b>B. Photogrammetric field positions** require</b> 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		
<b>FIELD</b> <b>I. NEW POSITION DETERMINED OR VERIFIED</b> Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection 5 - Field identified 6 - Theodolite 7 - Planetable 8 - Sextant A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75		
<b>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</b>		
<b>II. TRIANGULATION STATION RECOVERED</b> 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		
<b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b> Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75		



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of NOAA Corps Operations  
Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102-3767

NOAA Ship RAINIER

June 2, 1995

**ADVANCE  
INFORMATION**

Director  
DMAHTC  
ATTN: MCNM  
6500 Brookes lane  
Washington, DC 20315-0030

Dear Sir:

While conducting hydrographic survey operations in Southern Stephens Passage, Alaska, NOAA Ship RAINIER discovered thirty dangers to navigation. They have been reported to DMAHTCNAVWARN and the Seventeenth Coast Guard District. A copy of the correspondence describing the dangers is enclosed.

Sincerely,

Dean R. Seidel  
Captain, NOAA  
Commanding Officer

Enclosures



000336Z MAY 95  
 FM NOAA S RAINIER  
 TO CCGDSEVENTEEN JUNEAU AK  
 DMAHTCCNAVWARN WASHINGTON DC//MCNM//  
 INFO NOAA MOP SEATTLE WA  
 ACCT CM-VCAA

ADVANCE  
 INFORMATION

BT  
 UNCLAS

NOAA SHIP RAINIER HAS LOCATED 30 DANGERS TO NAVIGATION IN SOUTHERN STEPHENS PASSAGE, ALASKA (PROJECT OPR-0136-RA) WITHIN THE LIMITS OF HYDROGRAPHIC SURVEYS H-10595 AND H-10602. THE FOLLOWING INFORMATION IS PROVIDED FOR PUBLICATION IN LOCAL NOTICE TO MARINERS:

DEPTHS ARE REDUCED TO MLLW BASED ON PREDICTED TIDES.

FOR H-10595:

CHARTS AFFECTED: 17360 29TH ED JUL 9/94 1:217,828 (NAD83)  
 17362 9TH ED MAY 5/90 1:40,000 (NAD83)

ITEM	DANGER	DEPTH	LATITUDE	LONGITUDE	Depth(m)	Fix
A.	SHOAL	COVERS 1 1/4 fm	57/27/11.5N	133/57/09.1W	2.6	3541+3
B.	SHOAL	COVERS 8 3/4 fms	57/26/38.7N	133/57/36.4W	16.2	1605+2
	SHOAL	COVERS 7 1/4 fms	57/26/34.2N	133/56/57.9W	13.6	1613+2
	SHOAL	COVERS 1 3/4 fms	57/26/56.3N	133/54/49.3W	3.3	3509+5
E.	SHOAL	COVERS 2 1/4 fms	57/27/00.7N	133/54/51.7W	4.5	3503+4
F.	SHOAL	COVERS 1 fm	57/27/12.2N	133/54/27.5W	2.0	5778+0
G.	SHOAL	COVERS 2 1/4 fms	57/27/00.9N	133/54/15.9W	4.3	8613+0
H.	SHOAL	COVERS 2 1/2 fms	57/26/44.6N	133/53/28.3W	5.0	8610+0
I.	SHOAL	COVERS 3/4 fm	57/26/40.9N	133/53/23.0W	1.4	8611+0
J.	SHOAL	COVERS 1 3/4 fm	57/26/15.7N	133/53/07.1W	3.6	3612+3
K.	SHOAL	COVERS 2 /12 fm	57/25/54.0N	133/52/47.7W	4.7	3624+3
L.	SHOAL	COVERS 3/4 fm	57/27/45.7N	133/49/53.0W	1.9	3692+3
M.	SHOAL	COVERS 8 1/4 fm	57/27/24.6N	133/50/11.3W	15.4	3666+3
N.	SHOAL	COVERS 7 3/4 fm	57/26/55.4N	133/50/24.0W	14.5	3644+2
O.	SHOAL	COVERS 3 1/2 fm	57/25/57.8N	133/55/23.5W	6.8	12422+0
P.	ROCK	UNCOVERS 1 ft	57/25/11.5N	133/52/45.5W	-0.3	10415+0
Q.	SHOAL	COVERS 4 3/4 fm	57/25/07.1N	133/52/42.5W	8.7	3704+2
R.	SHOAL	COVERS 5 1/2 fm	57/24/57.3N	133/52/01.8W	10.5	8607+0

FOR H-10602:

CHARTS AFFECTED: 17360 29TH ED JUL 9/94 1:217,828 (NAD83)  
 17362 9TH ED MAY 5/90 1:40,000 (NAD83)  
 17363 11TH ED APR 27/91 1 ;40,000 (NAD83)

ITEM	DANGER	DEPTH	LATITUDE	LONGITUDE	Depth(m)	Fix
A.	SHOAL	COVERS 7 1/4 fm	57/19/31.4N	133/56/02.6W	13.7	5698+2 ✓

**ADVANCE  
INFORMATION**

	ROCK UNCOVERS	1 ft	57/19/56.5N*	133/56/04.2W	-0.1	1187+0 ✓
	SHOAL COVERS	3 1/4 fm	57/19/56.5N*	133/54/51.9W	6.4	6361+2 ✓
D.	SHOAL COVERS	8 1/2 fm	57/20/26.0N	133/53/03.9W	15.9	7816+0 ✓
E.	REEF UNCOVERS	13 ft	57/19/52.3N	133/56/14.9W	-4.1	1191 ✓
			57/19/50.2N	133/56/14.9W		1192 ✓
			57/19/47.5N	133/56/20.6W		1193 ✓
F.	LEDGE UNCOVERS	19 ft FROM SHORE WITH THE FOLLOWING LIMITS				
			57/19/43.8N	133/56/20.3W	-5.8	1195 ✓
			57/19/39.0N	133/56/40.8W		✓
			57/19/32.6N	133/56/32.1W		1197 ✓
G.	SHOAL COVERS	7 1/2 fm	57/20/56.4N	133/52/20.2W	13.9	6265+4 ✓
H.	ROCK UNCOVERS	4 ft	57/21/11.9N	133/52/15.5W	-0.1	3220+0 ✓
I.	SHOAL COVERS	2 fm	57/21/19.1N	133/52/10.1W	3.9	6273+4 ✓
J.	SHOAL COVERS	1 fm	57/22/11.6N	133/51/41.8W	2.0	3340+0 ✓
K.	SHOAL COVERS	8 1/2 fm	57/23/39.9N	133/51/54.6W	15.8	6311+4 ✓
L.	SHOAL COVERS	8 1/4 fm	57/23/28.6N	133/51/54.8W	15.5	6190+1 ✓

THIS IS ADVANCE INFORMATION SUBJECT TO OFFICE REVIEW.  
 QUESTIONS CONCERNING THIS MESSAGE SHOULD BE DIRECTED TO THE  
 CHIEF, PACIFIC HYDROGRAPHIC SECTION AT (206)526-6835. A  
 LETTER WITH ATTACHED CHARTLET WILL BE MAILED TO CONFIRM  
 THIS MESSAGE.

BT

\* Corrected latitude is 57/19/59.5 N.

Sin EC, May 5790

17362

(CONTINUED ON CHART 17360)

(CONTINUED ON CHART 17361)

133° 51'

15

Cable Area

ADVANCE INFORMATION

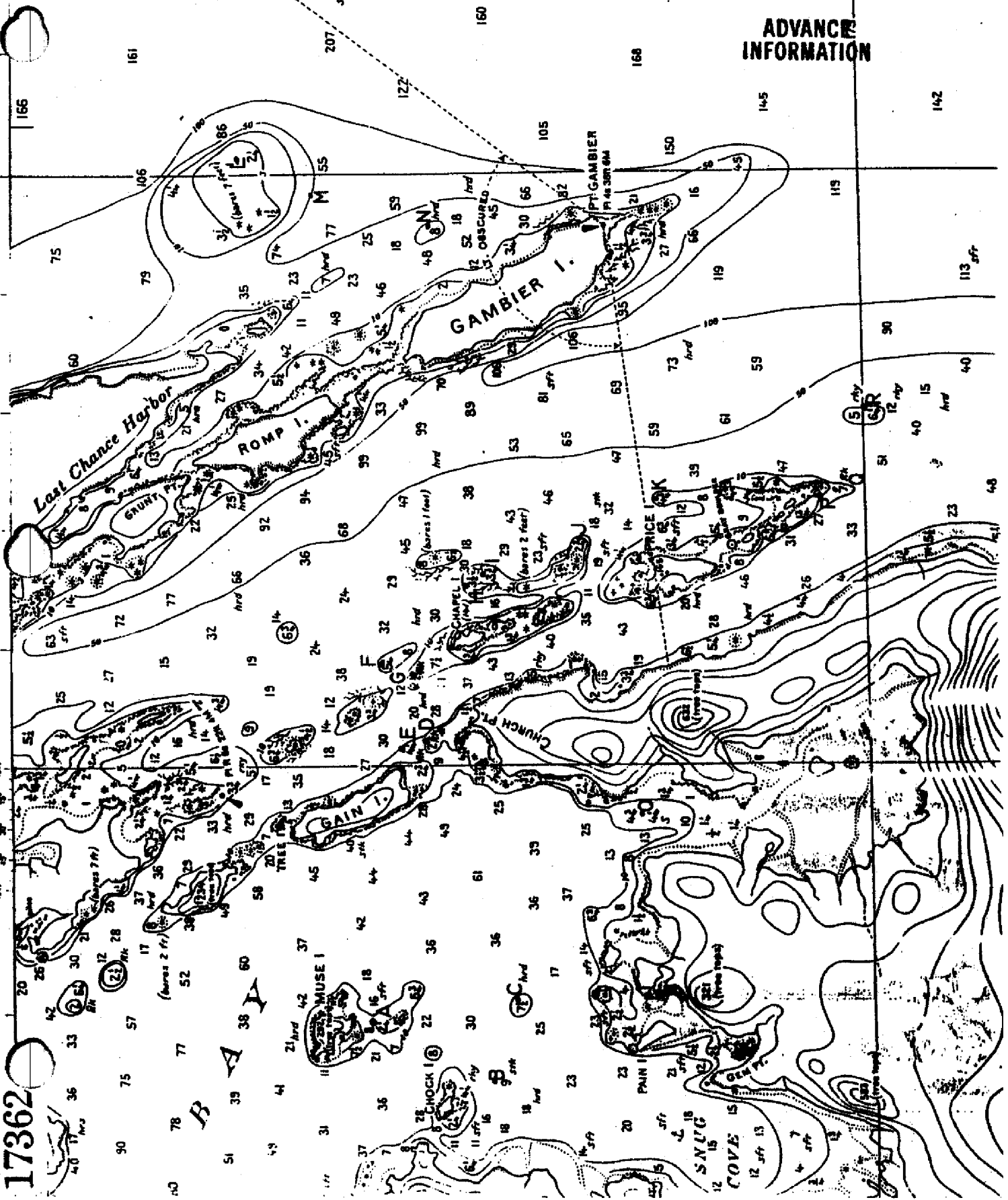


Chart 17362  
Scale 1:40,000

29th Ed. July 9/94

**17360**

Chart 17362  
Scale 1:40,000

GAMBIER BAY

ADVANCE  
INFORMATION

Chart 17363  
Scale 1:40,000

57° 20'

PYBUS BAY

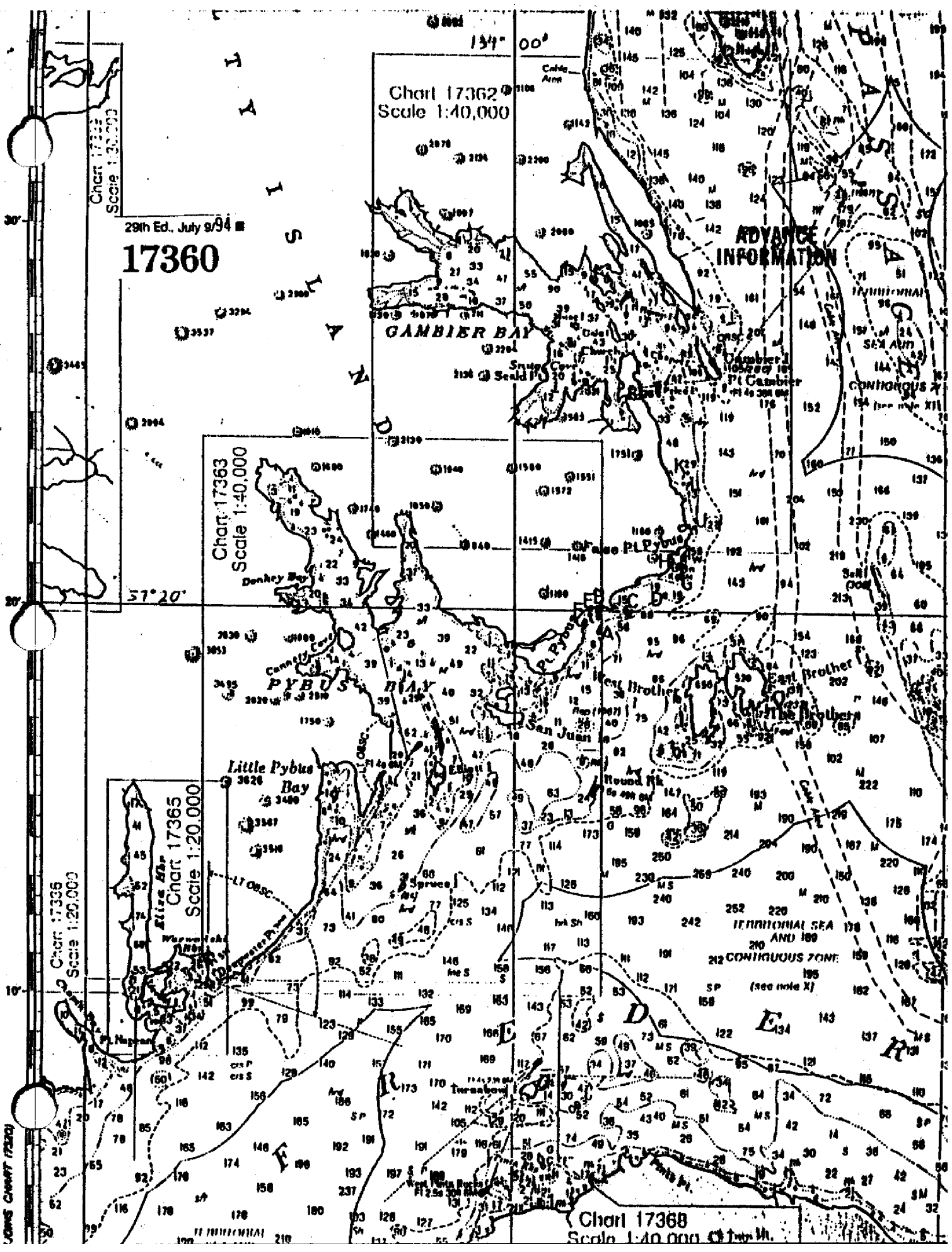
Little Pybus Bay

Chart 17365  
Scale 1:20,000

Chart 17365  
Scale 1:20,000

Chart 17368  
Scale 1:40,000

JOHN CHART (17320)







UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
OFFICE OF CHARTING AND GEODETIC SERVICES  
Seattle, Washington 98115-0070

June 9, 1995

Commander  
Seventeenth Coast Guard District  
Post Office Box 3-5000  
Juneau, Alaska 99802

**ADVANCE  
INFORMATION**

Dear Sir:

During the office processing of hydrographic survey H-10602 in Southern Stephens Passage, an error in a previously reported danger to navigation has been discovered. This danger affects the following charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Datum</u>
17360	29th Ed., 7/9/94	NAD83
17362	9th Ed., 5/5/90	NAD83

It is recommended that this change in position be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Section at (206) 526-6853.

Sincerely,

Kathryn A. Timmons  
Commander, NOAA  
Chief, Pacific Hydrographic Section

Enclosure

cc: DMA/HTC  
PMC  
RAINIER  
N/CG221



**ADVANCE  
INFORMATION**

Hydrographic Survey Registry Number: H-10602

Survey Title:           State:           Alaska  
                          Locality:       Southern Stephens Passage  
                          Sublocality:   False Pybus Point and Vicinity

Project Number:       OPR-O136-RA

Survey Date:           May 1995

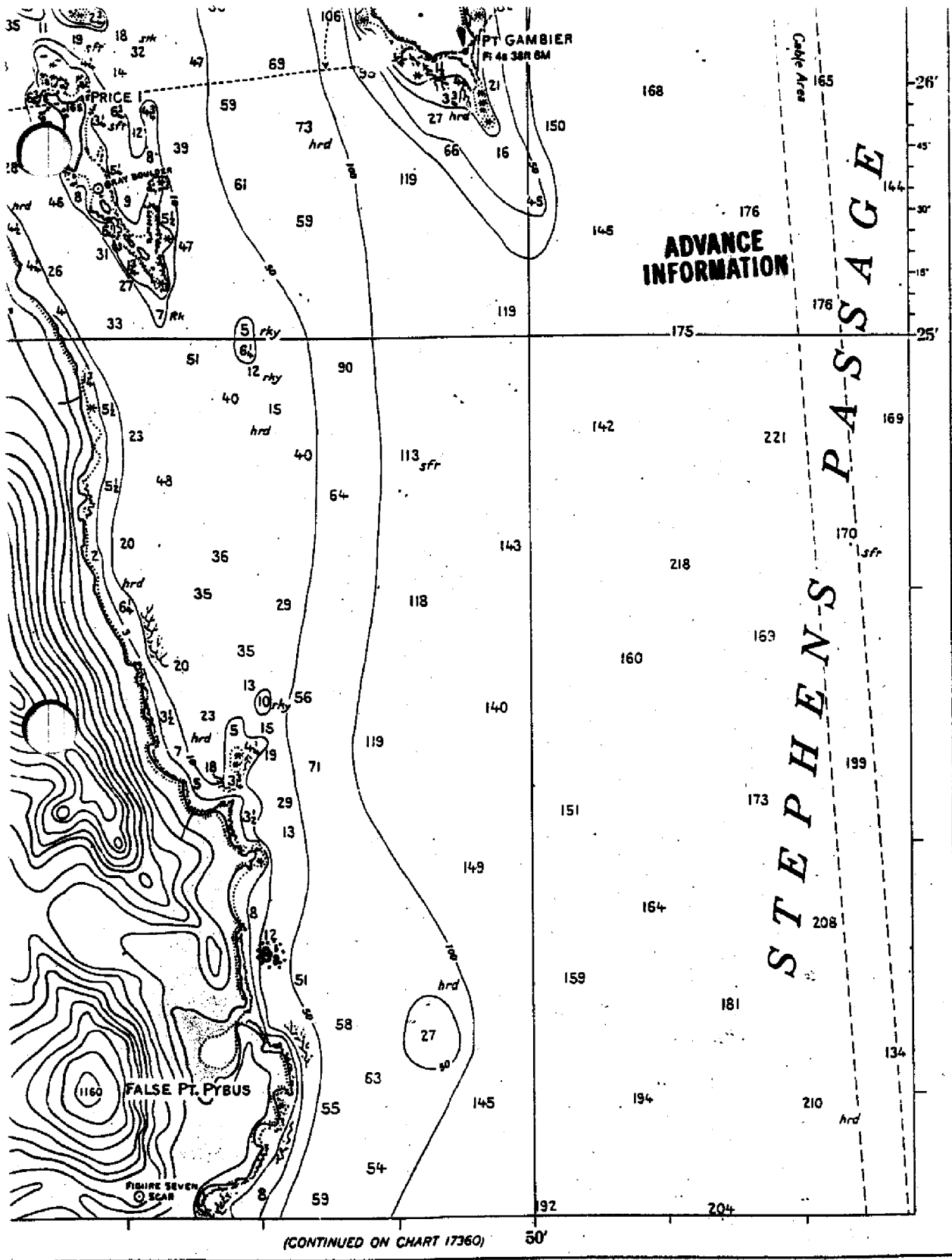
Features are reduced to Mean Lower Low Water using predicted tides.

Affected Nautical Charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Datum</u>
17360	29th Ed., 7/9/94	NAD83
17362	9th Ed., 5/5/90	NAD83

<u>Danger to Navigation</u>		<u>Latitude (N)</u>	<u>Longitude (W)</u>
Shoal, 8 1/2 Fathoms	incorrect	57/23/39.9	133/51/54.6
	correct	57/22/39.9	133/51/54.6

Questions concerning this report should be directed to the Pacific Hydrographic Section at (206) 526-6853.



(CONTINUED ON CHART 17360) 50'

DMA STOCK NO. 17XHA17362

(Gambier Bay)

SOUNDINGS IN FATHOMS - SCALE 1:40,000  
NAD 83

17362

9th EDITION  
5 MAY 1990



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Ocean and Earth Sciences  
Silver Spring, Maryland 20910

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

ORIGINAL

**DATE:** August 25, 1995

**HYDROGRAPHIC SECTION:** Pacific

**HYDROGRAPHIC PROJECT:** OPR-0136

**HYDROGRAPHIC SHEET:** H-10602

**LOCALITY:** False Pybus Point & Vicinity, Stephens Passage, Alaska

**TIME PERIOD:** May 1 - 15, 1995

**TIDE STATION USED:** 945-1785 The Brothers, Stephens Passage, AK  
Lat. 57° 17.7'N Lon. 133° 47.8'W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** -3.04 ft.

**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 14.0 ft.

**REMARKS:** RECOMMENDED ZONING

1. South of 57° 20.0'N, times and heights are direct on The Brothers, AK (945-1785).
2. North of 57° 20.0'N and south of 57° 23.0'N, times are direct and apply a x1.01 range ratio to The Brothers, AK (945-1785).
3. North of 57° 23.0'N, times are direct and apply a x1.02 range ratio to The Brothers, AK (945-1785).

**Notes:** 1. Times are tabulated in Greenwich Mean Time.

2. Data for The Brothers, AK (945-1785) are temporarily stored in files #745-1785.

*William W. Gibson*  
CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey	A CHART NO. 17360 B ON PREVIOUS SURVEY NO. 17365 C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K											
	ADMIRALTY ISLAND	X		X								
ALASKA (title)	X		X									2
FALSE POINT PYBUS	X		X									3
PYBUS, POINT	X		X									4
SQUARE POINT	X		X									5
STEPHENS PASSAGE	X		X									6
												7
												8
												9
												10
												11
												12
												13
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												23
												24
												25

Approved

*Charles C. Long*

Chief Geographer

JAN 17 1996

**APPROVAL SHEET**

for

**H-10602**

**RA-10-5-95**

**Standard procedures were followed in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual in producing this survey. The data were examined daily during data acquisition and processing.**

**The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.**



**Dean R. Seidel  
Captain, NOAA  
Commanding Officer**

**HYDROGRAPHIC SURVEY STATISTICS**

H-10602

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	2				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES				1	

**SHORELINE DATA**

SHORELINE MAPS (List):	DM-10029, DM-10030
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	17360 29th Ed., 17367 9th Ed., 17363 11th Ed.

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET			12635	
POSITIONS REVISED				
SOUNDINGS REVISED				
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS				
VERIFICATION OF SOUNDINGS				
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPILATION OF SMOOTH SHEET	88		88	
COMPARISON WITH PRIOR SURVEYS AND CHARTS				
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		21	21	
GEOGRAPHIC NAMES				
OTHER*				
*USE OTHER SIDE OF FORM FOR REMARKS				
	TOTALS	88	21	109

Pre-processing Examination by <b>LT P. Haines</b>	Beginning Date <b>6/7/95</b>	Ending Date <b>6/7/95</b>
Verification of Field Data by <b>D. Doles, R. Davies, J. Stringham</b>	Time (Hours) <b>88</b>	Ending Date <b>1/23/96</b>
Verification Check by <b>B. Olmstead</b>	Time (Hours) <b>3</b>	Ending Date <b>1/30/96</b>
Evaluation and Analysis by <b>R. Davies</b>	Time (Hours) <b>21</b>	Ending Date <b>2/7/96</b>
Inspection by <b>B. Olmstead</b>	Time (Hours) <b>10</b>	Ending Date <b>2/7/96</b>

**EVALUATION REPORT  
H-10602**

**A. PROJECT**

The hydrographer's report contains a complete discussion of the Project information.

**B. AREA SURVEYED**

This survey was conducted in Southern Stephens Passage, Alaska and includes an area of coastline between Gambier Bay and Pybus Bay. Depths range from 0 to 371 meters. The bottom consists primarily of mud and sand.

**C. SURVEY VESSELS**

The hydrographer's report contains information relating to survey vessels.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING**

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer; the Hydrographic Processing System (HPS) and AutoCad, Versions 12 and 13.

At the time of the survey certification the format for the transmission of digital data had not been finally approved. In the interim, digital data for this survey exists in the standard HPS format which is a database format using the .dbf extension. In addition, the sounding plot, created with the .dbf data and enhanced using the AutoCad system, is filed both in the AutoCad drawing format, i.e., .dwg; and in the more universally recognized graphics transfer format, .dxf. Copies of these data files will be retained at PHS until data transfer protocols are developed and approved.

The drawing files necessarily contain information which is not part of the HPS data set such as geographic name text, line-type, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes, remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 75.

The field sheet parameters have been revised to center the hydrography on the office plot. Data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

**E. SONAR EQUIPMENT**

Side scan sonar was not used on survey H-10602.



## **F. SOUNDING EQUIPMENT**

Sounding equipment is discussed in the hydrographer's report.

## **G. CORRECTIONS TO SOUNDINGS**

Predicted tides for Juneau, Alaska were used for the reduction of soundings during field processing. Approved hourly heights zoned direct from The Brothers, Stephens Passage, gage 945-1785, was used during office processing. Soundings have been corrected for dynamic draft, actual tides and sound velocity. The offset values and velocity correctors are adequate.

## **H. CONTROL STATIONS**

Sections H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of the horizontal control stations used during hydrography are published values based on NAD 83. The smooth sheet is annotated with a NAD 27 adjustment tick based on values determined with NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections.

Latitude: -1.221 seconds (-37.777 meters)  
Longitude: 6.238 seconds (104.294 meters)

The year of establishment of control stations originate with the horizontal control records for this survey.

## **I. HYDROGRAPHIC POSITION CONTROL**

Differential GPS(DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. No positions exceeded the limits in terms of horizontal dilution of precision (HDOP). NAD 83 is used as the horizontal datum for plotting and position computations.

## **J. SHORELINE**

Shoreline maps DM-10029 and DM-10030 were compiled on NAD 83 and apply to this survey.

The shoreline drawn on the smooth sheet originates from a 1:10,000 scale digital file provided by the Coastal Mapping Program. This file has been merged with the survey file during ACAD processing. Changes along the shoreline and new features in the area were

noted on this survey. Some of the islets and rocks depicted on the map were identified in the field as part of reefs, high points or extensions of the newly located ledges. The previously compiled configuration of ledges and reefs were updated to conform to the present hydrography. There was one revision to the mean high water line at latitude 57/24/00N, longitude 133/53/09W. All revisions have been depicted on the ACAD generated smooth sheet as applicable and are adequate to supersede prior photogrammetric shoreline maps.

TO: 5016.1-1  
TU: 5020.1

#### K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

#### L. JUNCTIONS

Survey H-10602 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10595	1995	1:10,000	North
H-10601A&B	1995	1:10,000	East
H-10604	1995	1:10,000	Southeast

The junctions with all of the above surveys are complete. Soundings and depth curves within the common areas are in good agreement.

#### M. COMPARISON WITH PRIOR SURVEYS

H-1996(1889-92) 1:80,000  
H-4512A(1925-26) 1:20,000

Surveys H-1996 and H-4512A cover the entire area of the present survey. Present survey depths are generally shoaler with an average difference of 2.0 meters (1 fathom). These differences can be attributed to greater sounding coverage, relative accuracy of the data acquisition techniques and natural accretion and erosional processes. All features and critical depths originating from the above listed prior surveys were adequately addressed during survey operations, except for the following.

A charted 27 fathom (49 meters) depth originating from H-1996 at latitude 57/22/14N, longitude 133/50/47W was not addressed by the hydrographer. Present survey depths in the area are approximately 169 meters (92 fathoms) with no indication that shoaling exists. However, the present survey did find similar depths of 37-49 meters (20-27 fathoms), approximately one nautical mile south of the charted 27 fathom depth. It is likely that these differences can be attributed to the relative accuracy of the data acquisition techniques between the present and prior survey. Chart soundings in the area according to this survey.

Survey H-10602 is adequate to supersede the prior surveys within the common area.

H-4143A WD AD(1922) 1:40,000

H-4512B WD(1925-26) 1:20,000

The above wire-drag surveys cover the entire area of the present survey. All depths were adequately investigated and should be superseded by this survey.

A few charted depths originating from H-4143A WD AD are suspect as to positioning and depth accuracy. The present survey found similar depths with the 1922 prior work within approximately 200 meters. Current hydrography provided sufficient bottom coverage in these areas to disprove the questionable depths at their charted locations. Differences are likely attributed to the relative accuracy of the data acquisition techniques between the present and prior survey.

#### **N. ITEM INVESTIGATIONS**

One AWOIS Item originating from miscellaneous sources was investigated during survey operations. Discussion and disposition of this item has been adequately addressed in the hydrographer's report.

#### **O. COMPARISON WITH CHART**

Survey H-10602 was compared with the following charts.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
17360	29th	July 9, 1994	1:217,828	NAD 83
17362	9th	May 5, 1990	1:40,000	NAD 83
17363	11th	April 27, 1991	1:40,000	NAD 83

##### **a. Hydrography**

Charted hydrography originates with the prior surveys mentioned in section M. The prior surveys are discussed in section M and requires no further discussion.

Survey H-10602 is adequate to supersede charted hydrography within the common area.

##### **b. Dangers to Navigation**

Twelve dangers to navigation were reported to the USCG, DMAHTC and N/CG 221 on June 2, 1995. One revision to the original dangers to navigation letter was found during office processing. This revision was submitted in a letter dated June 9, 1995. A copy of both reports is attached.

## **P. ADEQUACY OF SURVEY**

Hydrography is adequate:

- a. delineate the bottom configuration, determine least depth, and draw the standard curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigations; and
- c. show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1994 Edition.

## **Q. AIDS TO NAVIGATION**

There are no floating aids to navigation located within the survey area. There is one fixed aid to navigation within the survey area. False Point Pybus Daybeacon was located and serves its intended purpose. There is one landmark within the survey area. A prominent scar on the cliff face along the shoreline of Admiralty Island was verified during survey operations and is still of landmark value.

## **R. STATISTICS**

Statistics are itemized in the hydrographer's report.

## **S. MISCELLANEOUS**

No additional miscellaneous items were noted during office processing.

## **T. RECOMMENDATIONS**

This is a good hydrographic survey. No additional field work is recommended.

## **U. REFERRAL TO REPORTS**

Referral to reports is discussed in the hydrographer's report.

  
C.R. Davies  
Cartographer

APPROVAL SHEET  
H-10602

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disapproval of charted data. The digital data have been completed and all revisions and processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts have been made and are included with the survey records. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead Date: 2/7/96  
Bruce A. Olmstead  
Senior Cartographer, Cartographic Section  
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Kathy Simmons Date: 2/8/96  
Kathy Simmons  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

\*\*\*\*\*

Final Approval

Approved:  
Andrew A. Armstrong III Date: July 3, 1996  
Andrew A. Armstrong III  
Captain, NOAA  
Chief, Hydrographic Surveys Division

