

10308

Diagram No. 8802-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey .. Hydrographic
Field No. RA-10-4-89
Registry No. H-10308

LOCALITY

State Alaska
General Locality Alaska Peninsula
Sublocality .. North and East of
..... Ugaiushak Island

19 89

CHIEF OF PARTY
CAPT J.C. Albright

LIBRARY & ARCHIVES

DATE December 14, 1990

10308

CHH GP
16568
16013
16006
16011
16560 New Chart
500
530
531

HYDROGRAPHIC TITLE SHEET

H-10308

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-10-4-89

State Alaska

General locality Alaska Peninsula

Locality North and East of Ugaiushak Island

Scale 1:10,000 Date of survey June 20 to September 6, 1989

Instructions dated May 1, 1989 Project No. OPR-P180-RA

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

Chief of party Captain John C. Albright

Surveyed by LT Niichel, LTJG Glang, 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: T. Jones Automated plot by PHS Xynetics Plotter

Evaluation by: A. Luceno

Soundings in fathoms / ~~feet~~ and tenths at ~~MLW~~ MLLW

REMARKS: All times UTC. Revisions and marginal notes in black generated during office processing. Separates are filed with the hydrographic data.

AWO15 / SURF MSD 2/20/91

5C1-30-97

	MAY	JUNE	JULY	AUG	SEPT
SQ. N/A. SOUNDINGS	509	818	147	57.6	252
LNA. SOUNDINGS	7294	1036	1683	118	502
LNA. MISC. DISTANCE	1730	3717	1495	560	145
BOTTOM SAMPLES (GRAB)	4	5	2	4	—
ELECT. CONTROL STATIONS	1	2	5	2	—
TEMP. DEPTH SOUND VEL. CAST	1	—	—	—	—
HANSEN CAST	1	—	—	—	—
TIDE GAGES	2	—	—	—	—
WATER SAMPLES ANALYZED	9	2	10	4	—
GEOGETIC CONTROL STATIONS EST. Δ	—	—	2	2	0
SQ. N/A. SIDE SCAN SONAR	—	—	—	—	—
LNA. SIDE SCAN SONAR	—	—	—	—	—

SQ. N/A. SOUNDINGS
 LNA. SOUNDINGS
 LNA. MISC. DISTANCE
 BOTTOM SAMPLES (GRAB)
 ELECT. CONTROL STATIONS
 TEMP. DEPTH SOUND VEL. CAST
 HANSEN CAST
 TIDE GAGES
 WATER SAMPLES ANALYZED
 GEOGETIC CONTROL STATIONS EST. Δ
 SQ. N/A. SIDE SCAN SONAR
 LNA. SIDE SCAN SONAR

DENISON ISLAND
 CHORUKAT BAY
 RA-10-2-89
 H-10304
 ALASKAN COLUMNS

RA-10-3-89
 H-10305
 MASCLEOF BAY
 CAPE KUYUKAK
 JUNE 1989
 SEPTEMBER
 CENTRAL ISLAND
 UGAUSUMI ISLAND
 RA-10-4-89
 H-10308
 JULY 89
 RA-10-5-89
 H-10314
 AUGUST 89
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

PROGRESS SKETCH
 OPR-P180-RA
 HYDROGRAPHIC SURVEY
 ALASKA PENINSULA
 MAY 14 - AUGUST 31, 1989
 NOAA SHIP RAINIER
 JOHN C. ALBRIGHT, CAPT., NOAA
 SCALE OF CHART 16568

DENISON ISLAND
 CHORUKAT BAY
 RA-10-2-89
 H-10304
 ALASKAN COLUMNS

RA-10-3-89
 H-10305
 MASCLEOF BAY
 CAPE KUYUKAK
 JUNE 1989
 SEPTEMBER
 CENTRAL ISLAND
 UGAUSUMI ISLAND
 RA-10-4-89
 H-10308
 JULY 89
 RA-10-5-89
 H-10314
 AUGUST 89
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

DENISON ISLAND
 CHORUKAT BAY
 RA-10-2-89
 H-10304
 ALASKAN COLUMNS

RA-10-3-89
 H-10305
 MASCLEOF BAY
 CAPE KUYUKAK
 JUNE 1989
 SEPTEMBER
 CENTRAL ISLAND
 UGAUSUMI ISLAND
 RA-10-4-89
 H-10308
 JULY 89
 RA-10-5-89
 H-10314
 AUGUST 89
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

DENISON ISLAND
 CHORUKAT BAY
 RA-10-2-89
 H-10304
 ALASKAN COLUMNS

RA-10-3-89
 H-10305
 MASCLEOF BAY
 CAPE KUYUKAK
 JUNE 1989
 SEPTEMBER
 CENTRAL ISLAND
 UGAUSUMI ISLAND
 RA-10-4-89
 H-10308
 JULY 89
 RA-10-5-89
 H-10314
 AUGUST 89
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

DENISON ISLAND
 CHORUKAT BAY
 RA-10-2-89
 H-10304
 ALASKAN COLUMNS

RA-10-3-89
 H-10305
 MASCLEOF BAY
 CAPE KUYUKAK
 JUNE 1989
 SEPTEMBER
 CENTRAL ISLAND
 UGAUSUMI ISLAND
 RA-10-4-89
 H-10308
 JULY 89
 RA-10-5-89
 H-10314
 AUGUST 89
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

RA-10-3-89
 H-10305
 RA-10-4-89
 H-10308
 RA-10-5-89
 H-10314
 RA-10-3-89
 H-10301
 MAY 1989

Descriptive Report to Accompany Hydrographic Survey H-10308

Field Number RA-10-4-89

Scale 1:10,000

1989

NOAA Ship RAINIER

Chief of Party: Captain John C. Albright

A. PROJECT

This basic hydrographic survey along the Alaska Peninsula was completed as specified by Project Instructions OPR-P180-RA, dated May 1, 1989, Change Number 1 (May 5, 1989) and Change Number 2 (August 3, 1989). This survey is one of the optional 1:10,000-scale surveys, and is designated as sheet AM on the revised sheet layout dated September 16, 1987. ✓

This survey is one in a series which will provide contemporary hydrographic data to update existing charts and to construct a new series of 1:80,000-scale charts. This project responds to requests from the U.S. Coast Guard, Alaska congressional delegates, NOAA, Defense Mapping Agency, Fishing Vessel Association, and Kodiak Shrimp Trawlers Association. ✓

B. AREA SURVEYED

This survey is located along the southcentral Alaska Peninsula, approximately five nautical miles south of Cape Kuyuyukak. The survey includes Radial Island and the eastern shore of Ugaiushak Island. The survey area lies between latitude $56^{\circ}45'00''\text{N}$ - $56^{\circ}52'10''\text{N}$, and longitude $156^{\circ}44'00''\text{W}$ - $156^{\circ}51'10''\text{W}$. Data was acquired from June 20 through September 6, 1989 (DN 171 - DN 249). ✓

The eastern shoreline of Ugaiushak Island is characterized by rock ledges rising to sheer bluffs and tundra meadows. Radial Island is a small bare island, with steep sides and a symmetrically-fractured appearance. The bathymetry about Radial Island and northward is generally irregular. South of Radial Island, the bathymetry slopes sharply to depths as great as 85 fathoms and is much less rugged. The shallowest soundings, less than 10 fathoms, were found along the eastern shore of Ugaiushak Island, *and around Radial Island.* ✓

Bottom samples yielded various materials throughout the survey area. Samples in the northern area of the survey generally consisted of fine to coarse sand, broken shell, and pebbles. Samples collected in the southern portion of the survey contained coral, as well as sand and broken shell. Green mud was predominant throughout. ✓

C. SOUNDING VESSELS

All data were acquired by NOAA Ship RAINIER and three automated survey launches as shown below: ✓

<u>Vessel</u>	<u>EDP No.</u>	<u>Operation</u>
RAINIER	2120	Hydrography Bottom samples Plessey Casts
RA-4	2124	Hydrography
RA-5	2125	Hydrography Shoreline Verification Bottom Samples
RA-6	2126	Hydrography Shoreline Verification

No changes to the standard sounding configurations were necessary.

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

<u>EDP No.</u>	<u>Serial No.</u>	<u>DN</u>
2120	B046N	158-226
	A103N	236-243
2124	A119N	227-242
2125	A114N	152-178
	A117N	179-249
2126	B048N	160-241

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. The echo sounders sometimes failed to track properly while running over extremely steep or irregular bottom. 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

Data was checked during office processing and found to contain no significant errors.

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 1989 Corrections to Echo Soundings Data Package for OPR-P180-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 echo sounder. Supporting data and computations for all corrections to echo soundings, except heave, are included in the 1989 Corrections to Echo Soundings Data Package for OPR-P180-RA. * *settlement and squat correctors applied to smooth sheet.* ✓

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 was determined for all launches 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.* ✓

Sound Velocity

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

** Data was analyzed during office processing and found to contain no significant error.*

<u>Cast No.</u>	<u>Deepest Depth (m)</u>	<u>DN</u>	<u>Geographic Position</u>
3	140	176	56°52.8'N, 156°44.2'W
4	125	194	56°53.1'N, 156°43.9'W
8	140	211	56°52.9'N, 156°44.3'W
9	140	224	56°53.4'N, 156°43.3'W
10	180	240	56°49.5'N, 156°54.4'W

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 the Northwest Regional Calibration Center in Bellevue, WA on January 26, 1989.

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 also calibrated at the Northwest Regional Calibration Center.

A Nansen cast was taken on DN 148 together with Plessey Cast No. 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:

<u>Velocity Table No.</u>	<u>Cast No.</u>	<u>Applicable DN</u>	<u>Vessel</u>
3	3	172-179	Launches
4	4	188-200	Launches
5	4	188-200	RAINIER
8	8	208-215	Launches
9	9	221-229	Launches
10	9	224-229	RAINIER
11	10	234-249	Launches
12	10	234-249	RAINIER

Velocity correctors within each table were computed at 0.1-fathom increments using the PC program VELOCITY. The velocity tapes have been forwarded with the survey data; tape listings are appended to this report.

Tape listings filed with the hydrographic records.

Settlement and Squat

Settlement and squat correctors were determined for the automated survey launches in Shilshole Bay, Washington on February 23 and March 3, 1989. The correctors were determined for RAINIER near 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. ✓

* Sounding corrector abstracts and TC/TI tape listings are appended to this report.

Tide Correctors

Tidal zoning and correctors applicable to predicted tides for the Kodiak, Alaska tide station (945-7292) were provided on the chartlet accompanying the Project Instructions. The zone applicable to this survey has a height correction ratio of "x1.18" and time corrections of plus 20 minutes for high water and plus 40 minutes for low water. A printout of the predicted tide tapes is included with the survey data. ✓

Tide stations at Ugaiushak Island (945-8553) and Derickson Island (945-8522) were established and maintained by RAINIER personnel. Only the Ugaiushak Island tide data was required for this survey, but data from the Derickson Island tide gages 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 Section 4.3 of the Field Procedures Manual (FPM). A request for approved tides has been forwarded to N/OMA121. Copies of the Field Tide Note and the request for approved tides are appended to this report. ✓

E. HYDROGRAPHIC SHEETS

All field sheets were prepared aboard RAINIER on a Houston Instrument Complot DP-3 roll plotter using the PDP8/e HYDRO PLOT system and program RK201, "Grid, Signal, Lattice Plot". Program RK201 draws a Modified Transverse Mercator projection. The two 1:10,000-scale final field sheets are designated RA-10-4E-89 and RA-10-4W-89; each has an accompanying 1:10,000-scale detached position and bottom characteristic overlay. An additional 1:10,000-scale paper sheet was used to legibly portray soundings from 25m sounding lines. One 1:2500-scale sheet was used to legibly depict soundings from seven shoal developments (Developments 1, A thru F). The limits of the developments are shown on the two overlays. * Parameter tape listings for all final field sheets are appended to this report. ✓

Depth contours are drawn on the final field sheets in accordance with the Hydrographic Manual except in areas of steep bathymetry where all standard 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 Hydrographic Section (N/CG 245) for verification. ✓
office processing.

F. CONTROL STATIONS

A listing of the geodetic stations used to control this survey is appended to this report. Any station located on an offshore island where the station symbol obscures the island's depiction is 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 FPM 5.2.4. New stations were ✓

* Filed with the hydrographic records.

PHS preliminary adjusted listings.

1988 4
 positioned in 1989 by RAINIER personnel via closed traverse. The one fixed-point calibration site within the survey area, UGI CAL PT (201), was established from station HUEY via an angle and distance. ✓

The field positions for new stations are unadjusted. All stations within the survey area meet or exceed Third-order, Class I standards for positioning. Geographic positions are based on the North American Datum of 1927 and Clarke Ellipsoid of 1866. Further information can be found in the Summer 1989 Horizontal Control Report for OPR-P180-RA. ✓

G. HYDROGRAPHIC POSITION CONTROL

Soundings were located using Motorola Mini-Ranger III microwave positioning equipment in HYDROPLOT's range-range acquisition mode. Two diver-obtained least depths were acquired with Motorola Mini-Ranger Falcon 484 multiple-LOP equipment, and were converted to HYDROPLOT's paper tape medium. ✓

Positioning Equipment

Four Mini-Ranger III console/R-T pairs, one Mini-Ranger Falcon 484 console/R-T pair, and eleven transponders were used during this survey. The following tables summarize the mobile and shore equipment used.

Mobile Equipment

<u>EDP No.</u>	<u>Vessel</u>	<u>Equipment</u>	<u>Console/R-T</u>	<u>DN</u>
2120	RAINIER	MR III	B0269/H3705	179-225
2124	RA-4	Falcon	D0051/911615	239
2125	RA-5	MR III	711/F3413	179-213
"	"	"	720/B1405	214-249
2126	RA-6	MR III	506042/E2716	179-241

Shore Equipment

<u>Transponder Serial No.</u>	<u>Code</u>	<u>Transponder Serial No.</u>	<u>Code</u>
C1883	B	B1412	0
G3500	C	D2384	1
911711	D	B1106	2
F3256	E	E2713	3
G3501	F	F3248	4
		B1413	5

Baseline Calibrations

Opening and closing baseline calibrations were conducted in accordance with FPM 3.1.2.1 (see table below). Calibration data and descriptions of the baselines can be found in the Summer 1989 Electronic Control Data Package for OPR-P180-RA. ✓

<u>Location</u>	<u>Distance</u>	<u>DN</u>	<u>Description</u>
Kodiak, AK	1626m	130-131	Bell Flats-USCG tidal BM
Chiginagak Bay, AK	1351m	207	Nonrecoverable shore-to-shore (Codes 1, 3[new], 5, and B) ✓
Seattle, WA	966m	262-272	Lake Union MRCAL 2

The final field sheets were plotted with the opening baseline calibration correctors, except for data collected by all vessels using Code 1 (S/N D2384), which was plotted with the Chiginagak Bay corrector after DN 207. ✓

The hydrographer recommends that opening baseline calibration correctors be applied during final processing for all codes except those listed below, as the Seattle closing calibrations indicated a shift in some correctors of more than 4m. In compliance with FPM 3.1.2.3, the following prorated correctors are recommended for the affected Mini-Ranger console-R/T units: *see sect. 1 of Eval. Report* ✓

Recommended Prorated Correctors for Console-R/T: 711/F3413 **

<u>Code 3:</u>	<u>DN</u>	<u>Corrector (m)</u>	<i>(Launch 2125)</i>
	207-216	+1	
	217-225	+2	
	226-234	+3	
	235-243	+4	
	244-249	+5	

Recommended Prorated Correctors for Console-R/T: 506042/E2716 **

<u>Code 0:</u>	<u>DN</u>	<u>Corrector (m)</u>	<i>(Launch 2126)</i>
	171-174	+0	
	175-196	-1	
	197-218	-2	
	219-240	-3	
	241-249	-4	

** Listed codes using the above console-R/T units were not used during survey operations for H-10308

Recommended Prorated Correctors for Console-R/T: B0269/H3705

(Launch 2120)

<u>CODE E:</u>	<u>DN</u>	<u>Corrector (m)</u>	<u>CODE 3:</u>	<u>DN</u>	<u>Corrector (m)</u>
	171-174	+0	CODE 3 not used	207-215	+0
	175-196	+1		216-223	+1
	197-218	+2		224-231	+2
	219-240	+3 ✓		232-239	+3
	241-249	+4		240-247	+4
				248-249	+5

<u>CODE F:</u>	<u>DN</u>	<u>Corrector (m)</u>	<u>CODE 1:</u>	<u>DN</u>	<u>Corrector (m)</u>
	171-187	+3		171-206	+0 ✓
	188-206	+4 ✓		207-214	-2 ✓
	207-225	+5		215-221	-1 ✓
	226-244	+6		222-228	+0 ✓
	245-249	+7		229-235	+1
				236-242	+2
				243-249	+3

✓ Reflects only those days and correctors which affect H-10308.

Recommended Prorated Correctors for Console-R/T: D0051/911615

(Launch 2124)

<u>CODE B:</u>	<u>DN</u>	<u>Corrector (m)</u>
	238-241	-9 ✓ (Positions 4000, 4001)
	242-244	-8
	245-247	-7
	248-249	-6

Correctors applied on smooth sheet whenever applicable.

For console-R/T D0051/911615, the present HDAPS configuration does not allow field units to change baseline correctors. Prorated correctors were recommended for final processing, if N/CG245 HDAPS processing system hardware and software allows for changes to baseline correctors. *HDAPS system not used in this survey.*

System Check Procedures

Critical systems checks were conducted in accordance with FPM 3.1.2.2. Fixed-point critical systems checks were acquired at UGI CAL PT (201). Theodolite-EDMI critical systems checks were also used for checking the Mini-Ranger systems. The Wild T-2/EDMI combinations used were S/N 320734/67306 and S/N 320734/67384.

Noncritical systems checks were obtained daily when critical checks were not acquired. Noncritical system checks were conducted using the launch-to-launch, three-range, or multiple-LOP methods. In general, noncritical system checks fell within the allowable rejection limits; 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. 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. *concur.* ✓

Antenna Offset Distances (ANDIST)

The ANDIST corrector was 0.0m for all launches as each launch had its antenna located over the depth transducer. The ANDIST corrector for RAINIER (2120) was +6.6m. ✓

H. SHORELINE

Shoreline detail for Ugaiushak Island was transferred to the final field sheet from shoreline map ("T-sheet") TP-01156 (1:10,000; 1985). The 18m westward shift of all shoreline detail was applied to the T-sheet and all final field sheets in accordance with N/CG2's memorandum dated September 18, 1986 (see Supplemental Appendix). There was no photographic coverage for Radial Island. ✓ *(copy attached)*

Shoreline verification was completed in all areas in accordance with FPM 7.0. Shoreline examinations revealed ledges to be more extensive than depicted on the T-sheet, as isolated alongshore rocks were often high points on ledges. Few changes were made in areas along steep shoreline. These discrepancies can be attributed to large concentrations of kelp, and the photography not being flown at low stages of tide. All changes to the T-sheet are shown in red on the final field sheets. Detached positions (DP's) were obtained on ledges which extended seaward of the mean high water line. Verified T-sheet features, and additional features not on the T-sheet, are shown on the final field sheet in black. ✓

Submerged rocks shown on the T-sheet around Ugaiushak Island were searched for both visually and by echo sounder. The following T-sheet rocks were disproved by obtaining detached positions and making visual inspections of the area:

<u>Feature</u>	<u>Geographic Position</u>	<u>Pos. No.</u>
Rock, Subm.	56°47'25.0"N, 156°50'34.0"W <i>32.89</i>	7437
Rock, Subm.	56°47'26.0"N, 156°50'35.5"W <i>34.67</i>	7438
Rock, Subm.	56°47'24.0"N, 156°50'31.0"W <i>30.14</i>	7439
Rock, Subm.	56°47'22.5"N, 156°50'28.5"W <i>27.86</i>	7441
2 Rocks, Subm.	56°47'16.0"N, 156°50'21.8"W <i>21.32</i>	7443
Rock, Subm.	56°47'14.8"N, 156°50'18.9"W <i>18.46</i>	7444
Rock	56°47'12.5"N, 156°50'19.0"W <i>18.37</i>	7445
Rock, Subm.	56°47'10.4"N, 156°50'16.8"W <i>16.09</i>	7446
Rock, Subm.	56°47'06.1"N, 156°50'14.3"W <i>13.79</i>	7447
Rock, Subm.	56°47'30.5"N, 156°50'47.6"W	Visual Search
Rock, Subm.	56°47'29.4"N, 156°50'47.0"W	Visual Search

Heavy kelp concentrations were seen alongshore; kelp concentrations were confirmed by poor echo sounder traces. Kelp symbols were added to the final field sheet in all areas where growth was heavy. A foul limit was also delineated as many undetected rocks could easily exist within the thick kelp beds. ✓

Recommendation: Remove submerged rocks and add kelp and foul area limits as shown on the final field sheet. *Concur. chart as shown on smooth sheet.* ✓

The shoreline around Radial Island is generally steep and regular. It's sheer sides rise from well below the MLLW-line to a height of 57ft. DP's were obtained on Radial Island's perimeter and on two rocks on the northeast side of the island. The high-water line is depicted on the final field sheet in black as the DP's also marked the boundaries of high water. *Radial Island shown in red on smooth sheet* ✓

The position numbers associated with all DP's are shown on the overlays. All heights are in feet and are corrected to MLLW based on predicted tides. The heights of rocks and ledges refer to the highest portion of each feature. Cartographic codes are noted in the field records. ✓

I. CROSSLINES

A total of 50.4 nautical miles of crosslines were run perpendicular to the mainscheme sounding lines, representing 6.9% of the mainscheme hydrography. Crossline soundings agree within one fathom with mainscheme soundings. In several instances, the vessel acquiring the crossline data did not acquire the mainscheme data. The agreement between soundings obtained by different echo sounders in a common area is as stated above. ✓

J. JUNCTIONS *(See sect. 5 of Eval. Report)*

This survey junctions with H-10304 (1:10,000; 1989; north), H-10305 (1:10,000; 1989; northwest), H-10281 (1:10,000; 1988; northeast), H-10301 (1:20,000; 1989; east), and H-10314 (1:10,000; 1989; west). There are no contemporary surveys to the south. No irregularities were found when comparing soundings and depth contours. Minor discrepancies exist in areas of steep bathymetry, but general agreement of overlapping soundings between surveys is excellent. All soundings agreed to within one fathom of the junction soundings. ✓

K. COMPARISON WITH PRIOR SURVEYS

No prior surveys lie within the limits of this survey. ✓

L. COMPARISON WITH THE CHART

This survey was compared to NOS Preliminary Chart 16568, 6th edition, Apr 29/89, 1:106,600. ✓

Comparison of Sounding Features

The charted soundings within the limits of this survey originate from the USC&GS Reconnaissance Survey BP39180 (1944, 1:20,000). Eleven of the 14 charted ✓

soundings which lie within the limits of this survey agree to within two fathoms of this survey's soundings, or lie within 0.5 nautical mile of similar soundings. ✓

The following three charted soundings were disproved by running sounding lines at 50m intervals for a radius of approximately 0.25NM around each sounding:

<u>Sounding (fms)</u>	<u>Charted Position</u>	<u>Survey Depth (fms)</u>	<u>DN/ Pos. No.</u>
28	56°49'00"N, 156°50'00"W	51 to 54 43	180/5475+3
27	56°49'12"N, 156°50'18"W 16.34	55	180/5501+1 ✓
40	56°49'38"N, 156°50'00"W 01.44	62.3	226/7305

The techniques used for positioning and sounding during the reconnaissance surveys, as well as the irregular bathymetry, are probable causes for the discrepancies found between the charted soundings and this survey's soundings. ✓

Recommendation: Delete from the chart the three disproved soundings. Apply to the chart sounding data from this survey. ✓
CONCUR

Line spacing was reduced to 50m in depths less than 30fms in order to locate shoal depths and to better define depth contours. Additional shoal developments of 25m and 10m line spacing were run parallel to the mainscheme hydrography to determine least depths over shoals which were too deep for divers. ✓

Two dive investigations were conducted on this survey, one of which was reported as a danger to navigation (see Dangers to Navigation discussion). The dive investigation not reported was a rock shoal covered 9.7fms at 56°47'05.3"N, 156°50'00.9"W (DN 239, Pos. No. 4001). Each echo sounder depth considered for a dive operation was assigned a dive site number. These numbers appear on the dive investigation forms. The dive investigation forms are included with the submitted data. ✓

Comparison of Non-Sounding Features

In general, the charted rocks, islets and foul areas represent a portion of the detail found along the eastern shore of Ugaiushak Island. The islets and rocks are actually within a ledge which extends the length of the island. Large concentrations of kelp were found offshore of this ledge. ✓

On DN 241, visual search during low water was conducted for two lines (perhaps representing piers or structures) charted on the north and east sides of Radial Island. No structures or obstructions were found. The shoreline is sheer on all sides; the only feature alongshore are the two rocks on the northeast side which were discussed in Section H. It is presumed that these lines are cartographic errors. ✓

Recommendation: Remove the two lines charted on the north and east shores of Radial Island. Update all charted non-sounding features with data from this survey. *chart the area as shown on the smooth sheet.* ✓
CONCUR

There are no AWOIS items within the survey area. ✓

Dangers to Navigation

Eight dangers to navigation originating from shoal developments ^{of which is 2} and one dive investigation were reported by radio message and letter to the Seventeenth Coast Guard District and the Defense Mapping Agency Hydrographic and Topographic Center. A copy of the dangers to navigation correspondence is appended to this report. Position numbers assigned to the reported dangers are noted on the radio message.

M. ADEQUACY OF SURVEY

This is the first basic hydrographic survey to be conducted in this area. The survey is complete and adequate to be used for charting purposes, and to supersede any historical data.

N. AIDS TO NAVIGATION

There are no aids to navigation, submarine cables, pipelines or ferry routes within the limits of this survey.

O. STATISTICS

<u>Vessel:</u>	<u>2120</u>	<u>2124</u>	<u>2125</u>	<u>2126</u>	<u>Total</u>
# of Pos	1657	2	1307	2425	5391 5273
NM Hydro	337.2	0	178.8	360.1	876.1

NM ²	24.8	Velocity Casts	5
Detached Positions	40	Tide Stations	2
Bottom Samples	99	Current/Magnetic Stations	0

P. MISCELLANEOUS

No current measurements were made during this survey as no anomolous currents were observed.

Bottom samples were submitted to the Smithsonian Institution.

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. * Copies attached

Q. RECOMMENDATIONS

The hydrographer strongly endorses the Nautical Charting Division's current plan to correct and republish Preliminary Chart 16568 in March/April 1990, and annually thereafter as long as new surveys are available. See subject memos dated July 17, 1989 and August 21, 1989 in Supplemental Appendix. (Copies attached)

R. AUTOMATED DATA PROCESSING

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

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>VERSION</u>
RK 112	HYPERBOLIC, R/R HYDROPLOT	3/01/86
RK 116	R/AZ REAL TIME 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 226	R/AZ POSITION 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
	VELOCITY (Version 1.0)	3/11/88

The following position numbers were duplicated:

<u>DN/ Pos. No.</u>	<u>Originating Vessel</u>	<u>Duplicating Vessel</u>
226/6000-6081	2126	2125
237/5850-5863	2125	2125
239/6068-6128	2126	2125
208/6000-6104	2126	2126
237/7890-7898	2126	2126
238/7899-7960	2126	2126
239/8182	2126	2126

S. REFERRAL TO REPORTS

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

Title

Date Sent to N/CG245

1989 Horizontal Control Report for
OPR-P180-RA

October, 1989

1989 Electronic Control Data Package for
OPR-P180-RA

October, 1989

1989 Corrections to Echo Soundings Data
Package for OPR-P180-RA

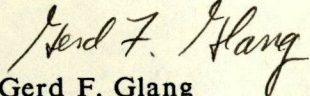
October, 1989

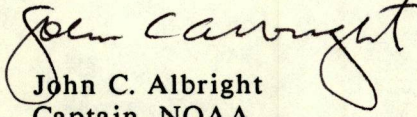
1989 Coast Pilot Report, OPR-P180-RA

October, 1989

Respectfully Submitted,

Approved and Forwarded,


Gerd F. Glang
Lieutenant (j.g.), NOAA


John C. Albright
Captain, NOAA
Commanding Officer

MASTER STATION LIST
OFR-P180-RA
ALASKA PENINSULA

FINAL VERSION

111	3	56	54	5250 ¹	156	46	4881 ⁰	250	0037	000000
/KAYAK 1988										
112	1	56	48	5510 ³	156	45	3920 ¹⁹⁰	250	0017	000000
*/RADIAL 1988										
115	3	56	51	04244	156	53	50796	250	0109	000000
/CENTRAL 1944										
117	3	56	47	02929	156	50	25485	250	0025	000000
/HAWK 1944										
119	3	56	55	04147	156	55	52580	250	0030	000000
/NAKOL 1944										
124	3	56	48	0775 ³	156	52	0175 ³	250	0044	000000
/PENNY 1989										
128	3	56	45	38956	156	51	0593 ⁰	250	0015	000000
*/TOEE 1989										
129	3	56	44	38595	157	00	4989 ³	250	0032	000000
/HYDRA 1944										

* Stations located on offshore islands where station symbol may obscure the depiction of the island.



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

September 25, 1989

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

Dear Sir:

While conducting hydrographic survey operations along southcentral Alaska Peninsula, NOAA Ship RAINIER discovered 19 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
for John C. Albright
Captain, NOAA
Commanding Officer

Enclosures





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

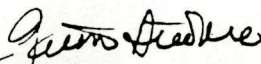
September 25, 1989

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

Dear Sir:

Enclosed is a confirmation copy of the radio message forwarded to your office regarding the dangers to navigation which I recommended for inclusion in the Local Notice to Mariners for the Seventeenth Coast Guard District. A copy of a chartlet showing the area in which the dangers exist is also enclosed.

Sincerely,


John C. Albright
FOR Captain, NOAA
Commanding Officer

Enclosures

cc: DMAHTC
N/CG221
N/MOP



KWJ/261650 2 SEP
JH HAND

PTTUZYUW RUHPTEF2307 2691646-UUUU--RUHPSUU.
ZNR UUUUU
P 261646Z SEP 89
FM NOAA S RAINIER
TO CCGDSEVENTEEN JUNEAU AK
DMAHTC (NAVWARN) WASHINGTON DC//MCNM//
INFO NOAA MOP SEATTLE WA
ADCT CM-VCAA
BT
UNCLAS

NOAA SHIP RAINIER HAS FOUND NINETEEN DANGERS TO NAVIGATION AND SIX INFORMATION ITEMS ALONG THE ALASKA PENINSULA, ALASKA (PROJECT OPR-P180-RA) WITHIN THE LIMITS OF HYDROGRAPHIC SURVEYS H-10305 (EASTERN NAKALILOK BAY; ITEMS A-H), H-10308 (RADIAL ISLAND AND VICINITY; ITEMS N-U) AND H-10314 (UGAIUSHAK ISLAND AND VICINITY; ITEMS V-Y). REQUEST THE FOLLOWING BE PUBLISHED IN LOCAL NOTICE TO MARINERS FOR SEVENTEENTH COAST GUARD DISTRICT:

	<u>dive site #</u>	<u>Pos #</u>
A. "ROCK SUBMERGED 2 FATHOMS AT LATITUDE 56/53/24.4N, LONGITUDE 156/50/12.2W."	1	1579
B. "ROCK PINNACLE SUBMERGED 1 1/2 FATHOMS AT LATITUDE 56/53/07.9N, LONGITUDE 156/50/51.3W."	3	1582
C. "ROCK SUBMERGED 7-1/2 FATHOMS AT LATITUDE 56/54/31.1N, LONGITUDE 156/54/13.7W."	4	1586
D. "ROCK SUBMERGED 2-1/2 FATHOMS AT LATITUDE 56/54/54.5N, LONGITUDE 156/55/12.6W."	5	1587
E. "ROCK SUBMERGED 7-1/2 FATHOMS AT LATITUDE 56/53/56.3N, LONGITUDE 156/54/32.0W."	6	1633
F. "ROCK SUBMERGED 6-1/2 FATHOMS AT LATITUDE 56/53/31.4N, LONGITUDE 156/55/01.2W."	7	1589
G. "ROCK SUBMERGED 2-1/2 FATHOMS AT LATITUDE 56/53/29.5N, LONGITUDE 156/55/25.9W."	8	6812⁴
H. "ROCK SUBMERGED 2-1/4 FATHOMS AT LATITUDE 56/53/06.3N, LONGITUDE 156/57/11.7W."	9	6786
I. "ROCK PINNACLE SUBMERGED 1/2 FATHOM AT LATITUDE 56/55/02.9N, LONGITUDE 156/53/37.6W."	10	1620
J. "ROCK SUBMERGED 3/4 FATHOM AT LATITUDE 56/55/03.2N, LONGITUDE 156/55/02.6W."	11	1631
K. "ROCK PINNACLE SUBMERGED 1-3/4 FATHOMS AT LATITUDE 56/55/48.9N, LONGITUDE 156/51/36.9W."	13	1626

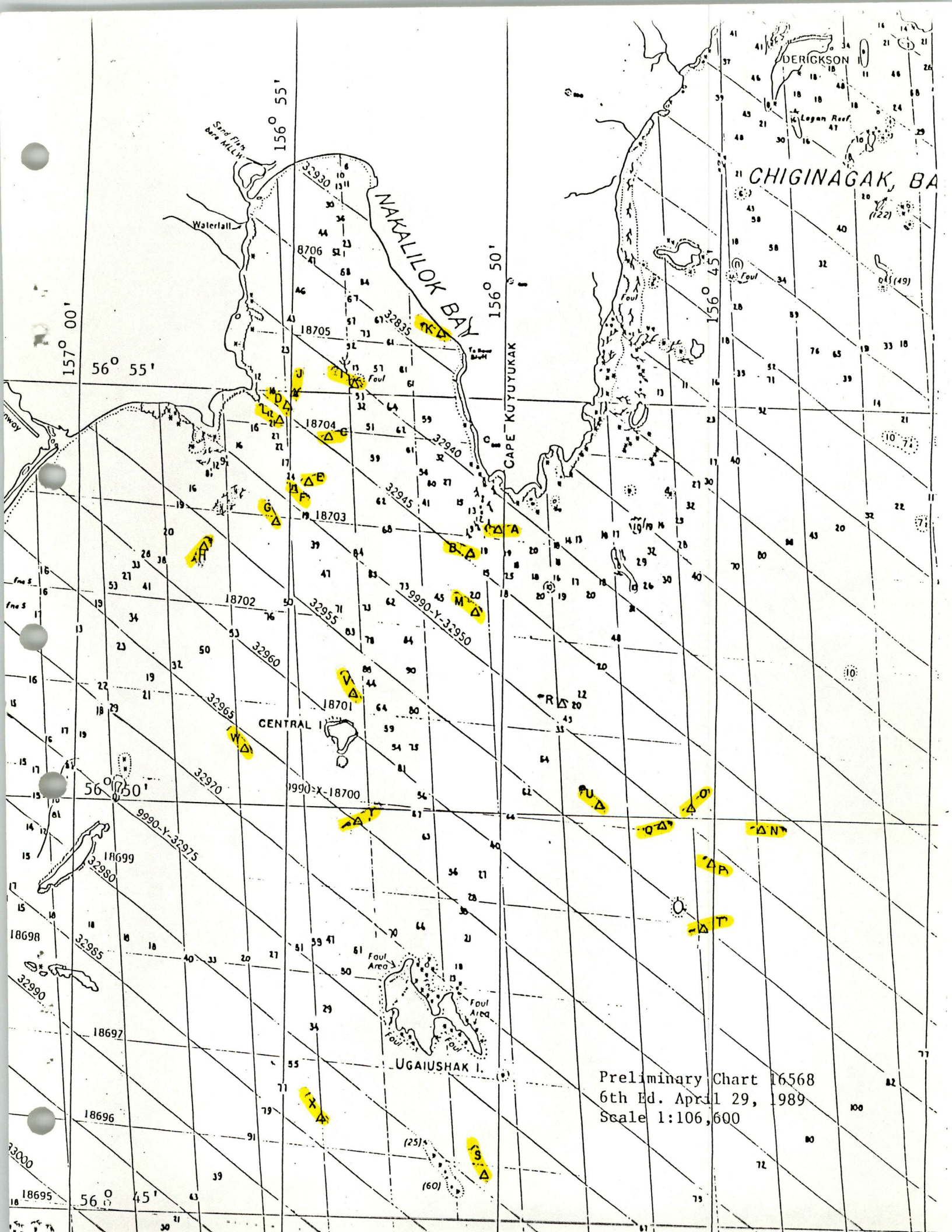
N.A

	Dive site #	Pos #	
K. "SHOAL SUBMERGED 9 FATHOMS AT LATITUDE 56/54/43.3N, LONGITUDE 156/55/25.0W."		1689 ⁺²	} N.A.
L. "SHOAL SUBMERGED 11 1/4 FATHOMS AT LATITUDE 56/52/28.2N, LONGITUDE 156/50/29.4W."		3554	
N. "SHOAL SUBMERGED 10-1/2 FATHOMS AT LATITUDE 56/49/44.1N, LONGITUDE 156/43/58.8W."		8112 ⁺³	
O. "SHOAL SUBMERGED 10 FATHOMS AT LATITUDE 56/50/00.7N, LONGITUDE 156/45/37.5W."		8232 ⁺²	
P. "SHOAL SUBMERGED 9 FATHOMS AT LATITUDE 56/49/17.8N, LONGITUDE 156/45/06.6W."		8160 ⁺²	
Q. "SHOAL SUBMERGED 12-3/4 FATHOMS AT LATITUDE 56/49/45.2N, LONGITUDE 156/46/17.4W."		8212 ⁺²	
R. "SHOAL SUBMERGED 13-1/4 FATHOMS AT LATITUDE 56/51/17.1N, LONGITUDE 156/48/38.5W."		6646 ⁺³	} Unrevised. Retain as reported
S. "SHOAL SUBMERGED 8-1/4 FATHOMS AT LATITUDE 56/45/22.4N, LONGITUDE 156/50/20.0W."	X	4000 ^{div}	
T. "SHOAL SUBMERGED 14-3/4 FATHOMS AT LATITUDE 56/48/27.7N, LONGITUDE 156/45/14.6W."		7076 ⁺³	
U. "SHOAL SUBMERGED 12-3/4 FATHOMS AT LATITUDE 56/50/00.3N, LONGITUDE 156/47/44.3W."		1523 ⁺⁵⁻⁶	
V. "ROCK PINNACLE SUBMERGED 7 3/4 FATHOMS AT LATITUDE 56/51/21.5N, LONGITUDE 156/53/38.0W."	1	4734	} N.A.
W. "ROCK SUBMERGED 4 3/4 FATHOMS AT LATITUDE 56/50/36.5N, LONGITUDE 156/56/07.0W."	2	4763	
X. "ROCK SUBMERGED 4 1/4 FATHOMS AT LATITUDE 56/45/59.1N, LONGITUDE 156/54/12.7W."	3	4764	
Y. "SHOAL SUBMERGED 15 1/4 FATHOMS AT LATITUDE 56/49/42.6N, LONGITUDE 156/53/25.1W."		2250 ⁺¹⁰	

DEPTHS ARE BASED ON PREDICTED TIDES AND REFERENCED TO MEAN LOWER LOW WATER. GEOGRAPHIC POSITIONS ARE BASED ON NAD83 DATUM. THE NOS CHART AFFECTED IS PRELIMINARY CHART 16548, 8TH EDITION, APR 29/89, 1:106,600.

THIS IS ADVANCE INFORMATION SUBJECT TO OFFICE REVIEW. A LETTER WITH ATTACHED CHARTLET WILL BE FORWARDED TO YOUR OFFICE TO CONFIRM THIS MESSAGE. QUESTIONS CONCERNING THIS MESSAGE SHOULD BE DIRECTED TO NOAA PACIFIC MARINE CENTER AT (206) 526-6835.

BT



CHIGINAGAK BAY

NAKALILOK BAY

CAPE KUTUYUKAK

CENTRAL I.

UGAIUSHAK I.

Preliminary Chart 16568
 6th Ed. April 29, 1989
 Scale 1:106,600

157° 00' 56° 55'

156° 55'

156° 50'

156° 45'

156° 50'

156° 45'

33000

100

80

72

73

82

77

71

40

33

22

14

11

21

26

16

14

21

24

28

32

36

40

44

48

52

56

60

64

68

72

76

80

84

88

92

96

100

104

108

112

116

120

124

128

132

136

140

144

148

152

156

160

164

168

172

176

180

184

188

192

196

200

204

208

212

216



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

NOAA Ship FAIRWEATHER
1801 Fairview Ave. East
Seattle, Washington 98102

August 19, 1986

TO: N/MOP - Robert L. Sandquist

FROM: Commanding Officer *J. W. Carpenter*
NOAA Ship FAIRWEATHER 5220

SUBJECT: Aerotriangulation Station and Shoreline Accuracy
for OPR-P180-FA-86

For project OPR-P180-FA-86, Southern Alaska Peninsula, FAIRWEATHER was supplied with 17 aerotriangulated hydrographic control stations (Job CM-8200, Cape Kilokak to Cape Kumlik, Alaska). This field season afforded the first opportunity to use some of the photogrammetric sites for hydrographic control.

To verify the location of station PR-12, launch critical system checks were accomplished using theodolite intersection. Differences of 15 to 20 meters from the Mini-Ranger baseline correctors were found. To verify other photo stations, a First-Order geodetic station (ASH) was occupied with horizontal angles (four-plate settings) turned from a First-Order station (PINA) to PR-72, PR-10, and PR-11. Using the computed distances from ASH to the aerotriangulated stations, differences between the observed and computed angles leads to positional errors of 17 to 18 meters (see Attachment A).

Third-Order, Class I positions were then determined for PR-12, PR-13, and PR-68. All three geodetic positions are approximately 18 meters west of the aerotriangulated positions (see Attachment A). This is the same error that was found with stations PR-72, PR-10, and PR-11, discussed above.

The majority of hydrography running west into the shoreline indicates that the high water line and ledge limits are west of where the shoreline manuscript depicts them. In many cases positive soundings are on or above the high water line. Comparison of detached positions on offshore rocks to the manuscript rock locations is difficult due to the rocks' large size and the launch orientation while taking the fix.

It is recommended that Job CM-8200 be reviewed as an 18-meter error to the east is suspected in both the aerotriangulated positions and the shoreline. FAIRWEATHER will not attempt to use any photogrammetric station positions from this project until the problem is resolved. Geodetic control has been extended south to Cape Providence as of this time.

It is felt that to best display manuscript data on the final field sheets all features from the manuscript (including shoreline) should be shifted 1.8 millimeters to the west before application to the final field sheets. As work is beginning on final field sheets H-10214 and H-10215, resolution

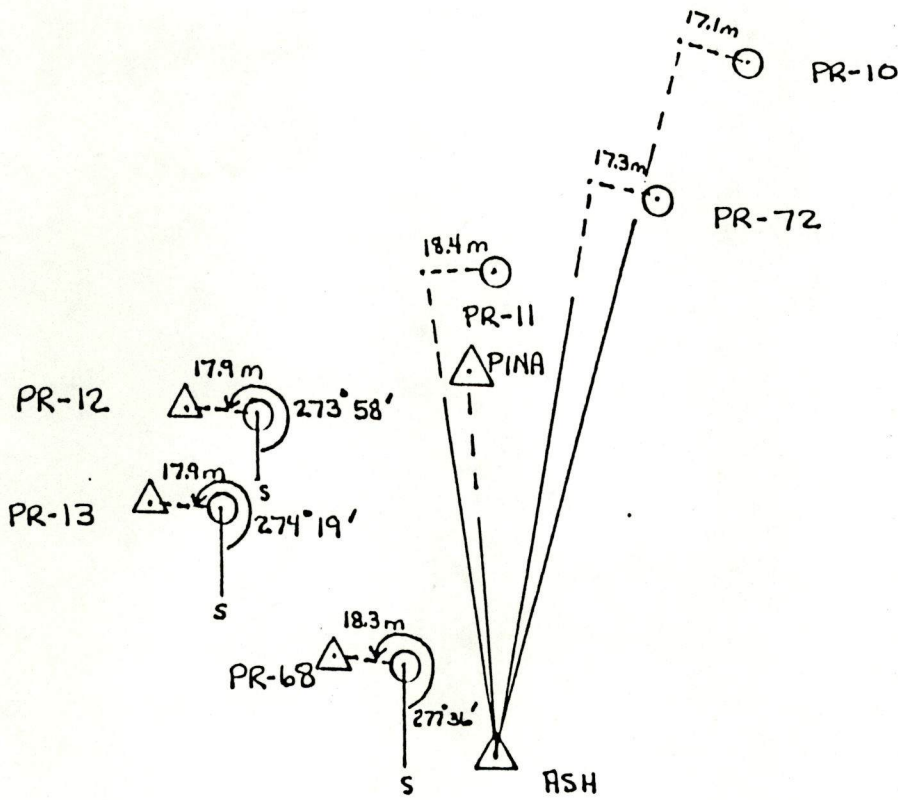
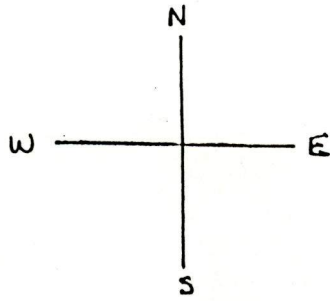


of this problem would be appreciated as soon as possible. If instructions have not been received before drafting is to begin, manuscript features will be shifted as described above.

Nautical Chart Branch may have an interest in knowing that the reference number method (PMC OORDER, Appendix P) was used for verifying the majority of alongshore manuscript rocks. Time and weather conditions will not permit obtaining detached positions on these rocks before the end of the field season.

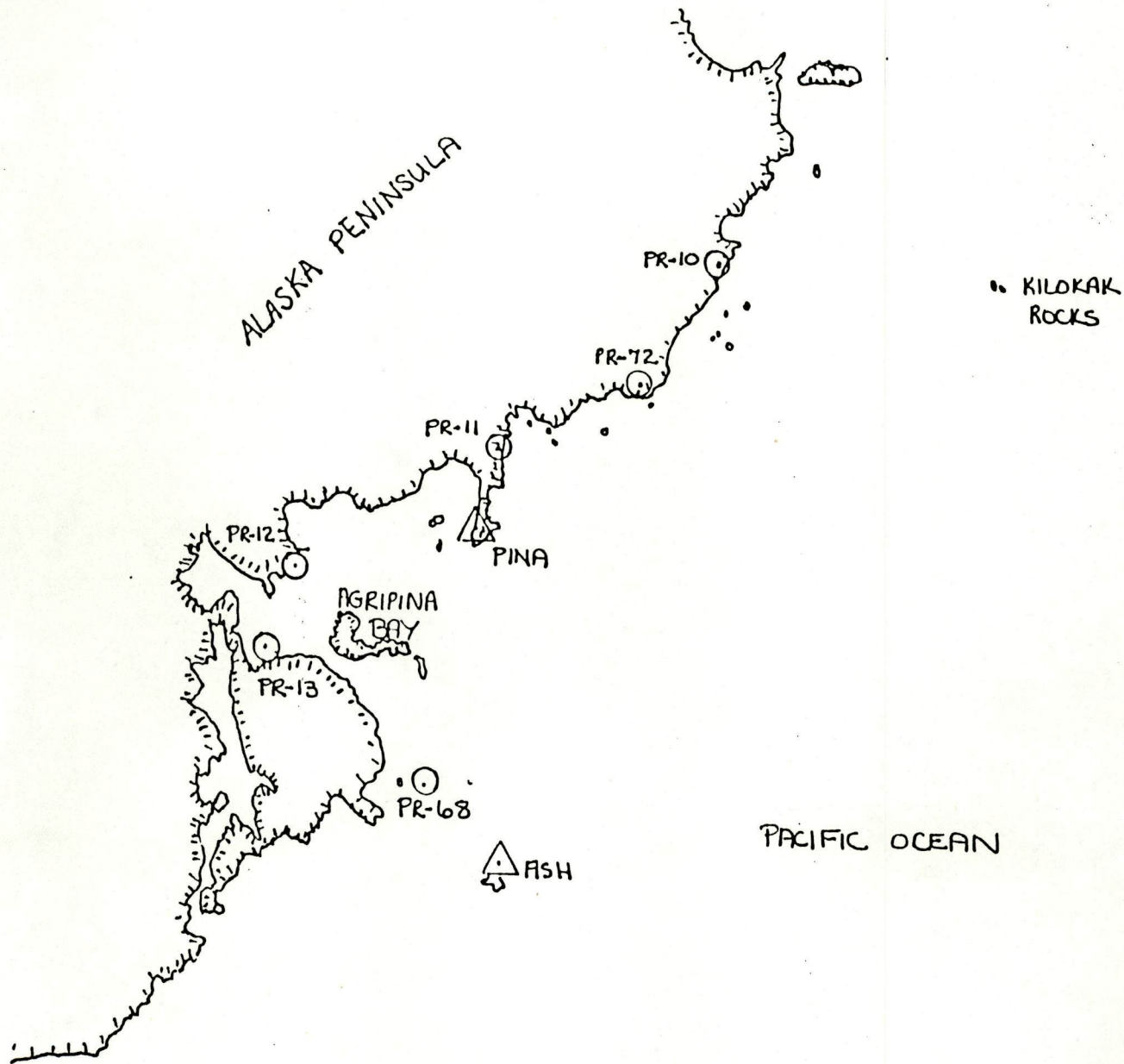
Attachments

ATTACHMENT A - Displacement of Stations



- ⊙ = Aerotriangulated Positions
- △ = Geodetic Positions

ANNEXMENT B - Station Locations





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

September 18, 1986

N/CG2311:PD

TO: N/MOP - Robert L. Sandquist

FROM: N/CG2 - J. Austin Yeager

SUBJECT: Aerotriangulation Stations and Shoreline Accuracy for
OPR-P180-FA-86

REF: Memorandum to N/MOP from Commanding Officer, NOAA Ship
FAIRWEATHER, Same Subject, dated August 19, 1986

The Commanding Officer, NOAA Ship FAIRWEATHER S220, has established that the control points furnished by the Aerotriangulation Unit, Photogrammetry Branch (PB), for Job CM-8200, Cape Kilokak to Cape Kumlik, Alaska, have a datum shift of approximately 18 meters. PB investigated this discrepancy and found it correct. When this project was bridged by aerotriangulation, the control points used were based on a 1948 geodetic adjustment. A new geodetic adjustment was performed in 1976. This adjustment caused a datum shift in longitude of approximately 1 second and .05 to .1 second in latitude.

Five geodetic control stations were selected from Job CM-8200 extending over the whole project. A comparison was made between the 1948 and 1976 adjustments.

<u>Station</u>	<u>1948 Adjustment</u>	<u>1976 Adjustment</u>	<u>Datum Shift</u>	<u>Meters</u>
Lagoon 1944	57°06'02.626" 156°30'28.250"	57°06'02.722" 156°30'29.290"	.096" 1.040"	2.97 17.50
Port 1944	57°00'40.699" 156°35'41.795"	57°00'40.792" 156°35'42.836"	.093" 1.041"	2.87 17.57
Yant 1944	56°50'45.505" 157°06'22.039"	56°50'45.579" 157°06'23.072"	.074" 1.033"	2.29 17.51
Sut 1925	56°34'17.611" 157°12'56.916"	56°34'17.673" 157°12'57.916"	.062" 1.000"	1.92 17.08
Lag 1954	56°40'38.729" 157°31'53.263"	56°40'38.779" 157°31'54.285"	.050" 1.022"	1.55 17.40



The mean value of this adjustment is 17.4 meters in longitude and 2.3 meters in latitude. This should be taken into consideration when applying these manuscripts.

A copy of this Memorandum will be inserted in each Descriptive Report for Job CM-8200.

cc:

- N/MOP21 - Richards ✓
- N/CG22 - Nortrup
- N/CG23 - Brewer
- N/CG24 - Matsushige



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SERVICE
 Pacific Marine Center
 1801 Fairview Avenue East
 Seattle, Washington 98102-3767

FW-11

OCT 8 1986

N/MOP21/TWR

RECEIVED

BY _____

OCT 20 1986

NOAA FAIRWEATHER (S220)
 Seattle, Washington

ca ju
↓
xo Rev
NRK
OP/CST

Action/SL

TO: Commanding Officer
 NOAA Ship FAIRWEATHER

Robert L. Sandquist

FROM: N/MOP - Robert L. Sandquist

SUBJECT: Aerotriangulation Stations and Shoreline Accuracy
 for OPR-P180-FA-86.

REF: NOAA Ship FAIRWEATHER Memorandum Dated 8/19/86 Same Subject

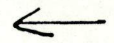
REF: N/CG2311 Memorandum Dated 8/19/86 Same Subject

The Photogrammetry Branch has determined that the shoreline map discrepancy reported by FAIRWEATHER was due to photogrammetry using geodetic control based upon a 1948 adjustment during aerotriangulation bridging rather than using the most recent 1976 adjustment. They recommend mean adjustment values of 17.4 meters in longitude and 2.3 meters in latitude be used when applying data from these manuscripts.

Your proposed solution of shifting all manuscript data 1.8 millimeters to the west before applying them to your 1:10,000 scale final field sheets is totally acceptable. The recommended values proposed by the Photogrammetry Branch will be used by the Nautical Chart Branch when compiling the smooth sheets for these surveys.

Further instructions for the future use of data from Job CM8200 will be contained in your 1987 project instructions for OPR-P180.

You are commended for your diligence in uncovering this discrepancy in the field. Well done.



w/Attachment (Ref. 2)
 cc: N/CG24
 N/MOP211



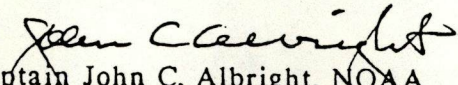


UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SERVICE

NOAA Ship RAINIER
 1801 Fairview Avenue East
 Seattle, Washington 98102

July 17, 1989

MEMORANDUM FOR: Rear Admiral Sigmund R. Petersen, NOAA
 Director, Pacific Marine Center

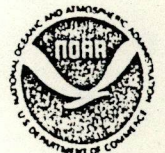
FROM: 
 Captain John C. Albright, NOAA
 Commanding Officer, NOAA Ship RAINIER

SUBJECT: New Edition Chart 16568

We recently received the new edition of Preliminary Chart 16568 which includes 1987 and previous survey data. A cursory comparison of the chart compilation with FAIRWEATHER field sheet H-10243 (1987) in the Cape Providence area raises several concerns. Either crucial survey data exists but was not shown on the final field sheet or excessive cartographic license was taken during chart compilation. The items below are numbered correspondingly on the attached copies of portions of Chart 16568 and survey H-10243.

1. Does a rock awash really exist at this location, as the chart indicates? Survey H-10243 shows only a least depth of 5.5 fathoms over a rock, as determined by divers. Last summer I selected a route into Chiginagak Bay which passed just south of this feature, between it and the 4-fathom shoal to the south, based on all information available on our copy of field sheet H-10243. Consequently, RAINIER has passed close aboard to this feature many times both last year and this, at various stages of tide. We've seen no evidence of a rock awash. The same is true of our launches and small boats working in the area. If this rock awash exists I will give this area a wider berth. If not, the chart should be revised to accurately portray the available depth.
2. The survey records need to be examined to determine if this feature really has a least depth of 4 1/4 fathoms, as charted. I suspect the true depth may be 14 fathoms. Close inspection of a mylar copy of the field sheet reveals that a "1" in front of the "4.2" may have been partially erased to make room for the hand-lettered "11.9." The sounding just to the west is 15.7 fathoms, the "1" just barely discernible on the mylar copy. Adding to my doubt is the absence of a dive investigation on this feature, even though a deeper sounding 0.4 n.m. west, 7.1 fathoms, was dove, and the fact that the feature was apparently not reported as a danger to navigation, as far as I can tell from the marginal notes. Also, the field sheet shows neither the 10- nor 5-fathom depth contours around this feature.

	<u>Chart</u>	<u>Survey H-10243</u>
3.	Rock Awash	Least depth 7.6 fathoms - dive
4.	Rock Awash	Least depth 2.5 fathoms - dive
5.	Rock Awash	Least depth 4.5 fathoms - dive



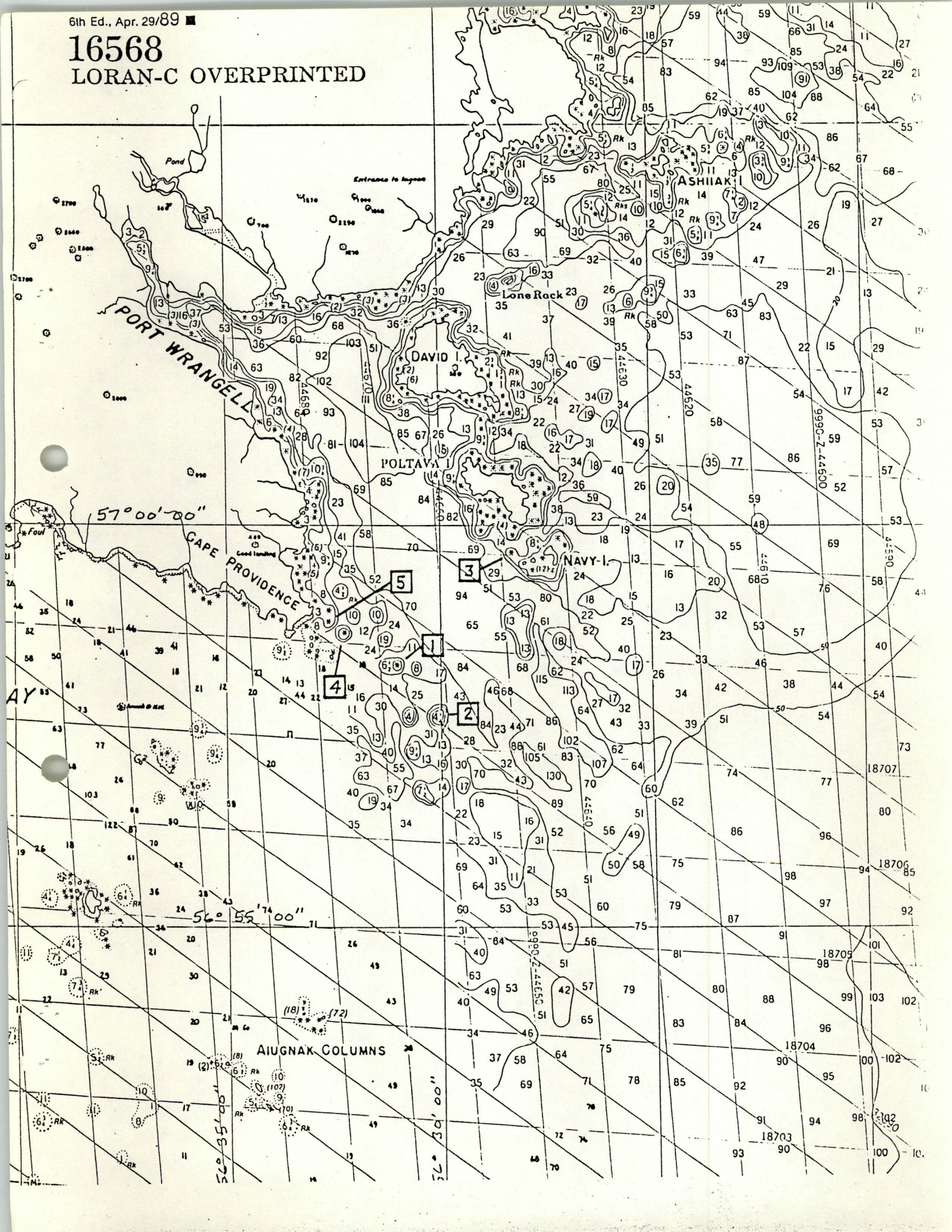
There are additional discrepancies of this nature near Cape Providence. I haven't examined other areas of the chart.

On a related issue, I'd appreciate knowing when the next edition of Preliminary Chart 16568, compiled with 1988 and 1989 data, is scheduled for publication so I can respond to inquiries from local users.

Attachments

16568

LORAN-C OVERPRINTED



PORT WRANGELL

DAVID I.

POLTAVA I.

NAVY I.

ASHIAK I.

Lone Rock

57° 00' 00"

CAPE PROVIDENCE

AY

56° 55' 00"

AIUGNAK COLUMNS

9990-Z-44500

9990-Z-44500

56° 30' 00"

18707

18706

18705

18704

18703

18702

18701

18700

18700

18700

18700

18700

18700



National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SERVICE
 OFFICE OF CHARTING AND GEODETIC SERVICES
 ROCKVILLE, MARYLAND 20852

RECEIVED
 AUG 21 1989
 PACIFIC MARINE CENTER

AUG 21 1989

**COPY FOR YOUR
 INFORMATION**

Action:	Date to MOP
PMC x 3	
Orig. x 3	CC XI
	CO, RA PMC
Initial P	
Remarks	

XO
 Foo
 Rtn co

MEMORANDUM FOR: Rear Admiral Sigmund R. Petersen, NOAA
 Director, Pacific Marine Center

FROM: *Christian Andreasen*
 Captain Christian Andreasen, NOAA
 Chief, Nautical Charting Division

SUBJECT: New Edition Chart 16568

We have not been able to determine how the rocks awash, referred to in your memorandum of July 17, 1989, came to be charted on the 6th edition of chart 16568. The most likely explanation is a misinterpretation of the labels "Rk" on the survey.

The final version of H-10243 will be reexamined prior to the publication of the next edition of chart 16568 and the chart will be brought into agreement with the survey. Chart 16568 is scheduled to be published in March or April 1990; a Notice to Mariners will be issued in the interim. Following the spring 1990 edition, the chart will be republished each year, as long as new surveys are available, then revert to its normal 8-year cycle.

CC:
 PMC RA - Albright



APPROVAL SHEET

Descriptive Report to Accompany

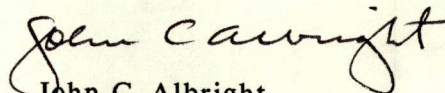
Hydrographic Survey

RA-10-4-89

H-10308

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
REVISED

DATE: Jan 23, 1990

MARINE CENTER: Pacific

OPR: P180

HYDROGRAPHIC SHEET: H-10308

LOCALITY: Alaska Peninsula, Gulf of Alaska, Radial Island
and vicinity

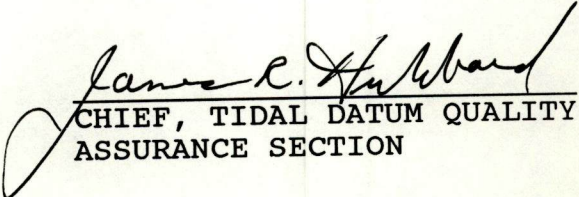
TIME PERIOD: June 25 - September 6, 1989

TIDE STATIONS USED: 945-8553 Ugaiushak Island, Ak
945-8522 Derickson Island, Ak

PLANE OF REFERENCE (MEAN LOWER LOW WATER):
945-8553 7.91 feet
945-8522 2.31 feet

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:
945-8553 9.2 feet
945-8522 9.3 feet

REMARKS: RECOMMENDED ZONING
For June data, apply a x0.99 range ratio to all
heights and a +0 hr 10 min time correction on
Derickson Island. For July thru September data,
zone direct on Ugaiushak Island.


CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

GEOGRAPHIC NAMES

Name on Survey ALASKA, ALASKA PENINSULA NORTH AND EAST OF UGAIUSHAK ISLAND	16568											
	A	B	C	D	E	F	G	H	K	Final Field Sheet		
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
ALASKA (TITLE)	X											1
ALASKA PENINSULA (TITLE)	X											2
RADIAL ISLAND									X			3
SHELIKOF STRAIT	X											4
UGAIUSHAK ISLAND	X											5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved:

Charles E. Huntington
Chief Geographer - NCG2x5

MAY 21 1990

HYDROGRAPHIC SURVEY STATISTICS

H-10308

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		9
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		6
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	2			2	
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

SHORELINE DATA

- SHORELINE MAPS (List):
- PHOTOBATHYMETRIC MAPS (List):
- NOTES TO THE HYDROGRAPHER (List):
- SPECIAL REPORTS (List):
- NAUTICAL CHARTS (List):

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			5273
POSITIONS REVISED			
SOUNDINGS REVISED			91
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS	119.5		119.5
VERIFICATION OF SOUNDINGS	241.5		241.5
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET	108.5		108.5
COMPARISON WITH PRIOR SURVEYS AND CHARTS		10.0	10.0
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		32.0	32.0
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	469.5	42.0
			511.5

Pre-processing Examination by D.J. Hill	Beginning Date	Ending Date 11/27/90
Verification of Field Data by T. Jones, E. Domingo	Time (Hours) 469.5	Ending Date 8/2/90
Verification Check by M. Sanders, J. Stringham	Time (Hours) 44.5	Ending Date 9/27/90
Evaluation and Analysis by A. Luceno	Time (Hours) 3.20	Ending Date 11/14/90
Inspection by D.J. Hill	Time (Hours) 4	Ending Date 11/26/90

EVALUATION REPORT

H-10308

1. INTRODUCTION

Survey H-10308 is a basic hydrographic survey accomplished by the NOAA Ship RAINIER under the following Project Instructions.

OPR-P180-RA, dated May 1, 1989
CHANGE NO. 1, dated May 5, 1989
CHANGE NO. 2, dated August 3, 1989

This survey occurred in Alaska, centered six nautical miles south of Cape Kuyuyukak in Shelikof Strait. The easternmost shore of Ugaiushak Island and Radial Island are within the survey area. The surveyed area extends from latitude $56^{\circ}45'00''\text{N}$ to latitude $56^{\circ}52'10''\text{N}$ and from longitude $156^{\circ}43'48''\text{W}$ to longitude $156^{\circ}51'10''\text{W}$. The bottom is regular and sloping except in the northeast quadrant where it is irregular. The area consists predominantly of mud, sand and shells. Depths in the surveyed area range from 0 to 86 fathoms.

Predicted tides for Kodiak, Alaska, reference station (945-7292) were used for the reduction of soundings during field processing. Approved hourly heights zoned from Derickson Island, Alaska, gage 945-8522, and Ugaiushak Island, Alaska, gage 945-8553, 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. The prorated correctors originating from the final baseline calibrations were not applied to the smooth sheet as recommended by the hydrographer. However, with the exception of positions 4000 and 4001 (dives), positional data plots within 0.5 mm at the scale of the survey. Positions 4000 and 4001 have been recomputed in the final listings and graphically revised on the smooth sheet. An accompanying computer printout contains the parameters and the correctors.

A digital file has been generated for this survey as required by the specifications contained in Hydrographic Survey Guideline No. 52, Standard Digital Data Exchange Format, April 15, 1986. 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, 1989, contain adequate discussions of horizontal control and hydrographic positioning.

Positions of horizontal control stations used during hydrography are 1988 and 1989 preliminary adjusted field and 1944 published values based on NAD 27. These values 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: +2.648 seconds (+81.9 meters)
Longitude: -7.371 seconds (-124.9 meters)

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

There are 53 weak fixes, angles of intersection less than 30 degrees or more than 150 degrees, noted in this survey. However, 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 and critical depths. These fixes are considered acceptable.

The southeastern shore of Ugaiushak Island shown on shoreline map TP-01156, photo date July 1982, Class III, is applicable to this survey. Radial Island, located by the hydrographer by taking detached positions along its perimeter, is shown in red on the smooth sheet.

3. HYDROGRAPHY

Except for the omission of the 0, 1, 2 and 3-fathom depth curves around Radial Island, 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-10308 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10281	1988	10,000	northeast
H-10301	1989	20,000	east
H-10304	1989	10,000	north
H-10305	1989	10,000	northwest
H-10314	1989	10,000	west

Adequate junctions with H-10301, H-10304, H-10305 and H-10314 have been satisfactorily effected and are complete. Soundings are in good agreement. Some soundings from these surveys have been transferred to the present survey to better portray the bottom in the common areas. The junction with survey H-10281 has not been formally completed since that survey was previously processed and forwarded for charting. The junction comparison was made using a copy. Soundings from survey H-10281 are in good agreement with survey H-10308. Some soundings from survey H-10281 were transferred to survey H-10308 to better portray the bottom.

There are no junction surveys covering the southern limit of the present survey. There are too few charted depths in this area to make a meaningful junctional comparison with the present survey.

6. COMPARISON WITH PRIOR SURVEYS

There are no prior surveys common to survey H-10308.

7. COMPARISON WITH CHART

Chart 16568, 6th edition, dated April 29, 1989; scale 1:106,000

a. Hydrography

The charted hydrography originates with Reconnaissance Survey BP39180 and is adequately discussed in section L of the hydrographer's report.

Survey H-10308 is adequate to supersede charted hydrography within the common area.

b. AWOIS

There are no AWOIS items originating from miscellaneous sources applicable to this survey.

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.

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 eight dangers to navigation from this survey to the USCG, DMAHTC and N/CG222. A copy of the message is attached. No additional dangers were discovered during office processing.

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10308 adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

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

Arsenio A. Luceno
Arsenio A. Luceno
Cartographer

APPROVAL SHEET
H-10308

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 disproval 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.

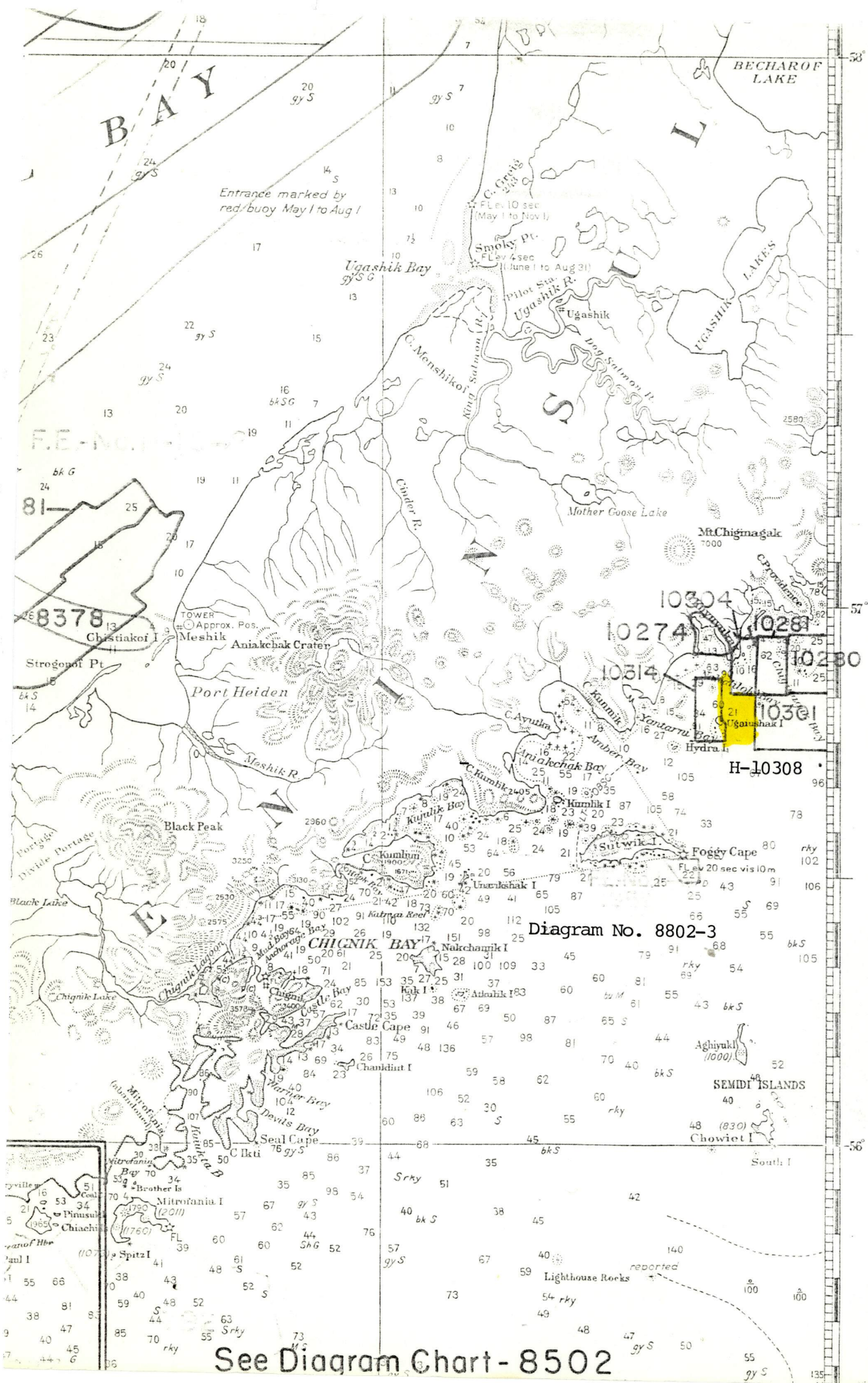
Dennis Hill Date: 11-26-90
Dennis J. Hill
Chief, Hydrographic Processing Unit
Pacific Hydrographic Section

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.

Pamela Chelgren-Koterba Date: 11/28/90
Commander Pamela Chelgren-Koterba, NOAA
Chief, Pacific Hydrographic Section

Final Approval

Approved: *Wesley V. Hull* Date: 2/15/91
Wesley V. Hull
Rear Admiral, NOAA
Director, Charting and Geodetic Services



See Diagram Chart - 8502

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10308

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
16568	12/11/89	ALMACEN	Full Part Before After Marine Center Approval Signed Via <i>partial application</i> Drawing No. <i>of sndgs. from field sheet.</i>
16568	11/6/90	ALMACEN	Full Part Before After Marine Center Approval Signed Via <i>full application of</i> Drawing No. <i>sndgs. from SS.</i>
530	1/10/91	<i>Alan P. Don</i>	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>No sndgs. or corrections applied.</i>
531	1/11/91	<i>Alan P. Don</i>	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>No sndgs. or corrections applied.</i>
500	1/14/91	<i>Alan P. Don</i>	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>No sndgs. or corrections applied.</i>
16013	4/3/91	ALMACEN	Full Part Before After Marine Center Approval Signed Via <i>full application of sndgs.</i> Drawing No. <i>from SS thru 16568.</i>
16011	4/24/91	ALMACEN	Full Part Before After Marine Center Approval Signed Via <i>Full application of sndgs.</i> Drawing No. <i>from SS thru 16013.</i>
16066	4/26/91	ALMACEN	Full Part Before After Marine Center Approval Signed Via <i>applied two sndgs</i> Drawing No. <i>(17, 29 fms) from SS thru 16013.</i>
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.

