10296

Diagram No. 8201-4

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

10296

Type of Survey Navigable Area Hydrographic

Field No. RA-20-1-89

Registery No. H-10296

LOCALITY

State Alaska

General Locality Frederick Sound

Sublocality Cape Bendel to Round Rock

1989

CHIEF OF PARTY
CAPT J.C. Albright

LIBRARY & ARCHIVES

DATE June 7, 1990

☆U.S. GOV. PRINTING OFFICE: 1985—566-054

CHTS

17360 ✓ 217 828
17320 ✓ 217,828
17368 ✓ 40,000
17363 ✓ 40,000
531 NC ✓ 2,100,000
16016 NC 969,756
500 NC ✓ 3,500,000
530 NC ✓ 4,860,700

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

H-10296

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 20-1-89

State Alaska

General locality Frederick Sound

Locality Cape Bendel to Round Rock

Scale 1:20,000 Date of survey March 14 to April 16, 1989

Instructions dated September 13, 1988 Project No. OPR-0358-RA

Vessel NOAA Ship RAINIER (2120), Launches RA-3 (2123), RA-4 (2124), RA-5 (2125) RA-6 (2126)

Chief of party CAPT J.C. Albright

Surveyed by LT Miller, LTJG, Niichel, ENS Smith, ENS Groeneveld, ENS Noll, ENS Duffy, ENS Haines, ENS Schoonover, ENS Muench

Soundings taken by echo sounder, ~~hand lead, pole~~ DSF 6000N; pneumatic depth gage

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Verification by: ~~Protracted by~~ L. Deodato Automated plot by PMC Xynetics Plotter

Evaluation by: ~~Verification by~~ A.A. Luceno

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

REMARKS: Revisions and marginal notes in black generated during office processing.

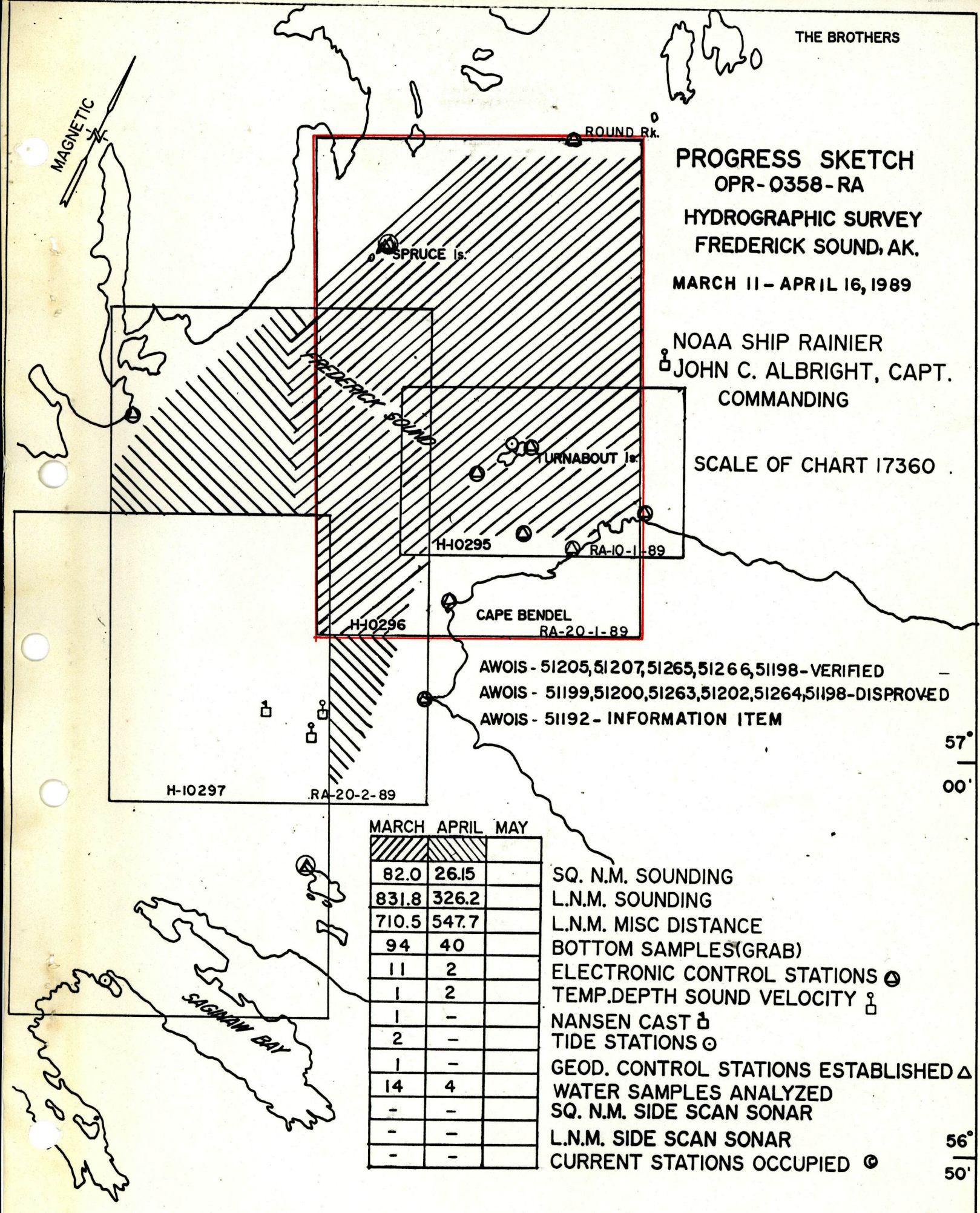
Separates are filed with the hydrographic data.

SC 3-28-97 AWOIS and SURF ✓ RWD 6/90

K.W.W. 6/18/90

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

U.S. GOVERNMENT PRINTING OFFICE: 1986 - 652-007/41215



MARCH	APRIL	MAY	
82.0	26.15		SQ. N.M. SOUNDING
831.8	326.2		L.N.M. SOUNDING
710.5	547.7		L.N.M. MISC DISTANCE
94	40		BOTTOM SAMPLES(GRAB)
11	2		ELECTRONIC CONTROL STATIONS
1	2		TEMP.DEPTH SOUND VELOCITY
1	-		NANSEN CAST
2	-		TIDE STATIONS
1	-		GEOD. CONTROL STATIONS ESTABLISHED
14	4		WATER SAMPLES ANALYZED
-	-		SQ. N.M. SIDE SCAN SONAR
-	-		L.N.M. SIDE SCAN SONAR
-	-		CURRENT STATIONS OCCUPIED

Descriptive Report to Accompany Hydrographic Survey H-10296

Field Number RA-20-1-89
Scale 1:20,000
1989

NOAA Ship RAINIER
Chief of Party: Captain John C. Albright

A. PROJECT

A basic hydrographic survey using the navigable area concept was completed in Frederick Sound, Alaska as specified by Project Instructions OPR-O358-RA dated September 13, 1988, and amended by Change No. 1 (January 17, 1989), Change No. 2 (February 13, 1989), Change No. 3 (March 27, 1989) and Change No. 4 (April 17, 1989). The survey is designated Sheet H on the revised sheet layout dated April 10, 1989.

This survey is one in a series which will provide contemporary hydrographic data for existing nautical charts and for a new series of 1:80,000-scale charts. It is part of a continuing program to improve chart coverage of the Inside Passage of southeast Alaska in response to requests from the Southeastern Alaska Pilots' Association, the Department of Transportation of Alaska, and other private interests such as the cruise liner and fishing industries.

B. AREA SURVEYED

The survey is located in southeast Alaska, in western Frederick Sound, from Pybus Bay south to Cape Bendel. The survey area is bounded by latitudes 57°15.5'N - 57°03.0'N, and longitudes 133°51.0'W - 134°08.0'W, except for the southeast area which junctions with H-8907, H-10295, and H-10297. The survey area lies offshore, with depths ranging from 13 to 250 fathoms. The bottom is primarily composed of green sand and pebbles.

Data acquisition was conducted from March 14 through April 16, 1989 (DN 073 - DN 106).

C. SOUNDING VESSELS

All data were acquired by RAINIER and the four automated survey launches shown below:

Vessel	EDP No.	Operation
RAINIER	2120	Bottom samples Nansen/Plessey Casts Hydrography
RA-3	2123	AWOIS Investigations
RA-4	2124	Hydrography
RA-5	2125	Hydrography Bottom Samples
RA-6	2126	Hydrography

No changes to the standard sounding configurations were necessary. However, Vessel 2123 was equipped with the new Hydrographic Data Acquisition and Processing System (HDAPS). An itemized list of the HDAPS acquisition and processing components is included in this report.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

NOAA Ship RAINIER and all survey launches were equipped with the Raytheon DSF-6000N echo sounders shown below. The echo sounders were operated in the HIGH + LOW (HIGH DIGITIZED) function, using manual gain controls on both high and low frequencies to obtain the best analog trace. Variations in the instrument initial, stylus arm length, and belt tension are not present in these echo sounders. Soundings were recorded in fathoms and tenths of fathoms. Two-fathom bar checks were conducted and recorded daily, using both the LOW and the HIGH + LOW (HIGH DIGITIZED) functions. The echo sounders were operated in accordance with the Provisional Instructions "Raytheon DSF-6000N Echo-Sounder Operating and Processing Instructions," dated July 5, 1983, and the N/CG2 memorandum "DSF-6000N Depth Errors as a Function of Receiver Gain," dated May 23, 1986.

Raytheon DSF-6000N Echo Sounders

Vessel	Serial Number	Day Numbers	
2120	B048N	073-078	
	B046N	079-106	
2123	A119N	073-094	No raw data
	A103N	095	No raw data
	A119N	096-106	No raw data
2124	A117N	073-106	
2125	A114N	073-093	
2126	B046N	073-078	
	B048N	078-105	

The echo sounders were continuously monitored during data acquisition. All sounding data were scanned at least two times, not only to ensure all significant peaks and deeps were inserted, but also to verify the digitized depths. While running over extremely steep, irregular bottoms, the echo sounders sometimes failed to track properly. Running at minimum speeds usually alleviated this problem, but marginal analog traces could not always be avoided.

Diver-obtained least depths were determined with a 3D Instruments pneumatic depth gage (S/N 8504192N). The gage was operated in accordance with Hydrographic Survey Guideline #55, and was last calibrated March 1, 1989 by the Pacific Operations Group (N/OMA 1214). In addition, field system checks were performed each day the pneumatic gage was used.

Leadline calibrations were performed by RAINIER personnel during February 1989 at PMC. Calibration forms are included in the Spring 1989 Corrections to Echo Soundings Data Package for OPR-0358-RA.

Corrections to Echo Soundings

Corrections to echo soundings were determined for static draft, heave, velocity of sound through water, settlement and squat, and predicted tides. All correctors except settlement and squat were applied to the final field sheets. Sounding correctors apply to both narrow and wide beams of the DSF-6000N echo sounder. Supporting data and computations for all corrections to echo soundings, except

heave, are included in the Spring 1989 Corrections to Echo Soundings Data Package for OPR-O358-RA.

Static Draft

For all launches, the distance from the transducer face to the gunwhale was measured with a large metal carpenter-square. Static draft measurements were then determined by dropping a leadline from the gunwhale to the water and subtracting this distance from the distance measured with the carpenter-square. The measurements from the gunwhale to the waterline were conducted with the fuel tanks averaging 3/4 full and three people aboard. A transducer depth of 0.3 fathom for all launches was determined on February 10, 1989. This transducer depth agrees with the launches' historical records.

While RAINIER was in dry-dock in February 1989, the distance from the transducer to the gunwhale was measured with a leadline. The distances from the gunwhale to the water were then measured when the ship was refloated and the fuel tanks were at 60% and 100% capacity. A transducer depth of 2.4 fathoms was calculated from these measurements.

Heave

Corrections for heave were applied while scanning. The scanning technique used in comparing the analog trace with the digital record was chosen to eliminate fluctuations greater than 0.2 fathom resulting from sea action. In certain areas, the extremely irregular bottom topography made it sometimes difficult to determine which fathogram features were caused by sea action.

There were no significant problems with the data during office processing.

Sound Velocity

Correctors for the velocity of sound through water were determined from the three Plessey SVD casts listed below:

Cast No.	Deepest Depth (m)	Day Number	Geographic Position
1	350	072	57°01.3'N, 134°08.2'W
N	300	072	57°01.3'N, 134°09.9'W
2	400	091	57°10.0'N, 133°51.4'W
3	350	106	57°00.9'N, 134°08.8'W

N=Nansen cast

The Plessey Sound Velocity Sensor, S/N 5653, was connected to a Hewlett/Packard 5326B Universal Frequency Counter, S/N 1312A02159. The sound velocity sensor was calibrated at Northwest Regional Calibration Center in Bellevue, WA on January 26, 1989.

The thermometers used in the Nansen cast were calibrated between January 6, 1988 and January 19, 1989. The Beckman Salinometer, S/N 24663, was calibrated on March 1, 1989. The thermometers and the salinometer were calibrated at the Northwest Regional Calibration Center in Bellevue, WA.

The Nansen cast was taken on the same day as Plessey Cast #1 to ensure the Plessey sensors were operating properly. The sound velocities determined by the two methods showed good agreement. Surface water temperatures and samples were obtained during each Plessey cast as additional checks on the Plessey system.

The surface water temperature, and the corresponding sound velocity, increased over time. The casts used for each velocity table and the days to which each velocity table is applied are shown below:

Velocity Table No.	Cast No.	Applicable DN
1	1	073-082
2	2	087-096
3	3	101-106

The PC program, VELOCITY, was used to compute velocity correctors at 0.1-fathom increments for each velocity table. The velocity correctors were determined for both RAINIER and launches. The correctors for the launches were used for all sounding vessels, as there was no appreciable difference between the correctors. The velocity tapes have been forwarded with the survey data; tape listings are included with this report.

Settlement and Squat

Settlement and squat correctors were determined for the automated survey launches at Shilshole Bay, Washington on February 23 and March 3, 1989. The correctors were determined for RAINIER at Turnabout Island, Frederick Sound, Alaska on April 1, 1989. All tests were conducted over a hard bottom in depths well exceeding seven times the vessels' drafts. Both sea and wind were calm. Observations were made through a Zeiss Ni2 leveling instrument (S/N 103453) to a rod held vertically on deck, directly over the transducer.

Ten level readings were made at each speed tested, and the average taken, to compute the correctors. Tide staff readings were taken concurrently with each set of level readings, and all tidal height differences were normalized to the tidal height of the dead-in-the-water level readings before the correctors were computed.

Soundings on the final field sheets are not corrected for settlement and squat. TC/TI tapes for each sounding vessel have been submitted with this survey; tape listings are included with this report. settlement & squat correctors applied to soundings in the smooth sheet.

Tide Correctors

Tidal zoning and correctors applicable to predicted tides for the Juneau, Alaska tide station (945-2210) were provided on the chart accompanying the Project Instructions. The zone applicable to this survey has a height correction ratio of "x 0.87" and time corrections of minus 17 minutes for high water and minus 14 minutes for low water. A printout of the predicted tide tapes is included with the survey data.

Tide stations at Turnabout Island (945-1655) and Saginaw Bay (945-1497) were established and maintained by RAINIER personnel. Only the Turnabout Island station was required for this survey but the Saginaw Bay data may be applicable. The field tide records and the Field Tide Note for both stations have been forwarded to N/OMA121 in accordance with Hydrographic Survey Guideline #50 and the Field Procedures Manual. A request for approved tides has been forwarded to N/OMA121. Copies of the Field Tide Note and the request for approved tides are included with this report. (Filed with the hydrographic data)
Saginaw Bay data are not applicable for this survey.

E. HYDROGRAPHIC SHEETS

Field sheets were plotted by HYDROPLOT and HDA~~PS~~ PS systems.

HYDROPLOT:

Field sheets were prepared aboard RAINIER on a Houston Instrument Complot DP-3 roll plotter, using the PDP8/e HYDROPLOT system and program RK201, "Grid, Signal, Lattice Plot". Program RK201 draws a Modified Transverse Mercator projection. The two 1:20,000-scale final field sheets are designated RA-20-1E-89 and RA-20-1W-89. Two 1:10,000-scale insets are also plotted on RA-20-1E-89. The insets show data acquired in the investigations of Items Nos. 1-3 as stated in Section 6.12.2 of the Project Instructions. In addition, four 1:2,500-scale and 1:5,000-scale development sheets (Dev. Nos. 2-5) were created to adequately display sounding data from various investigations. The limits of all development sheets are shown on the final field sheets. Parameter tape listings are included in this report. (Filed with the hydrographic data)

In plotting the final field sheets, overprints were removed by various techniques. The pen was manually lifted and special corrector tapes were made to edit out individual soundings. These tapes have not been submitted. Some soundings, including least depths, have been transferred by hand to the final field sheets from NSP data.

HDA/~~PS~~PS:

Development sheets for investigations of AWOIS items 51202, 51205 and 51207 were prepared aboard RAINIER on a Bruning Zeta 824A Plotter using the on-board processing system and program "SURVEY", Version 3.0.

Depth contours are drawn on the final field sheets in accordance with the Hydrographic Manual, except in areas of steep bathymetry where all prescribed contours could not be drawn without degrading the legibility of the sheets.

All field sheets, accompanying field records, and this Descriptive Report are being forwarded to the Pacific ~~Marine Center (N/MOP 21)~~ Hydrographic Section CG 245 for ~~verification~~ processing.

F. CONTROL STATIONS

A listing of the geodetic stations used to control this survey is included in this report. All stations located on offshore islands are noted on the listing.

Positions for all existing stations are from the NGS data base. All existing stations were recovered in accordance with methods stated in Section 5.2.4 of the Field Procedures Manual. New stations were positioned in 1989 by RAINIER personnel via closed traverse. A static calibration site on the islets west of Turnabout Island was established using an angle and distance from station LION. The field positions for new stations are unadjusted. All stations meet or exceed Third-order, Class I standards for positioning. Geographic positions are based on the North American Datum of 1927 and the Clark Ellipsoid of 1866. Further information can be found in the Spring 1989 Horizontal Control Report for OPR-O358-RA.

G. HYDROGRAPHIC POSITION CONTROL

Soundings were located using Motorola Mini-Ranger III microwave positioning equipment in HYDROPLOT's range-range acquisition mode. Vesno 2123 used a Motorola Mini-Ranger Falcon 484 microwave, multi-range positioning system for its HDA/PS control. Sextants or EDMI were used to obtain check fixes for some detached positions.

Positioning Equipment

Five Mini-Ranger III console/R-T pairs, two Mini-Ranger Falcon 484 console/R-T pairs, and ten shore transponders were used during the survey. The following tables summarize the mobile and shore equipment used.

Mobile Equipment

EDP No.	Vessel	Equipment	Console/R-T	DN
2120	RAINIER	MR III	720/B1405	071-106
2123	RA-3	Falcon	D0051/D2419	071-081
"	"	Falcon	F0247/D2395	082-106
2124	RA-4	MR III	715/911102	071-076
"	"	MR III	711/F3413	076-106
2125	RA-5	MR III	506042/E2716	071-093
2126	RA-6	MR III	B0269/B1089	071-094
"	"	MR III	506042/E2716	094-106

Shore Equipment

Transponder Serial Number	Code
911697	A
G3500	C
911711	D
F3256	E
G3501	F
B1412	0
D2384	1
B1106	2
911635	3
F3248	4

A check range was measured using a Hewlett-Packard EDMI serial number 1723A00202 (DN 103). The EDMI was offset from station CART by 1.59 meters, on the arc with the station. A three-point sextant check fix (DN 105) used the following Tamaya sextant serial numbers: T2975, T3009, T3859.

Baseline Calibrations

Opening and closing baseline calibrations were conducted over water, and in accordance with section 3.1.2.1 of the Field Procedures Manual (see table below). Calibration data and descriptions of the baselines can be found in the Spring 1989 Electronic Control Data Package for OPR-0358-RA.

Location	Distance	DN	Description
Seattle, WA	1312 m	044-066	Sand Point-Matthews Beach
Kodiak, AK	1626 m	130-131	Bell Flats-USCG tidal BM

The final field sheets were plotted with the opening baseline calibration correctors, as the maximum difference between opening and closing baseline calibrations for all codes was less than seven meters. It is recommended that the opening baseline correctors also be applied during final processing. *concur*

System Check Procedures

Critical systems checks were conducted in accordance with section 3.1.2.2 of the Field Procedures Manual; noncritical systems checks were obtained daily when critical checks were not acquired.

Fixed-point critical systems checks were acquired at the following stations: FIXED CAL POINT (210), PT MACARTNEY LT (206), ROUND ROCK LT (204), and TURN (161).

Three-point sextant fix critical system checks were used for checking the Falcon 484 on DN 077 and 102. The following Tamaya sextant serial numbers were used: T2985, T3200, T3862.

Theodolite intersection and theodolite-EDMI critical systems checks were also used for checking the Mini-Ranger systems. The following Wild T-2 serial numbers were used: 320741, 68648, 75599E. The Wild T-2/EDMI serial numbers used were: 320734/67306.

Noncritical system checks were conducted using the launch-to-launch, baseline crossing, three-range or multiple-LOP methods. In general, noncritical system checks fell within the allowable rejection limits and no systematic discrepancies with opening baseline correctors were observed.

Problems and Unusual Position Configurations

Null zones and erratic ranges were occasionally experienced due to the destructive interference of direct and reflected microwaves. This problem was significantly reduced by placing several of the shore transponders atop twenty- to thirty-foot Raydist towers. Time-and-course interpolations were used during data processing to correct the position of soundings taken when launches approached null zones (as indicated by the launches' erratic steering needles and automated plotters).

A small amount of positioning data was acquired with signal strengths one unit below the computed cutoff values. No soundings acquired during these periods plotted off-line; therefore, positional quality was not affected.

The Mini-Ranger Falcon 484 unit F0247/D2395 exhibited signal strengths of 99 when nearing its signal strength cut-off value which allowed ranges of low signal strength to be aquired indiscriminately. This was not considered a problem because the multiple LOP's accumulated by HDA~~#8~~ 25 immediately indicated if any range was erroneous by displaying a high residual for that LOP. All data acquired by HDA~~#8~~ 25 were scanned for position quality to check for maximum residuals which may have exceeded 0.5 mm at the scale of the survey. If it did, the position was flagged and examined for accuracy.

Antenna Offset Distances (ANDIST)

The ANDIST corrector was 0.0 meters for all launches as each launch had its antenna located over the depth transducer. For RAINIER, the distance between the navigation antenna and the transducer is +6.6 meters.

H. SHORELINE

There is no shoreline within the limits of the sounding area. However, shoreline within the sheet limits was transferred from 1:20,000-scale enlargements of NOS Charts 17363 (10th Ed.; Sept. 3/83; 1:40,000) and 17368 (3rd Ed.; Jan. 8/83; 1:40,000). Shoreline is shown in brown for orientation purposes only.

see Sect. 2 of Eval. Report

I. CROSSLINES

Crosslines were oriented perpendicular to the mainscheme sounding lines, and amounted to 13.7% of the mainscheme mileage. All soundings agree within one fathom. Although the vessel acquiring the crossline data did not acquire the corresponding mainscheme data, the agreement between soundings obtained by different echo sounders in common areas is as stated above.

J. JUNCTIONS

This survey junctions with H-10289 (1:20,000; 1988), H-10295 (1:10,000; 1989), and H-10297 (1:20,000; 1989) along the eastern, southern, and western boundaries, respectively. This survey also junctions with H-8907 along the southeast, near Cape Bendel. There are no contemporary surveys to the north of this survey.

No irregularities were found when comparing soundings and depth contours. Minor discrepancies exist in some areas of steep relief, but overall agreement of overlapping soundings between surveys is excellent with all soundings agreeing to within one fathom of junction soundings.

H-8907 (1:10,000; 1966):

Item #1 specified in Section 6.12.2 of the Project Instructions is a 3.2-fathom sounding at 57°04.8'N, 133°59.05'W on a shoal whose least depth was not determined during the junction survey.

Investigation: The feature was developed by echo sounder with 10-meter north-south and east-west line spacing (DN 075-077; Pos. Nos. 4306-4325, 4483-4498; Inset Item No. 1 & 2). A diver ~~obtained least~~ depth of 16.4 feet (2.8 fm) was obtained by pneumatic depth gage at 57°04'47.8"N, 133°59'03.5"W (DN 077; Pos. No. 4515). The feature is a rock ridge approximately 40 meters long, 15 meters wide and 20 feet high running in an east-west direction covered with kelp.

Recommendation: Chart 2-3/4 (2.8) fathoms at 57°04'47.8"N, 133°59'03.5"W. (Pos. 4515) Do not concur. chart 2.2fm rock at 57°04'47.48"N, 133°59'03.55"W (pos. 4317)

Item #2 specified in Section 6.12.2 of the Project Instructions is a 3.4-fathom sounding at 57°04.85'N, 133°58.7'W on a shoal whose least depth was not determined during the junction survey.

Investigation: The feature was developed by echo sounder with 10-meter north-south and east-west line spacing (DN 075-077; Pos. Nos. 4264-4305, 4499-4515; Inset Item No. 1 & 2). A diver-obtained least depth of 13.6 feet was obtained by pneumatic depth gage at 57°04'50.[illegible]"N, 133°58'48.[illegible]"W (DN 077; Pos. No. 4516). The feature is a rock pinnacle 30 meters in diameter, 20 feet high and is covered with kelp. This item is included in the danger to navigation message sent to the Seventeenth Coast Guard District and the Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC).

Recommendation: Chart 2-1/4 fathoms at 57°04'50.[illegible]"N, 133°58'48.[illegible]"W. (Pos. #4516) Concur.

Item #3 specified in section 6.12.2 of the Project Instructions is a 4.3-fathom sounding at 57°02.03'N, 134°01.68'W on a shoal whose least depth was not determined during the junction survey.

Investigation: The feature was developed by echo sounder with 25-meter north-south and east-west line spacing (DN 102-103; Pos. Nos. 4076-4108, 4114-4172; Inset Item No. 3). A diver-obtained least depth of 20.4 feet was obtained by pneumatic depth gage at 57°02'02.[illegible]"N, 134°01'37.[illegible]"W (DN 103; Pos. No. 4173). The feature is a series of four rock ridges that rise from surrounding depths of 5-8 fathoms.

Recommendation: Chart 3-1/4 fathoms at 57°02'02.[illegible]"N, 134°01'37.[illegible]"W. (Pos. #4173) concur.

K. COMPARISON WITH PRIOR SURVEYS

This survey was compared with the prior surveys listed below. In general, survey soundings agree within two fathoms with those from prior surveys. The techniques used for positioning and sounding during the prior surveys are the probable causes for any discrepancies. Wire drag surveys H-3993 WD (1:20,000; 1917) and H-3994 WD (1:20,000; 1917) were examined but no useful information was obtained.

H-1996 (1:80,000; 1889-1892):

In general, survey depths were within two fathoms of H-1996's depths with prior survey's depths being deeper. There are no consistent or distinct shifts in the contours except in the southwest corner of the current survey where present depths are approximately four fathoms deeper. Some depths are significantly deeper than those from the prior survey. Echo sounder investigations centered over the depths in question were conducted over these areas. Investigations consisted of 200-meter line spacing which resulted in 100% bottom coverage. The results are summarized below:

	H-1996 Depth	Charted Position	Area Investigated	H-10296 Depth
1.	120 fms	57°09.45'N 134°02.75'W	1400m x 1800m	171 fms
2.	107 fms	57°05.56'N 134°05.55'W	1600m x 1800m	197 fms
3.	73 fms	57°05.13'N 134°02.40'W	700m x 700m	187.fms

4.	113 fms	57°04.95'N 134°02.95'W	1200m x 2000m	18 fms	10

The hydrographer recommends deleting these charted soundings and applying the data from the present survey to the chart. concur.

The existence of these prior shoaler soundings have been adequately disproven by the present survey.

H-4511B WD (1:20,000; 1926-1927):

AWOIS Items #51199 and #51200 cataloged in the AWOIS listing dated January 10, 1989 are nine-fathom depths which appear on NOS Chart 17363 (10th Ed.; Sept. 3/83; 1:40,000).

AWOIS 51199 ϕ = 57°12'57.20"N λ = 134°04'45.50"W AWOIS 51200 ϕ = 57°12'59.00"N λ = 134°04'54.00"W

Investigation: The two items were investigated in one echo sounder search. An area of 125m x 125m around each AWOIS item was developed using ten-meter north-south line spacing (DN 081-082; Pos. Nos. 6573-6623, 6646-6744; Dev. No. 3). One hundred percent bottom coverage was achieved with this line spacing. Depths of 8-11 fathoms were found at the positions stated in the AWOIS listing. No specific features or unusual contour configurations were identified within the area investigated. Depths range from 0-1 fathoms along the north shore of Spruce Island and gradually increase to 15-20 fathoms offshore.

Supersede the two 56-foot depths on survey H-4511B WD.

Recommendation: Chart this area with depths and contours acquired from this development. concur.

H-4143 WD (1:40,000; 1920-1921):

AWOIS 51207 ϕ = 57°16'01.00"N λ = 133°56'45.00"W

AWOIS Item #51207: A ten-fathom depth shown on NOS Chart 17363 (10th Ed.; Sept. 3/83; 1:40,000). This item lies 0.5 NM north of the survey area.

Investigation: The feature was developed by HDA~~/PS~~ PS-equipped VESNO 2123. An echo sounder search consisting of ten-meter north-south line spacing was used to achieve 100% bottom coverage (DN 103; Pos. Nos. 3717-3802; HDA~~/PS~~ PS Sheet No. 26). A diver-obtained least depth of 52.8 feet was obtained by pneumatic depth gage at 57°15'59.6"N, 133°56'41.2"W (DN 104; Pos. Nos. 4177). The feature is a bedrock shoal area with two high points. This item is included in the danger to navigation message.

Supersede the 60-foot depth on survey H-4143 WD.

Recommendation: Delete 10-fathom depth charted at 57°16'01.0"N, 133°56'45.0"W. Chart ~~8 3/4~~ (9.0) fathoms at 57°15'59.6"N, 133°56'41.2"W. concur.

AWOIS Item #51202: A 14-fathom depth shown on NOS Chart 17360 (26th Ed.; Aug. 18/84; 1:217,828). AWOIS Item #51205: A 15-fathom depth shown on NOS Chart 17363 (10th Ed.; Sept. 3/83; 1:40,000).

AWOIS 51202 ϕ = 57°14'26.50"N λ = 133°57'53.50"W AWOIS 51205 ϕ = 57°14'42.00"N λ = 133°57'27.00"W

Investigation: These features were developed together with an echo sounder search of 30-meter line spacing skewed northeast-southwest and northwest-southeast (DN 087-089; Pos. Nos. 5110-5254; Dev. No. 5) and east-west lines spaced 20-meters. One hundred percent bottom coverage was achieved with these line spacings. Depths of 13-105 fathoms were found in this developement area. A least depth of 13.4 fathoms was obtained by echo-sounder, and is included in the danger to navigation message.

Supersede the 87-foot and 92-foot depths on survey H-4143 WD.

Recommendation: Delete 14.5-fathom depth charted at 57°14'26.5"N, 133°57'53.5"W (on chart 17360) and the 15-fathom depth charted at 57°14'42.0"N, 133°57'27.0"W. Chart 13 fathoms (chart 17363)

at 57°14'37.11"N, 133°57'28.27"W. (Pos. 5182+07) Update the charts with contours and depths obtained from this survey. concur 11

L. COMPARISON WITH THE CHART

This survey was compared to the following charts:

Chart No.	Edition	Date	Scale
17360	26th	August 18, 1984	1:217,828
17363	10th	September 3, 1983	1:40,000
17368	3rd	January 8, 1983	1:40,000

All charted depths originate from the prior surveys discussed in Section K and will not be discussed here.

AWOIS Items #51263 and #51264 originate from 1986 Chart Revision Photo BP131991 and are discussed below. AWOIS 51263 ϕ = 57°04'00.00"N λ = 134°02'25.00"W

AWOIS item #51263: An undetermined obstruction that may bare at MLLW.

Investigation: The feature was developed by running a zig-zag line and an axis line over the entire length of the feature (DN 088; Pos. Nos. 6801-6842; Dev. No. 4). Depths of 38-110 fathoms were found at the position stated in the AWOIS listing. No indication of any obstruction was identified and no kelp was observed in the area. concur. Obstruction adequately investigated and disproven

Recommendation: Update the chart with soundings from this development. concur.

AWOIS Item #51264: submerged rock. AWOIS 51264 ϕ = 57°05'27.50"N λ = 134°00'34.00"W

Investigation: The feature was developed with 25-meter line spacing in east-west and north-south orientation (DN 076-077; Pos. Nos. 4354-4426; Dev. No. 2). Depths ranged from 17 fathoms in the NE area of the development to 33 fathoms in the NW corner. Depths of 23-24 fathoms were found at the position stated in the AWOIS listing. There were no signs of a rock, swirling water or kelp in the area. concur. Rock adequately investigated and disproven.

Recommendation: Update the chart with soundings from this development. concur.

AWOIS Item #51198: rock awash shown on NOS Chart 17363 (3rd Ed.; Jan. 8/83; 1:40,000). AWOIS 51198 ϕ = 57°12'39.00"N λ = 134°05'29.00"W

Investigation: The feature was investigated on DN 102 at low water. The rock is the high point on a ledge which extends 400 meters southwest of Spruce Island and uncovers ~~bares~~ from 3 to 15 feet at MLLW. Three detached positions were taken along the ledge (DN 102, Pos. Nos. 9267-9269).

Recommendation: Retain rock awash charted at 57°12'39"N, 134°05'29"W. Do not concur. Delete charted rock awash. Chart the ~~ledge~~ as depicted in the survey data. concur.

Chart reef unc. 8Ft at MLLW in lat 57-12-33.07N, long 134-05-41.22W. (NAD 27)

Dangers to Navigation

Six items originating from shoal investigations were reported as dangers to navigation to the Seventeenth Coast Guard District and DMAHTC by radio message and letter. A copy of the correspondence is included with this report. Position numbers from the investigations are included on the radio message.

M. ADEQUACY OF SURVEY

This survey is complete and adequate to be used for charting purposes, and to supersede prior surveys within their common areas. *concur.*

N. AIDS TO NAVIGATION

No fixed or floating aids to navigation lie within the limits of this survey. However, Grave Island Light and Round Rock Light lie to the west and north, respectively, of this survey. The positions of these fixed aids were determined to Third-order, Class I accuracy per Section 4.2.1.1 of the Project Instructions. The unadjusted field positions were checked against published and charted positions. The comparisons are shown below:

Navigation Aid Light List No.	Light List Position *	Charted Position	Field Position
Grave Island Light 23575 (Fl W 4s)	57°16.0'N 134°04.9'W	57°16.0'N 134°04.9'W	57°16'00.7"N 134°04'53.8"W
Round Rock Light 23580 (Fl W 6s)	57°15.6'N 133°56.1'W	57°15.6'N 133°56.1'W	57°15'36.4"N 133°56'07.0"W

* Source: United States Coast Guard Light List, Volume VI, 1989.

The light characteristics given above were observed in the field and agree with the charted and Light List characteristics. The fixed aids adequately serve the apparent purposes for which they were established.

There are no bridges, overhead cables, submarine cables, pipelines or ferry routes within the limits of the survey.

O. STATISTICS

Vessel:	2120	2123	2124	2125	2126	Total
# of Pos	747	* ~~714~~ 18	~~415~~ 223	~~158~~ 223	~~1389~~ 1257	~~2750~~ 1788
NM Hydro	15.7	45.9	96.4	77.1	360.8	595.9

* no HOAPS raw data except for development.

NM^2 Hydrography	56.6	Velocity Casts	3
Bottom Samples	33	Current/Magnetic Stations	0
Detached Positions	10	Tide Stations	2

P. MISCELLANEOUS

Bottom samples have been submitted to the Smithsonian Institution. Bottom characteristics agree with those charted.

No current measurements were made; however, slack water along the north shore of Kupreanof Island occurred up to two hours before predicted high and low water.

The format recommended in Hydrographic Survey Guideline #66 for reporting dangers to navigation was modified for submission by radio message. All the information required in the guideline was included in the radio message forwarded from RAINIER.

Q. RECOMMENDATIONS

None

R. AUTOMATED DATA PROCESSING

HYDROPLOT data acquisition and processing were accomplished with a PDP 8/e HYDROPLOT computer system, using the following programs:

NUMBER	DESCRIPTION	VERSION
RK 112	HYPERBOLIC,R/R HYDROPLOT	3/01/86
RK 201	GRID, SIGNAL, AND LATTICE PLOT	4/18/75
RK 221	COMB R/R & HYPER PLOT NON-RT	7/25/86
RK 300	UTILITY COMPUTATIONS	10/21/80
RA 362	RK 330 AND AM 602 COMBINED	8/20/84
RK 407	GEODETIC INVERSE/DIRECT COMP	9/25/78
RK 409	GEODETIC UTILITY PACKAGE	9/20/78
AM 500	PREDICTED TIDE GENERATOR	11/10/72
RK 561	H/R GEODETIC CALIBRATION	12/01/82
AM 602	ELINORE - LINE ORIENTED EDITOR	12/08/82
RK 606	TAPE DUPLICATOR	8/22/74
AM 607	SELF-STARTING BINARY LOADER	8/10/80
RK 610	BINARY TAPE DUPLICATOR	1/31/85
RK 900	PLOT TEST TAPE GENERATOR FOR AM902	5/07/76
PM 901	CORE CHECK	3/01/72
AM 902	REAL TIME CHECKOUT	11/10/72
DA 903	DIAGNOSTIC-INSTRUCTION TIMER	2/27/76
RK 905	HYDROPLOT CONTROLLER CHECKOUT	3/18/81
RK 935	HYDROPLOT HARDWARE TESTS	3/15/82
RK 950	HARDWARE TESTS (DOCUMENTATION ONLY)	6/02/75
Ver. 1.0	VELOCITY (N/CG21 Program)	3/11/88

HDA/PS data acquisition and processing were accomplished using programs "SURVEY", Version 3.0, and "POSTSUR", Version 3.0.

S. REFERRAL TO REPORTS

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

Title	Date Sent to PMC
Spring 1989 Horizontal Control Report for OPR-0358-RA	May, 1989
Spring 1989 Electronic Control Data Package for OPR-0358-RA	June, 1989
Spring 1989 Corrections to Echo Soundings Data Package OPR-O358-RA	May, 1989
Marine Mammal Report, RP-12-89	May, 1989
Spring 1989 Coast Pilot Report, OPR-O358-RA	June, 1989

Respectfully Submitted,

Thomas A Nickel LTJG/NOAA
for Carl R. Groeneveld
Ensign, NOAA

Approved and Forwarded,

John C. Albright
Captain, NOAA
Commanding Officer

L

MASTER STATION LIST
OPR-0358-RA
FREDERICK SOUND, ALASKA

VER. 4/12/89

~~154 1 57 06 00468 133 53 21953 250 0005 000000~~
~~/PINT 1965~~

~~156 1 57 16 14675 133 37 47192 250 0027 000000~~
~~/FIVE FINGER LIGHTHOUSE 1917~~

161 1 57 07 52745 133 58 08473 250 0010 000000
/TURN, *1988*

162 3 57 03 38154 134 01 51809 250 0011 000000
/BENDEL 1917-*89*

*163 3 57 12 50490 134 04 57936 250 0003 000000
/BUS 1924

168 3 57 05 02713 133 56 32947 250 0001 000000
/KELP 1962

*169 3 57 07 12297 134 00 37354 250 0009 000000
/LION 1962

171 3 57 08 33433 134 16 39575 250 0020 000000
/PEAN 1917

*172 3 57 05 11646 134 00 3689*2* 250 0011 000000
/WEST PINTA ROCK LIGHT 1965

*173 3 57 12 42993 134 05 11538 250 0007 000000
/SPRUCE 1917

~~201 1 57 12 29978 133 35 18171 139 0012 000000~~
~~/BIRD ROCK LIGHT~~

204 1 57 15 36405 133 56 07007 250 0013 000000
/ROUND ROCK LIGHT, *1989*

206 1 57 01 308*72*~~64~~ 134 03 248*67*~~28~~ ~~250~~ ~~139~~ 0012 000000
/POINT MACARTNEY LIGHT, *1989*

210 3 57 07 11544 134 00 39124 139 0000 000000 *Not on smooth sheet used for calib. only*
/CAL POINT

* Stations located on offshore islands.

A 57 16 00649 134 04 53934 139
GRAVE ISLAND LIGHT, 1989

174 57 04 59927 133 56 46963 250 0002
ROSE, 1989

NOAA FORM 76-40 (8-74)
Replaces C&GS Form 567.

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

NONFLOATING AIDS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [X] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
NOAA Ship RAINIER	Alaska	Frederick Sound Keku Strait	6/02/89

The following objects HAVE [X] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
0358-RA		H-10296 H-10297	NAD 27

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
LL 23315	Kake Entrance Light 2	56 59	06.539 202.28	134 01	11.623 196.29		F-2-6-L 4/5/89	17360 17368
LL 23325	Kake Harbor Light 5	56 58	16.459 509.31	133 56	50.722 856.95		F-2-6-L 4/4/89	17360 17368
LL 23350	Portage Pass Light 2	56 57	25.922 802.13	133 55	19.959 337.33		F-2-6-L 4/5/89	17360 17368
LL 23565	Deepwater Point Light	57 10	20.367 630.05	134 14	03.226 54.21		F-2-6-L 3/22/89	17360 17363 17365 17368
LL 23575	Grave Island Light	57 16	00.6~~54~~ 49 20.~~23~~ 08	134 04	53.8~~45~~ 34 902.~~50~~ 31		F-2-6-L 3/17/89	17360 17363
LL 23580	Round Rock Light	57 15	36.465 1126.19	133 56	02.707 129.23			
	From Light List vol. VI 1988							
	Pacific Coast & Pacific Islands							

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	NAME	ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD	CAPT. John C. Albright, NOAA Commanding Officer	☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED	CAPT. John C. Albright, NOAA Commanding Officer	FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64.

OFFICE

I. 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

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field Identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

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

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

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

☆ U. S. GPO:1975-0-665-080/1155

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
NOAA Ship RAINIER S221
1801 Fairview Avenue East
Seattle, Washington 98102-3767

June 2, 1989

Commander
Seventeenth Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99802

Dear Sir:

Attached is a confirmation copy of the radio message sent to your office regarding ten dangers to navigation and six information items which I recommend for inclusion in the Local Notice to Mariners for the Seventeenth Coast Guard District. Copies of chartlets showing the area in which the dangers exist are also attached.

Sincerely,

John C. Albright
Captain, NOAA
Commanding Officer

Enclosure

cc: DMAHTC
N/CG221
N/MOP

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
NOAA Ship RAINIER S221
1801 Fairview Avenue East
Seattle, Washington 98102-3767

June 2, 1989

Director
DMAHTC
6500 Brooks Lane
Washington, D.C. 20315

Dear Sir:

While conducting hydrographic survey operations in Frederick Sound, southeast Alaska, NOAA Ship RAINIER discovered ten dangers to navigation and six information items. They have been reported to DMAHTC (NAVWARN) and the Seventeenth Coast Guard District. A copy of the correspondence describing them is enclosed.

Sincerely,

John C. Albright
Captain, NOAA
Commanding Officer

Enclosure

JCA

PTTUZYUW RUHPTEF0294 3210015-UUUU--RUHPSUU.
ZNR UUUUU
P 290500Z MAY 89
FM NOAAS RAINIER
TO CCGDSEVENTEEN JUNEAU AK
DMAHTC (NAVWARN) WASHINGTON DC//MCNM//
INFO NOAAMOP SEATTLE WA
ACCT CM-VCAA
BT
UNCLAS

MVH | NOT
4302K | 29-MAY-89
0619Z

NOAA SHIP RAINIER HAS FOUND TEN DANGERS TO NAVIGATION AND SIX INFORMATION ITEMS IN FREDERICK SOUND, ALASKA (PROJECT OPR-0358-RA) WITHIN THE LIMITS OF HYDROGRAPHIC SURVEYS H-10295 (TURNABOUT ISLAND AND VICINITY; ITEMS A-H), H-10296 (CAPE BENDEL TO PYBUS BAY; ITEMS I-N) AND H-10297 (POINT MACARTNEY TO DEEPWATER POINT LIGHT, ITEMS O-P). REQUEST THE FOLLOWING BE PUBLISHED IN LOCAL NOTICE TO MARINERS FOR THE SEVENTEENTH COAST GUARD DISTRICT:

DN/Pos. No.

A. "ROCK SUBMERGED 5-3/4 FATHOMS IS AT LATITUDE 57/07/22.7N, LONGITUDE 133/59/56.9W." 093/7002

B. "ROCK SUBMERGED 4-1/2 FATHOMS IS AT LATITUDE 57/07/20.9N, LONGITUDE 133/59/27.6W." 094/7143

C. "ROCK SUBMERGED 1/2 FATHOM IS AT LATITUDE 57/07/24.2N, 134/00/08.0W." 094/7144

D. "ROCK SUBMERGED 7-1/4 FATHOMS IS AT LATITUDE 57/05/33.9N, LONGITUDE 133/55/54.2W." 095/7248

E. "ROCK SUBMERGED 3-1/2 FATHOMS IS AT LATITUDE 57/05/57.4N, LONGITUDE 133/54/18.8W." 081/4872

F. "ROCK SUBMERGED 1 FATHOM IS AT LATITUDE 57/05/53.5N, 133/54/00.4W." 081/4873

G. "SHOAL SUBMERGED 10 FATHOMS IS AT LATITUDE 57/05/44.5N, LONGITUDE 133/55/18.0W." 079/2069 +6-+7

H. "ROCK SUBMERGED 2-1/2 FATHOMS IS AT LATITUDE 57/04/55.8N, LONGITUDE 133/57/02.8W." 104/7385

I. "~~ROCK~~ SHOAL SUBMERGED ~~13~~ 13.4 FATHOMS IS AT LATITUDE 57/14/37N, LONGITUDE 133/57/2~~5~~8.27W." 088/5182 +5

J. "ROCK SUBMERGED ~~2-1/4~~ 2.2 FATHOMS IS AT LATITUDE 57/04/50.23N, LONGITUDE 133/58/48.~~1~~58W." 077/4516

K. "SHOAL SUBMERGED 38 FATHOMS IS AT LATITUDE 57/10/58.47N, LONGITUDE 134/06/38.77W." 089/6917 0-+1

L. "SHOAL SUBMERGED 46 FATHOMS IS AT LATITUDE 57/11/34.45N, LONGITUDE 134/04/~~1~~08.44W." 088/6798 +5

M. "SHOAL SUBMERGED 23 FATHOMS IS AT LATITUDE 57/14/38.56N, 088/5189+3-+4
LONGITUDE 133/58/19.95W."

N. "ROCK RIDGE SUBMERGED ~~2-3/4~~ 9.0 FATHOMS IS AT LATITUDE 105/4177
57/15/59.53N, LONGITUDE 133/56/41.22W."

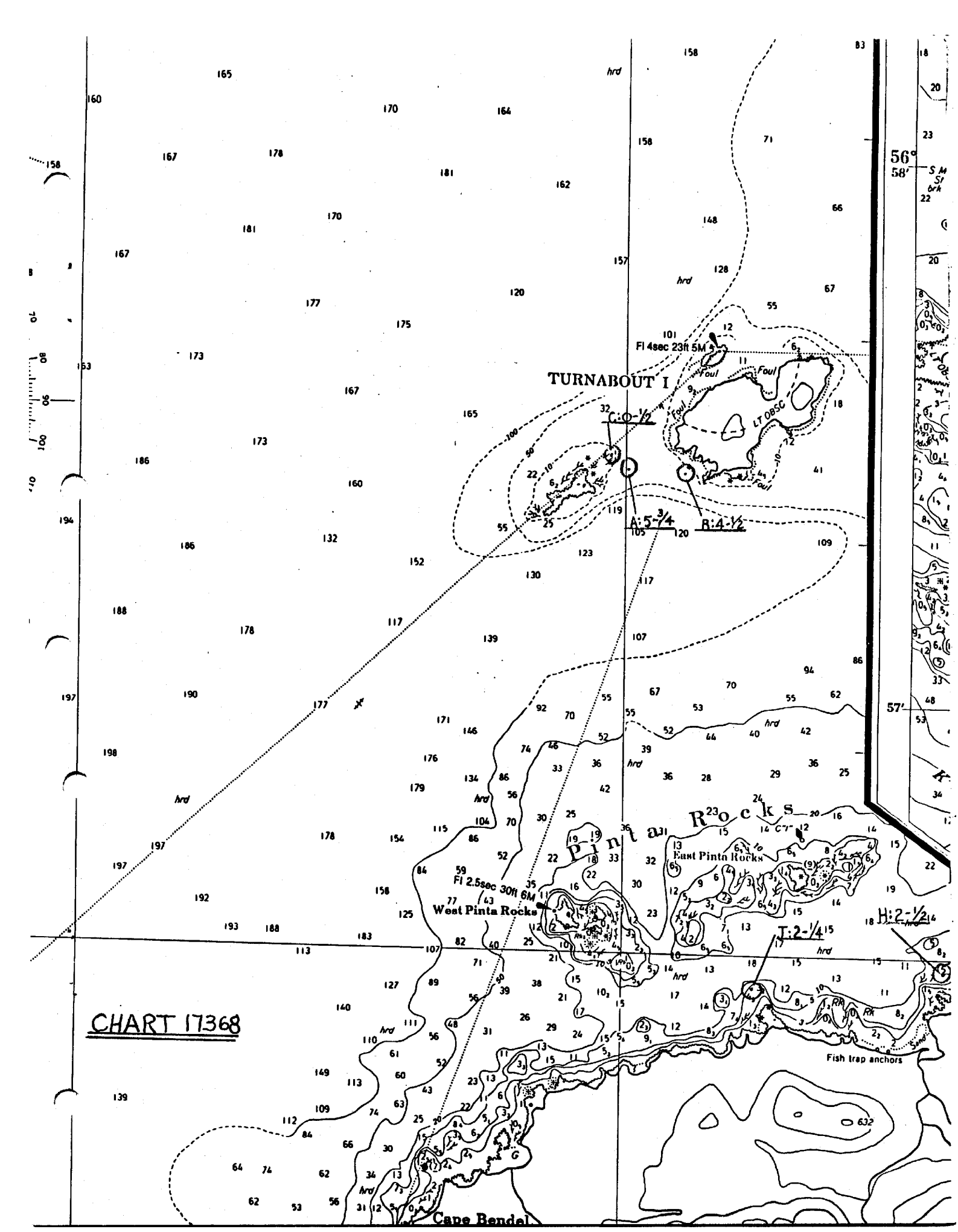
O. "SHOAL SUBMERGED 50 FATHOMS IS AT LATITUDE 57/07/42.2N, 091/3186+4-+5
LONGITUDE 134/16/10.0W. SHOAL IS 2.9 NM BEARING 204
DEGREES TRUE FROM DEEPWATER POINT LIGHT."

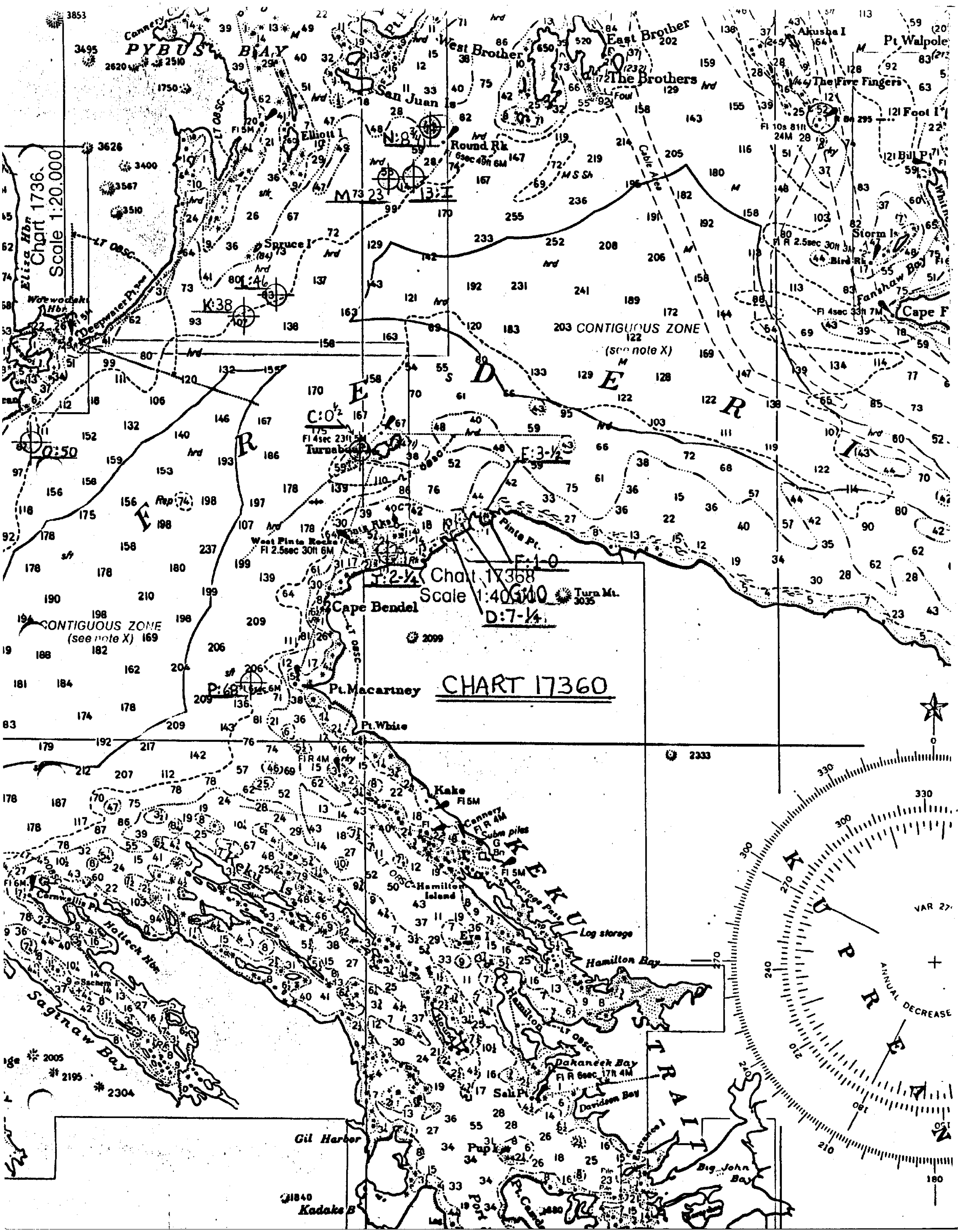
P. "SHOAL SUBMERGED 68 FATHOMS IS AT LATITUDE 57/01/35.8N, 106/3858+9
LONGITUDE 134/05/23.4W. SHOAL IS 1.1 NM BEARING 275
DEGREES TRUE FROM POINT MACARTNEY LIGHT."

DEPTHS ARE REDUCED TO MLLW BASED ON PREDICTED TIDES.
POSITIONS ARE BASED ON NAD 27 DATUM.
THE FOLLOWING CHARTS ARE AFFECTED:

17360	26TH ED	AUG 18/84	1:217,828	NAD 27 DATUM
17368	3RD ED	JAN 08/83	1:40,000	NAD 27 DATUM
17320	13TH ED	FEB 25/89	1:217,828	NAD 27 DATUM
17363	10TH ED	SEP 03/83	1:40,000	NAD 27 DATUM

THIS IS ADVANCE INFORMATION SUBJECT TO OFFICE REVIEW.
QUESTIONS CONCERNING THIS MESSAGE SHOULD BE DIRECTED TO THE PACIFIC MARINE CENTER AT (206) 526-6835. A LETTER WITH ATTACHED CHARTLETS IS BEING MAILED TO YOU TO CONFIRM THIS MESSAGE.
BT
#____


TURNABOUT I
Fl 4sec 23ft 5M
Foul
LT OBSC
C:0-1/2
A:5-3/4
B:4-1/2
Pinta Rocks
East Pinta Rocks
West Pinta Rocks
Fl 2.5sec 30ft 6M
H:2-1/2
T:2-1/4
Fish trap anchors
Cape Bendel
CHART 17368
56°
58'
57'


PYBUS BAY
Cannery
West Brother
East Brother
The Brothers
Akusha I
Pt Walpole
The Five Fingers
Foot I
Bill Pt
San Juan Is
Elliott I
Round Rk
N:8
M:23
13:1
Chart 17368
Scale 1:20,000
Eliza Hbr
Wowwodski Hbr
Deepwater Pt
Spruce I
K:38
L:46
Cable Area
M S Sh
CONTIGUOUS ZONE
(see note X)
Storm Is
Bird Rk
Fanshaw Bay
Cape F
O:50
C:0½
Turnabout I
E:3-½
Pinta Pt
Pinta Rks
West Pinta Rocks
F:1-0
J:2-¼
Chart 17368
Scale 1:40,000
Turn Mt.
Cape Bendel
D:7-¼
P:68
Pt.Macartney
CHART 17360
Pt.White
Kake
Cannery
Subm piles
Hamilton Island
Portage Pass
Log storage
Hamilton Bay
Keku Is
Cornwallis Pt
Halleck Hbr
Saginaw Bay
Eva I
Pt Hamilton
Dakaneek Bay
Sal Pt
Davidson Bay
Gil Harbor
Pup I
Big John Bay
Kadake B
FREDERICK SOUND
KEKU STRAIT
KUPREANOF
VAR 27
ANNUAL DECREASE

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

NOAA Ship RAINIER
1801 Fairview Avenue East
Seattle, Washington 98102-3767

May 11, 1989

Commander (OAN)
Seventeenth U.S. Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99802

Dear Sir:

Personnel from NOAA Ship RAINIER have determined the positions of fifteen aids to navigation and survey monuments at the request of the U.S. Coast Guard. All geographic positions meet Third-order, Class I specifications and are based on the North American Datum of 1927 and the Clark Ellipsoid of 1866. The positions listed below, except for stations CARROLL and YASHA, are field positions and are not adjusted. Stations CARROLL and YASHA are adjusted positions from the National Geodetic Survey data base. Station ROSE is a newly established station SSE of Turnabout Island which may be helpful locating aids to navigation in the area.

Navigation Aid or Survey Monument	Latitude(N)	Longitude(W)	1989 Light List Number
CARROLL Carroll Island	57°01'37.477"	134°28'23.802"	N/A
ROSE Kupreanof Island	57°04'59.934"	133°56'46.972"	N/A
YASHA Yasha Island	56°57'52.570"	134°33'35.526"	N/A
DUCK POINT LIGHT Stephens Passage	57°12'42.892"	133°30'52.968"	23270
GRAVE ISLAND LIGHT Pybus Bay	57°16'00.654"	134°04'53.845"	23575
DEEPWATER POINT LIGHT Frederick Sound	57°10'20.367"	134°14'03.226"	23565
POINT MACARTNEY LIGHT Frederick Sound	57°01'30.872"	134°03'24.866"	23550
TURNABOUT ISLAND LIGHT Frederick Sound	57°07'56.503"	133°59'09.533"	23570
WEST PINTA ROCKS LIGHT Frederick Sound	57°05'11.646"	134°00'36.892"	23555

KAKE ENTRANCE LIGHT 2 Keku Strait	56°59'06.539"	134°01'11.623"	23315
KAKE HARBOR LIGHT Keku Strait	56°57'39.846"	133°57'03.882"	23340
KAKE HARBOR LIGHT 5 Keku Strait	56°58'16.459"	133°56'50.722"	23325
KAKE MICROWAVE TOWER Keku Strait	56°58'35.630"	133°56'33.824"	N/A
PORTAGE PASS LIGHT Keku Strait	56°56'47.864"	133°53'51.998"	23360
PORTAGE PASS LIGHT 2 Keku Strait	56°57'25.922"	133°55'19.959"	23350

Questions concerning these data may be directed to: Commanding Officer, NOAA Ship RAINIER, 1801 Fairview Avenue East, Seattle, Washington 98102-3767, telephone (206) 442-4794.

Sincerely,

John C. Albright
Captain, NOAA
Commanding Officer

Enclosures

APPROVAL SHEET

Descriptive Report to Accompany

Hydrographic Survey

RA-20-1-89

H-10296

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.

John C. Albright
Captain, NOAA
Commanding Officer

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 14, 1989

MARINE CENTER: Pacific

OPR: 0358

HYDROGRAPHIC SHEET: H-10296

LOCALITY: Cape Bendel to Pybus Bay, Frederick Sound, Alaska

TIME PERIOD: March 14 - April 16, 1989

TIDE STATION USED: 945-1655 Turnabout Island, Alaska

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 7.55 feet

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 13.3 feet

REMARKS: RECOMMENDED ZONING
Zone direct

James R. Hubbard
CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10296

Name on Survey	A ON CHART NO. 17360	B ON PREVIOUS SURVEY NO. 17348	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 Manuscript	
ALASKA, FREDERICK SOUND CAPE BENDEL TO ROUND ROCK										
ALASKA (TITLE)										1
BENDEL, CAPE	X		X							2
EAST PINTA ROCKS			X							3
FREDERICK SOUND	X	X	X						T-12178 T-12179	4
KUPREANOF ISLAND	X		X						T-12178 T-12179	5
PINTA ROCKS			X						T-12179	6
ROUND ROCK	X	X								7
SPRUCE ISLAND	X	X								8
TURNABOUT ISLAND	X		X						T-12179	9
WEST PINTA ROCKS	X		X						T-12178	10
										11
										12
										13
										14
										15
										16
				Approved:						17
				Charles E. Harrington						18
				Chief Geographer - N/CG2x5						19
										20
				OCT 25 1989						21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 77-27(A) U.S. DEPARTMENT OF COMMERCE REGISTRY NUMBER
(9-83)

HYDROGRAPHIC SURVEY STATISTICS

H-10296

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	7 (4 mylar) (3 paper)
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	8 (2 mylar) (6 paper)

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES	2					
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES						

SHORELINE DATA

SHORELINE MAPS (List):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List): 17360 26th ed., 17363 10th ed., 17368 3rd ed.

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS VERIFICATION	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			2083
POSITIONS REVISED			68
SOUNDINGS REVISED			166
CONTROL STATIONS REVISED			

	TIME-HOURS VERIFICATION	TIME-HOURS EVALUATION	TIME-HOURS TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS	83		83
VERIFICATION OF SOUNDINGS	165		165
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION VERIFICATION			
COMPILATION OF SMOOTH SHEET	45		45
COMPARISON WITH PRIOR SURVEYS AND CHARTS		28	28
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		88	88
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	293	116	409

Pre-processing Examination by M.J. Bradley	*Beginning Date*	*Ending Date* 8/10/89
Verification of Field Data by L.T. Deodato, T. Jones, E. Domingo	*Time (Hours)* 248	*Ending Date* 12/22/89
Verification Check by J.L. Stringham, T. Jones	*Time (Hours)* 52.5	*Ending Date* 2/28/90
Evaluation and Analysis by A.A. Luceno	*Time (Hours)* 116	*Ending Date* 4/11/90
Inspection by D.J. Hill	*Time (Hours)* 4	*Ending Date* 5/10/90

* U.S. GOVT. PRINTING OFFICE 1983: 784-006/6061

EVALUATION REPORT

H-10296

1. INTRODUCTION

Survey H-10296 is a navigable area hydrographic survey accomplished by the NOAA Ship RAINIER under the following Project Instructions.

OPR-0358-RA, dated September 13, 1988
CHANGE NO. 1, dated January 17, 1989
CHANGE NO. 2, dated February 13, 1989
CHANGE NO. 3, dated March 27, 1989
CHANGE NO. 4, dated April 17, 1989

This survey occurred in Alaska and covers a portion of the northern entrance to Frederick Sound, from the southern approach to Pybus Bay, southward to Cape Bendel. The surveyed area extends from latitude 57°03'24"N to latitude 57°15'12"N and between longitude 133°53'48"W to longitude 134°00'00"W. Except in areas close to the shore and islets, the bottom is generally regular. The central portion of the surveyed area tends to deepen gradually towards the south and towards the northeast. The bottom consists of sand, broken shells, mud and pebbles. Depths in the area range from 0.7 fathoms in the vicinity of Spruce Island to 241 fathoms at the eastern limit of the surveyed area in the vicinity of latitude 57°13'00"N.

Predicted tides for Juneau, Alaska, were used for the reduction of soundings during field processing. Approved hourly heights zoned direct from Turnabout Island, Alaska, gage 945-1655, were used during office processing.

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. The TRA, sound velocity and electronic control correctors are adequate and required no revision. An accompanying computer printout contains the parameters and the correctors.

A digital file has been generated for this survey as required by N/CG2 Hydrographic Survey Guideline No. 23, Completion of Digital Hydrographic Surveys, September 7, 1983. The file, however, is incomplete. Certain feature descriptive information, all line type data and miscellaneous isolated features are not in the digital record due to the present lack of digitizing resources. The user should refer to the smooth sheet for complete depiction of survey data.

2. CONTROL AND SHORELINE

Sections F and G of the hydrographer's report and the Horizontal and Electronic Control Reports for OPR-P180-RA, 1988, contain adequate discussions of horizontal control and hydrographic positioning.

Positions of horizontal control stations used during hydrography are 1988 and 1989 field values and published values of surveys performed between 1917 and 1965. These control stations are based on NAD 27 and were used during office processing for the computation of positions. The smooth sheet and accompanying overlays are annotated with NAD 83 adjustment ticks based on values determined by N/CG121. Geographic positions based on NAD 83 may be plotted on the smooth sheet utilizing the NAD 27 projection by applying the following corrections.

Latitude:	+1.220 seconds (+37.7 meters)
Longitude:	-6.233 seconds (-104.8 meters)

The year of establishment of control stations shown on the smooth sheet originates with the hydrographer's signal list.

There are 70 weak fixes, angles of intersection less than 30 degrees or more than 150 degrees, noted in this survey. All the weak fixes occurred along the sounding lines except for one weak fix on a bottom sample. There are no significant plotting differences between the soundings located by these fixes and those in adjacent areas. Also, none of these fixes are used to position dangers to navigation. These fixes are considered acceptable.

The are no shoreline maps applicable to this survey. The shoreline depicted on the smooth sheet originates with shoreline maps T-4151, T-12178, T-12179, with the tenth edition of Chart 17363, and with blueprint 131991. The shoreline is shown for orientation only.

3. HYDROGRAPHY

Hydrography is adequate to:

a. delineate the bottom configuration, determine least depths, and draw the standard depth curves;

b. reveal there are no significant discrepancies or anomalies requiring further investigation; and

c. show the survey was properly controlled and soundings are correctly plotted.

4. CONDITION OF SURVEY

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.

5. JUNCTIONS

Survey H-10296 junctions with the following surveys.

Survey	Year	Scale	Area
H-8907	1966	10,000	southeast
H-10289	1988	20,000	east
H-10295	1989	10,000	southeast
H-10297	1989	20,000	west and south

The junctions with surveys H-10295 and H-10297 have been completed. The junctions with surveys H-8907 and H-10289 have not been formally completed since those surveys were previously processed and forwarded for charting. Some soundings from surveys H-8907 and 10289 have been transferred to survey H-10296 to better portray the bottom in the common area.

There are no junction surveys covering the northern limit of the present survey. There is no conflict between the charted depths and the soundings from the present survey.

6. COMPARISON WITH PRIOR SURVEYS

H-1996 1889 1:80,000

Survey H-1996 covers the whole area of the present survey. Taking into consideration the difference in scales of the two surveys and the methods of surveying, comparison with this prior survey is satisfactory.

Survey H-10296 is adequate to supersede the prior survey within the common area.

H-4143 WD 1920 1:40,000
H-4511b WD 1925-26 1:20,000

These prior wire drag surveys cover the area on this survey north of latitude 57°12'30"N and are the charting source for several AWOIS items. There are no conflicts between this survey and these prior wire drag surveys.

The following AWOIS items originate with the following prior surveys:

AWOIS item	Prior Survey
51199	H-4511b WD
51200	H-4511b WD
51202	H-4143 WD
51205	H-4143 WD
51207	H-4143 WD (outside survey limits)

These AWOIS items are adequately discussed in the hydrographer's report. Refer to section K of that report for the disposition of these items.

7. COMPARISON WITH CHART

Chart 17360, 26th edition, dated August 18, 1984; scale 1:217,828
Chart 17363, 10th edition, dated September 3, 1983; scale 1:40,000
Chart 17368, 3rd edition, dated January 8, 1983: scale 1:40,000

a. Hydrography

Charted hydrography originates with survey H-1996, the prior surveys discussed in section 6 of this report and miscellaneous sources. No further discussion is required.

Survey H-10296 is adequate to supersede charted hydrography within the common area.

b. AWOIS

AWOIS items 51198, 51263 and 51264 originate with miscellaneous sources. These items are adequately discussed in the hydrographer's report. Refer to section L of that report for the disposition of these items.

c. Controlling Depths

There are no charted channels with controlling depths within the area of this survey.

d. Aids to Navigation

There are no fixed or floating aids located within the area of this survey. However, the positions of two fixed aids to navigation were located and their characteristics observed, although outside the survey area. The fixed aids serve their intended purpose. These aids to navigation are adequately discussed by the hydrographer in section N.

e. Geographic Names

Names appearing on the smooth sheet and in the survey title have been approved by the Chief Geographer.

f. Dangers to Navigation

The hydrographer reported six dangers to navigation from this survey to the USCG, DMAHTC and N/CG222. Copies of the messages are attached. One additional danger was found during office processing and was reported to the USCG and DMA. A copy of the message is attached.

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10296 adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

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

Arsenio A. Luceno
Cartographer

APPROVAL SHEET
H-10296

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, symbolization, comparison(s) with prior surveys and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts of the survey 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.

Dennis Hall Date: 5/10/90

Name
Chief, Hydrographic Processing Unit
Pacific Hydrographic Section

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.

[signature] Date: 5/23/90

Name
Chief, Hydrographic Section

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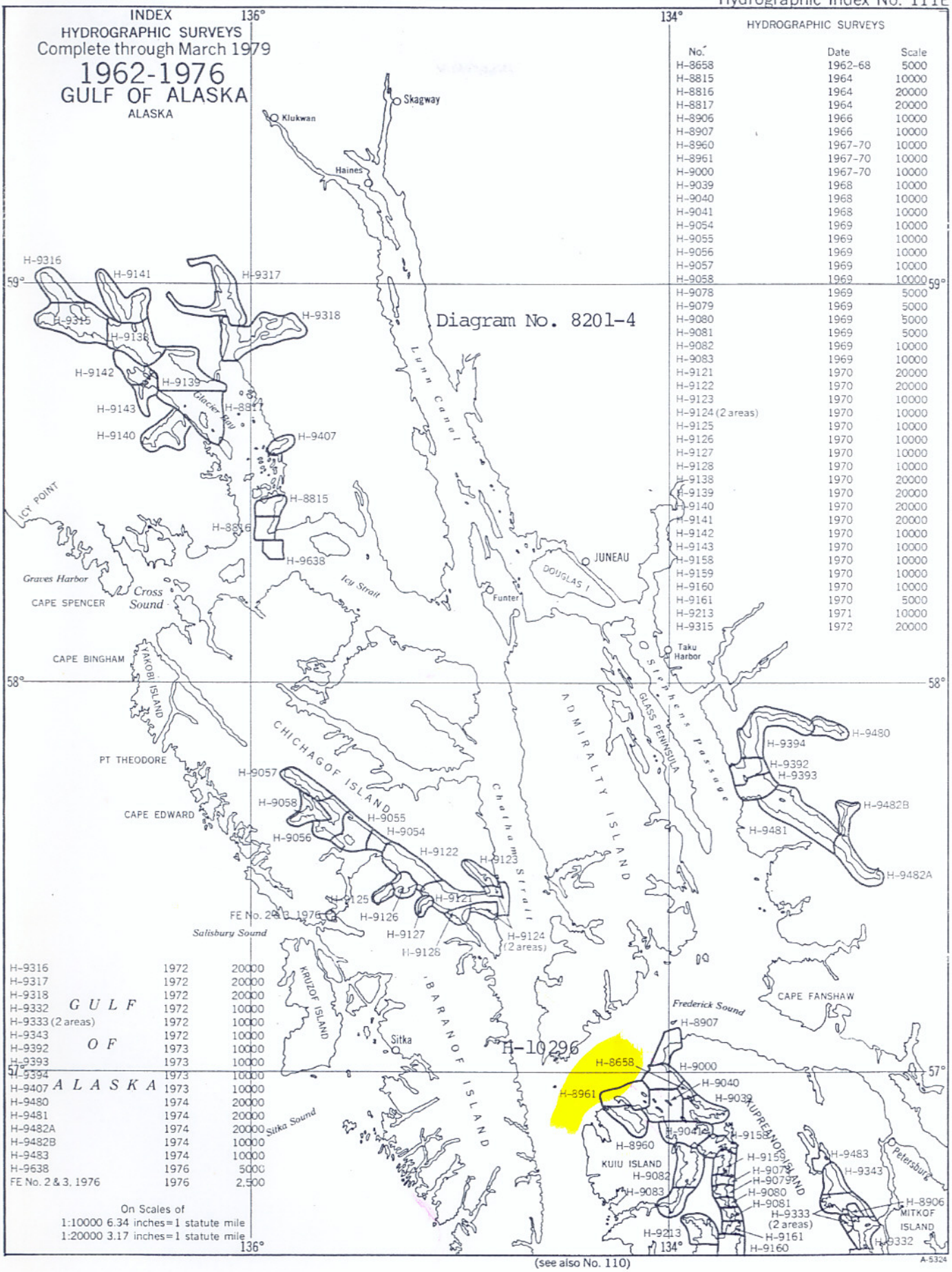
Final Approval:

Approved: [signature] Date: 6/12/90

Wesley V. Hull, RADM, NOAA
Director, Charting and
Geodetic Services

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Washington, D.C.

Hydrographic Index No. 111E



HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-8658	1962-68	5000
H-8815	1964	10000
H-8816	1964	20000
H-8817	1964	20000
H-8906	1966	10000
H-8907	1966	10000
H-8960	1967-70	10000
H-8961	1967-70	10000
H-9000	1967-70	10000
H-9039	1968	10000
H-9040	1968	10000
H-9041	1968	10000
H-9054	1969	10000
H-9055	1969	10000
H-9056	1969	10000
H-9057	1969	10000
H-9058	1969	10000
H-9078	1969	5000
H-9079	1969	5000
H-9080	1969	5000
H-9081	1969	10000
H-9082	1969	10000
H-9083	1969	10000
H-9121	1970	20000
H-9122	1970	20000
H-9123	1970	10000
H-9124 (2 areas)	1970	10000
H-9125	1970	10000
H-9126	1970	10000
H-9127	1970	10000
H-9128	1970	10000
H-9138	1970	20000
H-9139	1970	20000
H-9140	1970	20000
H-9141	1970	20000
H-9142	1970	10000
H-9143	1970	10000
H-9158	1970	10000
H-9159	1970	10000
H-9160	1970	10000
H-9161	1970	5000
H-9213	1971	10000
H-9315	1972	20000

H-9316	1972	20000
H-9317	1972	20000
H-9318	1972	20000
H-9332	1972	10000
H-9333 (2 areas)	1972	10000
H-9343	1972	10000
H-9392	1973	10000
H-9393	1973	10000
H-9394	1973	10000
H-9407	1973	10000
H-9480	1974	20000
H-9481	1974	20000
H-9482A	1974	20000
H-9482B	1974	10000
H-9483	1974	10000
H-9638	1976	5000
FE No. 2 & 3, 1976	1976	2,500

GULF OF ALASKA

On Scales of
1:10000 6.34 inches=1 statute mile
1:20000 3.17 inches=1 statute mile

A-5324

(see also No. 110)

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10296

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
17363	8/29/90	Dan Black	(Full) Part Before After Marine Center Approval Signed Via
			Drawing No. 12
17320	10/24/90	Dan Black	Full (Part) Before After Marine Center Approval Signed Via
			Drawing No. 24 THRU 17362.
531	1/9/91.	Eliot B. Domingo	Full Part Before After Marine Center Approval Signed Via Examined, NO
			Drawing No. Sndgs or Corrections Applied.
530	1/10/91.	Eliot B. Domingo	Full Part Before After Marine Center Approval Signed Via Examined, NO
			Drawing No. Sndgs or Corrections Applied.
500	1/14/91	Eliot B. Domingo	Full Part Before After Marine Center Approval Signed Via Examined, NO
			Drawing No. Sndgs or Corrections Applied.
17368	1/16/91	Eliot B. Domingo	Full ~~Part Before~~ After Marine Center Approval Signed Via Full application
			Drawing No. of Sndgs. from SS.
17360	1/31/91	Eliot B. Domingo	Full ~~Part Before~~ After Marine Center Approval Signed Via Full application
			Drawing No. of Sndgs from SS.
17320	2/13/91	Examined	Full Part Before After Marine Center Approval Signed Via Full application of
			Drawing No. sndgs. from SS thru 17320.
531	7-14-95	K Elliott	(Full) Part Before After Marine Center Approval Signed Via
			Drawing No. 21 NO CORRS.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.