

# 10012

Diagram No. 8553-2

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

Type of Survey .. Navigable Area Hydrographic....  
Field No. .... RA-10-1-82.....  
Office No..... H-10012.....

### LOCALITY

State ..... Alaska.....  
General Locality Cook Inlet.....  
Locality ..... Knik Arm.....

1982

CHIEF OF PARTY  
CAPT R.J. Land

### LIBRARY & ARCHIVES

DATE ..... December 21, 1983.....

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ref. L-8(83)

16660 }  
16663 } all Record of  
16664 } Application  
16665 } to sign off

HYDROGRAPHIC TITLE SHEET

H-10012

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-10-1-82

State Alaska

General locality Cook Inlet

Locality Knik Arm

Scale 1:10,000 Date of survey April 28 - May 19, 1982

Instructions dated January 27, 1982 Project No. OPR-P358-RA-82

Vessel NOAA Ship RAINIER, Launches 2123, 2124, 2125

Chief of party Ralph J. Land, CAPT, NOAA

Surveyed by LT James W. O'Clock, LT Susan J. Ludwig, ENS Michael R. Mathwig,  
ENS Richard B. Koehler, ENS Brian S. Postle

Soundings taken by echo sounder, hand lead, pole Ross Fineline fathometer

Graphic record scaled by Ship's Personnel

Graphic record checked by Ship's Personnel

Verification Reviewed by Richard Shipley Automated plot by PMC Xynetics Plotter

Evaluation Verification by Dennis J. Hill

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

REMARKS: All times are Greenwich Mean Time

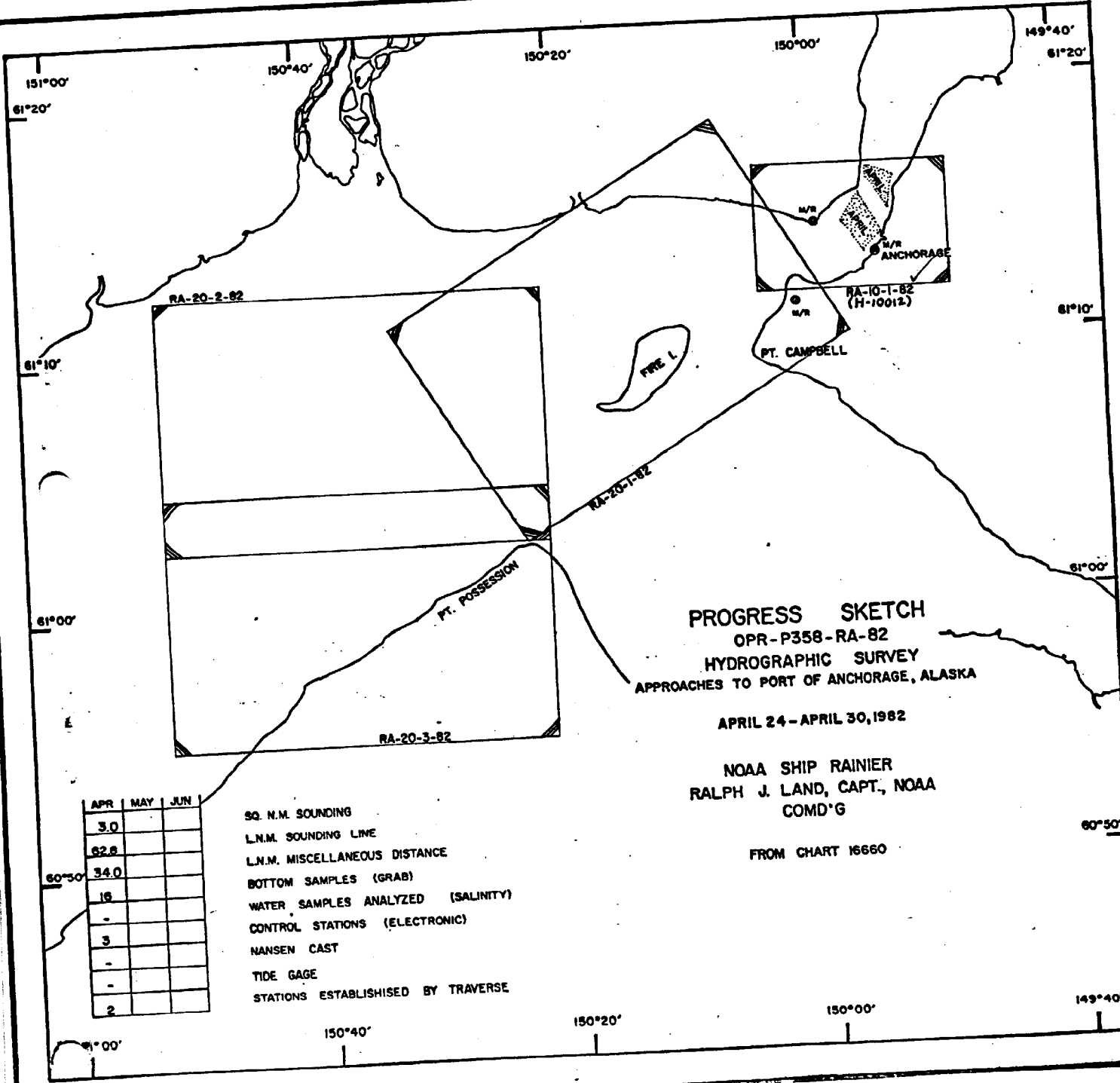
Revisions and marginal notes in black by evaluator.

STANDARDS CK'D 1-3-83

Clay

Survey checked 1/16/84 SJ Young

K.W.W. 5/9/91



**PROGRESS SKETCH**  
 OPR-P358-RA-82  
 HYDROGRAPHIC SURVEY  
 APPROACHES TO PORT OF ANCHORAGE, ALASKA

APRIL 24 - APRIL 30, 1982

NOAA SHIP RAINIER  
 RALPH J. LAND, CAPT., NOAA  
 COMD'G

FROM CHART 16660

	APR	MAY	JUN
90. N.M. SOUNDING	3.0		
L.N.M. SOUNDING LINE	62.8		
L.N.M. MISCELLANEOUS DISTANCE	34.0		
BOTTOM SAMPLES (GRAB)	18		
WATER SAMPLES ANALYZED (SALINITY)	-		
CONTROL STATIONS (ELECTRONIC)	3		
NANSEN CAST	-		
TIDE GAGE	-		
STATIONS ESTABLISHED BY TRAVERSE	2		

- 90. N.M. SOUNDING
- L.N.M. SOUNDING LINE
- L.N.M. MISCELLANEOUS DISTANCE
- BOTTOM SAMPLES (GRAB)
- WATER SAMPLES ANALYZED (SALINITY)
- CONTROL STATIONS (ELECTRONIC)
- NANSEN CAST
- TIDE GAGE
- STATIONS ESTABLISHED BY TRAVERSE

A. PROJECT

Survey H-10012 was conducted in accordance with Project Instructions numbered OPR-P358-RA-82, Approaches to Port of Anchorage, Alaska, dated ~~February 4~~<sup>January 27</sup>, 1982, and a supplement to the Project Instructions, Change No. 1, dated March 26, 1982. ✓

B. AREA SURVEYED

Survey H-10012 was performed in Northern Cook Inlet adjacent to the city of Anchorage, Alaska. ✓

The project area included the navigable waters east of longitude 150° 03' W and south of latitude 61° 16' N, with the inshore limit being the 3 fathom curve. ✓

Inclusive dates of the survey were April 28 - May 19, 1982. ✓

C. SOUNDING VESSEL

All soundings were obtained using the following hydrographic launches: RA-3 (2123), RA-4 (2124), and RA-5 (2125). No unusual sounding vessel configurations or problems were encountered. ✓

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Introduction

The echo sounding equipment for survey H-10012 was the Ross Fineline fathometer installed in launches RA-3, RA-4 and RA-5. This system includes the Ross model 400 transceiver, Ross model 5000 analog trace recorder, Ross model 6000 digitizer and a 100khz transducer. The table below summarizes the component serial numbers for each vessel. ✓

Table I - Echo Sounding Equipment Serial Numbers

<u>Component</u>	<u>RA-3 (2123)</u>	<u>RA-4 (2124)</u>	<u>RA-5 (2125)</u>
Transceiver	1048	1097	1040
Analog Recorder	1071	1070	1042
Digitizer	1041	1080	1040

Sound Velocity Correctors

Sound velocity corrections for echo soundings were derived from data obtained from two Nansen casts performed during this survey. Details of the cast are summarized below. ✓

Table II - Nansen Cast Data

<u>Date</u>	<u>Location</u>	<u>Velocity Table No.</u>
May 4, 1982	61° 13.5' N 149° 57.5' W	1,2
May 17, 1982	61° 14.7' N 149° 54.5' W	1,2

Water samples collected from the Nansen casts were analyzed for salinity using standard laboratory procedures (see H.O. 607 Instruction Manual for Obtaining Oceanographic Data, Third Edition, U.S. Naval Oceanographic Office, 1968). The salinometer used for salinity analysis was a Beckman Model No. RS-7B (S/N 59265). The unit was calibrated in April 1982 by the Northwest Regional Calibration Center, Bellevue, Washington (see separates following text for calibration results). Results from the casts were input into computer program RK530, velocity correction computations and run on the RAINIER's PDP 8/e computer system to yield velocity correctors for this survey. A list of the computed correctors are provided in the separates following the text. Velocity correctors for hydrography conducted Julian Date (JD) 118 through JD 133 were derived from the Nansen cast from May 4, 1982. Velocity correctors for hydrography conducted JD 134 through JD 139 were derived from the May 17, 1982 Nansen cast.

#### Launch Draft Correctors

Corrections for launch draft were determined from standard bar checks (see Hydrographic Manual, Fourth Edition, 1976). Bar checks were usually performed each day at the beginning and end of survey operations. However, due to swift currents, occasionally only one bar check per day was feasible.

Beginning and ending times of hydrography were often during strong ebb or flood current, resulting in the bar being pushed from underneath the transducer. Even if a reading was obtainable in this situation, the bar may have been at a different depth than indicated on the bar hand lines. The currents prevented bar checks from being performed or completed on JD 120/121 for launch 2125 and JD 127/128 for launch 2124. Graduations on bar hand lines were compared with steel measuring tapes prior to survey H-10012 and found to be within specifications.

The mean fathometer depths were subtracted from the corresponding true bar depths to obtain bar check correctors. The sound velocity correctors were applied to the bar check data to arrive at a final TRA value. The final TRA value used for the plotting of the field smooth sheet was 1.8 feet. At the greater depth of bar checks, the analog minus bar depth showed the difference to be 1.2 to 1.5 feet on most occasions. As this survey project proceeded into less muddy and silty waters the difference returned to the historic average of 1.8 feet. The bars were rechecked and were once again found to be accurate. Therefore, the heavily silted water appears to have affected the analog depths.

#### Launch Settlement and Squat

Settlement and squat tests for launches 2123, 2124, 2125 and 2126 were conducted at Shilshole Bay Marina in Puget Sound on April 2 and on April 6, 1982. The test results are included after the text.

## Sounding Equipment Corrections

The initial trace on the analog recorders was continuously monitored by launch personnel to prevent any error due to a drifting initial.

Daily phase calibrations were performed to prevent belt length error and stylus/paper misalignment. This was done in accordance with the calibration procedures contained in the PMC OORDER.

## E. HYDROGRAPHIC SHEETS

Field sheets were prepared using the PDP 8/e complot system on board the RAINIER. All sheets were based on a modified transverse mercator projection. A list of parameters used to define the hydrographic sheets is attached. All field records will be sent to the Pacific Marine Center, Seattle, Washington for verification. The smooth field sheet for this survey is plotted at a 1:10,000 scale. In addition, there are six semi-smooth expansion sheets at a 1:2500 scale. The shoalest sounding of each development has been transferred to the smooth sheet.

## F. CONTROL STATIONS

Horizontal control for project OPR-P358-RA-82 was provided by the recovery of 28 existing stations and the establishment of 12 new stations. Four of these stations were used for Miniranger sites and five additional stations were used for electronic calibration stations. A copy of the Master Station List is included in the attachments. The stations used each day are listed in the raw records.

The new stations were established using Third Order, Class I methods. All work was computed using the North American Datum of 1927. Direct and intersection methods were used to establish the new stations.

Station Anchor Steam (ECC) was established for the purpose of observing Range/Azimuth hydrography from the miniranger site, Anchor Steam. Raw data and computations for Anchor Steam (ECC) can be found in the separates following text.

The details concerning the location and recovery of each station, including the field records and processing computations, are located in the Horizontal Control Report, OPR-P358-RA-82, submitted to the Pacific Marine Center on June 28, 1982.

## G. HYDROGRAPHIC POSITION CONTROL

Range - Range and Range Azimuth positioning methods were used during survey H-10012, employing Motorola Miniranger III systems, and a WILD T-2 theodolite. The tables below summarize the location of all miniranger mobile and shore equipment.

Miniranger Mobile Equipment

<u>Vessel</u>	<u>Console S/N</u>	<u>R/T S/N</u>
2123	715	1660
2124	30269	1636
2125	720	2710

Miniranger Shore Equipment

<u>Code</u>	<u>Transponder S/N</u>	<u>Station</u>
A	1573	102
B	4951	101
E	911721	101
0	911632	100
2	B1106	101

Miniranger Calibration and Systems Checks

Systems checks were performed twice daily in accordance with the Hydrographic Manual & PMC OORDER except where noted below. These checks were obtained by 3-point sextant angles to visible signals located over Third Order, or higher, station. ✓

Launch 2125 did not calibrate code E on JD 127 when running range - range hydrography. However, when launch 2125 calibrated code E on JD 128, the results were within the specified tolerances.

For the morning calibration of code E on JD 128, launch 2125 compared the rates of code E with code 2. On JD 128, both miniranger transponders (E and 2) were located on the same station. The morning calibration for code 2 on JD 128 was performed by 3-point sextant angles to visible signals. At the end of hydrography on JD 128, code E was calibrated by 3-point sextant angles to visible signals and the results conformed to the tolerances specified in the Hydrographic Manual. There is no reason to expect faulty system operation for code E on JD 127.

Miniranger baseline calibrations were performed at the Pacific Marine Center prior to departure to Alaska. The second baseline calibration took place at the Port of Anchorage municipal pier on May 27, 28, and 29, 1982. The initial corrections to electronic position control for each R/T - console pair and transponder combination were used in plotting the smooth field sheet for survey H-10012. The initial baseline calibration also determined minimum signal strength cutoff values for each system combination. The data for these calibrations is included in the Electronic Control Report.

## Miniranger Performance

All shore stations were positioned over Third Order, Class I (or higher) stations. Power to one station was provided by the ship's 24-volt power supply normally used for Raydist. The other stations used four 12-volt batteries connected in series and recharged by a solar panel.

It was difficult to obtain consistent miniranger performance during the course of this survey, as a result of many null zones and skip zones that were present. In areas where it was very difficult to run range - range hydrography, range - azimuth hydrography was conducted.

The pattern of soundings on the smooth field sheet reflects the problems with miniranger control that were encountered. The cause of the inconsistent miniranger performance is attributed to a combination of the large tide range and the fact that the operation was conducted in a metropolitan area. Possible sources of electronic interference include an extensive air traffic system for both civilian and military aircraft, and nearby radio and microwave relay towers.

Code 0 (station 101) produced problems of skip and null zones for the entire length of the survey. The installation of a high gain antenna failed to rectify this situation. It is possible that the location, rather than the miniranger, caused the skip and null zones. The daily systems checks for code 0 were all within specifications, in spite of its inconsistent performance.

After May 21, 1982, a new magnetron was placed in the code 0 miniranger due to a malfunction of the old device. The second miniranger baseline calibration (performed in Anchorage) for code 0 contained the new magnetron. The smooth field sheet is plotted using the first baseline calibration.

In spite of the above difficulties, miniranger performance was adequate to complete this survey with adherence to the specifications stated in the Hydrographic Manual and PMC OORDER.

## H. SHORELINE

As stated in the project instructions OPR-P358-RA-82, this survey is a Navigable Area Survey and requires no field edit investigation. Shoreline for the field sheets was taken from the latest editions of charts 16660 and 16664. No gross discrepancies were found in the charted shoreline. *See Evaluator's Report, sect. 2*

## I. CROSSLINES

A total of 22.8 miles of crosslines were run, representing 10.9 % of the mainscheme mileage. Agreement of the 358 comparisons between crossline and mainscheme soundings is as follows:



0 - 30 feet	30 comparisons within 1.2 feet 19 comparisons within 3 feet 6 comparisons greater than 3 feet
30 - 66 feet	110 comparisons within 3 feet 24 comparisons within 6 feet 1 comparison greater than 6 feet
66 - 330 feet	168 comparisons within 9 feet

Crossline agreement is good since 86% of the comparisons meet the criteria as stated in Section 1.1.2 Part B.II.1 of the Hydrographic Manual. The observed discrepancies are distributed randomly on the sheet. The amount of disagreement found here is not unusual considering bottom profile irregularities, and the fact that most of the compared soundings are not exactly coincident. Also, the use of actual tides rather than predicted tides will result in a better comparison. This is because of the non-sinusoidal characteristic of the actual tide curve compared to that of the computer generated curve. All of the launches involved in this survey (RA-3, RA-4, and RA-5) ran crosslines in addition to the mainscheme mileage. The same launch did not necessarily run both types in a given area.

#### J. JUNCTION

The junction of this survey was compared with present survey H-10000. The following is a statement on the agreement of the comparisons: ✓

0 - 30 feet	3 comparisons within 1.2 feet 3 comparisons withing 3 feet
30 - 66 feet	20 comparisons within 3 feet 4 comparisons within 6 feet
66 - 300 feet	5 comparisons with 9 feet

Junction agreement is good since 80% of the comparisons meet the criteria as stated in Section 1.1.2. Part B.II.1 of the Hydrographic Manual.

#### K. COMPARISON WITH PRIOR SURVEYS

This survey was compared with prior surveys H-9438 (1974) 1:10,000 reduction, H-9440 (1974) 1:10,000, and H-9441 (1974) 1:10,000. The following is a statement on the agreement of the comparisons:

*See Evaluator's  
Report, sect. 6*

##### H-9438

0 - 30 feet	9 comparisons within 1.2 feet 12 comparisons within 3 feet 9 comparisons within 6 feet 15 comparisons greater than 6 feet
-------------	--

30 - 66 feet      73 comparisons within 3 feet  
                     26 comparisons within 6 feet  
                     35 comparisons within 9 feet  
                     42 comparisons greater than 9 feet

66 - 300 feet    131 comparisons within 9 feet  
                     40 comparisons within 18 feet  
                     35 comparisons within 24 feet  
                     5 comparisons greater than 24 feet

49% of the comparisons meet the criteria as stated in Section 1.1.2.  
Part B.II.1 of the Hydrographic Manual.

H-9440

0 - 30 feet      10 comparisons within 1.2 feet  
                     6 comparisons within 3 feet  
                     6 comparisons within 6 feet  
                     1 comparison greater than 6 feet

30 - 66 feet      42 comparisons within 3 feet  
                     7 comparisons within 6 feet  
                     1 comparison within 9 feet

66 - 300 feet    112 comparisons within 9 feet  
                     36 comparisons within 24 feet  
                     11 comparisons within 24 feet  
                     1 comparison greater than 24 feet

70.4% of the comparisons meet the criteria as stated in Section 1.1.2.  
Part B.II.1 of the Hydrographic Manual.

H-9441

0 - 30 feet      120 comparisons within 1.2 feet  
                     80 comparisons within 3 feet  
                     50 comparisons within 6 feet  
                     25 comparisons greater than 6 feet

30 - 66 feet      235 comparisons within 3 feet  
                     85 comparisons within 6 feet  
                     39 comparisons within 9 feet  
                     42 comparisons greater than 9 feet

66 - 300 feet    324 comparisons within 9 feet  
                     69 comparisons within 18 feet  
                     19 comparisons within 24 feet  
                     4 comparisons greater than 24 feet

62% of the comparisons meet the criteria as stated in Section 1.1.2.  
Part B.II.1 of the Hydrographic Manual.

The results of this survey do not show excellent agreement with prior surveys H-9438, H-9440, and H-9441. Some of the discrepancies are due to the fact that the compared soundings are seldom coincident. This is particularly a problem with H-9438, 1:10,000 reduction since the sounding numbers are much smaller in size than those on the (10-1) smooth sheet. In addition, the presence of strong currents and unstable bottom composition (sand and mud) are evidence that the bottom profile of this area is continually changing.

L. COMPARISON WITH THE CHART

*See Evaluator's Report, sect. 7*

This survey was compared with chart 16664 18th Ed., Jan 16/82 (prelim), 1:15,000 scale inset enlarged to 1:10,000 scale and chart 16664 18th Ed., Jan 16/82 (prelim), 1:40,000 scale enlarged to 1:10,000 scale. The soundings compared as follows:

1:15,000 inset  
enlarged to 1:10,000

0 - 30 feet	15 comparisons within 1.2 feet 12 comparisons within 3 feet 17 comparisons within 6 feet 2 comparisons greater than 6 feet
30 - 66 feet	55 comparisons within 3 feet 32 comparisons within 6 feet 20 comparisons within 9 feet 18 comparisons greater than 9 feet
66 - 300 feet	102 comparisons within 9 feet 22 comparisons within 18 feet 15 comparisons within 24 feet 9 comparisons greater than 24 feet

54% of the comparisons meet the criteria as stated in Section 1.1.2. Part B.II.1 of the Hydrographic Manual.

1:40,000 enlarged  
to 1:10,000

0 - 30 feet	22 comparisons within 1.2 feet 19 comparisons within 3 feet 27 comparisons within 6 feet 11 comparisons greater than 6 feet
30 - 66 feet	41 comparisons within 3 feet 29 comparisons within 6 feet 17 comparisons within 9 feet 27 comparisons greater than 9 feet

66 - 300 feet	52 comparisons within 9 feet
	13 comparisons within 18 feet
	13 comparisons within 24 feet
	3 comparisons greater than 24 feet

42% of the comparisons meet the criteria as stated in Section 1.1.2. Part B.II.1 of the Hydrographic Manual.

The results of this survey do not show excellent agreement with the published chart 16664 1:40,000 scale, or the 1:15,000 scale inset. Since compared soundings often do not lie on top of one another (particularly with the 4 x enlargement of the 1:40,000 scale), some discrepancies could result. As mentioned in Section K, the comparison of the present survey and the 1974 survey shows evidence of extensive scouring and deposition due to action by strong currents on the sand/mud bottom.

The two submerged dolphins at charted positions  $61^{\circ} 13' 59.5''$  N,  $149^{\circ} 53' 54''$  W and  $61^{\circ} 13' 48.5''$  N,  $149^{\circ} 54' 28.5''$  W were searched for with negative results (see expansion sheet # 5). A wire drag and diver investigation of this area was not attempted due to strong currents and zero underwater visibility. It is recommended that the presence or absence of the dolphins be determined using side scan sonar equipment. These items should remain on the chart until disproved. *Concur*

The mooring buoy at charted position  $61^{\circ} 13' 48''$  N,  $149^{\circ} 54' 32''$  W was positioned in this survey using the mean of 3 three-point sextant fixes at  $61^{\circ} 13' 52.97''$  N,  $149^{\circ} 54' 19.12''$  W. The mooring buoy is placed in this approximate position seasonally after the heavy ice floes leave the harbor. ✓

#### M. ADEQUACY OF SURVEY

This survey is complete and sufficient to supersede all prior surveys *within the common area* for charting purposes.

#### N. AIDS TO NAVIGATION

There are no floating aids to navigation in the survey area. Comparison of the fixed aids to navigation, as listed on NOAA Form 76-40, with the Light list, Vol. III, 1982, revealed two positional errors. Point MACKENZIE LIGHT (LL#3517) is listed at  $61^{\circ} 14.3'$  N,  $149^{\circ} 59.0'$  W, it's correct position is  $61^{\circ} 14.3'$  N,  $149^{\circ} 59.1'$  W. Point WORONZOF LIGHT 10 (LL#3514) is listed at  $61^{\circ} 12.3'$  N,  $150^{\circ} 00.9'$  W, it's correct position is  $61^{\circ} 12.3'$  N,  $150^{\circ} 00.8'$  W. An inverse computation of the verified positions of the WORONZOF ranges, refer to Horizontal Control Report OPR-P358-RA-82, resulted in a range of  $081^{\circ} 03.7'$ . The Light list (LL#3516) range value of  $081^{\circ} 30'$  does not agree. The Point MACKENZIE range was verified visually and is listed correctly. The charted cable area (CH#16664, and 16660) extending from Point MACKENZIE to Point WORONZOF, was not verified, except verbally by local residents, and should be retained on the chart. All fixed aids and landmarks were verified or recommended for deletion, and are listed on the NOAA 76-40 Forms included with this report. ✓

O. STATISTICS

<u>Survey Launch</u>	<u>Linear/Nautical Miles of Hydrography</u>	<u>Square Nautical Miles</u>	<u>Number of Positions</u>
RA-3 (2123)	176.1	-----	117 <del>0</del> 8
RA-4 (2124)	6.1	-----	8 <del>9</del> 2
RA-5 (2125)	74.0	-----	80 <del>4</del> 8
TOTAL	256.2	8.75	206 <del>4</del> 8

Bottom samples: 34

One tide station was maintained at the Anchorage Municipal Pier.

Two Nansen casts were taken in the survey area.

P. MISCELLANEOUS

All NAV DOWN errors generated during the course of hydrography on the computer launches were corrected in the corrector tapes.

A new power cable crossing is to be included on the next edition of Chart 16664. A chartlet and a copy of the engineering drawings are included in the Descriptive Report package.

*Drawing fwd to N/CG 222*

*Bp. 120357*

Q. RECOMMENDATIONS

This survey is considered complete and adequate, and there are no recommendations.

R. AUTOMATED DATA PROCESSING

Data acquisition and processing were accomplished per instructions in the Hydrographic Manual (4th Edition), Manual of Automated Hydrographic Surveys, the PMC OORDER, Hydrographic Survey Guidelines and the Hydrographic Data Requirements for 1982.

Soundings and positions were taken by an ASI Logger and a Hydroplot system using range - range program RK111 and RK112. There are daily master tapes and corresponding corrector tapes which include the TRA for the launches and electronic control baseline correctors for mini-ranger consoles and R/T units and all depth corrections. Velocity tapes were generated from Nansen cast data. The following is a list of all computer programs and version dates used for data acquisition or processing:

	<u>PDP 8/e Programs</u>	<u>Version Date</u>
RK111	Range-Range Real Time Plot	01/30/76
RK112	Hyperbolic, R/R Hydroplot	08/04/81
RK201	Grid, Signal and Lattice Plot	04/18/75
RK211	Range-Range Non-Real Time Plot	02/02/81
RK212	Visual Station Table Load	04/01/74
RK216	Range Azimuth Non-Real Time Plot	02/09/81
RK300	Utility Computations	10/21/80
RK330	Reformat and Data Check	05/04/76
PM360	Electronic Corrector Abstract	02/02/76
RK407	Geodetic Inverse/Direct Computation	09/25/78
AM500	Predicted Tide Generator	11/10/72
RK530	Layer Corrections for Velocity	05/10/76
RK561	H/R Geodetic Calibration	02/19/75
AM602	Elinore-Line Oriented Editor	05/20/75
AM603	Tape Consolidator	10/10/72
RK606	Tape Duplicator	08/22/74

The HP97 and HP9815A programmable calculators were used to compute geographic positions of electronic control stations and visual signals for calibrations.

S. REFERRAL TO REPORTS

The following reports contain information related to this survey: ✓

Echo Sounding Report	OPR-P358-RA-82
Electronic Control Report	OPR-P358-RA-82
Horizontal Control Report	OPR-P358-RA-82
Coast Pilot Report	OPR-P358-RA-82

Respectfully submitted,

*Brian S. Postle*

Brian S. Postle  
ENS, NOAA

INDEX TO ATTACHMENTS FOLLOWING TEXT

~~Final Baseline Correctors~~     *See Electronic Control Report*

Master Station List

~~ASCII Signal Tape Listing~~     *Filed with field records*

Hydrographic Sheet Projection Parameters

Field Tide Notes

Velocity Corrector Tape Listing

Geographic Names

Abstracts of TC/TI Tape Comp.

Abstracts of TC/TI Tapes

Abstracts of Positions

Bottom Samples (Log Sheet M)

Settlement and Squat

Electronic Corrector Abstracts

~~Abstracts of Times of Hydro and Field Edit~~     *Filed with field records*

Nonfloating Aids or Landmarks for Charts (76-40)

Cable Routes & Correspondence to USCG

~~Geodetic Data for Fixed Calibration Points & Descriptions of Stations~~

*Filed with field records*

Approval Sheet

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PARAMETER TAPE LISTING  
RA-10-1-82(H-10012)

RA-10-1-82  
SCALE: 1:10000  
SKEW: 23,22,48

FEST=36000  
CLAT=6743000  
CMER=150/20/0  
GRID=30  
PLSCL=10000  
PLAT=61/11/30  
PLON=150/02/15  
VESNO=2125  
YR=82  
ANDIST=0.0

EXPANSION #1  
SCALE: 1:2500  
SKEW: 0,10,13

FEST=36000  
CLAT=6743000  
CMER=150/20/0  
GRID=10  
PLSCL=2500  
PLAT=61/14/54  
PLON=149/54/14  
VESNO=2123  
YR=82  
ANDIST=0.0

EXPANSION #2  
SCALE: 1:2500  
SKEW: 90,7,8

FEST=36000  
CLAT=6743000  
CMER=150/20/0  
GRID=10  
PLSCL=2500  
PLAT=61/13/00  
PLON=149/56/20  
VESNO=2123  
YR=82  
ANDIST=0.0



EXPANSION #3  
SCALE: 1:2500  
SKEW: 0,22,44

FEST=36000  
CLAT=6743000  
CMER=150/20/0  
GRID=10  
PLSCL=2500  
PLAT=61/12/45  
PLON=150/01/00  
VESNO=2123  
YR=82  
ANDIST=0.0

EXPANSION #4  
SCALE: 1:2500  
SKEW:0,4,9

FEST=36000  
CLAT=6743000  
CMER=150/20/0  
GRID=10  
PLSCL=2500  
PLAT=61/14/36  
PLON=149/53/50  
VESNO=2124  
YR=82  
ANDIST=0.0

EXPANSION #5  
SCALE: 1:2500  
SKEW:46,5,16

FEST=36000  
CLAT=6743000  
CMER=150/20/0  
GRID=10  
PLSCL=2500  
PLAT=61/13/37  
PLON=149/54/27  
VESNO=2123  
YR=82  
ANDIST=0.0

EXPANSION #6  
SCALE: 1:2500  
SKEW:90,7,13

FEST=36000  
CLAT=6743000  
CMER=150/20/0  
GRID=10  
PLSCL=2500  
PLAT=61/15/20  
PLON=149/53/11  
VESNO=2124  
YR=82  
ANDIST=0.0

FIELD TIDE NOTE

Field tide correctors for H-10012 were based on predicted tides for Anchorage, Alaska (945-5920). The predicted tides were interpolated using Program AM500. No zoning correctors were required for this survey.

The Anchorage, Alaska (945-5920) primary tide station ( $61^{\circ} 14.2^{\prime}$  N,  $149^{\circ} 53.3^{\prime}$  W) was the only gage required for H-10012. As the gage was not functioning properly upon arrival, it was repaired on April 26, 1982 by RAINIER personnel and the Pacific Tide Party.

The staff value of the zero line on the tide record is -3.5 ft. and the time meridian for records annotation is  $150^{\circ}$  W.

GEOGRAPHIC NAMES

H-10012

Name on Survey	ON CHART NO. 16664										
	ON PREVIOUS SURVEY NO.										
	ON U.S. QUADRANGLE MAPS										
	FROM LOCAL INFORMATION										
	ON LOCAL MAPS										
	P.O. GUIDE OR MAP										
	RAND McNALLY ATLAS										
	U.S. LIGHT LIST										

	A	B	C	D	E	F	G	H	K	
ANCHORAGE	X									1
CAIRN POINT	X									2
COOK INLET	X									3
FISH CREEK	X									4
KNIK ARM	X									5
POINT MACKENZIE	X									6
POINT WORONZOF	X									7
SHIP CREEK										8
ALASKA (title block)										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

Approved:

*Charles E. Harrington*  
Chief Geographer - NCG 2x5

21 JUNE 1983

NOAA Ship RAINIER  
Settlement and Squat  
April 1982

Settlement and squat tests were conducted at Shilshole Marina in Puget Sound on April 2 and April 6.

Tests were conducted as follows: One man on shore sighted through a level to the leveling rod located over the transducer on the launch. The readings started at 0 RPM and were read at RPM's listed below. A second set of readings were taken from full speed back down to 0 RPM. These two runs were averaged to arrive at the final readings.

RPM	RA-3 (1007)		RA-4 (1016)		RA-5 (1003)		RA-6 (1013)	
	Ft	Fm	Ft	Fm	Ft	Fm	Ft	Fm
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1000	+0.2	0.0	0.0	0.0	+0.1	0.0	+0.1	0.0
1200	+0.2	0.0	+0.2	0.0	+0.1	0.0	+0.2	0.0
1500	+0.2	0.0	+0.2	0.0	+0.2	0.0	+0.2	0.0
1800	+0.2	0.0	+0.2	0.0	+0.2	0.0	+0.2	0.0
2000	+0.2	0.0	+0.1	0.0	+0.1	0.0	+0.2	0.0
2200	+0.2	0.0	-0.2	0.0	-0.1	0.0	-0.2	0.0
2400	-0.2	0.0	-0.4	-0.1	-0.3	0.0	-0.3	0.0
2600	-0.5	-0.1	-0.5	-0.1	-0.5	-0.1	-0.5	-0.1
2800	----	----	-0.6	-0.1	----	----	----	----

VELOCITY CORRECTOR TAPE LISTING  
RA-10-1-82(H-10012)

TABLE NO. 1

000080	0	0000	0001	000	000000	000000
000220	1	0002				
000375	1	0004				
000515	1	0006				
000660	1	0008				
000790	1	0010				
000940	1	0012				
001020	1	0014				
001260	1	0016				
001400	1	0018				
001540	1	0020				
001690	1	0022				
001850	1	0024				
001970	1	0026				
002110	1	0028				
002240	1	0030				
999999	1	0032				

TABLE NO. 2

000220	0	0000	0002	000	000000	000000
000585	1	0002				
000940	1	0004				
001290	1	0006				
001680	1	0008				
001910	1	0010				
002400	1	0012				
999999	1	0014				

-2.5      -2.0      -1.5      -1.0      -0.5      0.0      0.5  
 CORRECTIONS IN FEET

OPR-P358-RA-82  
 ANCHORAGE, ALASKA  
 VELOCITY CORRECTIONS

TABLE NO. 1

DEPTH RANGE CORRECTIONS  
 (FT)                      (FT)

5.0	0.0
22.0	-0.2
58.5	-0.4
94.0	-0.6
129.0	-0.8
168.0	-1.0
191.0	-1.2
200.0	-1.4
DEEPER	

DEPTH IN FEET

50

100

150

200

250

NANSEN 5/12/82  
 TABLE NO. 1 (HYDRO FROM SIPS TO 150 FT - 500 FT (D. 1987))

NANSEN 5/12/82  
 TABLE NO. 2 (HYDRO FROM SIPS TO 150 FT - 500 FT (D. 1987))

NANSEN 6/1/82

TABLE NO. 2

DEPTH RANGE (FT)	CORRECTION (FT)
22	0.0
58.5	-0.2
94.0	-0.4
129.0	-0.6
168.0	-0.8
191.0	-1.0
200.0	-1.2
DEEPER	-1.4

TC/II TAPE LISTING  
FA-10-1-82(H-10012)

VESSEL: 2125(HA-5)  
FAHO S/N - 1040

202419	0	0000	0000	118	212500	000000
193701	0	0018	0001	120	000000	000000
204706	0	0000	0000	123	000000	000000
200015	0	0020	0001	125	000000	000000
192432	0	0000	0000	126	000000	000000
214102	0	0018	0001	129	000000	000000
185033	0	0020	0001	130	000000	000000
193430	0	0018				
224456	0	0020				
232900	0	0018				
<del>194602</del> 200700	0	0020	0002	138	000000	000000
230720	0	0018				
020000	0	0018	0002	139	000000	000000



IC/II TAPE LISTING  
RA-10-1-82(H-10012)

VESSEL: 2123(RA-3)  
FATHOMETER: 1071

185700 0 0016 0001 120 212300 000000  
193714 0 0020 0001 123 000000 000000  
202915 0 0016  
185607 0 0020 0001 124 000000 000000  
190208 0 0016  
201944 0 0020  
210346 0 0016  
210853 0 0020  
211052 0 0016  
212601 0 0020  
212709 0 0016  
213448 0 0020  
235210 0 0016  
190630 0 0020 0001 125 000000 000000  
190740 0 0016  
193449 0 0020  
193557 0 0016  
195106 0 0020  
195205 0 0016  
200340 0 0020  
201406 0 0016  
203234 0 0020  
203345 0 0016  
020000 0 0016 0001 128 000000 000000

VESSEL: 2124(RA-4)  
FATHOMETER: 1070

183825 0 0020 0001 127 212400 000000  
191824 0 0014  
192443 0 0020  
212408 0 0014  
230627 0 0020  
205656 0 0018 0001 128 000000 000000  
003127 0 0014 0001 129 000000 000000  
030000 0 0014 0001 129 000000 000000



TRA (TC/TT) TAPE: VESSEL 2123 (12A-3) SURVEY H-10012 RA-10-1, 82

FATHOMETER S/N 1071 YR 82 PAGE 1 OF 2

From TIME	TRA CORR.	DAY	VEL. TBL.	TRA corr. is the algebraic sum of these columns			COMMENTS	
				INITIAL	DRAFT F. ARC	S./ SQUAT		
185700	1.6	120	1	0.0	1.8	0.0	-0.2	HYDRO BEGINS
193714	2.0	123	1	0.0	1.8	0.0	+0.2	
202915	1.6	123	1	0.0	1.8	0.0	-0.2	
185607	2.0	124	1	0.0	1.8	0.0	+0.2	
190208	1.6	124	1	0.0	1.8	0.0	-0.2	
201944	2.0	124	1	0.0	1.8	0.0	+0.2	
210346	1.6	124	1	0.0	1.8	0.0	-0.2	
210853	2.0	124	1	0.0	1.8	0.0	+0.2	
211052	1.6	124	1	0.0	1.8	0.0	-0.2	
212601	2.0	124	1	0.0	1.8	0.0	+0.2	
212709	1.6	124	1	0.0	1.8	0.0	-0.2	
213448	2.0	124	1	0.0	1.8	0.0	+0.2	
235210	1.6	124	1	0.0	1.8	0.0	-0.2	
190630	2.0	125	1	0.0	1.8	0.0	+0.2	
190740	1.6	125	1	0.0	1.8	0.0	-0.2	
193449	2.0	125	1	0.0	1.8	0.0	+0.2	





ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2125

SHEET : PA-10-1-82

TIME	DAY	PATTERN 1	PATTERN 2
202419	118	-00001	+000010
003735	119	-00001	+000010
192959	119	-00001	+000010
193701	120	-00001	+000010
185300	123	-00001	+000010
204706		+00000	-00001
003240	124	+00000	-00001
200015	125	-00001	<del>-36215</del>
002200	126	-00001	<del>-25176</del>
050000		+00000	+00000
192432	126	-000010	+00000
214102	129	+00000	+31100
235620		+00000	+57031
000147	130	+00000	<del>+64423</del>
030000		+00000	+00000
182234	130	+00000	<del>+98098</del>
000030	131	+00000	<del>+28197</del>
030000		+00000	+00000
184540	131	+000100	<del>+20263</del>
230000		+00000	+00000
000700	138	+00002	+19196
020000		+00000	+00000
194602	138	+00002	+91268
000130	139	+00002	<del>+21588</del>
020000		+00000	+00000

NOTE: FOR RANGE-AZIMUTH HYDRO DISREGARD PATTERN 2 CORRECTORS.

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2123

SHEET : FA-10-1-82

TIME	DAY	PATTERN 1	PATTERN 2
185700	120	+00000	-00002
000225	121	+00000	-00002
190559	123	+00000	-00002
003613	124	+00000	-00002
185351	124	+00000	-00002
000005	125	+00000	-00002
185007	125	+00001	+00000
000005	126	+00001	+00000
185621	126	+00001	+00000
000006	127	+00001	+00000
192152	127	+00000	- <del>00002</del>
210037		+00001	+00000
000125	128	+00001	+00000

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2124

SHEET : RA-10-1-82

TIME	DAY	PATTERN 1	PATTERN 2
183825	127	-00001	-00002
224006		+00002	-00001
005908	128	+00000 <del>1</del> 2	-00000 <del>1</del>
201521	128	-00001	-00000
001336	129	-00001	+37050
030000		+00000	+00000

NOTE: FOR RANGE-AZIMUTH HYDRO DISREGARD PATTERN 2 CORRECTORS.



MASTER STATION LIST  
 OFF-1358-FA-82  
 ANCHORAGE, ALASKA

FINAL VERSION

100	3	61	11	21628	150	00	58376	250	0084	000000	
/WIND 1982											
101	3	61	13	13222	149	54	01358	250	0044	000000	
/ANCHOR STEAM 1982											
102	1	61	14	19454	149	59	05885	250	0027	000000	
/MAC #3 1947 #1 1960 1941 Rm3, Rm1,											
103	4	61	13	13193	149	54	01309	243	0044	000000	
/ANCHOR STEAM 1982 ECCENTRIC											
<del>104</del>	<del>4</del>	<del>61</del>	<del>07</del>	<del>35804</del>	<del>150</del>	<del>16</del>	<del>48041</del>	<del>250</del>	<del>0005</del>	<del>000000</del>	
<del>/WEST POINT 1982</del>											
105	4	61	10	05201	150	13	21833	250	0052	000000	(LL3510)
/FACE POINT LIGHT 1982 (NEW)											
106	4	61	02	03954	150	24	10627	250	0023	000000	611502(LL3507)
/FI POSSESSION LIGHT 1974											
107	7	61	00	20505	150	30	17765	250	0028	000000	
/PRIMO 1982 (TEMPORARY)											
108	7	60	59	08021	150	34	17820	250	0022	000000	
/MOOSEHEAD 1982 (TEMPORARY)											
109	6	60	57	22856	150	41	01915	250	0009	000000	601504(LL3506)
/MOOSE PT. LIGHT 1966											
110	2	60	55	16655	150	44	57212	250	0029	000000	601504(LL3506)
<del>/CHALK 1963, 1964</del>											
200	4	61	13	<sup>5998</sup> <del>5007</del>	149	52	21662	139	0107	000000	
/ANCHORAGE ACS MICROWAVE TOWER, <del>CENTER</del> , 19 <del>82</del> <sup>80</sup>											
201	4	61	13	46510	149	52	35348	139	0068	000000	611493
/ANCHORAGE MUNICIPAL TANK, 1964											
202	3	61	12	25181	149	55	20367	139	0075	000000	611493
/ANCHORAGE RADIO STA KENI TWP, 1954, 1964											

203	3	61	14	19554	149	59	05994	139	0030	000000	
/POINT MACKENZIE LIGHT 1973										611493(LL3517)	
204	3	61	14	22627	149	59	17289	139	0029	000000	
/PT. MACKENZIE RNG. FRONT LT., 1974										611493(LL3518)	
205	3	61	14	29188	149	58	52550	139	0043	000000	
/PT. MACKENZIE RNG. REAR LT., 1974										611493(LL3519)	
206	3	61	09	34034	150	01	54687	139	0110	000000	
/SITE POINT RADOME 1964										611502(1025)	
207	3	61	10	38206	149	58	50663	139	0079	000000	
/PATCO INTERNATIONAL CONTROL TOWER 1982											
208	3	61	10	22690	150	11	51552	139	0038	000000	
/FIRE ISLAND RNG FRONT LT 1974										611502(LL3511)	
<del>209</del>	<del>3</del>	<del>61</del>	<del>10</del>	<del>15602</del>	<del>150</del>	<del>12</del>	<del>19144</del>	<del>139</del>	<del>0050</del>	<del>000000</del>	
<del>/FIRE ISLAND RNG REAR LT 1974</del>										<del>611502(LL3512)</del>	
210	3	61	12	09033	150	01	11117	139	0024	000000	
/PT WORONZOF RNG FRONT LT 1974										611502(LL3515)	
211	3	61	12	10383	150	00	53325	139	0036	000000	
/PT WORONZOF RNG REAR LT 1974										611502(LL3516)	
212	4	61	12	15117	150	00	49417	139	0048	000000	
/PT WORONZOF LIGHT "10" 1982										(LL3514)	
<del>213</del>	<del>1</del>	<del>61</del>	<del>07</del>	<del>35808</del>	<del>150</del>	<del>16</del>	<del>48039</del>	<del>250</del>	<del>0009</del>	<del>000000</del>	
<del>/FIRE ISLAND LIGHT 1967, 1982</del>										<del>611502(LL3509)</del>	
214	1	61	10	17462	150	12	35026	250	0052	000000	
/RACE POINT LIGHT 1966 (OLD)										611502	
215	4	61	07	50319	150	14	45240	139	0070	000000	
<del>/RAINIER 1982</del>											

ABSTRACT OF POSITIONS

RA-10-1-82

(H-10012)

VESSEL: 2123 (RA-3)

ANDIST: 0.0

<u>Day</u>	<u>Position</u>	<u>Control</u>	<u>S1</u> <u>M</u> <u>S2</u>	<u>Remarks</u>
120/121	3000-3251	04	101 100	Mainscheme Hydro. Pos. 3017-3018; 3032-3035; 3042-3043; 3055-3058; 3071-3075; 3091-3096 inside expansion sheet No. 5, 1:2500.
123	3252-3267	04	101 100	Mainscheme Hydro. Pos. 3254-3256 inside expansion sheet No. 5.
123	3268-3308	04	101 100	Crosslines. Pos. 3299-3302; on expansion sheet No. 3.
124	3311-3348	04	101 100	Mainscheme Hydro. Pos. 3321-3322 inside expansion sheet No. 5, 1:2500.
124	3349-3414	04	101 100	Mainscheme Hydro. Pos. 3379-3380; 3389-3390; 3399-3401; 3409-3411 inside expansion sheet No. 1, 1:2500. Pos. 3387-3388; 3401-3403; 3407-3408; 3440-3442 inside expansion sheet No. 4.
124/125	3426-3446	04	101-100	Crosslines. Pos. 3437-3439 inside expansion sheet No. 6. Pos. 3440-3445 inside expansion sheet No. 1.
125	3447-3684	04	102 101	Mainscheme Hydro. Pos. 3450-3451; 3459-3461; 3469-3471; 3478-3482; 3492-3496; 3498-3503; 3514-3527; 3538-3554; 3564-3580; 3590-3605; 3625-3628; 3639-3645; 3649-3655; 3666-3672; 3678-3684 inside expansion sheet No. 3, 1:2500.
125	3684-3686	04	102 101	Not to be smooth plotted.
125	3686-3713	04	102-101	Mainscheme Hydro. Pos. 3697-3703; 3710-3713 inside expansion sheet No. 3, 1:2500.
125	3713-3720	04	102-101	Not to be smooth plotted.

<u>Day</u>	<u>Position</u>	<u>Control</u>	<u>S1 M S2</u>	<u>Remarks</u>
125	3720-3742	04	102 101	Mainscheme Hydro. Pos. 3728-3734; 3741-3742 inside expansion sheet No. 3.
125	3742-3743	04	102 101	Not to be smooth plotted.
125/126	3743-3853	04	102-101	Mainscheme Hydro. Pos. 3758-3764; 3769-3776; 3787-3793; 3799-3805; 3818-3823; 3828-3832; 3847-3851 inside expansion sheet No. 3.
126	3854-3934	04	102 101	Mainscheme Hydro. Pos. 3856-3858; 3877-3879; 3884-3885 inside expansion sheet No. 3.
126	3935-3936	04	102 101	Not to be smooth plotted.
126/127	3937-3997 2000-2021	04	102 101	Mainscheme Hydro.
127	2022-2073	04	102 101	Crosslines. Pos. 2023-2028; 2034-2041; 2051-2058 inside expansion sheet No. 3.
127	2074-2127	04	101 100	Mainscheme Hydro.
127	2128-2180	04	102 101	Mainscheme Hydro.
127/128	2181-2214	04	102 101	Development line on expansion sheet No. 3, 1:2500.
128	2215-2223	04	102 101	Mainscheme Hydro.

REJECTED POSITIONS: 3006-3010; 3023-3025; 3309-3310; 3333; 3360; 3396; 3398; 3415-3425; 3435; 3533; 3587; 3612; 3631; 3855; 3990-3991; 2084-2085; 2087; 2097; 2114-2116; 2137-2138; 2185-2186; 2199.

ABSTRACT OF POSITIONS

RA-10-1-82

(H-10012)

VESSEL: 2124 (RA-4)

ANDIST: 0.0

<u>Day</u>	<u>Position</u>	<u>Control</u>	<u>S1 M S2</u>	<u>Remarks</u>
127	4000-4029	04	101 100	Mainscheme Hydro.
127	4035-4046	04	102 101	Crossline. Running MACKENZIE RANGE
127	4047-4054	04	102 101	Development lines expansion sheet No. 2, scale 1:2500. Pos. 4054 duplicate same this Julian Day.
127	4054-4062	04	101 100	Lines along edge of Anchorage Pier.
128	4063-4104	03	103 100	R/AZ. Mainscheme Hydro. Pos. 4076-4077 inside expansion Sheet No. 4. Pos. 4086-4093 development lines on expansion sheet No. 1.

REJECTED POSTIONS:

4002-4005; 4011-4013; 4030-4031; 4050-4052.

ABSTRACT OF POSITION

RA-10-1-82

(H-10012)

VESSEL: 2125 (RA-5)

ANDIST: 0.0

<u>Day</u>	<u>Position</u>	<u>Control</u>	<u>S1 M S2</u>	<u>Remarks</u>
118/119	5000-5009	04	101 100	Bottom samples.
119	5010-5015	04	101 100	Bottom samples.
120	5016-5114	04	101 100	Mainscheme Hydro. Pos. 5045-5046; 5054-5059; 5063-5066; 5076-5078; 5080-5083; 5093-5095; 5099-5101; 5110-5111 inside expansion sheet No. 6, scale 1:2500. Mainscheme Hydro. Pos. 5112 inside expansion sheet No. 1, scale 1:2500.
123	5115-5132	04	101 100	Mainscheme Hydro. Pos. 5119-5121; 5125-5127 inside expansion sheet No. 1, scale 1:2500.
123/124	5133-5138	04	101 100	Bottom samples.
125	5139-5227	03	103 100	R/AZ Mainscheme Hydro. Pos. 5160-5179 inside expansion sheet No. 1, 1:2500. And Pos. 5145-5150 inside expansion sheet No. 4, scale 1:2500.
126	5228-5255	03	103 100	R/AZ - Development lines expansion sheet No. 1, scale 1:2500. Pos. 5248-5255 duplicates on JD 130.
126	5256-5259	03	103 100	R/AZ Crossline. Inside expansion sheet No. 1. Pos. 5256-5259 duplicates on JD 130.
126	5260-5271	04	102 101	Bottom samples. Pos. 5260-5271 duplicates on JD 130.
129	5272-5365	03	103 100	R/AZ Mainscheme Hydro. Pos. 5272- 5276 duplicates on JD 130/131.
130	5366-5373	03	103 100	R/AZ Mainscheme Hydro.
130	5374-5407	03	103 100	R/AZ Development lines expansion sheet No. 1.

<u>Day</u>	<u>Position</u>	<u>Control</u>	<u>S1 M. S2</u>	<u>Remarks</u>
130	5408-5410	03	103 100	R/AZ Crossline expansion sheet No. 1.
130	5411-5414	03	103 100	R/AZ Mainscheme Hydro.
130	5415-5425	03	103 100	R/AZ Development lines. expansion sheet No. 4, scale 1:2500.
130	5426-5427	03	103 100	R/AZ Mainscheme Hydro.
130	5248-5261	03	103 100	R/AZ Mainshceme Hydro. Duplicate same position on JD 126.
130	5262-5276	03	103 100	R/AZ Development expansion sheet No. 2. Duplicate same positions on JD 126 and JD 129.
130/131	5277-5309	03	103 100	R/AZ Development expansion sheet No. 3, scale 1:2500. Duplicate same positions on JD 129.
131	5428-5508	03	103 100	R/AZ Development lines. Expansion sheet No. 3.
138	5509-5621	03	103 100	R/AZ Crossline.
138	5622-5639	03	103 100	R/AZ Development lines, expansion sheet No. 5, scale 1:2500, to look for submerged dolphin.
138	5640-5676	03	103 100	R/AZ Development lines on expansion sheet No. 6, scale 1:2500.
138/139	5677-5724	03	103 100	R/AZ Development lines on expansion sheet No. 3, scale 1:2500.
139	5725-5748	03	103 100	R/AZ Mainscheme Hydro.

REJECTED POSITIONS:

5044, 5147, 5282-5286.

OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

DATE CHECKED  
5/13/82

CHECKED BY  
PHN

REMARKS  
(Unusual conditions, core recovery, depth of cutter, stat. no., type of bottom, relief i.e., slope, plain, disposition, etc.)

OBS. INIT.

NOAA FORM 75-44  
(11-72)

VESSEL 2125 (RA-5)	DATE 1982	PROJ. NO. OAR-7358-RA-82		YEAR 1982	DEPTH 12	SAMPLE POSITION		WEIGHT OF SAMPLER	AP. PROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS	OBS. INIT.
		LATITUDE 61° N	LONGITUDE 149° W											
5000	4/28	15	53.81	54	02.34	141.4	25168				gy	fne S		RK
5001	"	15	50.22	52	52.03	67.0					gy	Silt		
5002	"	15	21.22	53	21.46	65.9					gy	Med crs P		
5003	"	14	47.12	53	27.83	65.5					gy	Silt med crs P		
5004	"	14	22.94	54	00.46	80.9					gy	crs S		
5005	"	14	32.95	55	24.65	63.6					gy	med S		
5006	"	14	52.46	54	27.90	96.9					gy	med S		
5007	"	15	23.94	54	21.53	151.0					gy	fne S		
5008	4/29	14	49.16	56	12.38	24.5					gy	med G crs P		
5009	"	14	17.43	56	31.88	52.2					gy	med S		
5010	"	14	02.19	55	30.12	89.4					gy	fne S		
5011	"	13	53.76	54	22.19	79.8					gy	fne S		
5012	"	13	32.66	55	42.76	112.8					gy	med S		
5013	"	13	48.96	56	36.94	95.7					gy	fne S		
5014	"	14	08.89	57	40.63	88.4					gy	fne S		
5015	"	15	11.25	55	18.51	96.8					gy	fne S		
5133	5/3	13	26.49	57	37.14	75.2					gy	med S		RK

Use more than one line per sample if necessary.



OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

VESSEL	SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (M)	WEIGHT OF SAM- PLER	AP- PROX. PENE- TRA- TION	LENGTH OF CORE	COLOR OF SED- IMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief, i.e., slope, plain, disposition, etc.)	OBS. INIT.		
			PROJ. NO.	YEAR									CHECKED BY	DATE CHECKED
2125 (RA-5)		1982	08° 35' N	149° 00' W	76.7	25/lbs		gy	fine S			5/13/82		
5134		5/3	13 21.18	57 08.20	76.7			gy	fine S			RK		
5135		"	13 01.26	57 34.47	39.9	"		gy	med P					
5136		5/4	13 19.15	58 27.57	168.4	"		gy	med S					
5137		"	13 41.35	59 11.91	101.1	"		gy	fine S					
5138		"	13 49.79	00 03.44	73.1	"		gy	fine S					
5260		5/6	13 23.07	59 35.38	136.4	"		bk	ars S					
5261		"	13 02.75	59 21.10	135.3	"		bk	fine S					
5262		"	12 50.07	58 30.74	38.1	"		bk	fine S					
5263		"	12 41.97	59 35.67	39.6	"		bk	fine S					
5264		"	13 04.05	00 17.36	57.0	"			med P					
5265		"	13 27.91	00 39.17	100.7	"			med S					
5266		"	13 48.47	01 05.61	42.3	"		bk	fine S					
5267		"	13 49.06	02 44.99	33.4	"		bk	fine S					
5268		"	13 44.81	01 58.78	34.6	"		bk	fine S					
5269		"	13 24.85	01 39.46	75.6	"		bk	med S					
5270		"	12 56.14	01 13.43	57.0	"		bk	med P					
5271		5/6	12 38.75	00 31.19	24.5	"		bk	med crs P					

Use more than one line per sample if necessary.

NOAA FORM 7  
(8-74)

Replaces CAGS Form 567.

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED

REPORTING UNIT  
(Field Party, Ship or Office)

NOAA Ship RAINIER

STATE

Alaska

LOCALITY

Anchorage

DATE

6/29/82

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

**NON-NAVIGATIONAL LANDMARKS FOR CHARTS**

ORIGINATING ACTIVITY

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

(See reverse for responsible personnel)

DATUM

N. A. 1927

METHOD AND DATE OF LOCATION  
(See instructions on reverse side)

CHARTS  
AFFECTED

CHARTING NAME

DESCRIPTION  
(Record reason for deletion of landmark or aid to navigation.  
Show triangulation station names, where applicable, in parentheses)

LATITUDE

LONGITUDE

OFFICE

FIELD

MICROWAVE TOWER

(ANCHORAGE ACS MICROWAVE TOWER, 1960)

61 13

55.988

21.661

Triang. Rec.

16664

TANK

(ANCHORAGE MUNICIPAL TANK, 1964)

61 13

46.510

35.348

Triang. Rec.

16660

TV TOWER

(ANCHORAGE TV STA KTVA TOWER, 1954)

61 13

09.991

31.163

Triang. Rec.

16664

RTR

(ANCHORAGE RADIO STA KENI TOWER, 1954)

61 12

25.181

20.367

Triang. Rec.

16660

AERO ROT W&G

ANCH INTL AERO LT  
(POSITION FROM FFAID-AIRPORT OBSTR CH)

61 09

41.410

07.929

Triang. Rec.

16664

NO NGS LISTING WAS FOUND

RADOME

(SITE POINT RADOME, 1964)

61 09

34.034

54.687

Triang. Rec.

16664

TOWER

(PATCO INTL CONTROL TOWER, 1982)  
FIELD POSITION

61 10

38.206

50.663

F-3-6-L

16664

See L-8(83) page 8

NONFLOATING AIDS OR ~~LANDMARKS~~ FOR CHARTS

Replaces CAGS Form 567.  TO BE CHARTED  TO BE REVISED  TO BE DELETED

REPORTING UNIT (If field Party, Ship or Office) NOAA Ship RAINIER

STATE Alaska

LOCALITY Anchorage

DATE 6/29/82

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

(See reverse for responsible personnel)

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

OPR PROJECT NO. OPR-P358-RA-82

JOB NUMBER N.A.

SURVEY NUMBER H-10012

DATUM N.A. 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	LATITUDE		LONGITUDE		OFFICE	FIELD	CHARTS AFFECTED
		° /	'	° /	'			
		D.M. Meters	//	D.M. Meters	//			
LIGHT	(POINT MACKENZIE LIGHT, 1973) 1982 LIGHT LIST #3517	61 14	19.554	149 59	05.994	Triang. Rec.	16664	16660
	POSITIONAL ERROR ON LIGHT LIST		605.3		89.4	5/6/82		
LIGHT	(POINT MACKENZIE RANGE FRONT LIGHT, 1974) 1982 LIGHT LIST #3518	61 14	22.627	149 59	17.289	Triang. Rec.	16664	16660
LIGHT	(POINT MACKENZIE RANGE REAR LIGHT, 1974) 1982 LIGHT LIST #3519	61 14	29.188	149 58	52.550	Triang. Rec.	16664	16660
LIGHT	(POINT WORONZOF RANGE FRONT LIGHT, 1974) 1982 LIGHT LIST #3515	61 12	09.033	150 01	11.117	Triang. Rec.	16664	16660
	POSITIONAL ERROR ON FFAID		279.6		166.0	5/4/82		
LIGHT	(POINT WORONZOF RANGE REAR LIGHT, 1974) 1982 LIGHT LIST #3516	61 12	10.383	150 00	53.325	Triang. Rec.	16664	16660
	POSITIONAL ERROR ON FFAID		321.4		796.4	5/4/82		
	POSITIONAL ERROR ON FFAID							

See L-8(83) page 10.



NOAA FORM 76-40  
(6-74)

Replaces C&GS Form 567.

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED

REPORTING UNIT  
(Field Party, Ship or Office)  
NOAA Ship RAINIER

STATE  
Alaska

LOCALITY  
Anchorage

DATE  
6/29/82

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

**NON-FLUORESCENT OR LANDMARKS FOR CHARTS**

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
  - GEODETIC PARTY
  - PHOTO FIELD PARTY
  - COMPILATION ACTIVITY
  - FINAL REVIEWER
  - QUALITY CONTROL & REVIEW GRP.
  - COAST PILOT BRANCH
- (See reverse for responsible personnel)

The following objects HAVE  BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS.

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	DATUM		POSITION		LONGITUDE // D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side)	CHARTS AFFECTED		
		JOB NUMBER	SURVEY NUMBER	LATITUDE ° / D.M. Meters	LONGITUDE ° / D.P. Meters				OFFICE	FIELD
OPR-P358-RA-82	N.A.	H-10012								
RTR	(FORT RICHARDSON USAF TWR, 1944) NOT OF LANDMARK VALUE NOT EASILY VISIBLE		61 15	11.154	149 42	55.496	F-VIS-V 6/10/82	16664 16660		
TANK	(FORT RICHARDSON TANK, 1944) NOT OF LANDMARK VALUE LIMITED VISIBILITY		61 14	54.857	149 47	55.840	F-VIS-V 6/10/82	16664 16660		
TOWER	(FORT RICHARDSON TOWER, 1944) NOT OF LANDMARK VALUE LIMITED VISIBILITY		61 14	59.772	149 47	45.627	F-VIS-V 6/10/82	16664 16660		
CUPOLA	CUPOLA - OBSTRUCTED BY RECENT BUILDING POSITION FROM FFAID		61 13	01.0	149 54	08.2	F-VIS-V 6/10/82	16664		
RMAST (KHAR)	(ANCHORAGE RAD STA KHAR MAST, 1964) THE THREE RADIO TWR'S CHARTED IN THE VICINITY OF THIS MAST ARE CONFUSING TO THE MARINER AND NOT EASILY DISCERNABLE FROM ONE ANOTHER		61 11	07.984	149 52	07.582	F-VIS-V 6/10/82	16664 16660		

See 6-8(83) p 9 13

NOAA FORM 76-40  
(8-74)

Replaces C&GS Form 367.

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

**NONFLUORINATING AIDS FOR LANDMARKS FOR CHARTS**

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
  - GEODETIC PARTY
  - PHOTO FIELD PARTY
  - COMPILATION ACTIVITY
  - FINAL REVIEWER
  - QUALITY CONTROL & REVIEW GRP.
  - COAST PILOT BRANCH
- (See reverse for responsible personnel)

REPORTING UNIT  
(If left Party, Ship or Office)

NOAA Ship RAINIER

STATE

Alaska

LOCALITY

Anchorage

DATE

6/29/82

CHARTING NAME: OPR-P358-RA-82

REPORTING UNIT: N.A.

STATE: H-10012

LOCALITY: N.A. 1927

DATE: 6/29/82

CHARTING NAME: TOWER

DESCRIPTION: (INTERNATIONAL, 1954)

REASON FOR DELETION: THIS TOWER WAS DESTROYED IN 1979

REASON FOR DELETION: DURING CONSTRUCTION OF THE NEW INTERNATIONAL AIRPORT

REASON FOR DELETION: (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)

REASON FOR DELETION: (INTERNATIONAL, 1954)

REASON FOR DELETION: THIS TOWER WAS DESTROYED IN 1979

REASON FOR DELETION: DURING CONSTRUCTION OF THE NEW INTERNATIONAL AIRPORT

REASON FOR DELETION: (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)

REASON FOR DELETION: (INTERNATIONAL, 1954)

REASON FOR DELETION: THIS TOWER WAS DESTROYED IN 1979

REASON FOR DELETION: DURING CONSTRUCTION OF THE NEW INTERNATIONAL AIRPORT

REASON FOR DELETION: (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)

REASON FOR DELETION: (INTERNATIONAL, 1954)

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REASON FOR DELETION: DURING CONSTRUCTION OF THE NEW INTERNATIONAL AIRPORT

REASON FOR DELETION: (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)

REASON FOR DELETION: (INTERNATIONAL, 1954)

REASON FOR DELETION: THIS TOWER WAS DESTROYED IN 1979

REASON FOR DELETION: DURING CONSTRUCTION OF THE NEW INTERNATIONAL AIRPORT

*See L-8(83) pg 11*

METHOD AND DATE OF LOCATION  
(See instructions on reverse side)

OFFICE

FIELD

CHARTS AFFECTED

16664

16660

F-VIS-V

5/4/82



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

Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102

August 18, 1982

Commanding Officer  
Seventeenth Coast Guard District  
P. O. Box 3-5000  
Juneau, Alaska 99803

Dear Sir:

Preliminary office review of the hydrographic survey off of Anchorage recently completed by the NOAA Ship RAINIER shows significant change to the charted depths in some areas. These changes are considered to be dangers to navigation and are submitted for inclusion in the local Notice to Mariners for NOAA Chart 16664. Indicated least depths are reduced to MLLW based on predicted tides.

1. A 28 foot shoal at latitude 61°15'06.5"N, longitude 149°53'31"W. (pub in LNM 34/83)
2. Shoaling to 29 feet at latitude 61°14'48"N, longitude 149°55'50"W which extends the charted 30 foot curve eastward from latitude 61°14'36"N, longitude 149°56'25"W and latitude 61°15'04"N, longitude 149°55'50"W. (pub in LNM 34/82)
3. A 30 foot shoal at latitude 61°13'43.5"N, longitude 149°54'27.5"W.
4. Shoaling to 16 feet at latitude 61°13'36"N, longitude 149°54'32.5"W.
5. Shoaling to 29 feet at latitude 61°13'59"N, longitude 149°59'41"W.
6. Shoaling to 58 feet at latitude 61°13'52.5"N, longitude 149°59'13"W which shifts the charted 60 foot curve eastward from latitude 61°13'51"N, longitude 149°59'50"W.

Sincerely,

Charles K. Townsend  
Rear Admiral, NOAA  
Director, Pacific Marine Center

cc: C322  
C.O., RAINIER



APPROVAL SHEET

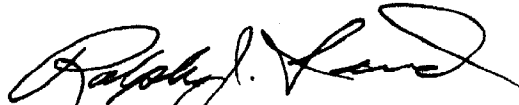
DESCRIPTIVE REPORT TO ACCOMPANY  
HYDROGRAPHIC SURVEY

H-10012

RA-10-1-82

In producing this sheet, standard procedures were observed in accordance with the Hydrographic Manual, PMC OORDER, and the Instruction Manual for Automated Hydrographic Surveys. The data was examined daily during the execution of the survey.

The boatsheet and the accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.



Ralph J. Land  
Captain, NOAA  
Commanding Officer



**HYDROGRAPHIC SURVEY STATISTICS**

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS		1
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARC, EXCESS		8

DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES						
CAHIERS			2 - Raw			
VOLUMES						
BOXES			1 - Smooth			

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	TOTALS
POSITIONS ON SHEET			
POSITIONS CHECKED		2068	
POSITIONS REVISED		200	
SOUNDINGS REVISED		189	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	2	* (VER)/(EVAL)	
VERIFICATION OF CONTROL		02/05	
VERIFICATION OF POSITIONS		57/06	
VERIFICATION OF SOUNDINGS		141/10	
COMPILATION OF SMOOTH SHEET		37/10	
APPLICATION OF TOPOGRAPHY		03/00	
APPLICATION OF PHOTOBATHYMETRY		00/00	
JUNCTIONS		03/00	
COMPARISON WITH PRIOR SURVEYS & CHARTS		00/38	
VERIFIER'S REPORT		10/09	
OTHER		00/02	
<b>TOTALS</b>		253/80	333

Pre-Verification by <b>James L. Stringham</b>	Beginning Date <b>8/21/82</b>	Ending Date <b>8/23/82</b>
Verification by <b>Richard A. Shipley</b>	Evaluation by <b>Dennis J. Hill</b>	Beginning Date <b>9/2/82</b>
Verification Check by <b>James L. Stringham, James S. Green</b>	Time (Hours) <b>31</b>	Date <b>8/3/83</b>
Marine Center Inspection by <b>HIT</b>	Time (Hours) <b>5</b>	Date <b>8/12/83</b>
Quality Control Inspection by	Time (Hours)	Date
Requirements Evaluation by	Time (Hours)	Date

\* Time in this column is for Verification (VER) and Evaluation (EVAL)

PACIFIC MARINE CENTER  
EVALUATION REPORT

REGISTRY NO: H-10012

FIELD NO: RA-10-1-82

Alaska, Cook Inlet, Knik Arm

SURVEYED: April 28 - May 19, 1982

SCALE: 1:10,000

PROJECT NO: OPR-P358-RA-82

SOUNDINGS: Ross Fineline  
Fathometer

CONTROL: Mini-Ranger  
Range/Range  
Range/Azimuth

Chief of Party.....CAPT R. J. Land

Surveyed By.....LT J. W. O'Clock  
LT S. J. Ludwig  
ENS M. R. Mathwig  
ENS R. B. Koehler  
ENS B. S. Postle

Automated Plot By.....PMC Xynetics Plotter

Verified By.....R. Shipley

Evaluated By.....D. J. Hill

1. INTRODUCTION

H-10012 (1982) is a navigable area survey conducted in accordance with Project Instructions OPR-P358-RA-82, dated March 26, 1982 and Change 2 dated September 15, 1982. *dated Jan. 27, 1982, change 1*

This survey extends from north of Cairn Point in the Knik Arm portion of Cook Inlet south to Point Woronzof. The inshore limit of hydrography is variable but prescribed by the project instructions to be the 3-fathom curve.

Field tide reductions are based on predicted tides from the primary station at Anchorage (945-5920), while final tide reductions are based on the same station.

The electronic corrector abstracts were revised during processing because of errant recording procedures in the field (see section 4).

The sounding corrector table for vessel 2125 was revised during processing to include an additional time period (see section 4).

The digital records for this survey have been updated to include categories of information required to comply with N/CG letter, Policy for Certification and Delivery of Hydrographic Surveys, December 17, 1982. Certain descriptive information, however, may not be included in the digital record due to the

restrictions of the presently available cartographic codes. The user should refer to the smooth sheet for complete information.

## 2. CONTROL AND SHORELINE

a. Hydrographic position control is adequately discussed in paragraphs F and G of the Descriptive Report and the Horizontal Control Report OPR-P358-RA-82. The smooth sheet was plotted using field and published positions for control stations.

b. Shoreline has been transferred from chart 16664, 18th edition, January 16, 1982 and from prior survey H-9940 (1974). It has been inked in brown to indicate that it is to be used for orientation purposes only.

## 3. HYDROGRAPHY

Soundings at crossings are in good agreement.

Standard depth curves have been completed and brown curves have been added to better define the bottom configuration.

The development of bottom configuration and least depths is adequate in all navigable areas with the exception of those areas itemized in section 6, Comparison with Prior Surveys, where prior survey data was carried forward to supplement the present survey.

## 4. CONDITION OF SURVEY

The condition of the survey records and deficiencies in field procedures have been discussed extensively in the Preprocessing Examination Critique dated August 18, 1982. Items contained in the critique are not repeated here and reference should be made to the attached copy for complete information. The following items supplement those contained in the critique.

Numerous anomalous spike-type indications appear on the echo sounder analog record. The hydrographer has not discussed the phenomenon nor is there any indication that they were developed to verify or disprove as definite features. These features may be indications of shoals or obstructions and have been edited into the survey digital file and are displayed on the smooth sheet. Future surveys should include sufficient investigations to identify the cause for any such anomalous indications.

A review of echo sounder records indicates an extensive development of a feature annotated as a wreck. Other hydrographic records fail to document this effort or indicate the final disposition. Since the feature is clearly evident on the analog sounder record it has been entered into the digital hydrographic record as a submerged wreck with an estimated depth of 29 feet at MLLW at latitude 61°15'06.08"N, longitude 149°53'31.22"W. This feature should be thoroughly developed during future surveys to determine least depth.

# 50721

Electronic control correctors were improperly recorded in the Electronic Control Report due to a mis-identification of two sets of Mini-Ranger instruments. In addition, final correctors were revised after baseline calibration observations were re-averaged.

The sounding corrector table for vessel 2125 did not include time 0700 for Julian day 138 which is the beginning time for a period requiring velocity correctors from Table II.

Section H of the Descriptive Report states that shoreline for the field sheets was transferred from charts 16660 and 16664 when in fact the transfer was made from survey H-9440.

#### 5. JUNCTIONS

<u>Survey</u>	<u>Scale</u>	<u>Relative Location</u>
H-10000 (1982)	1:10,000	Southwest

The junction has been completed and inked.

#### 6. COMPARISON WITH PRIOR SURVEYS

H-9438 (1974)	1:10,000
H-9440 (1974)	1:10,000
H-9441 (1974)	1:10,000
H-9760 (1978)	1:10,000

The general area east of longitude 149°58'00"W has experienced significant change. Although a comparison of standard depth curves seems to indicate a relatively stable bottom with some lateral shifting parallel to the channel axis, a closer comparison of soundings indicates that in general the center, deeper portion of Knik Arm is becoming more shallow by as much as 22 feet, while shoaler areas near each shoreline are becoming deeper by about 20 feet. These changes have resulted in a relative leveling of the inlet when viewed in profile. The area west of the referenced longitude has experienced less overall change; however, distinct, localized changes have occurred, resulting in new isolated depths of 42-47 feet.

Numerous soundings and notes have been carried forward to supplement the present survey. Since these data are color coded on the smooth sheet, they are summarized below to preclude the possibility of lost identity resulting from monochromatic reproduction.

<u>Data</u>	<u>Source</u>	<u>Latitude</u>	<u>Longitude</u>
57 ft. depth	H-9438	61°14'30"N	149°54'03"W
28 ft. depth	H-9440	61°15'12"N	149°53'13"W
27 ft. depth	H-9440	61°15'38"N	149°53'27"W
34 ft. depth	H-9441	61°14'14"N	149°56'33"W
27 ft. depth	H-9441	61°12'55"N	149°58'20"W
39 ft. depth	H-9760	61°13'19"N	149°59'50"W
12 ft. depth	H-9438	61°14'41"N	149°53'00.5"W
15 ft. depth	H-9438	61°14'39.5"N	149°53'01"W
28 ft. depth	H-9438	61°14'40"N	149°53'06"W
40 ft. depth	H-9438	61°14'40"N	149°53'09"W
30 ft. depth	H-9438	61°14'38.2"N	149°53'06"W
20 ft. depth	H-9438	61°14'37"N	149°53'05"W
18 ft. depth	H-9438	61°14'36"N	149°53'06"W
31 ft. depth	H-9438	61°14'36"N	149°53'09"W

<u>Data</u>	<u>Source</u>	<u>Latitude</u>	<u>Longitude</u>
36 ft. depth	H-9438	61°14'33.8"N	149°53'08"W
24 ft. depth	H-9438	61°14'32"N	149°53'08"W
36 ft. depth	H-9438	61°14'28.5"N	149°53'11.5"W
21 ft. depth	H-9438	61°14'26.3"N	149°53'12"W
32 ft. depth	H-9438	61°14'20.5"N	149°53'17.5"W

The following data previously carried forward to prior surveys also supplements the present survey.

* 29 ft. depth	H-4036WD (1918)	61°15'02.7"N	149°53'34.0"W	
<del>* 29 ft. depth</del>	<del>H-4036WD (1918)</del>	<del>61°15'00"N</del>	<del>149°53'44"W</del>	DISCREDITED ON H6657(4) RWD 5/91 See CL733/91
* 35 ft. depth	H-8203 (1955)	61°15'00"N	149°53'27"W	
"boulders"	H-4035 (1918)	61°13'11"N	150°00'48"W	
"rky"	H-4036WD (1918)	61°13'17"N	149°59'57"W	
"tide rips"	H-7186 (1947)	61°12'48"N	150°01'00"W	

\* These depths have been corrected for a 2-foot subsidence resulting from the 1964 earthquake.

With the exception of depths carried forward the prior surveys are superseded within the common area.

#### 7. COMPARISON WITH CHARTS

16664, 18th Edition, January 16, 1982

a. Hydrography - A comparison with this chart indicates that most charted hydrography originates with the prior surveys previously discussed. With the exception of the following two features which were not verified or disproved, it is recommended that charted hydrography be revised in accordance with the present survey.

	<u>Latitude</u>	<u>Longitude</u>	
subm dol	61°13'59.5"N	149°53'54.0"W	Awois # 50719
subm dol	61°13'45.5"N	149°54'25.0"W	# 50720

An attached copy of a chart section has been marked to show the charted area common to the present survey.

b. Aids to Navigation - Charted aids to navigation have been located and described, and adequately serve their intended purpose. There are no uncharted aids within the survey area.

#### 8. COMPLIANCE WITH INSTRUCTIONS

With the exception of deficiencies discussed elsewhere in this report, this survey adequately complies with project instructions.

#### 9. ADDITIONAL FIELD WORK

Additional work will be required to verify or disprove all features carried forward to this survey from prior surveys. Comments on some of these and other areas requiring additional work follow.

The submerged wreck observed at latitude  $61^{\circ}15'06.08''\text{N}$ , longitude  $149^{\circ}53'31.22''\text{W}$  should be developed for least depth. In addition, the ~~two~~ 29-foot depths carried forward from H-4036WD(1918) at latitude  $61^{\circ}15'02.7''\text{N}$ , longitude  $149^{\circ}53'34.0''\text{W}$  and ~~latitude  $61^{\circ}15'00.0''\text{N}$ , longitude  $149^{\circ}53'44.0''\text{W}$~~  require further development. There is the possibility that the ~~three~~ areas are related and a thoroughly documented investigation is required when time is available. The investigation must include local information to substantiate the description of any feature as a wreck.

The submerged dolphins charted at latitude  $61^{\circ}13'59.5''\text{N}$ , longitude  $149^{\circ}53'54.0''\text{W}$  and latitude  $61^{\circ}13'45.5''\text{N}$ , longitude  $149^{\circ}54'25.0''\text{W}$  were not disproved and will require a bottom drag or side scan sonar disproval effort. The type of investigation may be dependent on the quality of the reported position.

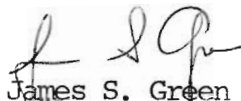
Additional soundings are required along the pier face and its approach in the vicinity of latitude  $61^{\circ}14'30''\text{N}$ , longitude  $149^{\circ}53'06''\text{W}$ .

Respectfully submitted,



Dennis J. Hill  
Cartographer

This survey has been verified and evaluated. I have examined the survey and it meets Charting and Geodetic Services survey standards and requirements for use in nautical charting except as noted in the Evaluation Report. The survey is recommended for approval.



James S. Green  
Supervisory Cartographer



## II. Preprocessing Examination Critique Items

### A. Danger to Navigation Reports

Seven items considered to be dangers to navigation were noted during the preprocessing examination of the final field sheet. These dangers to navigation were reported to the Seventeenth Coast Guard District by letter dated August 18, 1982 and a copy will be included in the Descriptive Report. Refer to Sections 1.6.4 and 5.9 of the Hydrographic Manual for requirements concerning danger to navigation reports.

### B. Compliance with Instructions

The RAINIER generally met the requirements for a navigable area survey as specified in the project instructions except that the 18 foot curve was not delineated in five small areas by sounding lines.

Sections 6.8 and 6.13 of the project instructions stated that advance copies of development areas shoaler than six fathoms at a scale of 1:2,500 be provided to the Corps of Engineers, Alaska District and also that advance copies of the final field sheets be provided to the Corps of Engineers, Seventeenth USCG District, Port of Anchorage, and C32. A statement in the Descriptive Report, in Section Q or by attachment, should have discussed how this requirement was met. CPM3 can provide this copying service if requested by the ship. Copies were provided by CPM3 in this instance only after an inquiry to the RAINIER revealed that no other action had been taken.

Appendix Q, Section 1.a of the PMC OORDER specifies that significant least depths manually transferred to the final field sheet from development overlays should be indicated by leader line and identified by position number. This was not done. Additional information such as method of depth determination; i.e., diver verified least depth, lead line least depth, etc., is very helpful. This results in a clearer and more informative final field sheet and is especially important when advance copies of final field sheets are being provided to other organizations.

### C. Final Field Sheet

The adequacy of the final field sheet is fair. Some least depths appearing on the development overlays were not transferred to the final field sheet. Depth curves defined by denser sounding line spacing on the development overlays were not in agreement with depth curves depicted on the final field sheet. Some of the depth curves appear anomalous; however, application of actual tides should correct this situation. A 63 foot sounding is misplotted and should have been corrected as the depth curve and adjacent soundings do not support this sounding (see Attachment A). A 9 foot sounding is misplotted and should have been removed from the final field sheet (see Attachment B). Two shoal areas off of Point Mackenzie and Knik Arm should have been developed more thoroughly to determine least depths (see Attachments Y and Z). The source of the shoreline and topographic details should be stated on the final field sheet and if the source is not a registered shoreline map, a note shall state it is for orientation purposes only. (Refer to Hydrographic Survey Guideline No. 17.)

The legibility of the final field sheet is fair. The wet ink plot needs improvement as several ink smears and varying line widths were apparent. While this does not affect data quality, it lends itself to a sloppy and non-professional looking survey sheet.

Individual development or expansion field sheet overlays should be discussed in Section E of the Descriptive Report. This information is necessary for complete and accurate verification of adequacy of developments and least depth determinations. (See Attachment C for examples of excellent development sheet discussions).

The plotted positions of two sounding lines which run parallel to the Port of Anchorage wharf are questionable. The Mini-ranger rates were inconsistent and a majority of the soundings were plotted by scaled rates or time and course methods. Some of the positions do not agree with the annotation on the raw data printout. For example, Position 4056 plots approximately 70 meters off the wharf rather than the indicated 60 feet. Also, using the charted feature as a reference point for scaling rates is poor practice since the chart scale is usually smaller than the survey scale and the chart could be in error. Sounding line 4057-4060 is unacceptable. The ending position was scaled without supportive information and all the in-between soundings were plotted by time and course. Supportive information must be complete, otherwise verification of the survey data cannot be accomplished. Additional lines should have been run to fill in two holidays off of the wharf. (See Attachments D through G and refer to Section 4.5.12 of the Hydrographic Manual.)

Crossline agreement in general was adequate; however, discrepancies of up to 11 feet were noted. Application of actual tides should resolve these discrepancies, although time errors or bad predictated tide tapes could account for the disagreement.

A few of the mainscheme or development sounding lines differ with adjacent lines by as much as 9 feet. Application of actual tides should resolve these discrepancies, although time errors, bad predictated tide tapes, or electronic position control problems could account for the disagreement. (See Attachments H through I.)

#### D. Descriptive Report

No statement as to the harmony of depths found at the outer limits of the project with charted depths in those areas was found in the Descriptive Report as required by Section 6.9 of the Project Instructions. **←NOTE**

Information regarding the leveling of the tide gage before and after the survey period should have been included in the field tide note. (Refer to Figure 5.5 of the Hydrographic Manual.)

#### E. Echograms

Stylus belt checks for VESNO 2125 are incorrect. The short mark should align horizontally with the long mark. Correct stylus belt length insures good quality phase checks and valid data. (See Attachments J through M and refer to Appendix B of the PMC OORDER.)



Phase checks should always be done over the entire range of survey depths (see Attachment N). It is suggested that the length of the phase check mark on the echogram be at least 5mm at the slowest speed setting.

The scanning of the echograms needs improvement. Least depths over some obvious peaks were missed as well as edges of sharp dropoffs. Accurate scanning is especially critical in depths of 10 fathoms or less. (See Attachments O through U.)

← NOTE  
10% rule

The depth for Position 5531 is incorrect as it appears the echosounder digitized on noise rather than the bottom. This depth was hand transferred from an expansion sheet and, as a result, a depth of 44 feet instead of 55 feet is shown on the final field sheet. The hydrographer should have checked the echogram and if in doubt run additional sounding lines to disprove or verify the sounding. (See Attachments H and V.)

Raw depth 75.2  
JCS

#### F. Sounding Volumes and/or Raw Data Printout

In general, annotations of the raw records were adequate although some header tape printouts and information stamps were not completely filled out.

When using on-line programs other than RK/112 or a logger to record data, frequent annotation of Mini-ranger signal strengths is required on the raw data printout. A few of the printouts did not have sufficient annotation. (Refer to Appendix Q, Section 1.d of the PMC OORDER.)

Scaling or manufacturing a Mini-ranger rate at the beginning of a sounding line without sufficient supportive information is unacceptable and the data should be rejected. In these situations, sounding lines must be re-run using a different control station setup or another type of hydrographic position control or a holiday will result. (See Attachment W).

#### G. Sounding Correctors

The corrections to echo soundings report has not been received at PMC as of August 11, 1982.

#### I. Horizontal Control

The horizontal control data package was received at PMC on June 30, 1982. The horizontal control critique will be forwarded upon completion of data entry into the NGS Base.

The 1974 date for Point Woronzof Light 10 on the final field sheet is incorrect. The light was established in 1979 (1982 Light List #3514). The light was located to 3rd Order Class I standards during the 1982 survey; therefore, 1982 should appear on the final field sheet.

The originals of NOAA Form 76-40, Nonfloating Aid or Landmarks for Charts should have been transmitted to C322 through CPM3 rather than

attached to the Descriptive Report. The original 76-40's are being returned for additional work. Copies are attached with informational notes from CPM33 that will aid in completing the forms as specified in Photogrammetry Instruction No. 64. The revised original 76-40's should be transmitted directly to C322 through CPM3.

#### J. Positioning Control

The electronic control report has not been received at PMC as of August 11, 1982.

All electronic corrector abstract printouts should be checked for consistency with the final baseline determined correctors. An error of 18 meters was noted on JD 131 for VESNO 2125 which results in an 18 meter shift of the plotted sounding lines. (See Attachment X.)

It is recommended that an azimuth check angle be observed, if possible, whenever a beginning and ending initial on a control station is performed during range-azimuth position control. This procedure allows for verification of the initial pointing and the position plot. (Refer to cover letter for PMC OORDER Appendices Q, R, S, T.)

#### L. Automated Data Check (FCHK)

There were two errors on the submitted data tapes that were fatal. The VESNO on two master tapes did not match the VESNO on the corresponding corrector tapes.

All the submitted data tapes were annotated well.

#### M. General Comments

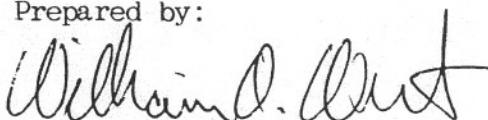
In the future, more effort needs to be expended aboard ship on reviewing the survey data for adequacy and completeness. Many of the items mentioned in the critique are apparent, should have been discovered during field review, and corrected.

#### N. Survey Acceptance

Except for the items noted above, the survey is in compliance with the project instructions and I recommend the survey be accepted for Marine Center processing.

I recommend that the advance copies of the final field sheets contain the additional following cautionary note: "Soundings reduced to MLLW based on predicted tide correctors. Soundings subject to change with application of actual tide correctors."

Prepared by:



William A. Wert



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

Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102

August 18, 1982

TO: CPM - Charles K. Townsend *CKT*

FROM: *Ned C. Austin*  
CPM3 - Ned C. Austin

SUBJECT: Preprocessing Examination for H-10012

I. Survey Information

A. Field No. RA-10-1-82 Registry No. H-10012

B. State Alaska

General Locality Knik Arm - Northern Cook Inlet

Sublocality Offshore - Vicinity of Anchorage

C. Project Instructions: OPR-P358-RA-82

Original dated January 27, 1982

Change No. 1 dated March 26, 1982

D. Date:

Field Work Commenced April 28, 1982

Field Work Completed May 19, 1982

plus 6 weeks = July 1, 1982

Data received at Marine Center July 21, 1982

plus 1 month = August 21, 1982

Examination critique transmitted to field August 20, 1982

Target for completion of Marine Center processing May 19, 1983





DATE: November 3, 1982

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 945-5920 Anchorage, Alaska

Period: April 28-May 18, 1982

HYDROGRAPHIC SHEET: H-10012

OPR: P358

Locality: Northern Cook Inlet, Kink Arm, Alaska

Plane of reference (mean lower low water): 6.61 ft.

Height of Mean High Water above Plane of Reference is 28.1 ft.

REMARKS: Recommended Zoning:

1. East of longitude  $150^{\circ}07'$  to  $150^{\circ}05'$  apply -15 minute time correction and x0.93 range ratio.
2. East of previous line to  $150^{\circ}00.0'$  apply -10 minute time correction and x0.95 range ratio.
3. East of the previous line to  $149^{\circ}55'$  apply x0.97 range ratio.
4. East of longitude  $149^{\circ}55'$ 
  - a. North of  $61^{\circ}16'$  +10 minute time correction
  - b. South of  $61^{\circ}16'$  zone direct

  
Chief, Tidal Datums and Information Branch

ATTACHMENT TO DESCRIPTIVE REPORT FOR H-10012

I have reviewed the smooth sheet, accompanying data, and reports of this hydrographic survey. Except as noted in the Evaluation Report, the hydrographic survey meets or exceeds Charting and Geodetic Services (C&GS) standards, complies with instructions, and is accurately and completely represented by the smooth sheet and digital data file for use in nautical charting.

*W. McClester* 11/18/83  
Chief, Nautical Chart Branch (Date)

CLEARANCE:

N/MOP2:RLSandquist

*RLSandquist*

SIGNATURE AND DATE:

11/18/83 LCA

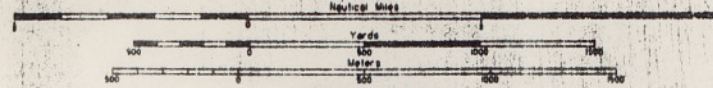
After review of the smooth sheet and accompanying reports, I hereby certify this survey is accurate, complete, and meets appropriate standards with only the exceptions as noted above. The above recommendations are forwarded with my concurrence.

*Charles K. Townsend* 11/18/83 LCA  
Director, Pacific Marine Center (Date)

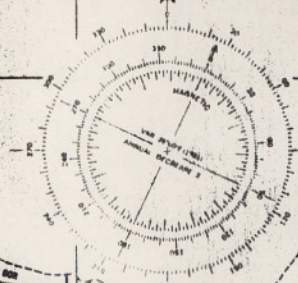


CHART 16664  
18th Ed. Jan. 16, 1982  
ANCHORAGE

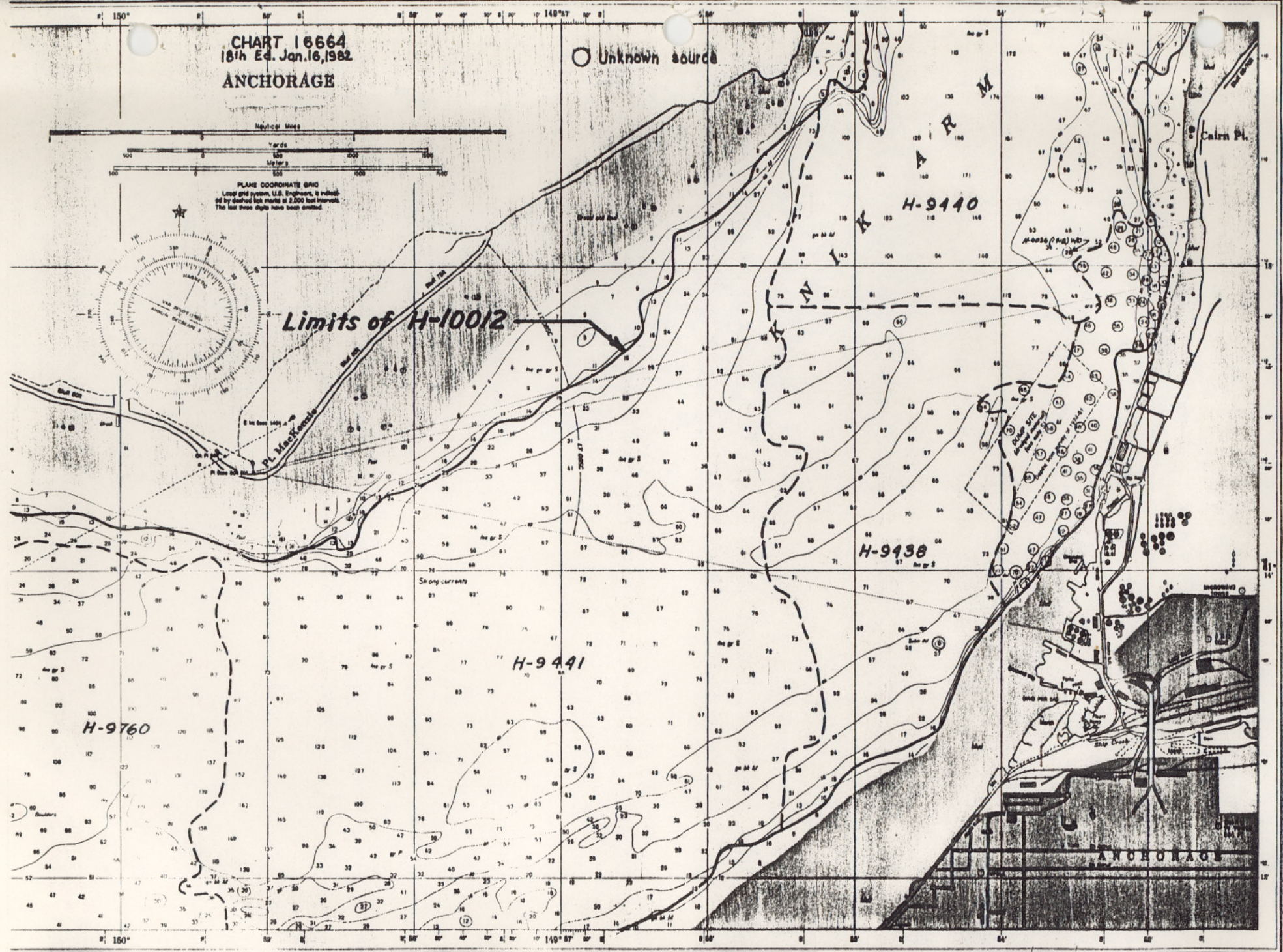
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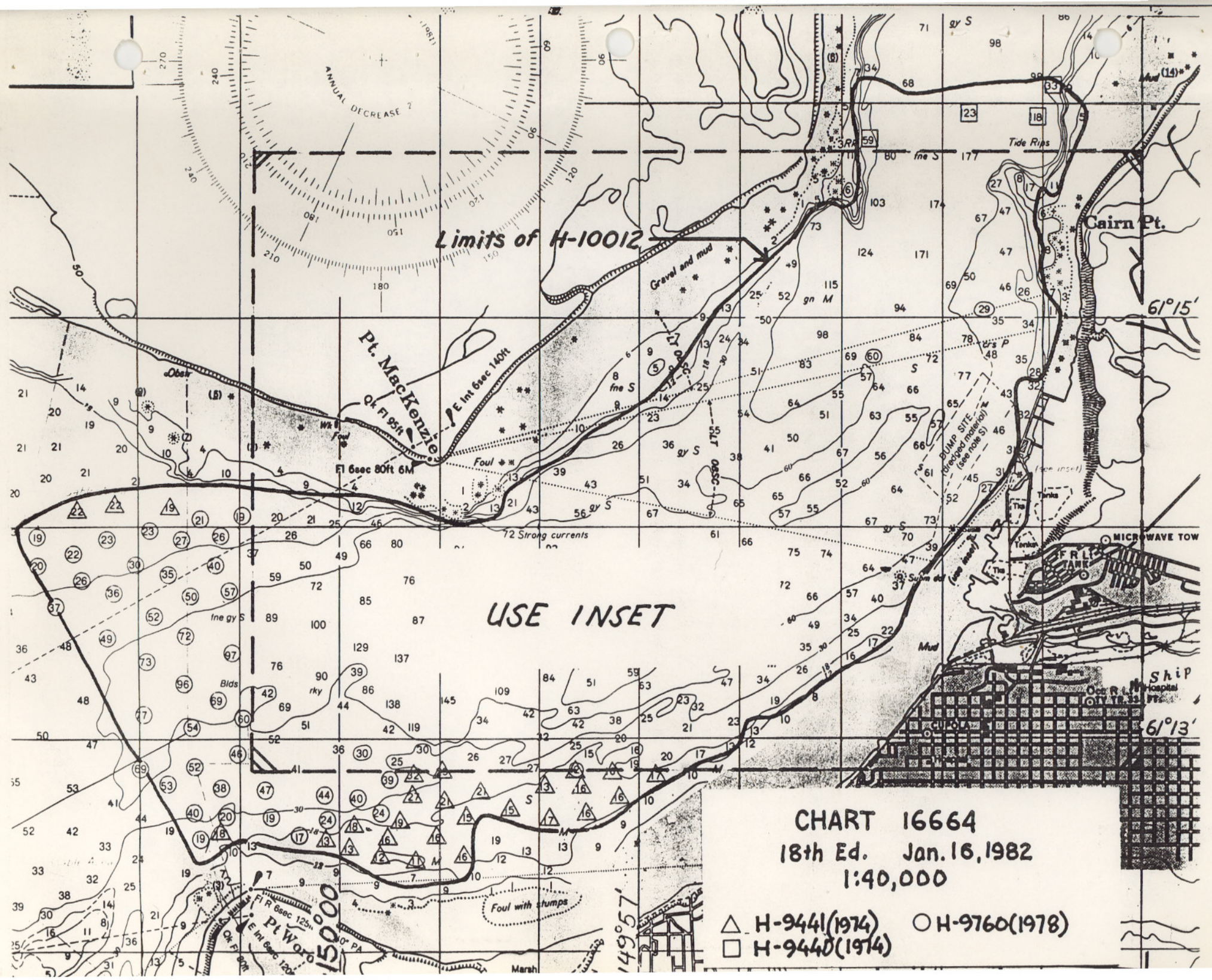
PLANE COORDINATE GRID  
Lower grid system, U.S. Engineers, is reduced  
by standard scale, based on 1:2500 feet interval.  
The last three digits have been omitted.



Limits of H-10012









**CABLE ROUTES**  
**CHUGACH ELECTRIC ASSOCIATION, INC.**  
**ANCHORAGE, ALASKA**  
CABLES LAID JUNE - OCTOBER, 1981

