9027

Diag. Cht. No. 9302 & 9380.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. OPR-483 *Office No.* H-9027

LOCALITY

State Alaska

General locality North Bering Sea

Locality Western Norton Sound

1968-69

CHIEF OF PARTY

H. D. Nygren & E. W. Richards

LIBRARY & ARCHIVES

DATE AUG. 1970

USCOMM-DC 37022-P66

9027

FORM C&GS-537
(8-15-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO.
H-9027

HYDROGRAPHIC TITLE SHEET

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.
OPR-483

State: Alaska

General locality: North Bering Sea

Locality: Western Norton Sound

Scale: 1:100,000 Date of survey: 19 June-18 Sept. 1968

Instructions dated: 21 May 1968; amended 24 July modified 26 July, 1968. 2 Aug 1968. Modified 13 Aug. 1968, & 29 Aug. 1968 Project No.: OPR - 483

Vessel: USC&GSS SURVEYOR

Chief of party: Harley D. Nygren, CAPT, USESSA and Eugene W. Richards, CAPT, USESSA

Surveyed by: Ship's personnel

Soundings taken by echo sounder, ~~hand lead, pole~~: DE-723

Graphic record scaled by: Ship's Personnel

Graphic record checked by: Ship's Personnel

Protracted by: Boat sheet Ship's Personnel Automated plot by: Smooth Sheet PMC

Soundings ~~penciled~~ inked by: Boat sheet Ship's Personnel - Smooth sheet soundings automated print by PMC

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

REMARKS: Velocity corrections are less than one half percent of the depth and are therefore not applicable. Tide and TRA corrections are to be applied by PMC for smooth sheet. Soundings inked on boat sheet are uncorrected (fathometer initial set at 18 feet).

Applied to tides 7/15/71

DJK

USC&GSS SURVEYOR

DESCRIPTIVE REPORT

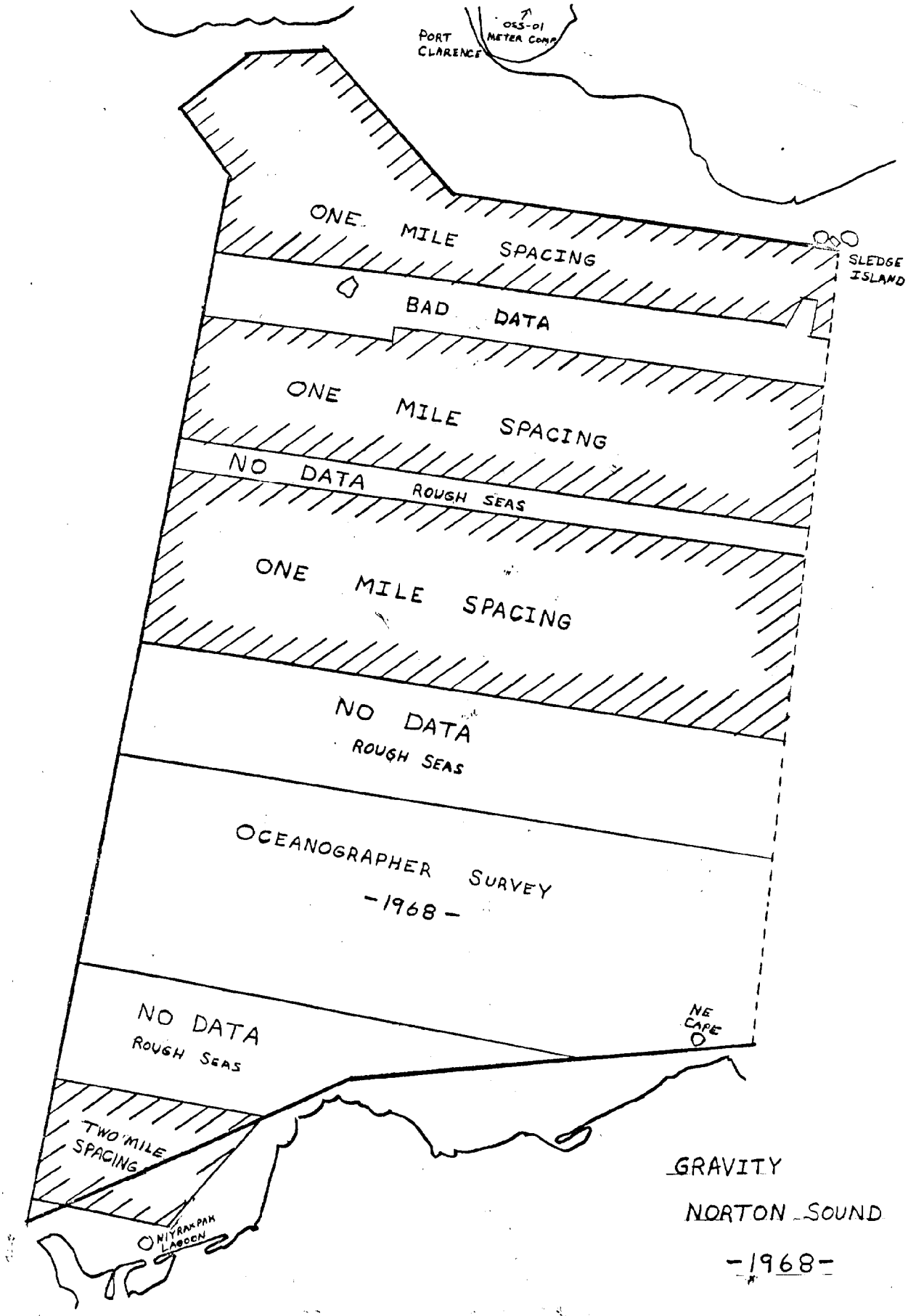
HYDROGRAPHIC SURVEY H-1-9020-9027
SCALE 1:100,000

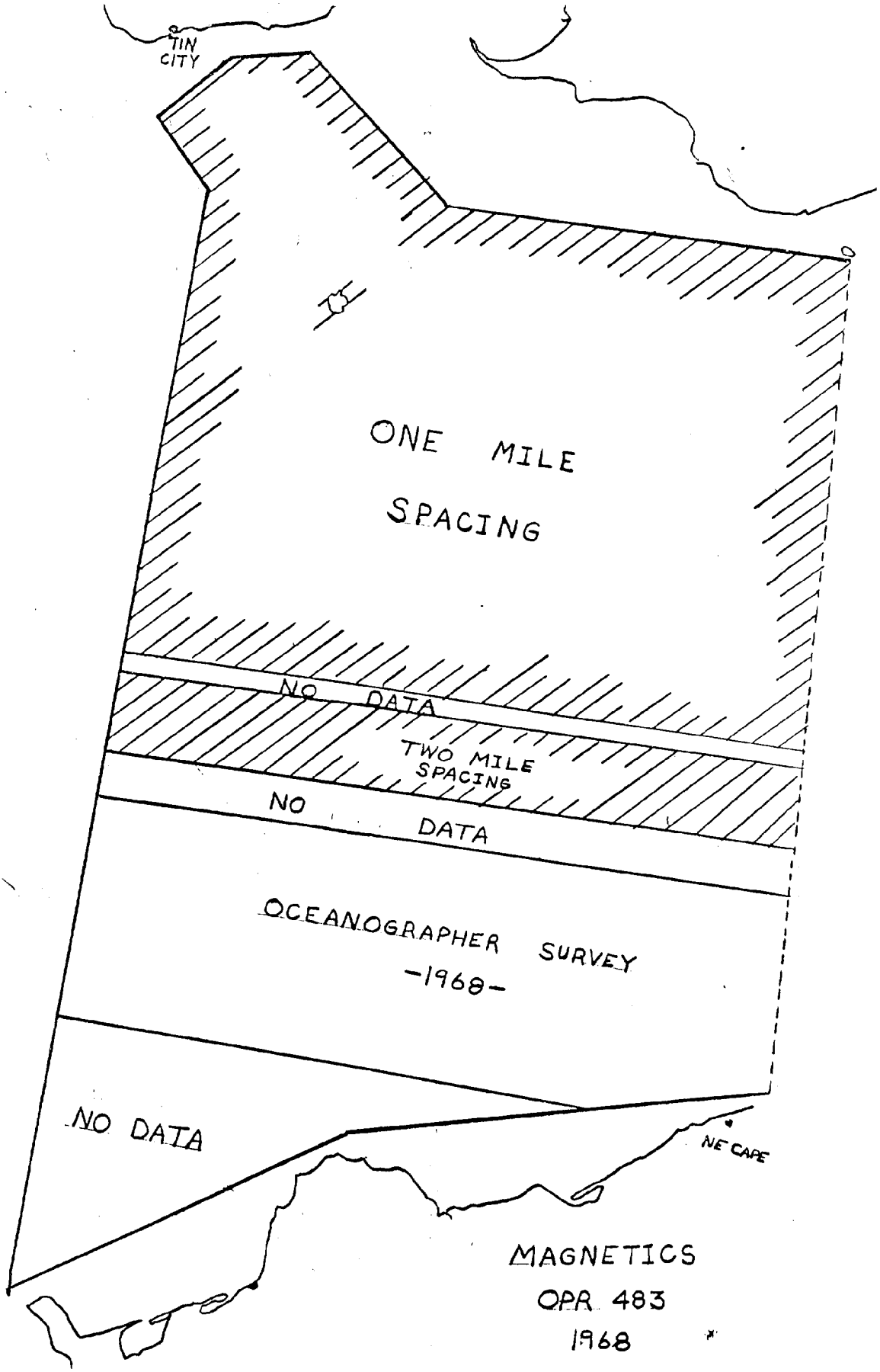
OPR-483
SUMMER 1968

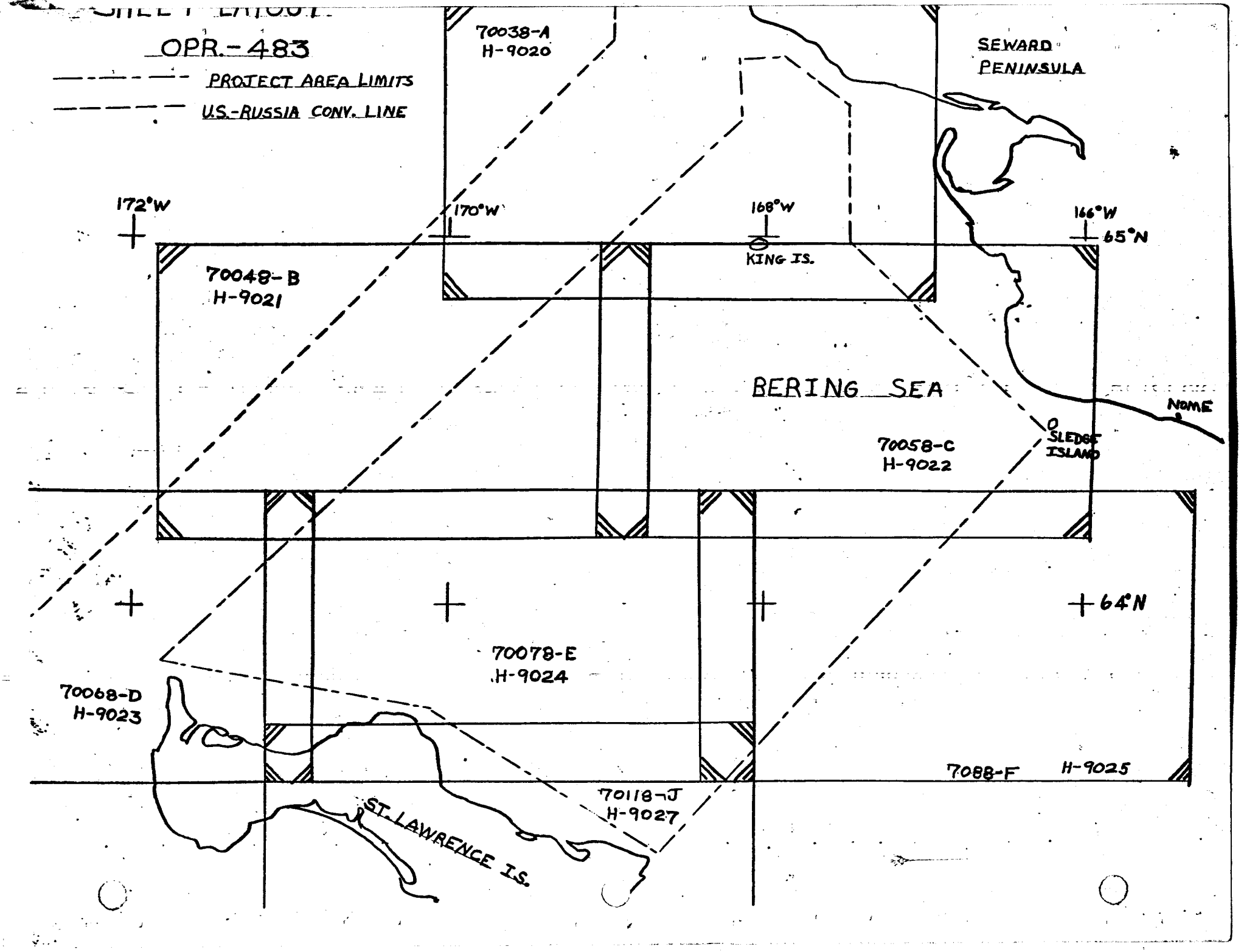
H. D. Nygren
Commanding

Eugene W. Richards
Commanding

Annex G.


PORT CLARENCE
OSS-01 METER COMP
ONE MILE SPACING
SLEDGE ISLAND
BAD DATA
ONE MILE SPACING
NO DATA ROUGH SEAS
ONE MILE SPACING
NO DATA ROUGH SEAS
OCEANOGRAPHER SURVEY -1968-
NO DATA ROUGH SEAS
NE CAPE
TWO MILE SPACING
NIYRAKPAK LAGOON
GRAVITY
NORTON SOUND
-1968-


TIN CITY
ONE MILE SPACING
NO DATA
TWO MILE SPACING
NO DATA
OCEANOGRAPHER SURVEY
-1968-
NO DATA
NE CAPE
MAGNETICS
OPR 483
1968


SHEET LAYOUT
OPR.-483
PROJECT AREA LIMITS
U.S.-RUSSIA CONV. LINE
70038-A
H-9020
SEWARD
PENINSULA
172°W
170°W
168°W
166°W
65°N
KING IS.
70048-B
H-9021
BERING SEA
NOME
SLEDGE ISLAND
70058-C
H-9022
64°N
70078-E
H-9024
70068-D
H-9023
7088-F
H-9025
70118-J
H-9027
ST. LAWRENCE I.S.

A. PROJECT

This survey was accomplished pursuant to Project Instructions for OPR-483, issued by the Director, Pacific Marine Center, dated 21 May 1968, and amended on 24 July 1968. Further correspondence modified these instructions in letters from C.O. SURVEYOR to Director, Pacific Marine Center on 26 July and 13 August 1968, and in letters from the Director, Pacific Marine Center to C.O. SURVEYOR on 2 August and 29 August 1968.

B. AREA SURVEYED

The project area surveyed occupies the portion of the Bering Sea lying between St. Lawrence Island, Tin City, and Sledge Island. The western limit of the first priority area of the Project Instructions lies approximately parallel to, and 15-25 miles east of, the United States - Russian Convention Line of 1867. Eastern limits of the project area can be approximated by a line drawn between Sledge Island and Northeast Cape, St. Lawrence Island.

The survey conducted in 1968 made junctions with the following prior surveys:

H-8558 and H-8559, 1:160,000 - 1960
H-7840, 1:40,000 - 1950
H-7849, 1:20,000 - 1950
H-7835, 1:20,000 - 1950
H-7912, 1:20,000 - 1951

As all sheets covered in OPR-483 are considered one survey, there are no contemporary surveys.

A reconnaissance survey, SU/SP-1-68, was run in an area one mile ENE of Sledge Island in search of the wreck described on page 271 of the Coast Pilot 9.

C. SOUNDING VESSEL

The sounding vessel for 95% of the survey was the USC&GSS SURVEYOR, whose work is identified by purple position numbers. The OCEANOGRAPHER's work is shown in red on the original sheet.

Launch Number 4 of the SURVEYOR ran the reconnaissance survey off Sledge Island; purple position numbers were used for this work.

D. SOUNDING EQUIPMENT

Sounding equipment was DE-723 Fathometers Numbers 138, 243, and 147. Fathometers were switched as necessitated by paper changes, sheet changes or failure of one of the units. The two common problems with the fathometers during OPR-483 were double traces and bad paper drive. Occasionally the records were spotty.

DE-723 Number 937 was used in Launch 4.

Corrections to echo soundings fall into three categories. Velocity corrections were determined from three series of Nansen casts and calculated by the method described in Section 5-117 of the Hydrographic Manual. They were found to be less that one half percent of the depth and therefore not applicable. TRA corrections were compiled from draft, initial, leadline comparisons, fine arc and A and F scale check corrections. All tide corrections will be applied at Pacific Marine Center after determination of reference planes by the Rockville Office.

E. SMOOTH SHEET

Boat sheet projections were made at Pacific Marine Center. Points were printed by the Gerber Plotter, latitiude and longitude lines and Raydist arcs were hand drawn on the sheets. After the final computation of Raydist calibration data, the maximum probable error in positioning should not exceed a 1/2 lane width.

Boat sheets furnished by Pacific Marine Center were used aboard the SURVEYOR for this project during this survey. The positions were plotted and soundings inked without any corrections applied to the soundings. The corrections applied to the Raydist positions were determined as the work progressed when possible. Sometimes, because of inexperienced Raydist operators, small corrections in lanes lost were missed. If a position didn't vary over four lanes, it was not replotted. These areas were all checked and a

F. CONTROL

Raydist control was used for the entire survey. Calibrations were made with three-point sextant fixes and a check angle when possible. The Raydist control is the subject of a Special Report - Raydist Corrections, Norton Sound, Alaska, OPR-483, 1968, which is a section of this Annual Report.

Three Raydist stations were set up around the project area. The red master station, PERRY 1968, was located on Sledge Island. The green remote station, OOSIK 1968, was at Tin City, and the purple remote station, DEL 1968, was set up at Northeast Cape, St. Lawrence Island. All three stations were located by second order, Class II, triangulation. Exact methods of triangulation are described in detail in the Special Report: Triangulation and Reconnaissance; which is also included in this overall report.

Hydrographic signals used for calibration were located by second order triangulation and third order traverse.

Visual control was used for the Sledge Island Reconnaissance survey.

G. SHORELINE

No inshore work was done on OPR-483 this season. While running hydrography close to King Island, radar distances and visual bearings taken off the island did not agree with distances from Raydist plot. These discrepancies were investigated; the layouts of King Island on Charts C&GS 9369 and 9380 were compared with Army Map Service air photo #13148. The comparison with the photo shows that the shape and orientation of King Island as shown on the above charts is incorrect. This discrepancy is the subject of a Memorandum from C.O. SURVEYOR, to Chief, Marine Chart Division, through Director, Pacific Marine Center, dated 14 September 1968.

The two small islets or high water rocks depicted on Charts C&GS 9369 and 9380 lying just southwest of King Island were not observed when the SURVEYOR was within a third of a mile of their charted position. It is very probable that they do not exist as charted, but could be rocks awash or sunken. They are not on the air photo of King Island.

H. CROSSLINES

Approximately 20% of the hydrography completed was run as crosslines. Comparison of uncorrected soundings at line crossings of the SURVEYOR's work was good. The maximum difference in soundings was three feet, although it was rarely more than two feet. The differences in soundings are most pronounced just prior to and just after fueling trips to Dutch Harbor. Fueling increases the draft of the SURVEYOR by over two feet. It is expected that when the TRA corrections are applied to soundings that the discrepancies at line crossings will be minimal.

Lines run by the SURVEYOR crossing the OCEANOGRAPHER's work produced more serious discrepancies. On the average, the SURVEYOR's soundings were five feet deeper than those of the OCEANOGRAPHER. There are two possible reasons for these differences. The first is that neither ship applied corrections to the raw soundings prior to plotting them on the boat sheets. A larger part of the discrepancies should be resolved when TRA and tide corrections are applied to soundings. The second reason is that the differences in control between the two ships could be responsible. The OCEANOGRAPHER was forced to rely upon Loran C and satellite navigation for much of her work, as it was impossible for both ships to use Raydist at the same time. Loran C accuracy in the area the OCEANOGRAPHER was working is 1/3 of a mile at best and probably closer to 1/2 mile. The SURVEYOR's Raydist accuracy in the same area was within 1/2 lane. This fact, coupled with the knowledge that when the two ships were lying alongside each other in Port Clarence, their soundings were exactly the same, leads to the conclusion that discrepancy in soundings at the crosslines arise from both a control problem and difference in TRA and tide corrections.

I. JUNCTIONS

Lines were run continuously during the survey without regard to sheet boundaries. An overlap of one fix interval, five minutes, was plotted whenever sheets were changed. Thus, the last two or three soundings on a given line prior to a sheet change were always the same as the first two or three soundings on the next sheet. This practice was responsible for the excellent junctions among the several sheets.

J. COMPARISON WITH PRIOR SURVEYS

Comparison of the OPR-483 work with the classified surveys H-8558, and H-8559, 1:160,000, 1960, is good.

Comparison with the work done in 1950; H-7835, 1:20,000, H-7840, 1:40,000 and H-7849, 1:20,000, indicates that the SURVEYOR's soundings range from 0 to four feet deeper than those indicated on the old surveys. Comparison with H-7912, 1:20,000, 1951, shows that the SURVEYOR's soundings average about two feet deeper than the smooth plotted soundings of the PIONEER.

The main reason for the differences in soundings is that the SURVEYOR's work at the time of comparison had not been corrected for tides or TRA corrections. Minor differences could be due to control, and to changing bottom configurations, although control for all surveys was good.

The wreck protruding 44' shown on H-7835 as being about one nautical mile east-northeast of Sledge Island was searched for on a special reconnaissance survey, SU/SP-1-68. No evidence of the wreck was found; a least depth of 18 feet was found in the general area. This information has already been published in the "Notice to Mariners". The wreck should be delted from Charts 9303 and 9380 as shown and an 18 foot shoal sounding with submerged wreck symbol shown.

K. COMPARISON WITH THE CHART

No new dangers to navigation were found during the course of the project. The only differences from the charts discovered have to do with King Island, discussed in section G and the wreck off Sledge Island, discussed in section J. The affected charts for King Island are C&GS 9369, 1st edition 11/25/57, revised 4/30/62 and 9380, 8th edition, 9/18/67. Charts showing the wreck near Sledge Island are C&GS 9380 and 9302, 20th edition 6/13/66.

L. ADEQUACY OF SURVEY

The first priority area was the only area surveyed during the summer of 1968. Although not entirely covered by the one-mile spacing required by the Project Instructions, the survey

is considered adequate for normal charting. One mile spacing was carried from the northeastern limits of the project area to a line between 64°39.3'N, 169°46.5'W, and 63°45.7'N, 167°39.0'W, comprising approximately 60% of the first priority area. An area roughly equivalent to 10% of the survey lying just north of St. Lawrence Island was also covered at one mile spacing through a combination of the SURVEYOR's and OCEANOGRAPHER's work. The remaining area was run at two mile spacing. One three mile split was left along a portion of the southwest limits of the one mile spacing. Crosslines were run throughout the entire area, except the portion lying between Sledge Island, King Island and Cape Rodney, and Cape Douglas.

M. AIDS TO NAVIGATION

Two aids to navigation were located during the summer of 1968; the Point Spencer Light and the new Sledge Island Light. The new Sledge Island Light, 64°29'4905"N, 166°11'46.21"W, is located near the old light and sits on the standard frame base with orange and white checkered sides. The Point Spencer Light, 65°16'40.67"N, 166°50'47.04"W, also sets on a frame structure with three sides covered by orange and white checkered wood and the south side open.

N. STATISTICS

Nautical miles of hydrography	8805
Nautical miles of magnetics	7676
Nautical miles of gravity	6014
Positions	8079
Square miles of hydrography	8931
Tide stations established	4
Current stations	4(2 lost, 1 found adrift)
Oceanographic stations	22
Launch statistics	16

O. MISCELLANEOUS

Several unusual submarine features were found in the project area. Sheet 70038-A contains a group of three submarine canyons with two intervening ridges, and part of a delta.

Two of the canyons flow north or northwest along either side of King Island. The third canyon flows northwest along the eastern limits of hydrography, then turns west, deepens, and joins the large canyon running just east of King Island. There are several places in the canyon bottoms favorable to the concentration of heavy mineral and the formation of placer deposits. A delta-like feature extends southwest into the project area from the approximate location of York, Latitude 65°30'N, Longitude 167° 40'W.

On sheet 70058-C, the major canyon lying east of King Island continues uphill, bifurcating near the top center of the sheet. One arm of the canyon runs southeast towards Sledge Island, the other continues south-southeast to the south edge of the sheet. The canyon west of King Island runs south and joins with the west arm of the other canyon. Contours indicated that the submarine canyon split to run on either side of King Island. Another canyon appears on the western edge of the sheet, also draining northward. A fifteen foot depression located eight miles southwest of Sledge Island might be favorable to the concentration of heavy minerals.

Other sheets show a fairly regular bottom with no unusual features, except on 70078-E. The area east of Savoonga and north of Stolbi Rocks, St. Lawrence Island contains a sharp ridge jutting east-northeast from the old village Kookoolik. Two miles southeast of the ridge is a depression over thirty feet deep, and there is a small mound rising thirty feet above the surrounding area. The depression is the most likely place for heavy mineral concentration discovered along the north shore of St. Lawrence Island.

P. RECOMMENDATIONS.

This survey is considered adequate for charting in its present form. Additional work could be done in the areas of two-mile line spacing and inshore areas favorable to the concentration of heavy minerals should be sampled and, if deposits are found, developed further.

Placing a single whip antenna atop the forward mast for Raydist reception solved the reception problem experienced

by the SURVEYOR in 1960. Other problems exist with the Raydist, however. The SURVEYOR's Electronics Officer reports that: "Contrary to previous statements by Hastings-Raydist Company, dual ship operations were found to be impossible using present range-range Raydist equipment. The second ship transmitter-receiver could not discern its 450 hertz signals from the 350 hertz signals of the SURVEYOR".

The Raydist Printout rarely worked well. Considerable time and effort could be saved if the lane count could be punched directly on a tape every minute, along with the lane corrections. If this portion of the survey was automated, only one QMS instead of the present two would be necessary to the operation. Minute by minute lane counts could be read directly into the computor instead of having to be transferred from the "grocery tape". It is realized that a new unit to put Raydist lane counts directly onto the tape would have to be designed and built, and that the computor at Pacific Marine Center would need a new program to handle the data. The effect involved in these operations would be well spent in order to save time, problems, and money aboard ship.

If Raydist stations are set up in the same places next year, back up generators should be supplied at Tin City and Northeast Cape. Calibration buoys should be lighted, better anchored and used more extensively for calibration purposes. Calibration areas should be re-erected at Pt. Spencer, Gambell, Northeast Cape, Sledge Island, Niyrakpak Lagoon and possibly Nome. Sheets on a 1:20,000 scale should be provided for all calibration areas.

In order to facilitate geodetic work in the 1969 season, both levels and one of the T-2's on board should be reworked. Three operational electrochains should be obtained. The remaining T-sheets of St. Lawrence Island, as well as those east and west of Nome should be acquired.

Three of the four current buoys planted evidently broke free of their moorings. In the future, heavier wire, at least 3/8 inch cable, should be used for anchoring. Two of the buoys and three current meters were lost. There is a possibility that Buoy #3 sank, and it should be dragged for.

The present Coast Survey vehicle in Nome, a 26 year old Jeep stored with the Weather Bureau, cannot be relied upon to last another season. A new four wheel drive, four-door pick-up truck should be obtained from GSA for use in the Nome area.

Finally, the importance of a helicopter to the SURVEYOR's work in 1969 cannot be overemphasized. A helicopter would save many thousands of dollars in ship time during the season.

Q. REFERENCES TO REPORTS

Special Reports:

Triangulation and Reconnaissance.
Correction to Echo Soundings.
Magnetics and Gravity.
Raydist Corrections.
Helicopter support OPR-483.
SU/SP-1-68.

List of Records:

Forwarded to Alaska Field Director, Anchorage, Alaska, 6/24/68, Transmittal Letter SU-59-68:

1 Special Report: Inspection and Servicing of Tide Gage and Seismic Sea Wave Detector, Unalaska, Alaska, June 19-20, 1968".

1 "Leveling Record-Tide Station" (Form 258).

Forwarded to Pacific Marine Center 7/27/58, Transmittal Letter SU-71-68:

1 Magnetics effects of USC&GSS SURVEYOR, graph on tracing cloth.

Forwarded to Pacific Marine Center 7/27/68, Transmittal Letter SU-72-68:

8 Packets of correspondence on magnetometer test results.

Forwarded to U.S. Geological Survey, Nome, Alaska, 8/5/68, Transmittal Letter SU-73=68:

21 Top and bottom samples.

1 Plastic bag with sample.

1 Cloth bag with sample.

Forwarded to Currents Division, C&GS, Rockville, Md, 9/20/68, Transmittal Letter SU-77-68:

2 Film, Geodyne current meter, station 5.

2 Film, Geodyne current meter, station 1.

4 Current meter data log sheets.

Forwarded to Pacific Marine Center 10/18/68, Transmittal Letter SU-83-68:

32 Rolls, magnetics and gravity punch tape.

32 Magnetics printouts.

1 Roll, magnetometer test reading.

1 Roll, gravity anchor reading.

9 Rolls, magnetic analog records.

Forwarded to Pacific Marine Center 10/18/68, Transmittal Letter SU-84-68:

6 Bundles, gravity graphic records.

6 Bundles, gravity short period hams.

6 Bundles, gravity long period hams.

Forwarded to Pacific Marine Center 10/18/68, Transmittal Letter SU-86-68:

8 Bundles fathograms.

Forwarded to Pacific Marine Center 10/18/68, Transmittal Letter SU-87-68:

8 Corrector tape printouts.

14 Rolls, raw data punch tape.

Forwarded to Pacific Marine Center 10/18/68, Transmittal Letter SU-88-68:

10 Boat sheets; A,B,C,D,E,F,G,H,I,J,J,K

Forwarded to Pacific Marine Center 10/18/68, Transmittal Letter SU-89-68:

4 Bundles Raydist printouts.

8 Rolls corrector tapes.

1 Roll TRA tape.

1 Bundle rejected data.

383 Raydist plotting abstracts.

1 Calibration record book.

Forwarded to Pacific Marine Center 10/23/68, Transmittal Letter SU-90-68:

16 Rolls marigrams

9 Leveling Records (Form 258).

12 Tide Station Reports (Form 681)

22 Tide Hourly Heights (Form 362)

Forwarded to Pacific Marine Center 10/23/68, Transmittal Letter SU-91-68:

1 TRA printout.

4 Bundles, raw data tape printouts.

Forwarded to Pacific Marine Center 10/23/68, Transmittal Letter SU-92-68:

1 Leveling record, Unalaska (Form 258)

Forwarded to Pacific Marine Center 11/12/68, Transmittal Letter SU-99-68:

2 Folders, Special Report - Raydist Correctors.

TIDE NOTE

Upon arrival at Dutch Harbor, 19 June 1968, the tide gage was checked and found to be operating satisfactorily. Levels were run. The seismic Seaway System was repaired. On 9 September 1968, the tide staff was re-established due to construction on the pier and levels were run. The tide gage was then removed, later to be replaced by the Alaska Field Director.

Four bubbler 0-20 foot tide gages were established around the periphery of the project area. Locations of the stations are as follows:

Niyrakpak Lagoon St. Lawrence Island	67° 37.6' N 171° 23.1' W
Northeast Cape St. Lawrence Island	63° 19.7' N 168° 55.0' W
Port Clarence Point Spencer	65° 15.4' N 166° 50.8' W
Nome	64° 30.0' N 165° 25.8' W

Gage	Established	Re-Established	Removed	Days of Operation
Nome	23 Jun '68		19 Sep '68	62
N.E. Cape	30 Jun '68	2 Sep '68	6 Sep '68	56
Niyrakpak Lagoon	11 Jul '68		20 Sep '68	44
Point Spencer	3 Jul '68	23 Jul '68	25 Aug '68	54

Because of clock malfunction, the gage at Nome was replaced. The orifice or staff was not moved. The tide staffs at Northeast Cape and Point Spencer were replaced due to storm action.

The gage at Nome was attended by ship's personnel. The gage at Northeast Cape was attended by shore party personnel and the gage at Point Spencer by Coast Guard personnel. The gage at Niyrakpak Lagoon was attended by ship's personnel when convenient. The gage at Niyrakpak Lagoon was never checked during a complete cycle. After removal, the clock was tested aboard ship and the results were forwarded with the marigrams.

All tide stations are in the 150°W, +10 time zone. Datum levels have yet to be determined by the Washington Office, Pacific Marine Center will decide where to use the information from each gage and will apply all tide corrections to soundings.

Tide data was sent to Pacific Marine Center on 23 October 1968 under cover of Transmittal Letter SU-90-68.

CURRENT NOTE

Under the Project Instructions, 5 current stations were assigned. Four were two meter stations with a meter at 20 feet and at near bottom and one with a single meter at 20 feet.

Four current stations were observed; they were:

Station	No. of Meters	Latitude	Longitude	Established	Removed	Days Oper.
1	2	63°24.7'	168°27.8'	14 Jul '68	11 Aug '68	26
2	1	64°12.4'	168°05.5'	15 Jul '68		
3	2	65°02.5'	167°43.7'	14 Aug '68		
5	2	64°22.0'	165°28'	16 Aug '68	6 Sep '68	22

Buoy number 1 was recovered 26 miles from where it had been planted. The anchor wire had parted, possibly due to storm action. Buoy's number 2 and 3 were never recovered. They either sank or broke loose.

The 120" current buoys were anchored with 200 pound Danforth anchors. thirty feet of 1¼ inch wire with a scope at 1.5.

It is recommended that for future use, the buoys be anchored with wire larger that ¼". Better radar reflectors on the buoys would aid in their recovery. A small radio transmitter might be installed on the buoy, activation upon parting of the anchor wire to enable the ship to home in on the buoy with the RDF.

Exposed film and meter records were sent to Pacific Marine Center on 19 September 1968 under cover of Transmittal Letter SU-77-68.

ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS

Velocity corrections are less than one half percent of the depth and are therefore not applicable.

The Special Report on Corrections to Echo Soundings, OPR-483, Summer 1968, describes the computations of all corrections to echo soundings.

An abstract of the TRA corrections is included in this report.

TRA CORRECTIONS - OPR-483

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
7/23	2025	21	18.0	18.4	+0.4	-0.4	0.0	205
	2047	25	17.9	18.4	+0.5		+0.1	
	2119	32	18.0	18.4	+0.4		0.0	
7/24	0000	69	18.0	18.3	+0.3		-0.1	206
	1310	172	18.1	18.3	+0.2		-0.2	
	1620	215	18.2	18.3	+0.1		-0.3	
	2118	246	18.0	18.3	+0.3		-0.1	
	2121	247	17.9	18.3	+0.4		0.0	
	2125	248	17.8	18.3	+0.5		+0.1	
	2129	249	17.7	18.3	+0.6		+0.2	
	2130	249	18.0	18.3	+0.3		-0.1	
7/25	0510	276	18.0	18.2	+0.2		-0.2	207
	0519	279	18.1	18.2	+0.1		-0.3	
	0528	281	18.2	18.2	0.0		-0.4	
	0537	282	18.3	18.2	-0.1		-0.5	
	0546	284	18.4	18.2	-0.2		-0.6	
	0555	286	18.5	18.2	-0.3		-0.7	
	0604	288	18.6	18.2	-0.4		-0.8	
	0612	290	18.7	18.2	-0.5		-0.9	
	0835	291	18.0	18.2	+0.2		-0.2	
	1023	311	17.9	18.2	+0.3		-0.1	
	1030	312	17.8	18.2	+0.4		0.0	
7/26	0655	320	18.0	18.1	+0.1		-0.3	208
	0745	331	17.9	18.1	+0.2		-0.2	
	0753	333	17.8	18.1	+0.3		-0.1	
	0754	333	18.0	18.1	+0.1		-0.3	
	2000	464	17.3	18.1	+0.8		+0.4	
	2022	468	18.0	18.1	+0.1		-0.3	
	2122	478	18.1	18.1	0.0		-0.4	
	2202	486	18.2	18.1	-0.1		-0.5	
	2252	496	18.3	18.1	-0.2		-0.6	
	2342	504	18.4	18.1	-0.3		-0.7	
7/27	0032	512	18.5	18.0	-0.5		-0.9	209
	0103	517	18.6	18.0	-0.6		-1.0	
	0108	518	18.0	18.0	0.0		-0.4	
	0210	528	17.9	18.0	+0.1	-0.4	-0.3	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
7/27	0358	550	18.0	18.0	0.0	-0.4	-0.4	209
	0645	580	17.9	18.0	+0.1		-0.3	
	0705	584	17.8	18.0	+0.2		-0.2	
	0725	588	17.7	18.0	+0.3		-0.1	
	0745	592	17.6	18.0	+0.4		0.0	
	0805	596	17.5	18.0	+0.5		+0.1	
	0810	597	17.4	18.0	+0.6		+0.2	
	1113	599	18.0	18.0	0.0		-0.4	
	1630	642	18.1	18.0	-0.1		-0.5	
	1700	648	18.2	18.0	-0.2		-0.6	
	1725	653	18.1	18.0	-0.1		-0.5	
	1750	658	18.0	18.0	0.0		-0.4	
	1810	662	17.9	18.0	+0.1		-0.3	
	1825	665	17.8	18.0	+0.2		-0.2	
	1826	666	18.0	18.0	0.0		-0.4	
	1945	681	18.1	18.0	-0.1		-0.5	
	2100	696	18.2	18.0	-0.2		-0.6	
	2321	706	18.3	18.0	-0.3		-0.7	
	2322	707	18.0	18.0	0.0		-0.4	
7/28	0000	714	18.1	17.9	-0.2		-0.6	210
	0008	716	18.0	17.9	-0.1		-0.5	
	0215	739	18.1	17.9	-0.2		-0.6	
	0235	744	18.2	17.9	-0.3		-0.7	
	0239	744	18.0	17.9	-0.1		-0.5	
	1515	850	18.1	17.9	-0.2		-0.6	
	1605	860	18.2	17.9	-0.3		-0.7	
	1710	873	18.3	17.9	-0.4		-0.8	
	1815	886	18.4	17.9	-0.5		-0.9	
	1850	894	18.5	17.9	-0.6		-1.0	
	1854	894	18.0	17.9	-0.1		-0.5	
	2040	911	17.9	17.9	0.0		-0.4	
	2150	925	17.8	17.9	+0.1		-0.3	
	2247	937	17.7	17.9	+0.2		-0.2	
7/29	0055	940	17.7	17.8	+0.1		-0.3	211
	0115	945	17.6	17.8	+0.2		-0.2	
	0122	945	18.0	17.8	-0.2		-0.6	
	0735	1021	18.1	17.8	-0.3		-0.7	
	0815	1029	18.2	17.8	-0.4		-0.8	
	0824	1031	18.0	17.8	-0.2		-0.6	
	0910	1040	17.9	17.8	-0.1	-0.4	-0.5	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction	Total Correction	Julian Date
7/29	0925	1043	17.8	17.8	0.0	-0.4	-0.4	211
	0940	1046	17.7	17.8	+0.1		-0.3	
	0955	1049	17.6	17.8	+0.2		-0.2	
	1013	1053	17.5	17.8	+0.3		-0.1	
	1030	1056	17.4	17.8	+0.4		0.0	
	1037	1057	17.3	17.8	+0.5		+0.1	
	1044	1059	18.0	17.8	-0.2		-0.6	
	1106	1063	18.1	17.8	-0.3		-0.7	
	1116	1065	18.2	17.8	-0.4		-0.8	
	1127	1067	18.0	17.8	-0.2		-0.6	
7/30	0538	1143	18.0	17.7	-0.3		-0.7	212
	0625	1155	17.9	17.7	-0.2		-0.6	
	0642	1159	17.8	17.7	-0.1		-0.5	
	0700	1163	17.6	17.7	+0.1		-0.3	
	0715	1166	17.5	17.7	+0.2		-0.2	
	0723	1168	17.4	17.7	+0.3		-0.1	
	0726	1168	18.0	17.7	-0.3		-0.7	
	0928	1193	18.1	17.7	-0.4		-0.8	
	0955	1198	18.2	17.7	-0.5		-0.9	
	1002	1199	18.0	17.7	-0.3		-0.7	
	1012	1301	17.9	17.7	-0.2		-0.6	
	1026	1204	17.8	17.7	-0.1		-0.5	
	1048	1208	17.7	17.7	0.0		-0.4	
	1058	1211	17.6	17.7	+0.1		-0.3	
	1108	1213	17.5	17.7	+0.2		-0.2	
	1112	1213	18.0	17.7	-0.3		-0.7	
7/31	2250	1348	18.1	17.7	-0.4		-0.8	213
8/1	0000	1363	18.2	17.6	-0.6		-1.0	214
	0800	1378	18.0	17.6	-0.4		-0.8	
	1300	1437	18.1	17.6	-0.5		-0.9	
	1312	1439	18.0	17.6	-0.4		-0.8	
	1415	1452	17.9	17.6	-0.3		-0.7	
	1550	1471	17.8	17.6	-0.2		-0.6	
	1830	1505	18.0	17.6	-0.4		-0.8	
	1935	1520	18.1	17.6	-0.5		-0.9	
	2040	1535	18.2	17.6	-0.6		-1.0	
	2117	1542	18.3	17.6	-0.7		-1.1	
	2128	1544	18.0	17.6	-0.4		-0.8	
	2205	1552	17.9	17.6	-0.3		-0.7	
	2217	1554	17.8	17.6	-0.2		-0.6	
	2221	1555	18.0	17.6	-0.4	-0.4	-0.8	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
8/2	0000	1575	18.0	17.5	-0.5	-0.4	-0.9	215
	0004	1576	17.9	17.5	-0.4		-0.8	
	0008	1577	17.8	17.5	-0.3		-0.7	
	0012	1577	17.7	17.5	-0.2		-0.6	
	0016	1578	17.6	17.5	-0.1		-0.5	
	0020	1579	17.5	17.5	0.0		-0.4	
	0022	1579	18.0	17.5	-0.5		-0.9	
	0730	1632	18.1	17.4	-0.7		-1.1	
	0745	1636	18.2	17.4	-0.8		-1.2	
	0800	1639	18.3	17.4	-0.9		-1.3	
	0803	1639	18.4	17.4	-1.0		-1.4	
	0804	1640	18.0	17.4	-0.6		-1.0	
	0828	1645	17.0	17.4	+0.4		0.0	
	0907	1653	16.9	17.4	+0.5		+0.1	
	0930	1658	16.8	17.4	+0.6		+0.2	
	0950	1662	16.7	17.4	+0.7		+0.3	
	1003	1665	18.0	17.4	-0.6		-1.0	
	1504	1729	18.6	17.4	-1.2		-1.6	
	1545	1734	18.0	17.4	-0.6		-1.0	
	2300	1811	17.9	17.4	-0.5		-0.9	
	2328	1817	17.8	17.4	-0.4		-0.8	
	2329	1817	18.0	17.4	-0.6		-1.0	
	2340	1819	18.1	17.4	-0.7		-1.1	
	2350	1821	18.2	17.4	-0.8		-1.2	
	2355	1822	18.3	17.4	-1.0		-1.4	
	2358	1822	18.0	17.4	-0.6		-1.0	
8/3	0000	1823	18.0	17.4	-0.6		-1.0	216
	0050	1833	17.9	17.4	-0.5		-0.9	
	0106	1836	18.0	17.4	-0.6		-1.0	
	1010	1927	17.9	17.4	-0.5		-0.9	
	1150	1947	17.8	17.4	-0.4		-0.8	
	1350	1972	17.7	17.4	-0.3		-0.7	
	1404	1975	18.0	17.4	-0.6		-1.0	
8/6	0545	1985	18.0	17.2	-0.8		-1.2	219
	0715	2003	17.9	17.2	-0.7		-1.1	
	0745	2009	17.8	17.2	-0.6		-1.0	
	0756	2011	18.0	17.2	-0.8		-1.2	
	0840	2020	18.1	17.2	-0.9		-1.3	
	0920	2028	18.2	17.2	-1.0		-1.4	
	1004	2037	18.0	17.2	-0.8	-0.4	-1.2	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
8/11	2045	2062	18.0	18.9	+0.9	-0.4	+0.5	224
8/12	0205	2108	18.1	18.9	+0.8		+0.4	225
	0237	2114	18.0	18.9	+0.9		+0.5	
8/13	0235	2189	17.9	18.9	+1.0		+0.6	226
	0325	2199	17.8	18.9	+1.1		+0.7	
	0415	2209	17.6	18.9	+1.3		+0.9	
	0505	2219	17.5	18.9	+1.4		+1.0	
	0555	2229	17.4	18.9	+1.5		+1.1	
	0636	2237	17.3	18.9	+1.6		+1.2	
	0637	2237	18.0	18.9	+0.9		+0.5	
	0740	2250	18.1	18.9	+0.8		+0.4	
	0812	2256	18.2	18.9	+0.7		+0.3	
	0829	2260	18.0	18.9	+0.9		+0.5	
8/14	0000	2388	18.0	18.8	+0.8		+0.4	227
	0100	2400	18.1	18.8	+0.7		+0.3	
8/16	0112	2802	17.7	18.3	+0.6		+0.2	229
	0124	2812	18.0	18.3	+0.3		-0.1	
	0355	2845	17.9	18.3	+0.4		0.0	
	0445	2855	17.8	18.3	+0.5		+0.1	
	0710	2866	18.0	18.3	+0.3		-0.1	
	0745	2873	17.9	18.3	+0.4		0.0	
	0815	2879	17.8	18.3	+0.5		+0.1	
	0845	2885	17.7	18.3	+0.6		+0.2	
	0915	2891	18.0	18.3	+0.3		-0.1	
	1240	2932	18.1	18.3	+0.2		-0.2	
	1243	2933	18.0	18.3	+0.3		-0.1	
	1420	2952	17.9	18.3	+0.4		0.0	
	1525	2965	17.8	18.3	+0.5		+0.1	
	1622	2977	18.0	18.3	+0.3		-0.1	
	1640	2980	18.1	18.3	+0.2		-0.2	
	1650	2982	18.2	18.3	+0.1		-0.3	
	1705	2985	18.3	18.3	0.0		-0.4	
	1715	2987	18.4	18.3	-0.1		-0.5	
	1725	2989	18.5	18.3	-0.2		-0.6	
	1733	2990	18.0	18.3	+0.3		-0.1	
8/17	0000	3057	18.0	18.0	0.0		-0.4	230
	0435	3094	18.1	18.0	-0.1		-0.5	
	0440	3095	18.2	18.0	-0.2		-0.6	
	0445	3096	18.3	18.0	-0.3	-0.4	-0.7	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
8/16	0710	2866	18.0	18.3	+0.3	-0.4	-0.1	229
	0745	2873	17.9	18.3	+0.4		0.0	
	0815	2879	17.8	18.3	+0.5		+0.1	
	0845	2885	17.7	18.3	+0.6		+0.2	
	0915	2891	18.0	18.3	+0.3		-0.1	
	1240	2932	18.1	18.3	+0.2		-0.2	
	1243	2933	18.0	18.3	+0.3		-0.1	
	1420	2952	17.9	18.3	+0.4		0.0	
	1525	2965	17.8	18.3	+0.5		+0.1	
	1622	2977	18.0	18.3	+0.3		-0.1	
	1640	2980	18.1	18.3	+0.2		-0.2	
	1650	2982	18.2	18.3	+0.1		-0.3	
	1705	2985	18.3	18.3	0.0		-0.4	
	1715	2987	18.4	18.3	-0.1		-0.5	
	1725	2989	18.5	18.3	-0.2		-0.6	
	1733	2990	18.0	18.3	+0.3		-0.1	
8/17	0000	3057	18.0	18.0	0.0		-0.4	230
	0435	3094	18.1	18.0	-0.1		-0.5	
	0440	3095	18.2	18.0	-0.2		-0.6	
	0445	3096	18.3	18.0	-0.3		-0.7	
	0450	3097	18.5	18.0	-0.5		-0.9	
	0454	3098	18.0	18.0	0.0		-0.4	
	0805	3137	17.9	18.0	+0.1		-0.3	
	0825	3141	17.8	18.0	+0.2		-0.2	
	0835	3143	17.7	18.0	+0.3		-0.1	
	0843	3145	18.0	18.0	0.0		-0.4	
8/19	0740	3215	18.0	17.8	-0.2		-0.6	232
	0820	3223	17.9	17.8	-0.1		-0.5	
	0840	3227	17.8	17.8	0.0		-0.4	
	0900	3231	17.7	17.8	+0.1		-0.3	
	0920	3235	17.6	17.8	+0.2		-0.2	
	0935	3238	17.5	17.8	+0.3		-0.1	
	0950	3241	17.4	17.8	+0.4		0.0	
	1004	3244	18.0	17.8	-0.2		-0.6	
	1010	3245	18.1	17.8	-0.3		-0.7	
	1013	3246	18.0	17.8	-0.2		-0.6	
	1035	3250	17.9	17.8	-0.1		-0.5	
	1037	3251	18.0	17.8	-0.2		-0.6	
	1725	3334	18.1	17.8	-0.3	-0.4	-0.7	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
8/19	1733	3336	18.0	17.8	-0.2	-0.4	-0.6	232
	1807	2243	18.3	17.8	-0.5		-0.9	
	2010	3362	17.9	17.8	-0.1		-0.5	
	2012	3362	18.0	17.8	-0.2		-0.6	
	2225	3389	18.1	17.8	-0.3		-0.7	
	2241	3392	18.0	17.8	-0.2		-0.6	
8/20	0000	3401	18.0	17.7	-0.3		-0.7	233
	0050	3411	17.9	17.7	-0.2		-0.6	
	0105	3414	17.8	17.7	-0.1		-0.5	
	0109	3415	18.0	17.7	-0.3		-0.7	
	0630	3475	17.8	17.7	-0.1		-0.5	
	0638	3477	18.0	17.7	-0.3		-0.7	
	0945	3514	17.9	17.7	-0.2		-0.6	
	0955	3516	17.8	17.7	-0.1		-0.5	
	1005	3518	17.7	17.7	0.0		-0.4	
	1010	3519	17.6	17.7	+0.1		-0.3	
	1011	3519	18.0	17.7	-0.3		-0.7	
	2355	3649	17.9	17.7	-0.2		-0.6	
21	0004	3651	18.0	17.6	-0.4		-0.8	234
	1015	3739	17.8	17.6	-0.2		-0.6	
	1020	3740	17.6	17.6	0.0		-0.4	
	1025	3741	17.4	17.6	+0.2		-0.2	
	1029	3742	18.0	17.6	-0.4		-0.8	
	1440	3792	17.9	17.6	-0.3		-0.7	
	1510	3798	17.8	17.6	-0.2		-0.6	
	1520	3800	18.0	17.6	-0.4		-0.8	
	1530	3802	17.9	17.6	-0.3		-0.7	
	1545	3805	17.8	17.6	-0.2		-0.6	
	1555	3807	17.7	17.6	-0.1		-0.5	
	1610	3810	17.6	17.6	0.0		-0.4	
	1614	3811	18.0	17.6	-0.4		-0.8	
	2130	3873	17.9	17.6	-0.3		-0.7	
	2135	3874	17.8	17.6	-0.2		-0.6	
	2140	3875	17.6	17.6	0.0		-0.4	
	2142	3876	17.5	17.6	+0.1		-0.3	
	2145	3877	17.4	17.6	+0.2		-0.2	
	2150	3878	17.3	17.6	+0.3		-0.1	
	2155	3879	17.2	17.6	+0.4		0.0	
	2200	3880	17.1	17.6	+0.5		+0.1	
	2205	3881	17.0	17.6	+0.6		+0.2	
	2207	3881	18.0	17.6	-0.4	-0.4	-0.8	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julia Date
8/22	0000	3904	18.0	17.4	-0.6	-0.4	-1.0	235
	0540	3967	17.9	17.4	-0.5		-0.9	
	0555	3970	17.8	17.4	-0.4		-0.8	
	0600	3971	18.0	17.4	-0.6		-1.0	
	1215	4021	17.9	17.4	-0.5		-0.9	
	1225	4023	17.8	17.4	-0.4		-0.8	
	1235	4025	17.7	17.4	-0.3		-0.7	
	1240	4026	18.0	17.4	-0.6		-1.0	
	1655	4077	17.9	17.4	-0.5		-0.9	
	1705	4079	17.8	17.4	-0.4		-0.8	
	1709	4080	18.0	17.4	-0.6		-1.0	
	1825	4095	17.9	17.4	-0.5		-0.9	
	1855	4101	17.8	17.4	-0.4		-0.8	
	1904	4103	18.0	17.4	-0.6		-1.0	
	2100	4126	17.9	17.4	-0.5		-0.9	
	2113	4129	18.0	17.4	-0.6		-1.0	
	2331	4152	17.4	17.4	0.0		-0.4	
	2340	4154	18.0	17.4	-0.6		-1.0	
8/23	0000	4158	18.0	17.2	-0.8		-1.2	236
	1000	4269	18.1	17.2	-0.9		-1.3	
	1003	4270	18.0	17.2	-0.8		-1.2	
	1415	4320	17.9	17.2	-0.7		-1.1	
	1425	4322	17.8	17.2	-0.6		-1.0	
	1429	4323	18.0	17.2	-0.8		-1.2	
	1442	4325	18.4	17.2	-1.2		-1.6	
	1444	4326	18.0	17.2	-0.8		-1.2	
8/24	1235	4397	17.9	17.2	-0.7		-1.1	237
	1245	4399	17.8	17.2	-0.6		-1.0	
	1249	4400	17.7	17.2	-0.5		-0.9	
	1251	4400	18.0	17.2	-0.8		-1.2	
	2350	4519	17.6	17.2	-0.4		-0.8	
	2359	4521	18.0	17.2	-0.8		-1.2	
8/25	0000	4521	18.0	17.0	-1.0		-1.4	238
	0400	4568	17.0	17.0	0.0		-0.4	
	0911	4630	18.0	17.0	-1.0		-1.4	
	1103	4652	18.1	17.0	-1.1		-1.5	
	1106	4653	18.0	17.0	-1.0		-1.4	
8/27	2140	5015	17.9	17.0	-0.9		-1.3	240
	2150	5017	17.8	17.0	-0.8	-0.4	-1.2	

Draft	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
8/27	2200	5018	17.7	17.0	-0.7	-0.4	-1.1	240
	2205	5019	17.6	17.0	-0.6		-1.0	
	2210	5021	17.5	17.0	-0.5		-0.9	
	2218	5022	17.4	17.0	-0.4		-0.8	
	2218	5023	18.0	17.0	-1.0		-1.4	
8/28	0000	5043	18.0	16.9	-1.1		-1.5	241
	1010	5156	17.9	16.9	-1.0		-1.4	
	1025	5159	17.8	16.9	-0.9		-1.3	
	1036	5161	18.0	16.9	-1.1		-1.5	
	1740	5225	18.1	16.9	-1.2		-1.6	
	1750	5227	18.0	16.9	-1.1		-1.5	
8/29	0035	5308	17.9	16.9	-1.0		-1.4	242
	0045	5310	17.8	16.9	-0.9		-1.3	
	0055	5312	17.7	16.9	-0.8		-1.2	
	0059	5313	17.6	16.9	-0.7		-1.1	
	0101	5313	18.0	16.9	-1.1		-1.5	
	0600	5373	18.1	16.9	-1.2		-1.6	
	0720	5389	18.2	16.9	-1.3		-1.7	
	0830	5403	18.0	16.9	-1.1		-1.5	
	0930	5415	18.1	16.9	-1.2		-1.6	
	0933	5415	18.0	16.9	-1.1		-1.5	
	1241	5433	17.0	16.9	-0.1		-0.5	
	1309	5459	18.0	16.9	-1.1		-1.5	
	1325	5462	18.1	16.9	-1.2		-1.6	
	1331	5464	18.0	16.9	-1.1		-1.5	
	1720	5508	17.9	16.9	-1.0		-1.4	
	1734	5511	18.0	16.9	-1.1		-1.5	
	1840	5524	17.9	16.9	-1.0		-1.4	
	1847	5525	18.0	16.9	-1.1		-1.5	
	2030	5546	17.9	16.9	-1.0		-1.4	
	2055	5551	17.8	16.9	-0.9		-1.3	
	2155	5555	17.7	16.9	-0.8		-1.2	
	2202	5556	18.0	16.9	-1.1		-1.5	
8/30	0000	5580	18.0	16.8	-1.2		-1.6	243
	0200	5604	18.1	16.8	-1.3		-1.7	
	0225	5609	18.2	16.8	-1.4		-1.8	
	0310	5618	18.3	16.8	-1.5		-1.9	
	0327	5621	18.0	16.8	-1.2		-1.6	
	0830	5682	17.9	16.8	-1.1		-1.5	
	0850	5686	17.8	16.8	-1.0	-0.4	-1.4	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
8/30	0910	5690	17.6	16.8	-0.8	-0.4	-1.2	243
	0930	5694	17.5	16.8	-0.7		-1.1	
	0945	5697	17.4	16.8	-0.6		-1.0	
	0952	5698	18.0	16.8	-1.2		-1.6	
	1050	5710	18.1	16.8	-1.3		-1.7	
	1100	5712	18.2	16.8	-1.4		-1.8	
	1110	5714	18.3	16.8	-1.5		-1.9	
	1125	5717	18.4	16.8	-1.6		-2.0	
	1131	5718	18.0	16.8	-1.2		-1.6	
	1145	5721	17.9	16.8	-1.1		-1.5	
	1155	5723	17.8	16.8	-1.0		-1.4	
	1156	5723	18.0	16.8	-1.2		-1.6	
9/2	0821	5774	18.0	16.7	-1.3		-1.7	246
	1255	5830	17.7	16.7	-1.0		-1.4	
	1305	5832	17.5	16.7	-0.8		-1.2	
	1310	5833	18.0	16.7	-1.3		-1.7	
	1404	5844	18.1	16.7	-1.4		-1.8	
	1440	5849	18.2	16.7	-1.5		-1.9	
	1456	5851	18.0	16.7	-1.3		-1.7	
	1705	5862	18.1	16.7	-1.4		-1.8	
	1710	5863	18.2	16.7	-1.5		-1.9	
	1715	5864	18.0	16.7	-1.3		-1.7	
	1853	5884	17.3	16.7	-0.6		-1.0	
	1923	5890	18.0	16.7	-1.3		-1.7	
	1945	5894	17.8	16.7	-1.1		-1.5	
	2100	5909	17.5	16.7	-0.8		-1.2	
	2115	5912	18.0	16.7	-1.3		-1.7	
	2235	5930	17.6	16.7	-0.9		-1.3	
	2243	5935	18.0	16.7	-1.3		-1.7	
9/3	0143	5945	18.0	16.6	-1.4		-1.8	247
	0237	5956	17.9	16.6	-1.3		-1.7	
	0247	5958	17.8	16.6	-1.2		-1.6	
	0248	5959	18.0	16.6	-1.4		-1.8	
	0320	5965	17.6	16.6	-1.0		-1.4	
	0358	5973	18.0	16.6	-1.4		-1.8	
	0835	6000	17.9	16.6	-1.3		-1.7	
	0845	6002	17.8	16.6	-1.2		-1.6	
	0852	6003	18.0	16.6	-1.4		-1.8	
	0940	6013	17.9	16.6	-1.3		-1.7	
	0950	6015	17.8	16.6	-1.2	-0.4	-1.6	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
9/3	1000	6017	17.7	16.6	-1.1	-0.4	-1.5	247
	1010	6019	17.6	16.6	-1.0		-1.4	
	1013	6020	18.0	16.6	-1.4		-1.8	
	1645	6099	18.1	16.6	-1.5		-1.9	
	1656	6101	18.0	16.6	-1.4		-1.8	
	1705	6103	17.9	16.6	-1.3		-1.7	
	1710	6104	17.8	16.6	-1.2		-1.6	
	1712	6104	18.0	16.6	-1.4		-1.8	
	2010	6112	17.9	16.6	-1.3		-1.7	
	2020	6114	17.8	16.6	-1.2		-1.6	
	2023	6115	18.0	16.6	-1.4		-1.8	
	2225	6140	17.9	16.6	-1.3		-1.7	
	2233	6142	17.8	16.6	-1.2		-1.6	
	2236	6143	18.0	16.6	-1.4		-1.8	
	2250	6145	18.1	16.6	-1.5		-1.9	
	2258	6147	18.2	16.6	-1.6		-2.0	
	2301	6147	18.0	16.6	-1.4		-1.8	
9/4	0000	6159	18.0	16.3	-1.7		-2.1	248
	0220	6187	17.9	16.3	-1.6		-2.0	
	0235	6191	17.8	16.3	-1.5		-1.9	
	0242	6192	18.0	16.3	-1.7		-2.1	
	1140	6273	18.1	16.3	-1.8		-2.2	
	1155	6276	18.2	16.3	-1.9		-2.3	
	1201	6277	18.0	16.3	-1.7		-2.1	
	1215	6280	17.9	16.3	-1.6		-2.0	
	1220	6281	17.8	16.3	-1.5		-1.9	
	1225	6282	17.7	16.3	-1.4		-1.8	
	1228	6283	18.0	16.3	-1.7		-2.1	
	1850	6354	17.9	16.3	-1.6		-2.0	
	1900	6357	17.8	16.3	-1.5		-1.9	
	1920	6360	17.7	16.3	-1.4		-1.8	
	1930	6363	17.6	16.3	-1.3		-1.7	
	1940	6365	17.5	16.3	-1.2		-1.6	
	2106	6368	18.0	16.3	-1.7		-2.1	
9/5	0000	6403	18.0	16.2	-1.8		-2.2	
	0050	6413	17.9	16.2	-1.7		-2.1	
	0054	6414	17.8	16.2	-1.6		-2.0	
	0058	6415	17.7	16.2	-1.5		-1.9	
	0101	6415	18.0	16.2	-1.8		-2.2	
	0450	6461	18.1	16.2	-1.9	-0.4	-2.3	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
9/5	0510	6465	18.2	16.2	-2.0	-0.4	-2.4	249
	0519	6467	18.0	16.2	-1.8		-2.2	
	0950	6515	17.3	16.2	-1.1		-1.5	
	0958	6517	18.0	16.2	-1.8		-2.2	
	1330	6559	18.1	16.2	-1.9		-2.3	
	1400	6565	18.2	16.2	-2.1		-2.4	
	1418	6569	18.0	16.2	-1.8		-2.2	
9/6	0000	6684	18.0	16.1	-1.9		-2.3	256
	1150	6817	17.9	16.1	-1.8		-2.2	
	1154	6818	17.8	16.1	-1.7		-2.1	
	1158	6819	17.7	16.1	-1.6		-2.0	
	1201	6819	18.0	16.1	-1.9		-2.3	
	1550	6865	17.9	16.1	-1.8		-2.2	
	1620	6871	17.8	16.1	-1.7		-2.1	
	1635	6875	18.0	16.1	-1.9		-2.3	
9/12	1935	6914	18.0	18.0	0.0		-0.4	
	1955	6918	18.1	18.0	-0.1		-0.5	
	2015	6922	18.2	18.0	-0.2		-0.6	
	2035	6926	18.3	18.0	-0.3		-0.7	
	2055	6930	18.4	18.0	-0.4		-0.8	
	2102	6931	18.0	18.0	0.0		-0.4	
	2115	6934	17.9	18.0	+0.1		-0.3	
	2125	6936	17.8	18.0	+0.2		-0.2	
	2135	6938	17.7	18.0	+0.3		-0.1	
	2145	6940	17.6	18.0	+0.4		0.0	
	2155	6942	17.5	18.0	+0.5		+0.1	
	2201	6943	18.0	18.0	0.0		-0.4	
	2225	6948	18.1	18.0	-0.1		-0.5	
	2245	6952	18.2	18.0	-0.2		-0.6	
	2259	6955	18.0	18.0	0.0		-0.4	
9/13	1005	7085	17.9	18.0	+0.1		-0.3	257
	1015	7087	17.8	18.0	+0.2		-0.2	
	1020	7088	17.7	18.0	+0.3		-0.1	
	1025	7089	17.6	18.0	+0.4		0.0	
	1030	7090	17.5	18.0	+0.5		+0.1	
	1033	7091	18.0	18.0	0.0		-0.4	
	1430	7140	17.9	18.0	+0.1		-0.3	
	1450	7144	17.8	18.0	+0.2		-0.2	
	1505	7147	17.7	18.0	+0.3	-0.4	-0.1	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
9/13	1513	7149	18.0	18.0	0.0	-0.4	-0.4	257
	1650	7168	18.1	18.0	-0.1		-0.5	
	1725	7175	18.2	18.0	-0.2		-0.6	
	1755	7182	18.3	18.0	-0.3		-0.7	
	1830	7189	18.4	18.0	-0.4		-0.8	
	1839	7191	18.0	18.0	0.0		-0.4	
9/14	0825	7247	17.8	18.0	+0.2		-0.2	258
	0830	7248	17.6	18.0	+0.4		0.0	
	0835	7249	17.4	18.0	+0.6		+0.2	
	0840	7250	17.2	18.0	+0.8		+0.4	
	0850	7252	17.0	18.0	+1.0		+0.6	
	0940	7254	17.8	18.0	+0.2		-0.2	
	0945	7255	17.6	18.0	+0.4		0.0	
	2147	7397	18.4	18.0	-0.4		-0.8	
	2215	7403	18.0	18.0	0.0		-0.4	
	2225	7405	17.9	18.0	+0.1		-0.3	
	2235	7407	17.8	18.0	+0.2		-0.2	
	2245	7409	17.6	18.0	+0.4		0.0	
	2255	7411	17.5	18.0	+0.5		+0.1	
	2305	7413	17.4	18.0	+0.6		+0.2	
	2310	7414	17.3	18.0	+0.7		+0.3	
	2315	7415	17.2	18.0	+0.8		+0.4	
	2318	7416	18.0	18.0	0.0		-0.4	
	2335	7419	18.1	18.0	-0.1		-0.5	
	2350	7422	18.2	18.0	-0.2		-0.6	
9/15	0000	7424	18.3	17.9	-0.4		-0.8	259
	0007	7425	18.0	17.9	-0.1		-0.5	
	0035	7431	17.9	17.9	0.0		-0.4	
	0100	7436	17.8	17.9	+0.1		-0.3	
	0107	7437	18.0	17.9	-0.1		-0.5	
	1105	7554	17.9	17.9	0.0		-0.4	
	1118	7557	17.8	17.9	+0.1		-0.3	
	1128	7559	17.7	17.9	+0.2		-0.2	
	1138	7561	17.6	17.9	+0.3		-0.1	
	1142	7562	18.0	17.9	-0.1		-0.5	
	1500	7600	17.5	17.9	+0.4		0.0	
	1515	7603	18.0	17.9	-0.1		-0.5	
	1600	7612	18.5	17.9	-0.6		-1.0	
	1610	7614	18.0	17.9	-0.1	-0.4	-0.5	

Date	GMT	Pos. No.	Initial Setting	Amid-ship Draft	Draft vs Initial Correction	Instrument Correction*	Total Correction	Julian Date
9/16	0000	7705	18.0	17.9	-0.1	-0.4	-0.5	260
	0030	7711	17.9	17.9	0.0		-0.4	
	0045	7714	17.8	17.9	+0.1		-0.3	
	0055	7716	17.7	17.9	+0.2		-0.2	
	0059	7717	18.0	17.9	-0.1		-0.5	
	0155	7727	23.0	17.9	-5.1		-5.2	
	0350	7739	18.0	17.9	-0.1		-0.5	
	2035	7831	17.9	17.9	0.0		-0.4	
	2050	7834	17.8	17.9	+0.1		-0.3	
	2053	7835	18.0	17.9	-0.1		-0.5	
9/17	0945	7960	17.9	17.9	0.0		-0.4	261
	1045	7962	17.8	17.9	+0.1		-0.3	
	1055	7964	17.7	17.9	+0.2		-0.2	
	1105	7966	17.6	17.9	+0.3		-0.1	
	1110	7967	18.0	17.9	-0.1	-0.4	-0.5	

*Instrument Correction determined by lead-line comparison - all fathometers have -0.4' correction.

LIST OF SIGNALS

1:100,000 Boat Sheets

Signal	Sheet	Authority
CAB	70068D	Traverse
DEL	70118J	DEL, 1968
NASKOK EAST BASE	70068D	NASKOK EAST BASE, 1950
NASKOK WEST BASE	70068D	NASKOK WEST BASE, 1950
OOSIK	70038A	OOSIK, 1968
PERRY	70058C	PERRY, 1968

Calibration Sheets

Niyrakpak Lagoon, 1:20,000

Signal	Authority
CABIN, 1968 (CAB)	Traverse
CABIN, 1950 (PUK)	T-9577
NASKOK EAST BASE	NASKOK EAST BASE, 1950
NASKOK WEST BASE	NASKOK WEST BASE, 1950

Point Spencer, 1:20,000

ASTRO	CLARENCE ASTONOMICAL MARK, 1900, 1944
AZ	T-9648
CON	T-9648
LOR	LORAN-C TOWER, NM 23, 1968
TOW	T-9648

Northeast Cape, 1:40,000 (70138L)

DEL	DEL, 1968
HOLM	HOLM, 1951
PINNACLE	PINNACLE, 1951
REIM	REIM, 1951
STOKE RM 2	STOKE RM 2, 1951
VOO	Triangulation

Nome - Sledge Island, 1:40,000 (70158N)

EAST JETTY LIGHT	C&GS 9383
NOME CAA RADIO RANGE	NOME CAA RADIO RANGE, 1963
PERRY	PERRY, 1968
SLEDGE A.M.S.	SLEDGE A.M.S., 1949
SLEDGE AZIMUTH MARK	SLEDGE AZIMUTH MARK, 1949
SLEDGE ISLAND LIGHT	SLEDGE ISLAND LIGHT, 1950
SUB BEACH	SUB BEACH, 1944

ABSTRACT OF CORRECTIONS TO DISTANCE MEASUREMENTS

The following list, copied from the Special Report on Raydist Corrections, OPR-483, Summer 1968, tabulates corrections to distance measurements:

From Pos.#	To Pos.#	Corrections PERRY	OOSIK	DEL
20	125	0		0
127	274	0		0
276	290	0		0
292	317	0		0
320	698	0		0
701	937	0		0
940	1040	0		-1
1041	1061	0		+4
1062	1106	0		-1
1107	-	0		-4
1143	1167	0	0	
1168	1192	+1	0	
1193	1217	+2	0	
1218	-	+3	0	
1219	1242	+3	-1	
1243	1267	+4	-1	
1268	1293	+5	-1	
1296	1297	0	0	
1298	1301	0	-3	
1302	1322	0	-4	
1324	-	0		-1
1325	1333	0		-2
1334	-	0		-3
1335	-	+1		-3
1336	-	-3		-3
1337	1375	-9		-3
1378	1591	0	0	
1592	1617	0	+4	
1620	1842	0	0	
1845	1981	0	0	
1984	2049	0	0	
2062	2086	0	0	
2087	2172	-5	-7	
2174	2282	0	0	

From Pos.#	To Pos.#	Corrections PERRY	OOSIK	DEL
2285	2303	0	0	
2304	-	0	-4	
2305	2649	0	-10	
2651	2672	0	0	
2674	2795	0	0	
2798	2864	-8	+2	
2865	3211	0	0	
3215	3303	0	0	
3304	3359	+5	-6	
3361	3396	0	0	
3398	3642	0	0	
3644	3715	0	0	
3717	3972	0	0	
3973	4243	0	0	
4245	4353	0	0	
4356	4499	0	0	
4500	4517	+33	-42	
4518	4710	0	0	
4713	4823	0	0	
4824	4997	0	0	
4998	5421	-5	+1	
5422	5625	-6	+1	
5626	5771	-5	0	
5774	5941	+3	0	
5943	5998	0	0	
5999	6108	0	0	
6110	6203	0	0	
6204	6246	0	-2	
6247	-	+3	-3	
6248	-	+2	-5	
6249	6250	+2	-10	
6251	-	+1	-4	
6252	-	0	-1	
6253	6257	+2	+2	
6258	-	+7	-2	
6259	-	+10	-5	
6260	6261	+14	0	
6262	6365	+17	-2	
6266	6320	+17	-4	

From Pos.#	To Pos.#	Corrections PERRY	OOSIK	DEL
6323	6332	+17		-34
6333	6366	+17		-37
6368	6537	0		0
6538	6547	0		-2
6548	6733	0		-7
6735	6764	0	0	
6765	6770	0	+1	
6771	6911	0	+3	
6913	6947	-2	+1	
6949	6988	-2	-	0
6989	7205	-2	+1	
7208	7717	0	0	
7718	7733	+3	-4	
7734	7854	+3	-6	
7855	7880	+2	-5	
7881	7882	+1	-5	
7883	7894	+5	-7	
7895	7919	+33	+20	
7920	8041	+36	+23	
8042	8080	0	0	

PERRY - DEL	PERRY - OOSIK
20 - 1107	1168 - 1322
1325 - 1375	1378 - 6320
6323 - 6733	6735 - 6947
6949 - 6988	6989 - 8080

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

ADDENDUM

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. OPR-483 Office No. H-9027

LOCALITY

State ALASKA

General locality BERING SEA

Locality NORTON SOUND

19 68 & 69

CHIEF OF PARTY

E. W. Richards

LIBRARY & ARCHIVES

DATE 14 SEP 1970

Processing Office Notes - OPR-483, Norton Sound, Alaska

H-9020

The Ship SURVEYOR worked on this sheet in 1968 and 1969.

This sheet was relatively free of major discrepancies. Crosslines were within allowable limits and junctions were satisfactory.

There is a series of ridges running in a Northwest to Southeast direction and approximately at Lat. 64°57'30", Long. 167°45'00".

This sheet junctions with H-9021 and H-9022 (1968-1969).

H-9021

Work on this sheet was by the Ship SURVEYOR in 1968 and 1969.

The 1968 work on this sheet had differences of up to 3 feet in deeper water (D scale), most of which were eliminated by adjustment in depths. The 1969 work appears to agree quite well within itself. Generally the differences between the 1968 and 1969 work is a maximum of two feet, which is about the maximum in each year's work by itself.

This sheet junctions with H-9020, H-9022, H-9024 (1968-1969).

H-9022

This is the inshore sheet that had the R. Station on it. Not much trouble was encountered on the sheet, other than the normal things. Both baselines were on this sheet and there were some instances when the positions were computed on the wrong side of the baseline. Very little difference in the 1968 and 1969 soundings was found. Only the Ship SURVEYOR worked on this sheet. This sheet joins H-9020, H-9021, H-9024, H-9025 and H-9026 (1968-1969).

H-9023

This survey was accomplished by the Ship SURVEYOR in 1968 and 1969.

No particular difficulties were encountered on this sheet. The soundings are in good agreement, with a maximum discrepancy of about two feet.

This sheet junctions with H-9021 and H-9024 (1968-1969).

This sheet is an incomplete survey.

H-9024

The work on this sheet was accomplished by the Ship OCEANOGRAPHER and SURVEYOR in 1968 and by theSURVEYOR in 1969.

No adjustments were made to the SURVEYOR's 1969 soundings. Up to four feet was added to the SURVEYOR 1968 work to get agreement with the 1969 soundings. One to five feet was added to the 1968 OCEANOGRAPHER soundings to get agreement with the 1968 and 1969 soundings by the SURVEYOR.

Corrections to the soundings on this sheet were applied as outlined in the memorandum from the Chief of the Chart Division, dated 5-4-70 and referenced C324.

This sheet junctions with H-9021, H-9022, H-9023, H-9025, and H-9027.

H-9025

The work on this sheet was by the OCEANOGRAPHER and SURVEYOR in 1968 and by the SURVEYOR in 1969.

The same adjustments were made on this sheet as were mentioned for H-9024.

This sheet joins H-9022, H-9024, H-9026 and H-9048.

H-9026

The work on this sheet was accomplished by the Ship SURVEYOR in both 1968 and 1969..

The 1968 work consisted of only about 40 positions which were in satisfactory agreement with the 1969 work.

The 1969 work agree very well with itself with the maximum difference at crossing only one foot.

This is an incomplete sheet and will be finished in 1970.

This sheet joins H-9022 and H-9025.

H-9027

This sheet was accomplished by the OCEANOGRAPHER and SURVEYOR in 1968 and the SURVEYOR in 1969.

Adjustments were made to the 1968 soundings as were made on H-9024 and H-9025.

There is a series of ridges east of Northeast Cape at about Lat. 63°15'N and Long. 168°20' and 168°30'W. that lie in a N.E., S.W. direction. This area was not thoroughly developed and it was recommended, by the Hydrographer, that it be done later.

This sheet junctions with H-9024 and H-9048.

This is an incomplete survey.

H-9048

All the work on this sheet was done by the Ship SURVEYOR in 1969.

The soundings appear to agree very well, at crossings, with the maximum difference being about one foot.

This is an incomplete sheet and makes junctions with H-9025 and H-9027.

JUNCTIONS

The junstions on all sheets were butt junctions because the whole project was run as though it was one sheet. We believe all junctions to be in satisfactory agreement.

SHORELINE

No shoreline was applied to these sheets because there was no inshore hydrography.

CONTROL

The control for the Ship OCEANOGRAPHER in 1968 was mostly Loran-C with some Raydist, when the SURVEYOR wasn't on the working area. The control for the Ship SURVEYOR in both 1968 and 1969 was Raydist. There was, however, a change of frequency from 3281 Khz in 1968 to 3300.4 Khz in 1969.

Respectfully submitted,

William M. Martin
Supervisory Carto. Tech.
Pacific Marine Center

Approved and Forwarded,

K. William Jeffers, CDR, USESSA
Chief, Processing Division
Pacific Marine Center

FORM C&GS-111 (11-60) (PREV. ED. A.O. 204-10)

UNITED STATES GOVERNMENT

Memorandum

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

TO : Chief, Processing Division
Pacific Marine Center

DATE: May 4, 1970

In reply refer to: C324

FROM : Chief, Marine Chart Division

SUBJECT: Norton Sound Survey Processing

The smooth sheets H-9020, 9021, 9022, and 9023 have been examined with special attention to crossing differences between the SURVEYOR's 1968 and 1969 work.

Although we were without benefit of the original sounding records our examination disclosed general agreement within ± two feet as you report, together with a few discrepancies of about three feet. In many crossings the addition of a plus two-foot correction to the 1968 work would improve the crossings and very few would have suffered by this revision.

During our verification of the 1960 surveys we have attempted to bring the soundings on surveys H-8558 and H-8559 into reasonable agreement with the SURVEYOR's 1969 overlapping work. To a large extent this was possible by applying a plus four-foot correction to the 1960 soundings. On some lines, however, the plus four foot did not adequately satisfy conditions and where this occurred an additional plus or minus correction was applied. The reason for this variation has not been determined but in general the crossings between the 1960 and 1969 work will hopefully be ± two feet which under the circumstances we will consider as acceptable.

The examination of the preliminary sounding overlay for H-9025 revealed some crossing differences of two feet within the 1969 work but approximately 95 percent of the crossings are within one foot. Crossing differences within the 1968 work were within the same range and ratio and similarly between the 1968 and 1969 work. No definite pattern of disagreement is apparent and as exact agreement occurs in such a large percent of the crossings, no constant can be applied to advantage.

One section of a line of 1968 soundings identified by annotation on the position overlay is deeper than the 1969 soundings by three feet and should be verified in the records. From a comparison with H-9024 it appears that end sections of some sounding lines on H-9025 have been adjusted. The adjustments required on H-9024 will generally bring the junctional soundings into better agreement.

It is recommended that no general adjustment of soundings be made on H-9025 inasmuch as the crossing discrepancies are within ± two feet.

Assuming the 1969 work to be of better quality and more rigidly controlled than the 1968 work, a comparison of the sounding lines for the two seasons on H-9024 reveals some consistency in crossing differences. On the preliminary position overlay of H-9024, there has been annotated corrections for the 1968 lines applicable in reducing crossing differences within ± two feet. Some variation in the correction must be accepted to do this but the trend is apparent. An examination of the records may justify changing some of the annotations. It is recommended that this type of study be extended to complete this sheet and that correctors so obtained be applied to the soundings. The maximum additional corrector probably will be about plus four feet and the minimum will be plus two feet. The OCEANOGRAPHER's work should be corrected as necessary to bring it into line.

This solution to the problem does not indicate the reason for the discrepancies and it may be considered arbitrary but at least it will bring about a relative consistency in the data that is desirable for our main purpose in making the survey.

for John O. Boyer

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-9027

Name on Survey	A On Chart No.	B On previous survey No.	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	
Bering Sea										1
Norton Sound										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

PREPARED BY

Frank W. Pietsch

CARTOGRAPHIC TECHNICIAN

APPROVED BY

A. Joseph Wright

CHIEF GEOGRAPHER

FORM C&GS-946
(REV. 11-65)
(PRESC. BY HYDROGRAPHIC MANUAL 20-2, 6-94, 7-13)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS

HYDROGRAPHIC SURVEY NO. 9027

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET & 2-PNO	1	BOAT SHEETS	4
DESCRIPTIVE REPORT	1	OVERLAYS	2

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS						
VOLUMES						
BOXES			2			

T-SHEET PRINTS *(List)*

SPECIAL REPORTS *(List)*

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				
POSITIONS CHECKED				
POSITIONS REVISED				
DEPTH SOUNDINGS REVISED				
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS				
JUNCTIONS				
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS				
SPECIAL ADJUSTMENTS				
ALL OTHER WORK				
TOTALS		200		

PRE-VERIFICATION BY	BEGINNING DATE	ENDING DATE
VERIFICATION BY No record avail. Assumed time DEW	BEGINNING DATE	ENDING DATE
REVIEW BY	BEGINNING DATE	ENDING DATE

USCOMM-DC 36271-P65

FORM C&GS-946A
(REV. 11-65)
(PRES. BY HYDROGRAPHIC MANUAL, 6-94)

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VERIFIER'S REPORT

HYDROGRAPHIC SURVEY, H-9027

INSTRUCTIONS - This form serves to identify items of a check list in verification together with items which are separately reported to the Reviewer. The form is not to be forwarded to the Reviewer. A report, which is prepared for the Reviewer, should identify items by number and letter and will be filed in the Descriptive Report until the survey is reviewed.

CL - Check List Items: should be checked as having been completed during the verification processes.

R - Report Item: This column refers to those items reported to the reviewer and is used to indicate the items discussed.

Part I - DESCRIPTIVE REPORT	CL	R
Note: The verifier should first read the Descriptive Report for general information and problems.		
1. The Descriptive Report was consulted, paragraphs checked if found satisfactory, and notations were made in soft black pencil regarding action taken. Remarks Required: -- None		
2. Soundings originating with the survey and mentioned in the Descriptive Report have been verified and checked in soft black pencil, including latitude and longitude, together with position identification. Remarks Required: --None		
3. All reference to survey sheets mentioned in the Descriptive Report should include registry number and year. Remarks Required: -- None		
Part II - SHORELINE AND SIGNALS		
4. Source of shoreline signals Remarks Required: -- List all surveys a. Give earliest and latest dates of photographs b. Field inspection date c. Field Edit date d. Reviewed-Unreviewed		
5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences.		
6. The plotting of all triangulation stations, topographic stations and hydrographic signals has been checked and noted in processing stamp No. 42 on the smooth sheet. Remarks Required: -- None		
7. Objects on which signals are located and which fall outside of the high-water line have been described on the sheet. Remarks Required: -- List those signals still unidentified.		
Part III - JUNCTIONS		
Note: Make a cursory comparison preliminary to inking soundings in area of overlap.		
8. All junctions of contemporary or overlapping sheets were transferred in colored ink and overlapping curves were made identical. Remarks Required: -- None		
9. The notation in slanted lettering "JOINS H----(19)" was added in colored ink for all verified contemporary adjoining or overlapping sheets. Those not verified are shown in pencil. Remarks Required: -- None		

Part III - JUNCTIONS (Continued)	CL	R
10. Junctions with contemporary surveys were satisfactory except as follows: Remarks Required: -- Consider conditions after adjustments have been made; note adjustments made. Make special notes of **Butt** junctions and areas which are **SUPERSEDED.**		
Part IV - VOLUMES		
11. All items affecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken and exceptions noted in the volumes. Remarks Required: -- None		
12. Condition of sounding records was satisfactory except as follows: Remarks Required: -- Mention deficiencies in completeness of notes or actions for the following: (a) rocks (b) line turns (c) position values of beginning and ending of lines (d) bar check or velocity correctors (e) time recording (f) notes or markings on fathograms (g) was reduction of soundings accurately done? (h) was scanning accurate? (i) were peaks at uneven intervals missed? (j) were stamps completed? (k) references to adjacent features		
Part V - PROTRACTING		
13. All positions verified instrumentally were check marked in color in the sounding records, and verifier initialed the processing stamp. Remarks Required: -- None		
14. The protracting and plotting of all unsatisfactory crossings were verified. Remarks Required: -- None		
15. All detached positions locating **critical** soundings, rocks, buoys, breakers, obstructions, kelp, etc., were verified and the position numbers are legible. Remarks Required: -- None		

USCOMM-DC 36272-P65

Part V - PROTRACTING (Continued)	CL	R
16. The protracting was satisfactory except as follows: Remarks Required: -- Refers to protracting in general except for specific faults repeated often, or faults in control information, which required considerable replotting or adjustments.		
17. The protractor has been checked within the last three months. Remarks Required: -- Date of check, type of protractor and number.		
Part VI - SOUNDINGS		
18. All soundings are clear and legible, and critical soundings are a little larger than adjacent soundings. Remarks Required: -- None		
19. Sounding line crossings were satisfactory except as follows: Remarks Required: -- Discuss adjustments.		
20. The spacing of soundings as recorded in the records was closely followed; Remarks Required: -- None		
21. The scanning, reduction, spacing, plotting of questionable soundings have been verified. Remarks Required: -- None		
22. The smooth plotting of soundings was satisfactory except as follows: Remarks Required: -- Refer to legibility, errors in spacing, and errors in numbers - but not to errors in scanning.		
Part VII - CURVES		
23. The depth curves have been inspected **before** inking. Remarks Required: -- By whom was the pencile d curves inspected.		
24. The low-water line and delineation of shoal areas have been properly shown in accordance with the following: a. From T-Sheet in dotted black lines b. From soundings in orange c. Approximate position of sketched curve is dashed orange d. Approximate position of shoal area **not sounded** in black dashed Remarks Required: -- None		
25. Depth curves were satisfactory except as follows: (This statement should not refer to the manner in which the curves were drawn). Remarks Required: -- Indicate areas where curves could not be drawn completely because of lack of soundings. For some inshore areas a general statement is sufficient.		

Part VIII - AIDS TO NAVIGATION	CL	R
26. All fixed aids located together with those on the contemporary topographic sheets, have been shown on the survey. Remarks Required: -- Conflicts of any nature listed.		
27. All floating aids listed in the Descriptive Report should be verified and checked in soft black pencil, including latitude and longitude and position identification. Remarks Required: -- None		
Part IX - BOATSHEET		
28. The boat sheet was constantly compared with the smooth sheet with reference to notes, position of sounding lines and supplemental information. Remarks Required: -- None		
29. Heights of rocks awash were correctly reduced and compared with topographic information. Remarks Required: -- Note excessive conflicts with topographic information.		
Part X - GENERAL		
30. All information on the sheet is shown in accordance with figures 82 and 83 in the Hydrographic Manual (Pub. 20-2). Remarks Required: -- None		
31. Unnecessary pencil notes have been removed from the sheet. Remarks Required: -- None		
32. Degree, minute values and symbols have been checked; also electronic distance arcs have been properly identified and checked on the smooth sheet. Remarks Required: -- None		
33. The bottom characteristics are adequately shown. Remarks Required: -- None		
Part XI - NOTES TO THE REVIEWER		
34. Unresolved discrepancies and questionable soundings.		
35. Notation of discrepancies with photogrammetric survey inserted in report of unreviewed photogrammetric survey or on copy.		
36. Supplemental information.		

Verified by

Date

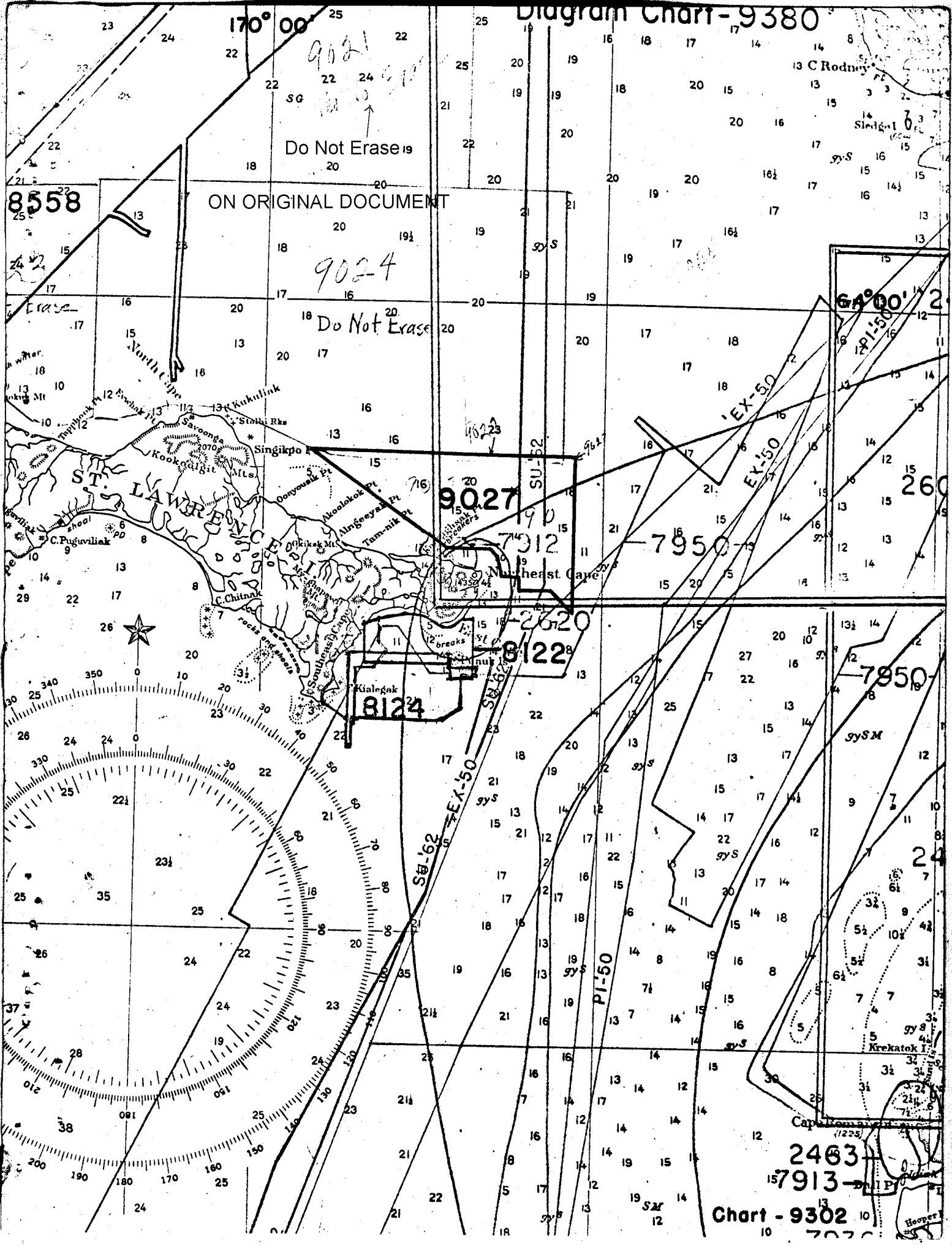


Diagram Chart-9380
170° 00'
64° 00'
Do Not Erase
ON ORIGINAL DOCUMENT
Do Not Erase
8558
9024
9027
7912
7950
8122
8124
2220
7950
2463
7913
Chart - 9302
ST. LAWRENCE ISLAND
Northeast Cape
Kialegak
C.Chitnak
C.Puguviliak
Singikpo Pt
Kukulink
Savoonga
Kook Cliff Mts.
Okikak Mt
Southeast Cape
Krekatok I.
Sledge I.
C Rodney
SU-62
SB-62
EX-50
PI-50

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9027

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
9380	9/20/71	C.S. Forbes	~~Full~~ Part Before ~~After~~ Verification Review Inspection ~~Signed Via~~
		D.J. Kennon	Drawing No. Examined - no critical corrections.
			Added two sdgs one critical one in void area
9380	2/28/73	James Graham	~~Full~~ Part Before ~~After~~ Verification Review Inspection Signed Via
			Drawing No. 12 Examined, no corr. at this
			time.
9302	3/15/73	James Graham	~~Full~~ Part Before ~~After Verification Review~~ Inspection Signed Via
			Drawing No. 19 Examined thru cht 9380
			dwg. #12. No corr. at this time.
16006	4/16/90	DM MCKINNEY	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. CONSIDER ADEQUATELY APPLIED
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63