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PHOTOGRAMMETRY BRANCH  
COASTAL MAPPING PROGRAM

PROJECT CM-8410  
COMPLETION REPORT

ALASKA

CROSS SOUND

Cape Spencer to Dundas Bay  
TP-01327, TP-01328, TP-01329, TP-01330  
TP-01331

Agency Vault - Original Report

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ALASKA

Cross Sound

Cape Spencer to Dundas Bay  
TP-01327, TP-01328, TP-01329, TP-01330, TP-01331

Year of Source - 1985

UNITED STATES DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE  
OFFICE OF CHARTING AND GEODETIC SERVICES  
NAUTICAL CHARTING DIVISION

Agency Vault - Original Report

PHOTOGRAMMETRY BRANCH  
COASTAL MAPPING PROGRAM

PROJECT CM-8410  
COMPLETION REPORT

Alaska  
Cross Sound  
Cape Spencer to Dundas Bay  
TP-01327, TP-01328, TP-01329, TP-01330, TP-01331


Clearance and Approval

This report summarizes the photogrammetric operations related to project completion and is submitted for approval. The maps, associated project data, and this report meet the requirements and standards of the Photogrammetry Branch Coastal Mapping Program. Clearance for project registration is requested.

Submitted by,

  
Gregory L. Fromm  
Acting Chief, Compilation Section A  
Photogrammetry Branch, NCD

APPROVED:

  
Commander Lewis A. Lapine, NOAA  
Chief, Photogrammetry Branch  
Nautical Charting Division, Office of Charting and Geodetic Services

4/19/90  
Date

COASTAL MAPPING PROGRAM PROJECT CM-8410  
 Alaska  
 Cross Sound  
 Cape Spencer to Dundas Bay

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## COASTAL MAPPING PROGRAM PROJECT CM-8410

### Introduction

Coastal Mapping Program Project CM-8410 was planned to provide five coastal survey maps depicting the shoreline and other cartographic features of mapping interest in the coastal zone of Cross Sound Alaska, extending from Cape Spencer to Dundas Bay. Refer to FIGURE 1 for a graphic reference of the project site.

The maps were assigned map identifiers TP-01327 through TP-01331. Maps TP-01327 through TP-01330 were prepared at 1:20,000 scale and map TP-01331 was prepared at 1:10,000 scale. All maps depict a full line Oblique Mercator Projection based on the North American Datum of 1927 and supplemental projection ticks based on the North American Datum of 1983. Refer to FIGURE 2 for information on the general area of coverage for each map and geographic limit coordinates.

The purpose of this project is consistent with the Photogrammetry Branch Coastal Mapping Program, which is to provide contemporary coastal zone survey data for the maintenance of the National Ocean Service Nautical Charting Program and Hydrographic Surveying activities.

### Planning

The planning phase for this project was initiated in 1984 to support Hydrographic Surveying Operations scheduled for the 1987 field season. The Pacific Photo Party of the Program Services Division, Pacific Marine Center was assigned all horizontal control activities required to permit aerial photography acquisition and aerotriangulation. The Flight Operations Unit of the Headquarters Office was assigned the responsibility of providing the proper photographic platform for photography acquisition. A photographer from the Coastal Planning Unit photographed the project area, selecting equipment, materials, and procedures as required to meet specified quality and accuracy requirements. Field Instructions were issued on March 1, 1985 with Change #1 dated March 25, 1985 and Change #2 dated Aug. 5, 1986. These instructions are bound in Appendix A, B, and C respectively. They fully define requirements for the field operations phases of this project.

### Field Operations

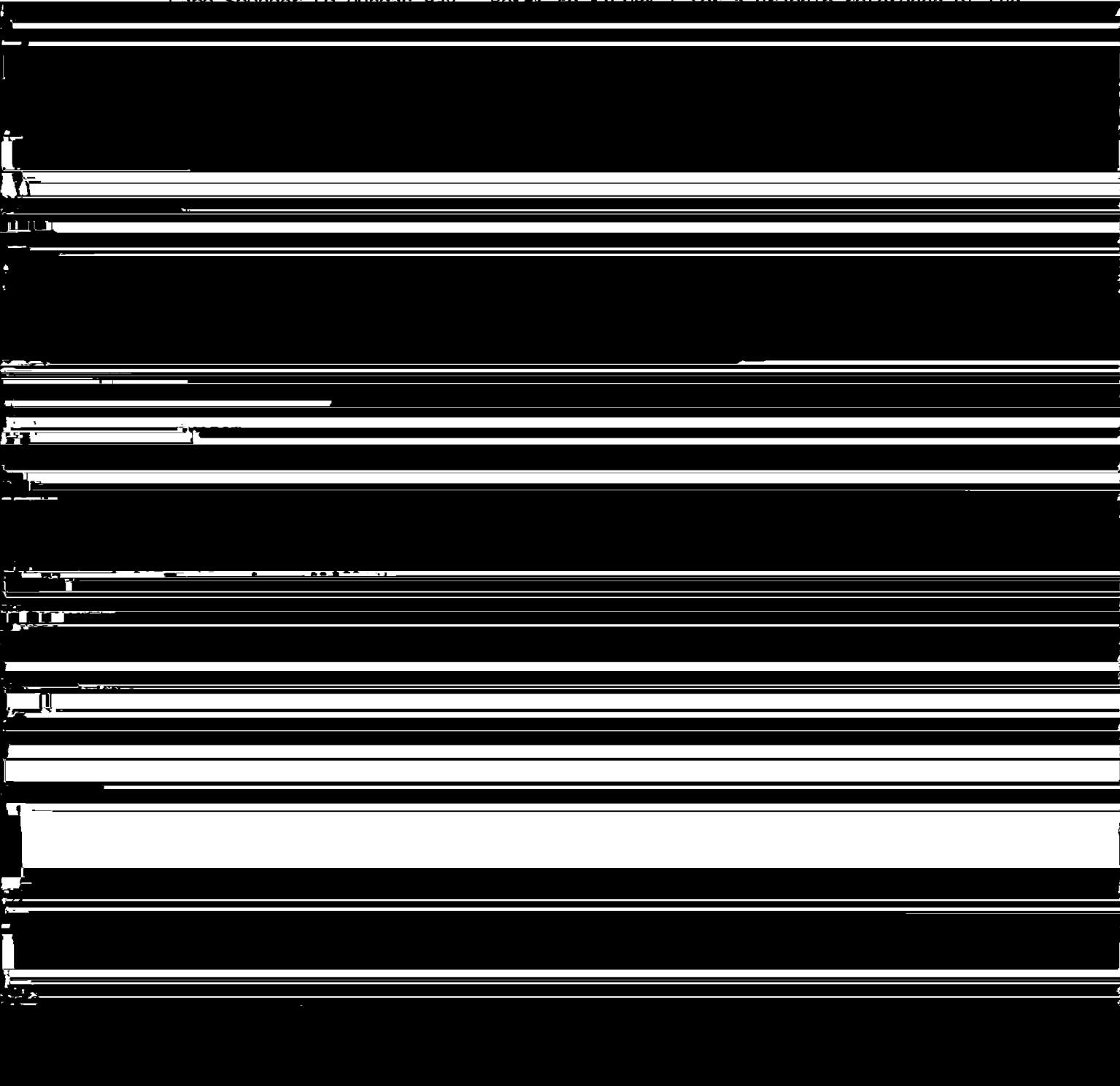
Field operations in support of this project were performed in August, 1986 and consisted of aerial photography and the recovery, establishment, and identification (premarking) of Horizontal Control necessary for aerotriangulation. Field surveying activities are summarized in a report bound in Appendix D.

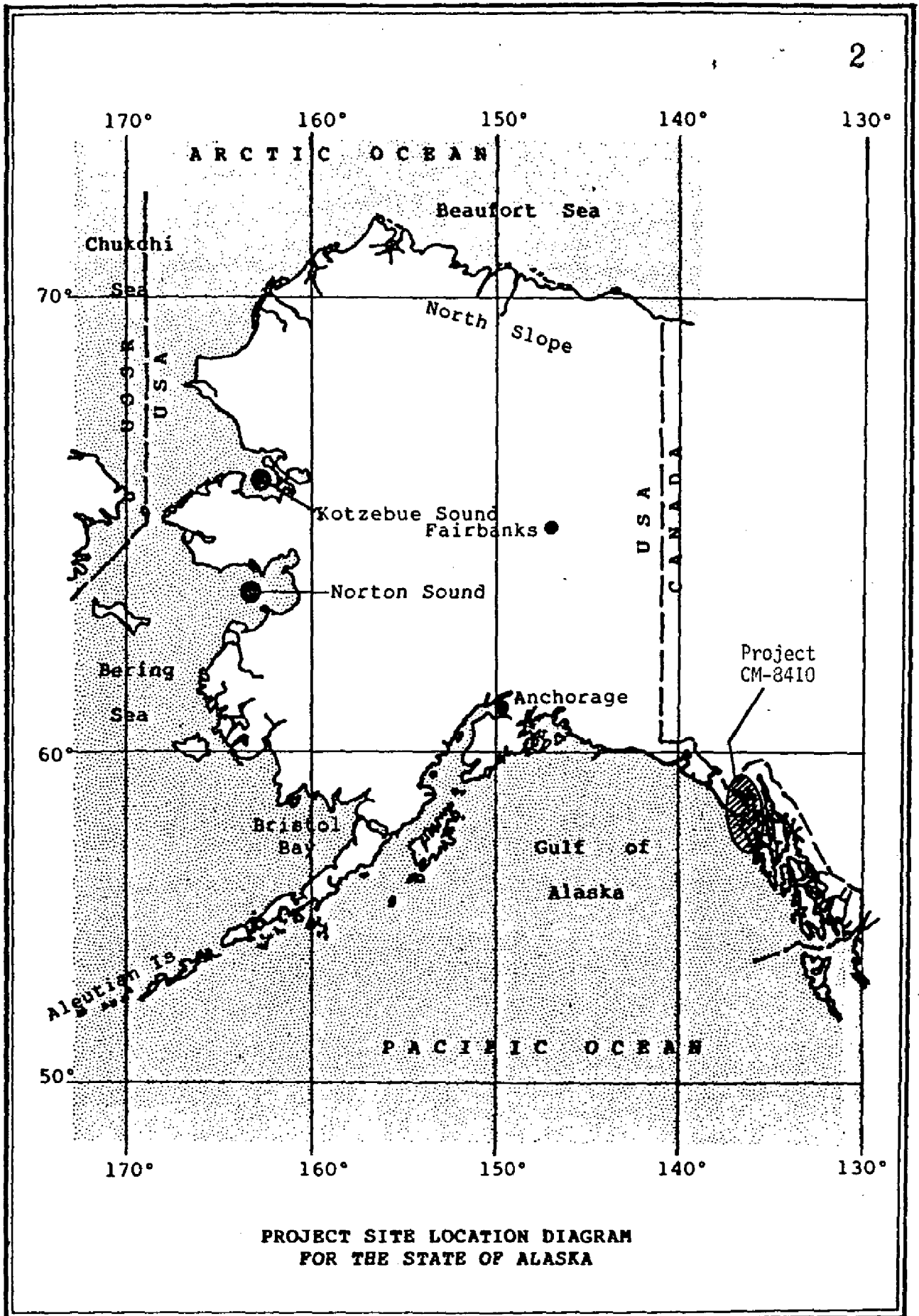
Refer to listing 1 for information on the Horizontal Control related to this project.

## COASTAL MAPPING PROGRAM PROJECT CM-8410

**Introduction**

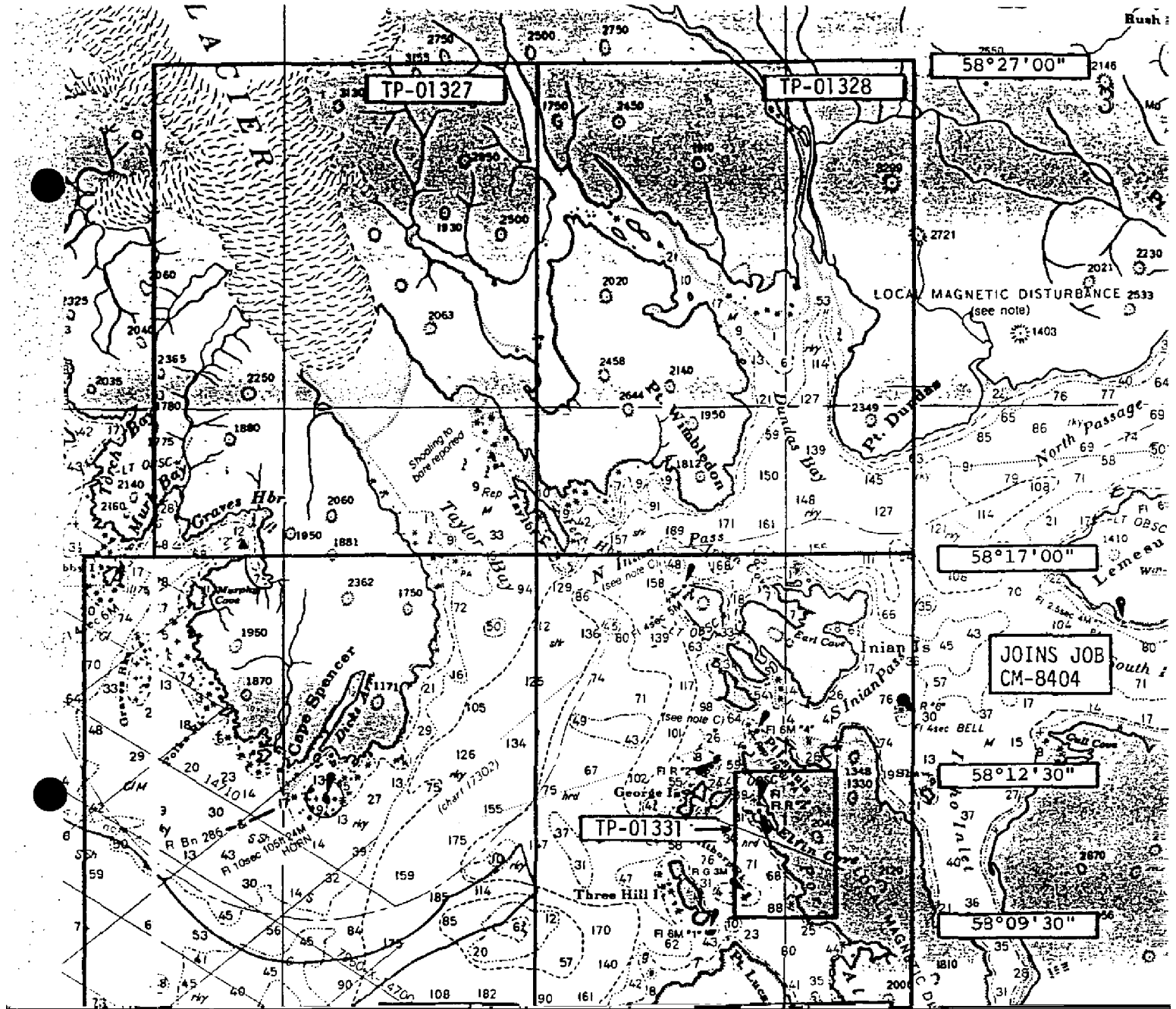
Coastal Mapping Program Project CM-8410 was planned to provide five coastal survey maps depicting the shoreline and other cartographic features of mapping interest in the coastal zone of Cross Sound Alaska, extending from Cape Spenger to Dudas Bay. Refer to FIGURE 1 for a graphic reference of the





PROJECT SITE LOCATION DIAGRAM  
FOR THE STATE OF ALASKA

FIGURE 1. Project Site Location Diagram



TP-01327

TP-01328

58°27'00"

58°17'00"

JOINS JOB  
CM-8404

58°12'30"

58°09'30"

TP-01331

LOCAL MAGNETIC DISTURBANCE  
(see note)

Shoaling to  
be reported

Graves Hbr

Cape Spencer

Three Hill I.

Inian Pass

North Passage

Lemeau

South

Three Hill I.

Three Hill I.

Three Hill I.

Three Hill I.

Three Hill I.

Three Hill I.

Three Hill I.

Three Hill I.

Three Hill I.

Three Hill I.



The Citation Jet, Air Photo Mission 1, piloted by officers of the NOAA Corps was used for the photographic operation. The photography required for this project was executed in June 1985.

Multispectral (MS) color photographs were acquired for basic aerotriangulation and compilation at 1:60,000 and 1:30,000 scales using the Wild RC 10 camera with Z cone, which has a Calibrated Focal Length of 153.16mm.

The aerial photographs of the project site were reviewed by the Coastal Planning Unit for proper endlap, horizontal control target visibility, and adequate coverage. The photographs were also reviewed by the Quality Control Unit for proper qualities required of mapping photographs, under the Quality Assurance Program. Both reviews took place in July, 1985.

### **Aerotriangulation**

Formal instructions for the aerotriangulation phase were issued on July 18, 1988 and are bound in Appendix E. The aerotriangulation phase was completed by the Aerotriangulation Unit of the Headquarters Office in November of 1987. The Aerotriangulation Report is bound in Appendix F and contains information on placement of horizontal control, photographs selected for data extraction, fit to control statistics, and summary of the procedures employed in phase completion.

### **Compilation**

Formal instructions for the office phase were issued July 18, 1988 and are bound in Appendix E. Standard procedures for analog compilation were executed in the completion of the project. Mean High Water (MHW), and Mean Lower Low Water (MLLW), Infrared Photography, at 1:60,000 and 1:30,000 scales, was not obtained. No Mean Lower Low Water Line was delineated on the maps. Shoreline delineation (MHW) is based on office interpretation of source photography indicated in Appendix G. Because photographic interpretation is subjective in nature, especially with regards to the symbolic representation of a feature relative to a vertical datum, no attempt is made to indicate the height/depth of applicable cartographic features that are in open-water areas. Numerous mountain tops and peaks were positioned on the maps with corresponding names where applicable. Photogrammetrically determined heights are given in feet. Elevations depicted are photogrammetric measurements from 3-dimensional stereo-models and indicate the relative height from the shoreline plane of reference to the feature. These elevations have not been field checked and may differ significantly from charts and other maps of the area. The relative vertical accuracy of these elevations above the shoreline plane of reference, based on a ninety percent confidence level, is predicted at plus or minus 20 feet.

The compilation phase was initiated in June 1988 and completed in Dec. 1988 by the Coastal Mapping Unit, Headquarters Office. The photogrammetric work station utilized in data acquisition was the National Ocean Service Analytical Plotter (NOSAP). No digital cartographic data was created during the compilation phase. The final maps were smooth drafted except for the application of annotation which was accomplished using waxed back stripper film.

Geographic Names depicted on the maps were acquired from corresponding NOS Nautical Charts and applied after approval by the Staff Geographer. The Final Geographic Names listings are bound in this report as Appendix H.

The actual limits of this photogrammetric survey may not coincide with the geographic limits of each map. The limits of a photogrammetric survey are determined by the extent and quality of photographic coverage, the density and placement of geodetic and aerotriangulated control and program requirements.

A Geographic Plotting Note and the corresponding datum shift values were computed for each map to serve as a guide to the user for converting information from NAD 83 to NAD 27 or NAD 27 to NAD 83. These values are not authoritative. For precise datum shift information contact the National Geodetic Survey.

The Project Diagram for CM-8410, Cross Sound, Alaska was revised on Aug. 19, 1988 by the Coastal Planning Unit, Headquarters Office. The western limits of Map TP-01329 was extended to include Graves Rocks in their entirety.

The northern reaches of Dundas Bay extended beyond the northern neat line of Map TP-01327. Control placement and model coverage allowed for the accurate compilation of this area beyond the neat line.

Coastal Mapping Project CM-8404, Icy Strait, Alaska adjoins this project on the East and was compiled on the North American Datum of 1983. Areas of Maps TP-01328 and TP-01330 were extended by the NAD 27 to NAD 83 Datum Shift Values to effect a tie between the projects.

Section 5.5.2 of the Office Instructions, Navigational Aids, required the labeling of landmarks and possible landmarks as described in Photogrammetric Instruction No. 78. The compilation activity deviated from this requirement and conformed to the new Coastal Mapping Program, Operations Manual, Section 12.

Office review of the project products was conducted in Jan. 1989 in the Coastal Mapping Unit, Headquarters Office. All maps and associated products were judged acceptable to program criteria. Comparisons were made against the following NOS Nautical Charts:

- 17300, 24th Edition (June 15, 1985), 1:209,978 scale
- 17301, 6th Edition (Sept. 1, 1979), 1:40,000 scale
- 17302, 14th Edition (Oct. 3, 1981), 1:80,000 scale and Inserts

**Final Review**

The final review phase was initiated in Jan. 1989 by the Coastal Mapping Unit, Headquarters Office. The coastal survey maps and associated horizontal discrete point data of this project were evaluated as meeting the requirements of the National Standards of Map Accuracy. Included in Appendix E, is a MEMORANDUM FOR THE RECORD describing the purpose and accuracies associated with photogrammetric elevations for peaks detailed within the project limits. The coastal survey maps and project data sets comply with the general requirements for a standard coastal mapping project.

All photographic devices, surveying, and photogrammetric mensuration instrumentation meet the standards of accuracy established for the disciplines of photography, field surveying and photogrammetry.

During the final review phase, all necessary copies of project products and data were processed. Refer to Appendix I for the final listing of cartographic features of charting interest for application in the nautical charting program. A Chart Maintenance Print was generated for each map within the project.

This Project Completion Report is the authoritative summary for project CM-8410 and is in compliance with Section 14, of the Coastal Mapping Program Operations Manual.

#### **Dissemination of Project Data**

The dissemination of project data was executed in accordance with the following:

##### **Federal Records Center of the National Archives and Records Admin.**

Copy of the Project Completion Report

Brown Jacket containing:

NOAA Form 76-41 (Control Record) - 3 original pages

One copy of Aerotriangulation Report

One copy of Aerotriangulated Control Listing

One copy of Project Diagram (page size)

One copy of detailed Project Diagram (folded)

One copy of USGS Mt. Fairweather Alaska/Canada, 1:250,000

PROJECT GEODETIC CONTROL LISTING

PROJECT: CM-8410; Cape Spencer to Dundas Bay, Cross Sound, Alaska

GEODETIC DATUM: North American Datum of 1927

The following permanent geodetic control was recovered or established during project operations. Data pertaining to stations is resident in the National Geodetic Survey Division (NGSD) Horizontal Control Databank.

The Station Identifier (STA ID) consists of the NGS Quad Number (Q) and the assigned station number (S) within the Quad, e.g. QQQQSSSSSS.

Refer to Nautical Charting Division Standard Digital Data Exchange Format documentation for quality code (QC) criteria.

STATION NAME	STA ID	Geodetic Coordinates(°-'-")		Location	
		Latitude	Longitude	QC	Day/Year
FINN	5813621044	58-11-42.708	136-20-59.706	3	001/1938
TOWN	581362	58-07-29.466	136-18-45.223	3	001/1942
INIANA	581362	58-14-41.713	136-17-09.069	3	001/1970
END 2	UNKNOWN	58-16-56.404	136-28-41.044	4	107/1985
CAPE	5813631010	58-11-52.918	136-38-20.700	3	001/1925
APRIL	UNKNOWN	58-13-39.235	136-34-53.483	4	107/1985
SHELF	5813631054	58-13-46.179	136-42-26.441	3	001/1925
MORAIN	UNKNOWN	58-16-49.477	136-34-24.074	4	142/1985
AID	5813621003	58-19-05.256	136-15-28.325	3	001/1901
DEED	5813621028	58-21-05.975	136-17-30.485	3	001/1901
DELTA	UNKNOWN	58-21-37.838	136-22-33.519	4	143/1985
DUN	UNKNOWN	58-24-01.991	136-28-21.375	4	142/1985
PEEP	5813631048	58-17-11.686	136-44-03.506	3	001/1925
TAYLOR	UNKNOWN	58-18-43.309	136-31-03.739	4	107/1985

- end -

Remarks: The aforementioned stations were recovered in 1985 by the Pacific Marine Center Photo Party or confirmed during the aerotriangulation and compilation phases.

Listing approved by:

Final Reviewer

*[Signature]*

Date

4/16/90

**APPENDIX A**



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

8

March 1, 1985

N/CG2313:EP

TO: N/MOP - Robert L. Sandquist  
FROM: N/CG2 - C. William Hayes *C. William Hayes*  
SUBJECT: PROJECT INSTRUCTIONS: FIELD - Job CM-8410, Cross Sound, Cape  
Spencer to Dundas Bay, Alaska, Shoreline Mapping

Subject instructions are forwarded for signature and issuance to the  
Chief, Program Services Division.

The copies required for distribution by this office have been retained.

Attachment





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

9

March 1, 1985

N/CG2313:EP

Chief, Program Services Division  
Pacific Marine Center

PROJECT INSTRUCTIONS: FIELD - Job CM-8410, Cross Sound, Cape Spencer to  
Dundas Bay, Alaska, Shoreline Mapping

1.0. PURPOSE

These instructions provide specifications and a schedule for placing targets on horizontal control stations in advance of aerial photography.

2.0. AREA

The area to be mapped is located in southeast Alaska on Cross Sound. Shoreline mapping at 1:10,000 and 1:20,000 scale will cover the shoreline of Cross Sound, offshore islands, and adjacent waterways. Mapping at 1:10,000 scale will cover the vicinity of Elfin Cove. This project is in support of hydrographic operations which are scheduled to begin in 1987.

3.0. PHOTOGRAPHY

3.1. Aerotriangulation photography at 1:60,000 scale and supplemental bridging and compilation photography at 1:30,000 scale will be obtained using color film. Also, 1:60,000- and 1:30,000-scale black-and-white infrared photography will be obtained at mean high water and mean lower low water  $\pm 1.0$  feet based on predicted tides (tide station Granite Cove based on Sitka will be used).

3.2. Target identification photography will be obtained at 1:15,000 scale and may be flown at less than optimum photographic conditions.

4.0. ASSIGNMENT

You are assigned all field operations required to place targets on horizontal control stations selected for aerotriangulation.

5.0. HORIZONTAL CONTROL

5.1. Horizontal control requirements for aerotriangulation have been furnished as part of the field data.

5.2. Limit recovery of horizontal control stations to those needed to meet aerotriangulation requirements. Prepare and submit recovery notes for each station for which a search was made.



5.3. New control stations, where needed, shall be established by triangulation, trilateration, traverse, or a combination of the three methods, in accordance with Third-Order, Class I specifications provided in the Director's Instructions for Third-Order Surveys, dated October 31, 1974.

5.4. Notify the Chief, Coastal Planning Unit (N/CG2313), if recovery of existing control does not meet aerotriangulation requirements. An alternative will be selected, if possible, to avoid establishing new control.

#### 6.0. PREMARKING OF CONTROL

6.1. As soon as possible after all control stations have been paneled, the field party will forward to the Rockville Office, Attention: N/CG2313, a chart section, quad, or any graphic depicting the station location, panel array used, and the panel number. This will assist in the film quality review and target identification and will help expedite the results to the field unit.

6.2. Wing panels will be used with all targets in accordance with established specifications but may be modified to conform with local terrain conditions.

#### 6.3. Aerotriangulation Control

6.3.1. Panel each station selected to meet horizontal control requirements in accordance with specifications given on the attached sheet for 1:60,000-scale photography.

6.3.2. Use panel array No. 1 for targets with a normal background; it may be modified, as necessary, to conform with local terrain conditions. Any deviation from given panel and spacing dimensions should be indicated on the large-scale sketch on NOAA Form 76-53, Control Station Identification Card.

6.3.3. Panel array No. 3 shall be used in areas where the background offers poor contrast to the center panel, such as on sandy terrain.

6.3.4. The distance given for dimension "C" may be increased, but not decreased.

6.3.5. Panel substitute stations wherever shadows or relief displacement will obscure the home stations. Reference marks may be paneled in lieu of the main station, if a position can be determined for it.

6.3.6. In cases where the target might be subject to vandalism, select two photoidentifiable objects. Observe directions and distances to them from the home station and record with sketch and description on separate NOAA form 76-53.

#### 7.0. CONTROL STATION IDENTIFICATION CARD

Prepare and submit a NOAA form 76-53 for each paneled station. Observe Photogrammetric Instruction No. 22, Revised September 30, 1965, except as follows:



a. Record distances and directions in the usual manner to the center of the station panel of all targets used as substitutes for horizontal control stations.

b. In the space provided for the sketch of Substitute Station A, make a large-scale sketch of the immediate vicinity showing the array used.

c. In the space provided for a sketch of Substitute Station B, make a smaller scale sketch that shows the relationship of the target to the surrounding terrain. Include one or more salient features to assist office personnel in locating the target on the photographs.

d. Indicate on suitable chart bases the approximate locations of all targets placed.

8.0. SCHEDULE

All stations shall be premarked and ready for photography by May 1, 1985. If premarking is not completed by this date, inform the Chief, Coastal Planning Unit (N/CG2313), so that this information can be relayed to the air photo mission.

9.0. REPORT

A field operations report covering all pertinent field work performed is required upon completion of the field phase of this project. The report shall be accompanied by all field data observed and collected and will be forwarded to the Rockville Office, Attention: N/CG2314.

10.0. MODIFICATIONS OF INSTRUCTIONS

If changes in procedures and methods seem advisable, please make appropriate recommendations to this office.

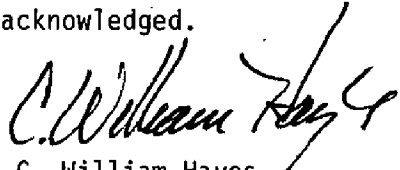
11.0. COSTS

All costs incurred on this assignment shall be charged to Task 8K6C01.

12.0. RECEIPT

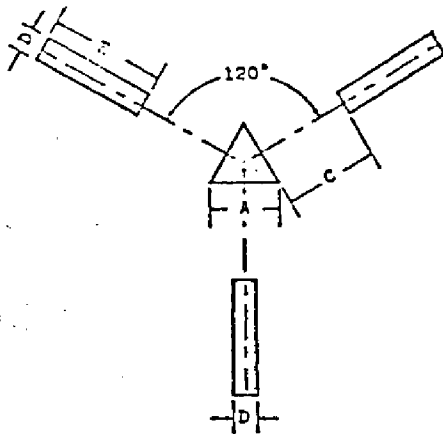
Receipt of these instructions shall be acknowledged.

Robert L. Sandquist  
Director  
Pacific Marine Center  
Marine Operations

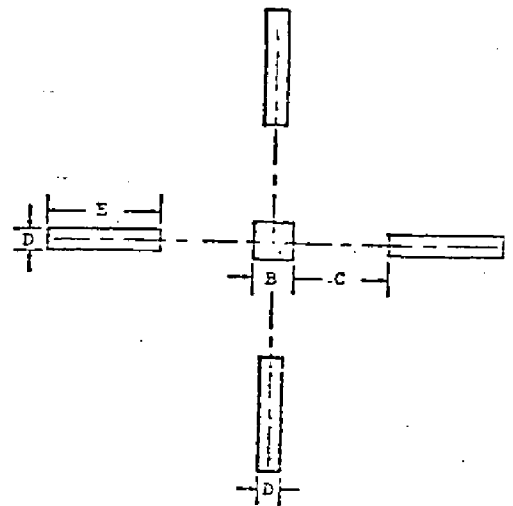
  
C. William Hayes  
Chief, Nautical Charting Division  
Charting and Geodetic Services

SPECIFICATIONS FOR PREMARKING CONTROL STATIONS  
Revised November 23, 1976

ARRAY NO. 1



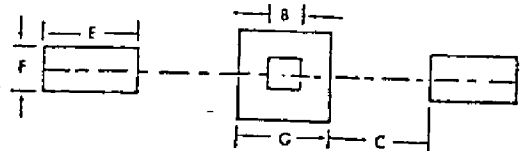
ARRAY NO. 2



NOTE:

1. The dimensions and centering of center panel over station or substitute station are critical.
2. Panel array No. 1 is preferred but No. 2 is acceptable.
3. Array No. 3 - for contrast in very light colored areas. The border surrounding center panel and the recognition panels shall be black.
4. Chief of party will select array that makes best application of field conditions and is authorized to adjust or omit one of the recognition panels if terrain is not suitable for placement of entire array.

ARRAY NO. 3



Photography Scale	PANEL AND SPACING DIMENSIONS (IN METERS)						
	A	B	C	D	E	F	G
1:10,000	0.5	0.3	1.3	0.2	0.9	0.9	1.5
1:20,000	1.1	0.7	2.6	0.4	1.8	0.9	1.9
1:30,000	1.6	1.0	3.9	0.5	2.7	0.9	2.2
1:40,000	2.2	1.3	5.2	0.7	3.6	0.9	2.5
1:50,000	3.2	2.0	7.8	1.1	5.4	1.8	3.8
1:60,000	3.8	2.3	9.1	1.3	6.3	1.8	4.1
1:70,000	4.4	2.6	10.4	1.4	7.2	1.8	4.4
1:80,000	5.0	3.0	11.7	1.5	8.0	1.8	4.8
1:100,000	6.1	4.0	18.2	2.2	10.8	3.6	7.6



**APPENDIX B**



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

14

March 25, 1985

N/CG2313:JDM

TO: N/MOP - Robert L. Sandquist  
FROM: N/CG2 - C. William Hayes *Donald E. Nitzsche*  
SUBJECT: CHANGE NO. 1 to PROJECT INSTRUCTIONS: FIELD - Job CM-8410, Cross  
Sound, Cape Spencer to Dundas Bay, Alaska, Shoreline Mapping

Subject CHANGE is forwarded for signature and issuance to the Chief,  
Program Services Division.

The copies required for distribution by this office have been retained.

Attachment





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

[REDACTED]

**APPENDIX C**



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

16

August 5, 1986

N/CG2313:JDM

TO: N/MOP - Robert L. Sandquist

FROM: *for* N/CG2 - J. Austin Yeager *Roy K. Matushige*

SUBJECT: CHANGE NO. 2 to PROJECT INSTRUCTIONS: FIELD - Job  
CM-8410, Cross Sound, Cape Spencer to Dundas Bay,  
Alaska, Shoreline Mapping

Subject CHANGE is forwarded for signature and issuance to the  
Chief, Program Services Division.

The copies required for distribution by this office have been  
retained.

Attachment







August 5, 1986

N/CG2313:JDM

Chief, Program Services Division  
Pacific Marine Center

PROJECT INSTRUCTIONS: FIELD - Job CM-8410, Cross Sound, Cape

1. Section 1.0. PURPOSE is amended to read:

These instructions provide specifications and a schedule for photoidentifying additional horizontal control stations required for aerotriangulation.

2. Section 3.0. PHOTOGRAPHY is amended to read:

Aerotriangulation photography has been obtained at 1:60,000 scale using color film. Selected black-and-white negative prints of the color film and

5. Section 8.0. SCHEDULE is amended to read:

Scheduling will be at your earliest opportunity.

6. All other provisions of the basic instructions remain unchanged.
7. Acknowledge receipt of this CHANGE.

Robert L. Sandquist  
Director  
Pacific Marine Center  
Marine Operations

*Roy Z. Matalushige*  
for J. Austin Yeager  
Chief, Nautical Charting Division  
Charting and Geodetic Services

**APPENDIX D**

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE  
PACIFIC MARINE CENTER  
PROJECT REPORT  
PHOTO IDENTIFICATION  
JOB CM-8410  
CAPE SPENCER TO DUNDAS BAY, ALASKA  
1986

I. AUTHORITY

BY INSTRUCTIONS OF THE DIRECTOR. PACIFIC MARINE CENTER.

II. DATES

FIELD WORK WAS ACCOMPLISHED DURING THE PERIOD OF AUGUST 18 TO AUGUST 21, 1986.

III. PURPOSE

THIS SURVEY WAS COMPLETED IN ACCORDANCE WITH CM-8410 PROJECT INSTRUCTIONS. CHANGE NO. 2 DATED AUGUST 5, 1986, TO PHOTOIDENTIFY ADDITIONAL HORIZONTAL CONTROL STATIONS REQUIRED FOR AEROTRIANGULATION.

IV. TERRAIN AND WORKING CONDITIONS

THE SHORELINE IS MOSTLY STEEP ROCK OUTCROPS WITH THE EXCEPTION OF SMALL BAYS WHICH HAVE GENTLY SLOPING GRAVEL AND BOULDER BEACHES BELOW THE HIGH WATER LINE (HWL). THE ENTIRE AREA IS HEAVILY VEGETATED WITH SPRUCE, FIR, AND DENSE UNDERBRUSH GROWING RIGHT TO THE HWL.

THE TIDE RANGE CAN BE AS MUCH AS 20 FEET AND IN CERTAIN RESTRICTED AREAS WHICH DRAIN LARGE VOLUMES OF WATER THE CURRENTS DURING MAXIMUM EBB OR FLOOD CAN BE DANGEROUSLY SWIFT.

THE WATER IS EXTREMELY COLD AND CAN CAUSE POOR VERTICAL REFRACTION ON WARM DAYS.

THE WEATHER DURING THE FIELD WORK WAS IDEAL BY SOUTH EAST ALASKA STANDARDS. LOW OVERCAST AND FOG IN THE MORNINGS WHICH GENERALLY BURNED OFF TO A HIGH OVERCAST IN THE AFTERNOON WAS THE NORM WITH LIGHT TO MODERATE WINDS.

V. PERSONNEL

MICHAEL J. McEWEN (NOS)  
ENS. JOHN STEGER (NOAA CORPS)

VI. EQUIPMENT

WILD T-2 THEODOLITE  
HEWLETT PACKARD 3810B EDM  
SIGNAL LAMPS  
3-PRISM RETRO REFLECTORS  
WILD ADJUSTABLE TRIPODS  
6-VOLT GELCELL BATTERIES  
30 METER STEEL TAPE  
TRANCEIVER RADIOS  
BELL 206 HELICOPTER

## VII. FIELD METHODS

FOUR PHOTO IDENTIFICATION POINTS WERE LOCATED AND POSITIONS DETERMINED BY CONVENTIONAL SURVEY METHODS. IN CIRCLED AREA 1 THE STATION WAS IDENTIFIED DIRECTLY. IN CIRCLED AREAS 2 AND 3 ONLY ONE SUBPOINT PER AREA WAS LOCATED. IN CIRCLED AREA 4 TWO SUBPOINTS WERE IDENTIFIED. TRANSPORTATION TO THE WORKING AREA WAS BY CONTRACT HELICOPTER FROM JUNEAU. THE TRANSIT TIME WAS IN EXCESS OF ONE HOUR. EARLY MORNING GROUND FOG AND HIGH TIDES IN THE MID MORNING TO AFTERNOON MADE IT DIFFICULT TO IMPOSSIBLE TO LAND IN CERTAIN AREAS AT WILL. BECAUSE OF THE EXPENSE OF THE HELICOPTER (\$850/DAY PLUS \$250/HR), LIMITED HELICOPTER FUNDS IN OUR BUDGET, AND A NEED TO RECOVER AND ESTABLISH HORIZONTAL CONTROL FOR THE NOAA SHIP MT. MITCHELL'S FALL 1986 FIELD SEASON. WE WERE ABLE TO ESTABLISH ONLY ONE SUBPOINT IN AREAS 2 AND 3. FOR THIS REASON GREAT CARE WAS TAKEN IN THE OBSERVATION OF THESE POINTS USING THIRD ORDER OBSERVING TECHNIQUES.

## VIII. STATISTICS

NUMBER OF STATIONS RECOVERED	7
NUMBER OF PHOTO ID POINTS ESTABLISHED	4
NUMBER OF STATIONS OCCUPIED	3
NUMBER OF DIRECTIONS OBSERVED	4
NUMBER OF EDM LINES MEASURED	4

RESPECTFULLY SUBMITTED BY

MICHAEL J. MCEWEN  
SEPTEMBER 12, 1986

TO: N/CG2313 - James McNamara

FROM: N/MOP 22 - Thomas Richards

SUBJECT: Photo Field Operations Report, Job CM-8410, Cross Sound, Cape Spencer to Dundas Bay, Alaska, Shoreline Mapping

This project was completed in accordance with CM-8410 Project Instructions Change No. 2 dated August 5, 1986.

Field work was accomplished during the period of August 18 to August 21, 1986.

Four photo identification points were located and positions determined by conventional survey methods. One point was identified directly. Due to the inordinate amount of time which would have been needed to identify two substitute stations in circled areas 2 and 3 and limited helicopter availability only one substitute station was located in each of these areas. For this reason great care was taken in the observation of these points using third order observing techniques.

Submitted by

*Michael J. McEwen*

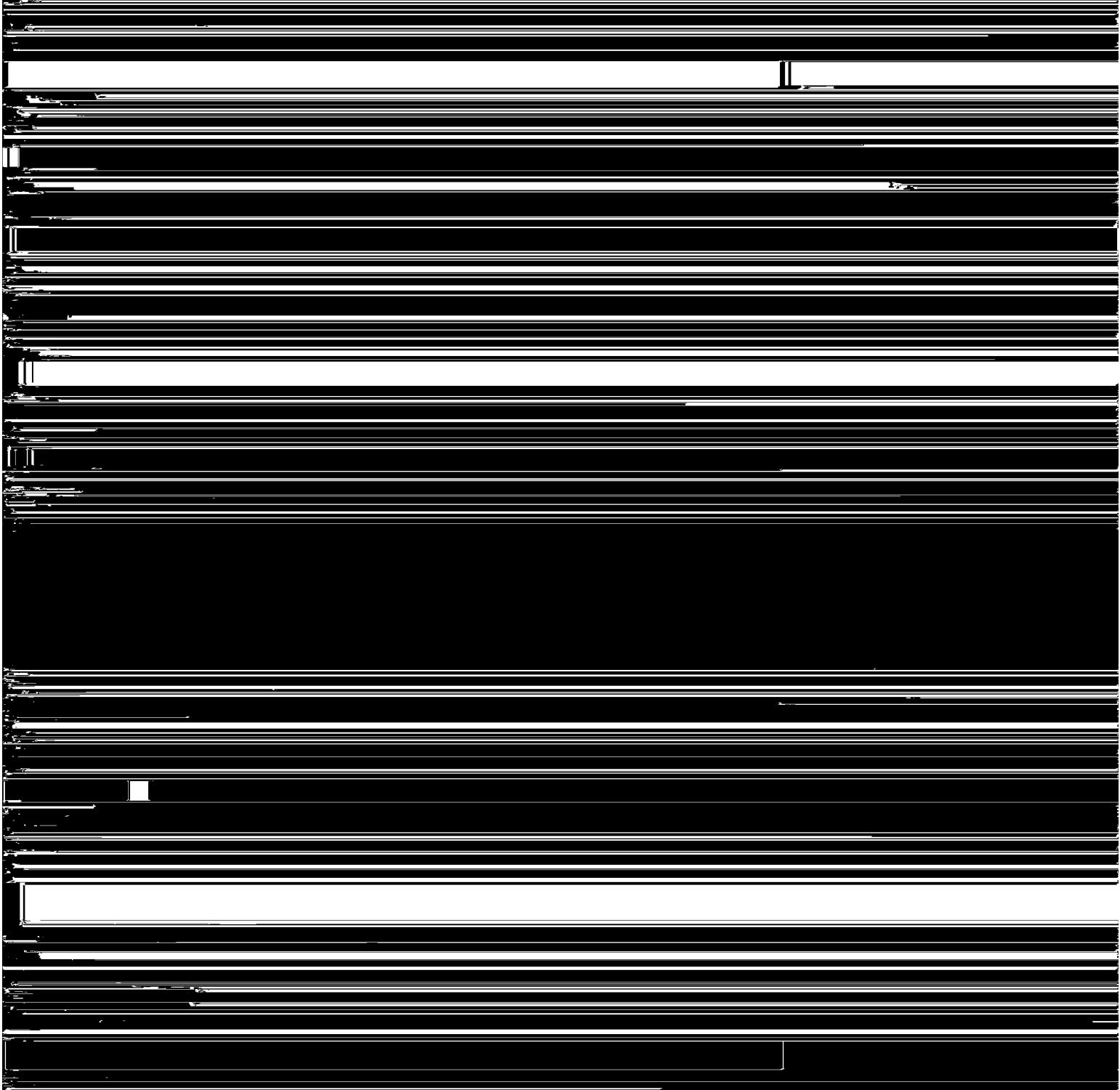
Michael J. McEwen  
September 10, 1986

## LIST OF GEOGRAPHIC POSITIONS

PHOTO ID POINT #1 (DAS 1985)	58/27/09.070 ✓	136/31/16.461 ✓
PHOTO ID POINT #2	58/19/06.997 ✓	136/15/21.468 ✓
PHOTO ID POINT #3	58/15/42.908 ✓	136/23/51.847 ✓
PHOTO ID POINT #4	58/10/33.450 ✓	136/20/08.189 ✓
PHOTO ID POINT #4A	58/09/42.709 ✓	136/19/35.140 ✓

*JGF*





**APPENDIX E**



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

25

July 18, 1988

TO: N/CG232 - Ivey O. Raborn *8/21 Brunson*





Chief, Coastal Mapping Unit  
Photogrammetry Branch  
Rockville, Maryland 20852

PROJECT INSTRUCTIONS: Office - Job CM-8410, Cross Sound,  
Cape Spencer to Dundas Bay, Alaska, Shoreline Mapping

1.0. PURPOSE

1.1. These instructions provide basic specifications for the production of data to be used in the nautical charting program. Compilation shall be based on aerotriangulation that has met the requirements of National Standards of Map Accuracy and on an office interpretation of aerial photographs.

1.2. Unless otherwise specified in these instructions, compilation, processing, and dissemination of all data shall be in accordance with the C&GS Topographic Manual, Part II, and applicable amending NOS Photogrammetric Instructions.

2.0. GENERAL

2.1. Scope. Five maps will be produced; TP-01327 through TP-01330 (1:20,000 scale) and TP-01331 (1:10,000 scale). Supplemental data sets associated with each final map will be prepared for use by nautical charting and hydrographic activities. All data collection and processing will be based on NAD 27.

2.2. Field Operations. Field work generally consisted of aerial photography and the recovery, establishment, and identification of geodetic control necessary for aerotriangulation. There was no field inspection of the shoreline.

2.3. Photography. Mapping photography is indicated below.

<u>Type</u>	<u>Scale</u>	<u>Camera</u>	<u>Date</u>
Color/MS	1:30,000	Wild RC-10 (Z)	6/85
Color/MS	1:60,000	Wild RC-10 (Z)	6/85



2.4. Aerotriangulation

2.4.1. Seven strips of the color photographs were bridged using analytical aerotriangulation methods; one strip 1:30,000 scale and six 1:60,000 scale. Premarked and photoidentified geodetic control was used. Elevations from USGS quadrangles were used as vertical control. Tie points between strips were established to augment the datum tie and to ensure adequate junctions. The amount of aerotriangulated control proved adequate and meets National Standards of Map Accuracy and NOS accuracy requirements. Aerotriangulated control is based on NAD 27.

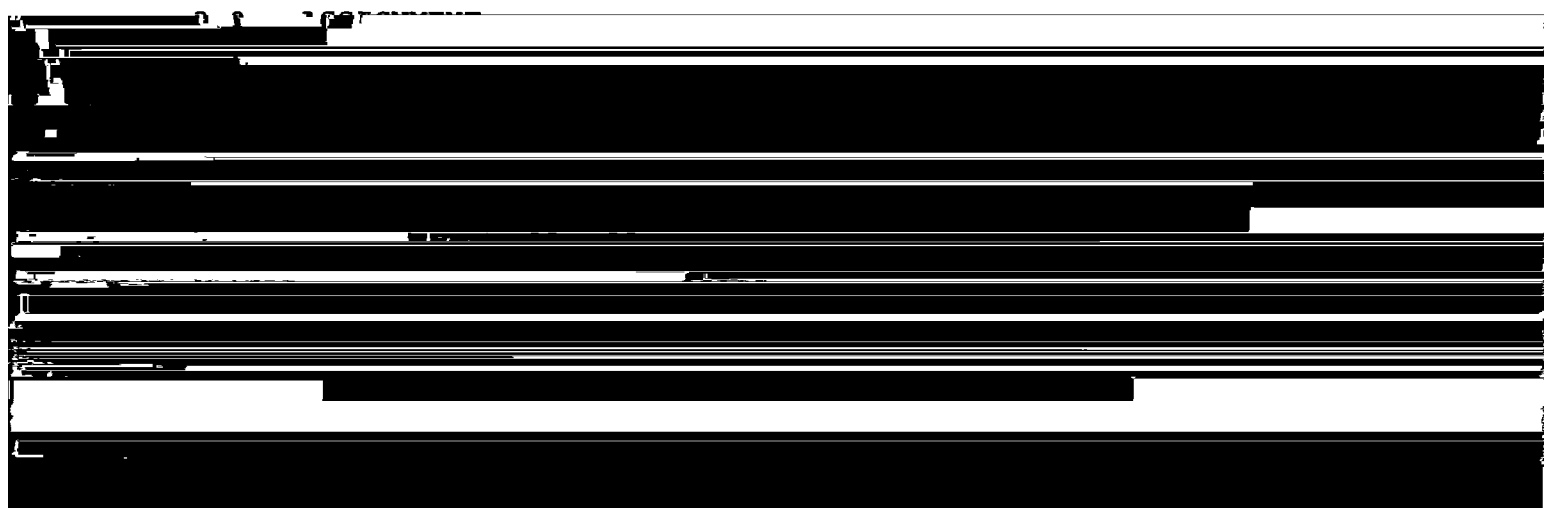
2.4.2. Reference identifiers which were assigned during the aerotriangulation phase to corresponding bridged photographs are indicated below. The diagrams which are included as part of the Aerotriangulation Report show area coverage of the bridged photographs using the reference identifiers.

<u>Photographs</u>	<u>Reference identifiers</u>
85 ZC 3153 - 3159 (odd # only)	85 ZC 0125 - 0128
85 ZC 3110 - 3120 (even # only)	85 ZC 0116 - 0121
85 ZC 3122 - 3126	85 ZC 0111 - 0115
85 ZC 3166 - 3170	85 ZC 0426 - 0430
85 ZC 3130 - 3133	85 ZC 0101 - 0104
85 ZC 3173 - 3178	85 ZC 0105 - 0110
85 ZC 3410 - 3413	85 ZC 0151 - 0154

2.5. Charts Affected. Charts 17300 through 17303 depict areas common to this survey.

2.6. Datums. The horizontal datum requirement is NAD 27; the vertical datums and planes of reference for symbolization are MHW and MLLW. The symbolization of rocks, reefs, ledges, and wrecks shall be referred to MLLW; all other coastal features will be referred to MHW.

2.7. Miscellaneous. The eastern limits of this survey adjoin project CM-8404, the southern limits coincide with project CM-8413. Project CM-8404 has recently been completed, CM-8413 will not enter the production cycle before FY 89.



#### 4.0. DATA FURNISHED

- a. Nautical charts and USGS quadrangles
- b. Control and job diagrams
- c. Field data
- d. Horizontal control data and records
- e. Bridged photographs (film positives)
- f. Base manuscripts (two for each map)
- h. Aerotriangulation Report
- i. Computer listings

#### 5.0. COMPILATION

5.1. Limits. Standard shoreline maps are required. The offshore limit of compilation is directly related to the extension, density, and placement of horizontal control provided.

#### 5.2. Delineation

5.2.1. Delineation will be accomplished using analytical and/or analog instrument methods based on interpretation of the bridged photographs.

5.2.2. Where selectivity is required because of density of detail, features that have landmark significance or of interest to a mariner are always retained. When features are too small or too numerous to show to scale, no attempt should be made to show all. Instead, a representative pattern of the symbol or area outline is to be shown, augmented by an explanatory note. Small features, especially when dangerous to navigation, may be slightly exaggerated in size, closely resembling their true shape; e.g., bare rock, islet.

5.2.3. Final manuscripts, based on NAD 27, will depict the Oblique Mercator Projection (full line); NAD 83 offset ticks are required. Refer to Photogrammetry memorandum instructions, "Implementation of the NAD 83 in the Coastal Mapping Program," dated October 2, 1987.

5.3. Cartographic Comparison. A comparison with the most recently published charts shall be made during all compilation phases. This effort (1) is particularly important to ensure charted open-water features shown as bare or uncovering are investigated and (2) will complement the interpretation of detail and/or the identification of conflicts. Major differences between map detail and the charts shall be noted and reported on map copies prepared in support of charting and hydrography; e.g., Chart Maintenance Print, Notes to Hydrographer Print.

5.4. Geodetic Control. Refer to Photogrammetry memorandum instructions "Listing and Plotting of Control Stations on

Shoreline Manuscripts," dated July 23, 1968, and "Labeling Triangulation Stations Field Positions on NOS Maps and in NOS Descriptive Reports," dated November 3, 1978.

#### 5.5. Navigational Aids

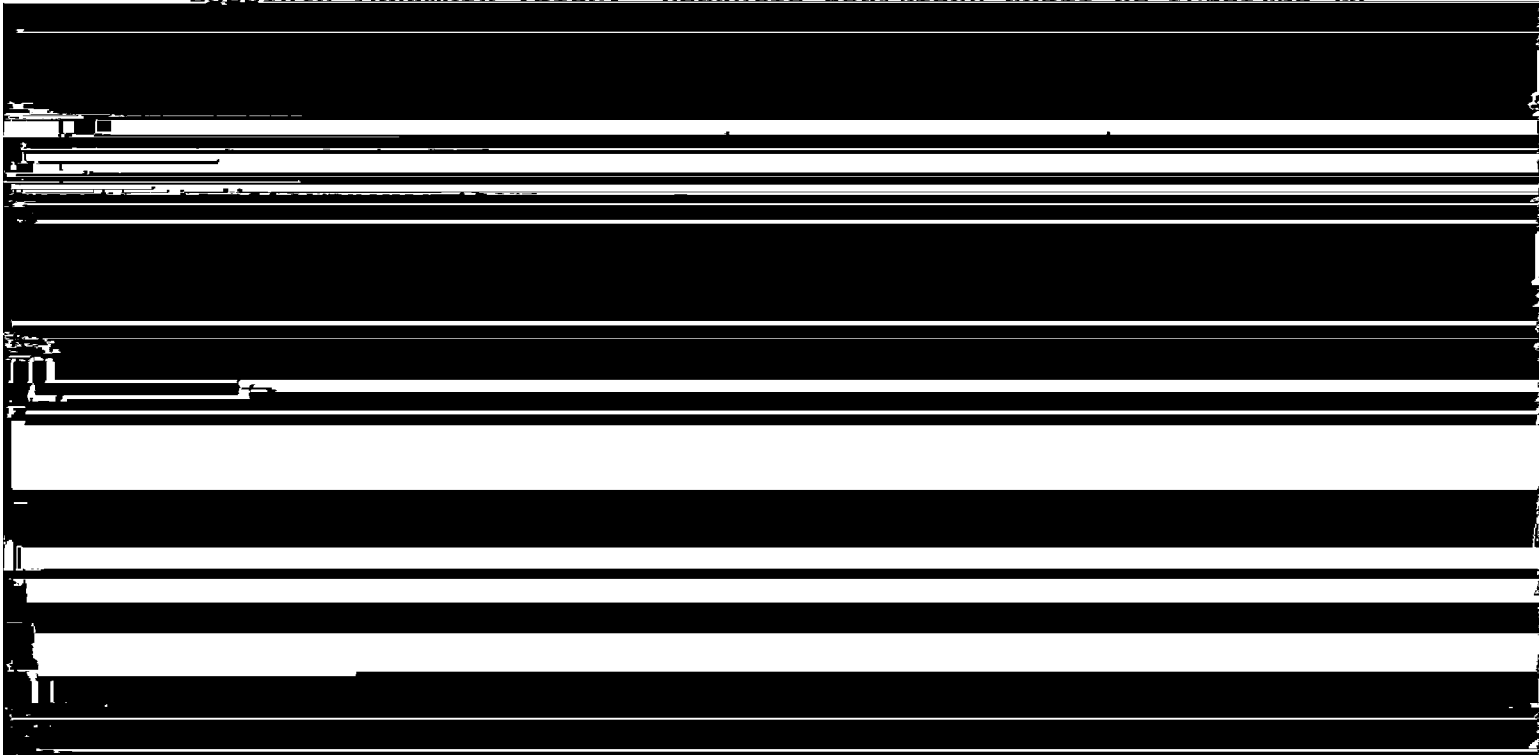
5.5.1. Locate or confirm aerotriangulated and geodetic positions of visible charted landmarks, fixed aids to navigation, and/or cartographic features that have possible landmark value using analytical and/or analog methods.

5.5.2. Refer to Photogrammetric Instruction No. 78 for symbolization and labeling. Map features of possible landmark value are to be symbolized the same as charted landmarks, however, label with upper and lower case letters; e.g., Tank (Possible Landmark).

5.5.3. Prepare a listing of the charted landmarks and/or fixed aids identified. The listing shall also contain features of possible landmark value. The listing shall outline:

- a. Map identifier
- b. Map scale
- c. Feature description
- d. Carto code
- e. Geographic position
- f. NCD quality code
- g. Date of photogrammetric source
- h. Horizontal datum

Refer to Nautical Charting Division Standard Digital Data Exchange Format (NCD SDDEF), Version 1 documentation dated April 1, 1985, for clarification of NCD quality and carto codes. Carto code "993" shall be assigned to cartographic features of possible landmark value. Geodetic positions shall be reported to



5.8. Drafting. Manuscripts will be drafted in accordance with Photogrammetric Instruction No. 55, Revision 2. When drafting small features or related symbols, the minimum length/size shall be .7 mm. The use of type (stick-up), in lieu of standing requirements, is permitted for lettering.

5.9. Geographic and Object Names

5.9.1. Requirements for names, including their placement, are outlined in Photogrammetric Instruction No. 63.

5.9.2. Obtain final geographic names list using the procedures outlined in Photogrammetric Instruction No. 63, section 2.03.1, last paragraph.

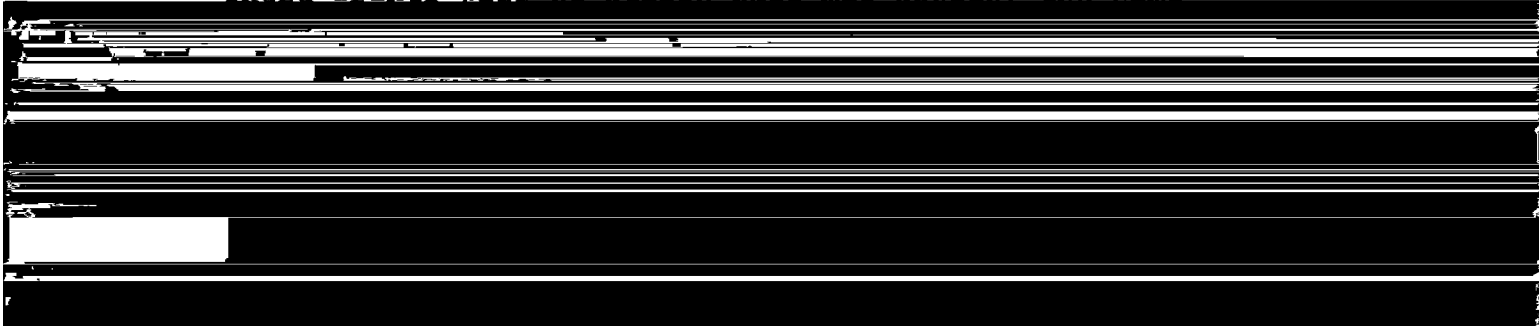
5.10. Reports. Refer to sections 1.2, 2.4.2, and 7.2. Include a brief statement in paragraph 49 (Notes to Reviewer) of the Compilation Report when selectivity of detail is required. Information required for inclusion in the Project Completion Report will be provided by N/CG2321.

5.11. Chart Maintenance Print. Prepare a stable base copy of each reviewed map and label Chart Maintenance Print. General requirements are specified in Photogrammetric Instruction No. 69 for completing this print. When preparing this print, keep in mind the objective is to provide comprehensive information about the adequacy, reliability, and completeness of map detail, as well as differences noted between the map and chart(s). Examples are (1) the inability to satisfactorily interpret photographic detail and (2) a difference between the chart(s) and map in the representation of a feature. This effort cannot be emphasized too strongly, because proper evaluation and usage of map detail will depend on this information. Include a statement regarding features not located as discussed in section 5.5.4.

5.12. Support Data. Supplemental survey data to support charting and hydrographic planning activities are indicated below; coordinate the processing and distribution of these data with N/CG2321. Refer to sections 2.1, 5.3, 5.5.3, 5.5.4, and 5.11.

<u>Type of Data</u>	<u>User</u>
Chart Maintenance Prints Listings of navigational aids	N/CG2222
* Notes to Hydrographer Prints Listings of navigational aids	N/CG241

\* These prints will be stable base map copies; the same





### 5.13. Communication

5.13.1. Forward a copy of each transmittal letter to N/CG2314 and N/CG2321. Data prepared in support of N/CG22 or N/CG24 functions shall be routed through N/CG2321.

5.13.2. Report major technical problems that are encountered to N/CG2321; e.g., problems with data acquisition, selection, and processing.

### 6.0. SCHEDULE

Schedule project completion by December 31, 1988. If this schedule cannot be met, inform N/CG2321 immediately.

### 7.0. MODIFICATIONS OF INSTRUCTIONS

7.1. If changes in procedures and/or methods seem advisable, please make appropriate recommendations to this office.

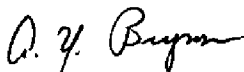
7.2. Departures from basic specifications, as necessitated by unique characteristics and special requirements for this mapping project, shall be contained in supplementary instructions or described in the text of the Job Completion Report and each applicable Descriptive Report; e.g., feature symbolization.

### 8.0. COSTS

All costs incurred on this assignment shall be charged to Task 8K6C01.

### 9.0. RECEIPT

Acknowledge receipt of these instructions.



Commander A. Y. Bryson  
Chief, Photogrammetry Branch  
Nautical Charting Division

Apr. 09, 1990

## MEMORANDUM FOR THE RECORD

FROM: JAMES W. MASSEY

SUBJECT: PEAK ELEVATIONS DEPICTED ON SHORELINE MAPS OF PROJECT  
CM-8410, CROSS SOUND, ALASKA

NOS Charts covering the area of this photogrammetric survey contain numerous contoured peaks with elevations and geographic names where applicable. In an effort to verify and supplement this information, which is considered to be supplemental navigational data, the Photogrammetry Branch determined photogrammetric elevations for numerous peaks within the survey area. Elevations are given in feet. The elevations were determined from model orientations that utilized vertical control, including shoreline points, derived from U.S. Geological Survey Quadrangles covering the area, and are based on relative heights above the Shoreline Plane of Reference. The elevations have not been field checked. The predicted relative vertical accuracy of these elevations, based on 90% confidence level, is plus or minus 20 feet. Analysis of these elevations with respect to published source documents indicate significant variations from NOS Charts and other maps of the area. The source and quality of elevations shown on these published products are unknown and were not investigated.

**APPENDIX F**

AEROTRIANGULATION REPORT  
CM-8410  
CAPE SPENCER TO DUNDAS BAY, ALASKA

NOVEMBER 1987

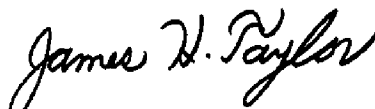
21. AREA COVERED

The area covered by this report is from Cape Spencer to Dundas Bay and across Gound... through the middle of this...  


25. PHOTOGRAPHY

The coverage and overlap proved to be adequate for this project. The quality of the photographs proved to be poor, which made measurement difficult.

Submitted by:



James H. Taylor  
Cartographer

Approved and Forwarded:



Don O. Norman  
Chief, Aerotriangulation Unit

CM-8410  
NOTES TO COMPILER

No aids or landmarks could be measured due to the poor quality of the photographs.

Refer to the index for the new bridging photo numbers.

CM-8410  
COLOR RATIO

	<u>STRIP 60-1</u>	
85-ZC-3153 thru 3159		Ratio <u>2.96</u>
	<u>STRIP 60-2</u>	
85-ZC-3110 thru 3120		Ratio <u>2.97</u>
	<u>STRIP 60-3</u>	
85-ZC-3122 thru 3126		Ratio <u>2.96</u>
	<u>STRIP 60-4</u>	
85-ZC-3166 thru 3170		Ratio <u>2.96</u>
	<u>STRIP 60-5</u>	
85-ZC-3130 thru 3133		Ratio <u>2.96</u>
	<u>STRIP 60-6</u>	
85-ZC-3173 thru 3178		Ratio <u>2.96</u>
	<u>STRIP 30-1</u>	
85-ZC-3410 thru 3413		Ratio <u>2.97</u>

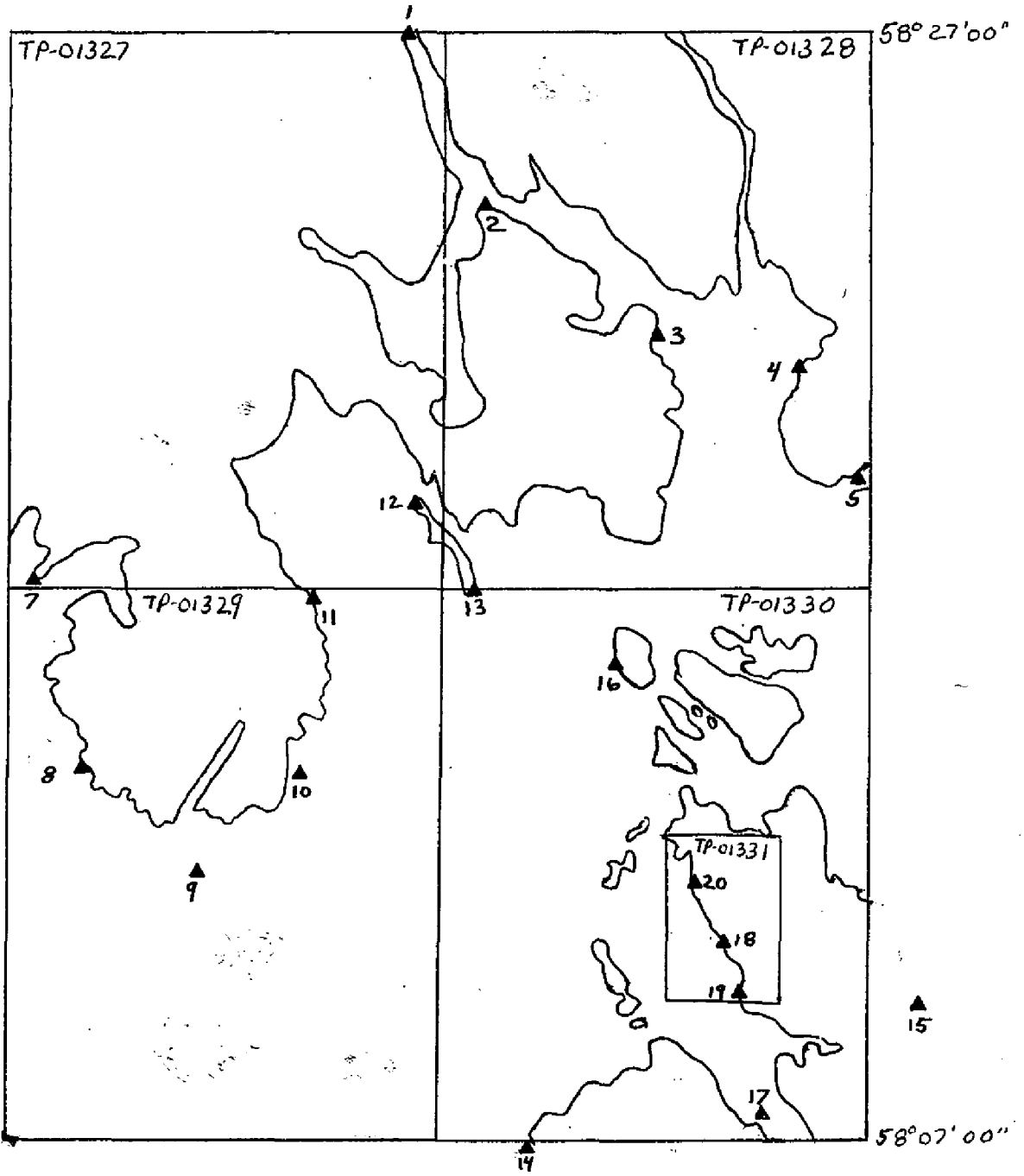
CM-8410  
FIT TO CONTROLBLOCK ADJUSTMENT  
▲ = CONTROL HELD

<u>STATION NAME</u>	<u>AERO NO.</u>	<u>X FT.</u>	<u>Y FT.</u>
DAS, 1985 Photo Point #1	105101▲	+0.1	-0.1
DUN, 1985	107100▲	+1.9	+1.5
DELTA, 1985	108100▲	-1.3	+3.6
DEED, 1901	109100▲	+0.4	-2.8
AID, 1901 Photo Point #2	110101▲	-1.3	-2.1
GARNET, 1925	114100▲	+0.3	-0.5
PEEP, 1925	116100▲	+0.7	-1.2
SHELF, 1925	118100▲	-2.4	-1.6
CAPE, 1925	120100▲	+1.0	+1.2
APRIL, 1985	120110▲	-1.7	-4.2
MORAIN, 1985	123100▲	-1.8	+3.6
TAYLOR, 1985	132100▲	-1.4	+2.7
END 2, 1985	133100▲	-3.7	+4.3
AIL, 1901 Sub Point	159101▲	-1.6	+2.1
IDAHO, 1985	153100▲	+0.3	+1.3
END 2, 1985 Photo Point #3	170101▲	-0.1	+1.2
TOWN, 1942	412100▲	+0.4	-3.2
TOWN, 1942 Photo Point #4	412101▲	+1.7	-1.8



CM-8410  
INDEX KEY TO NUMBERED CONTROL STATIONS

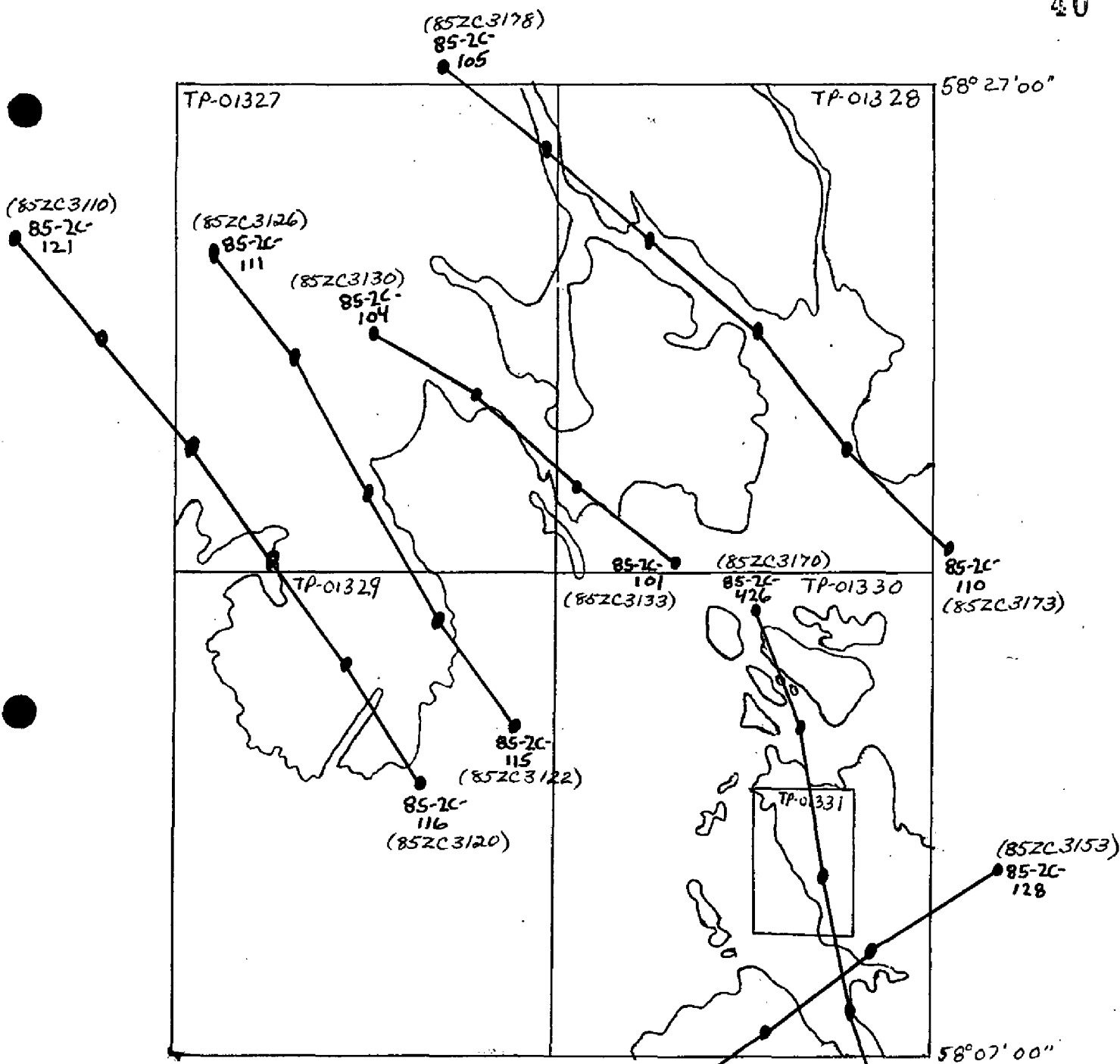
<u>INDEX NO.</u>	<u>STATION NAME</u>	<u>OBJECT</u>	<u>AERO NO.</u>
1	DAS, 1985	Photo Point #1	105101
2	DUN, 1985	Panel 13	107100
3	DELTA, 1985	Panel 12	108100
4	DEED, 1901	Panel 10	109100
5	AID, 1901	Photo Point #2	110101
6	GARNET, 1925	Panel 2	114100
7	PEEP, 1925	Panel 3	116100
8	SHELF, 1925	Panel 4	118100
9	CAPE, 1925	Panel 5	120100
10	APRIL, 1985	Panel 6	120110
11	MORAIN, 1985	Panel 7	123100
12	TAYLOR, 1985	Panel 8	132100
13	END 2, 1985	Panel 9	133100
14	AIL, 1901	Panel 15	159101
15	IDAHO, 1985	Panel 18	153100
16	END 2, 1985	Photo Point #3	170101
17	TOWN, 1942	Panel 16	412100
18	TOWN, 1942	Photo Point #4	412101
19	TOWN, 1942	Photo Point #4A	412122
20	FINN, 1938	Panel 17	411100
21	COB, 1901	Panel 1	710100



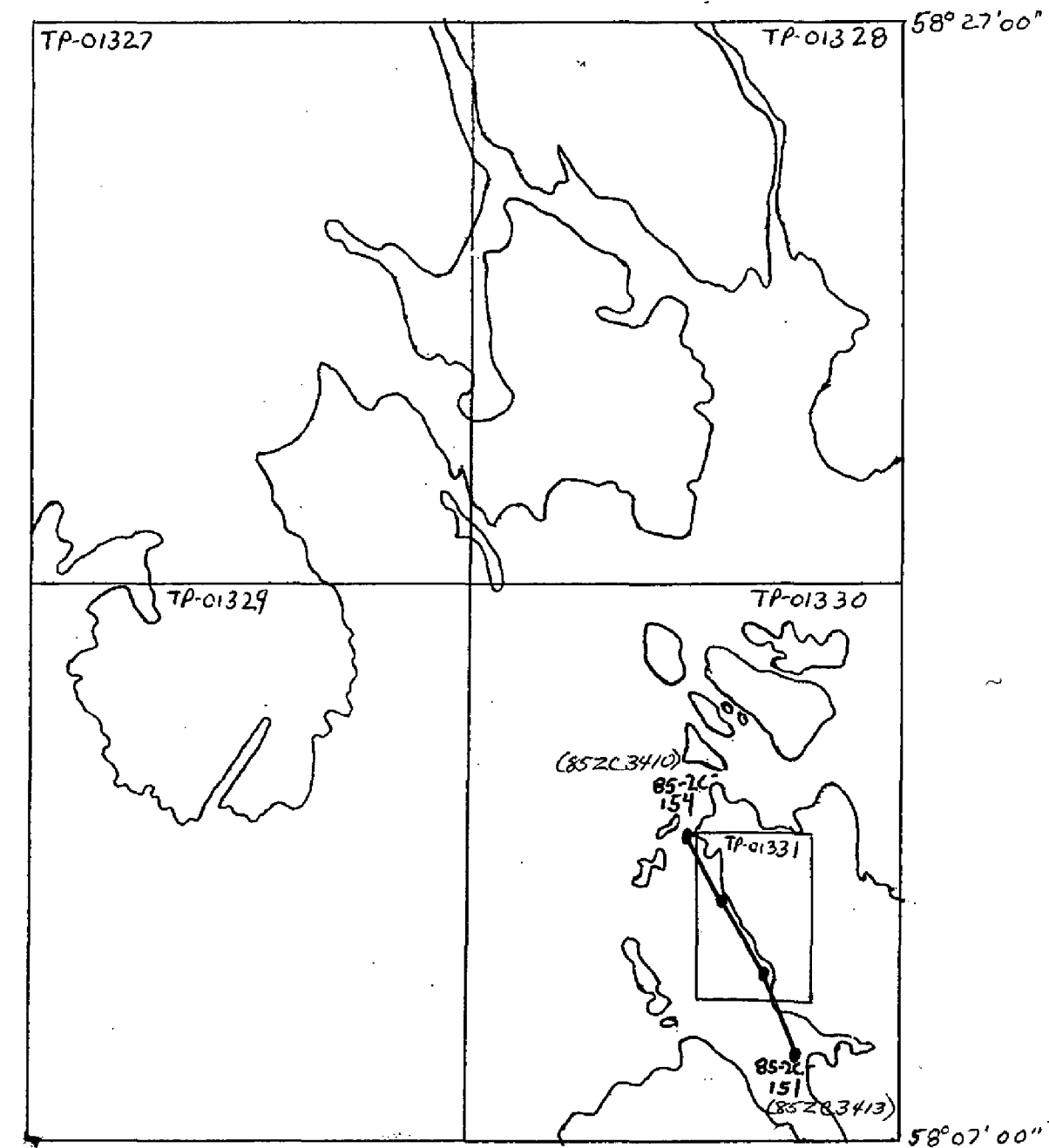
136° 45' 00"

136° 15' 00"

CM-8410  
 CROSS SOUND  
 CAPE SPENCER TO DUNDAS BAY  
 ALASKA  
 SHORELINE MAPPING  
 BRIDGING CONTROL



CM-8410  
 CROSS SOUND  
 CAPE SPENCER TO DUNDAS BAY  
 ALASKA  
 SHORELINE MAPPING  
 1:60,000 COLOR BRIDGING PHOTOS  
 ( ) denotes N.O.S. Photograph I. D. Numbers



136° 45' 00"

CM-8410  
 CROSS SOUND  
 CAPE SPENCER TO DUNDAS BAY  
 ALASKA  
 SHORELINE MAPPING

136° 15' 00"

1:30,000 COLOR BRIDGING PHOTOS  
 ( ) denotes N.O.S. Photograph I.D. Numbers

**APPENDIX G**

MAP COMPILATION SOURCES for PROJECT CM-8410

MAP TP-01327 MAP SCALE = 1:20,000

PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
*85Z(C)3114 & 3116	06/28/85	0951-0952	1:60,000	+7.5 FT MLLW/C.S.
85Z(C)3124 - 3126	06/28/85	1004-1005	1:60,000	+7.4 FT MLLW/C.S.
85Z(C)3130 - 3132	06/28/85	1014-1015	1:60,000	+8.4 FT MLLW/I.C.,N.I.P.
85Z(C)3177 - 3178	06/28/85	1122-1123	1:60,000	+7.1 FT MLLW/I.C.,N.I.P.

Photography Types: (C) = Color, Multispectral (MS)  
Standard Time is referenced to Alaska Time Zone (Meridian = 135°)

Office Reviewer - James W. Massey March 6, 90  
Date

REMARKS: \* = Only even numbered exposures were used on this flight line.  
The stages of tide indicated for the photography are based on predicted tides using the Sitka Alaska Gauge as the Mainstation and Subordinate stations as indicated:

C.S. = Cape Spencer (Mean Range of Tide = 8.1 Ft, MHW = 9.6 Ft)  
I.C.,N.I.P. = Inian Cove, North Inian Pass (Mean Range of Tide = 8.7 Ft, MHW = 10.6 Ft)

\*\*\*\*\*

MAP TP-01328 MAP SCALE = 1:20,000

PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
85Z(C)3132 - 3133	06/28/85	1015-1016	1:60,000	+8.4 FT MLLW/I.C.,N.I.P.
85Z(C)3173 - 3177	06/28/85	1120-1122	1:60,000	+7.1 FT MLLW/I.C.,N.I.P.

Photography Types: (C) = Color Multispectral (MS)  
Standard Time is referenced to Alaska Time Zone (Meridian = 135°)

Office Reviewer - James W. Massey March 6, 90  
Date

REMARKS: Refer to REMARKS for TP-01327.

MAP COMPILATION SOURCES for PROJECT CM-8410

MAP TP-01329 MAP SCALE = 1:20,000

PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
*85Z(C)3116 - 3120	06/28/85	0952-0953	1:60,000	+7.5 FT MLLW/C.S.
85Z(C)3122 - 3124	06/28/85	1003-1004	1:60,000	+7.4 FT MLLW/C.S.

Photography Types: (C) = Color, Multispectral (MS)  
Standard Time is referenced to Alaska Time Zone (Meridian = 135°)

Office Reviewer

*James W. Massey*  
James W. Massey Date

REMARKS: \* = Only even numbered exposures were used on this flight line.  
The stages of tide indicated for the photography are based on predicted tides using the Sitka Alaska Gauge as the Mainstation and Subordinate stations as indicated:  
C.S. = Cape Spencer (Mean Range of Tide = 8.1 Ft, MHW = 9.6 Ft)

\*\*\*\*\*

MAP TP-01330 MAP SCALE = 1:20,000

PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
*85Z(C)3153 - 3159	06/28/85	1050-1052	1:60,000	+7.0 FT MLLW/P.A.
85Z(C)3166 - 3170	06/28/85	1103-1105	1:60,000	+6.8 FT MLLW/P.A.

Photography Types: (C) = Color Multispectral (MS)  
Standard Time is referenced to Alaska Time Zone (Meridian = 135°)

Office Reviewer

*James W. Massey*  
James W. Massey Date

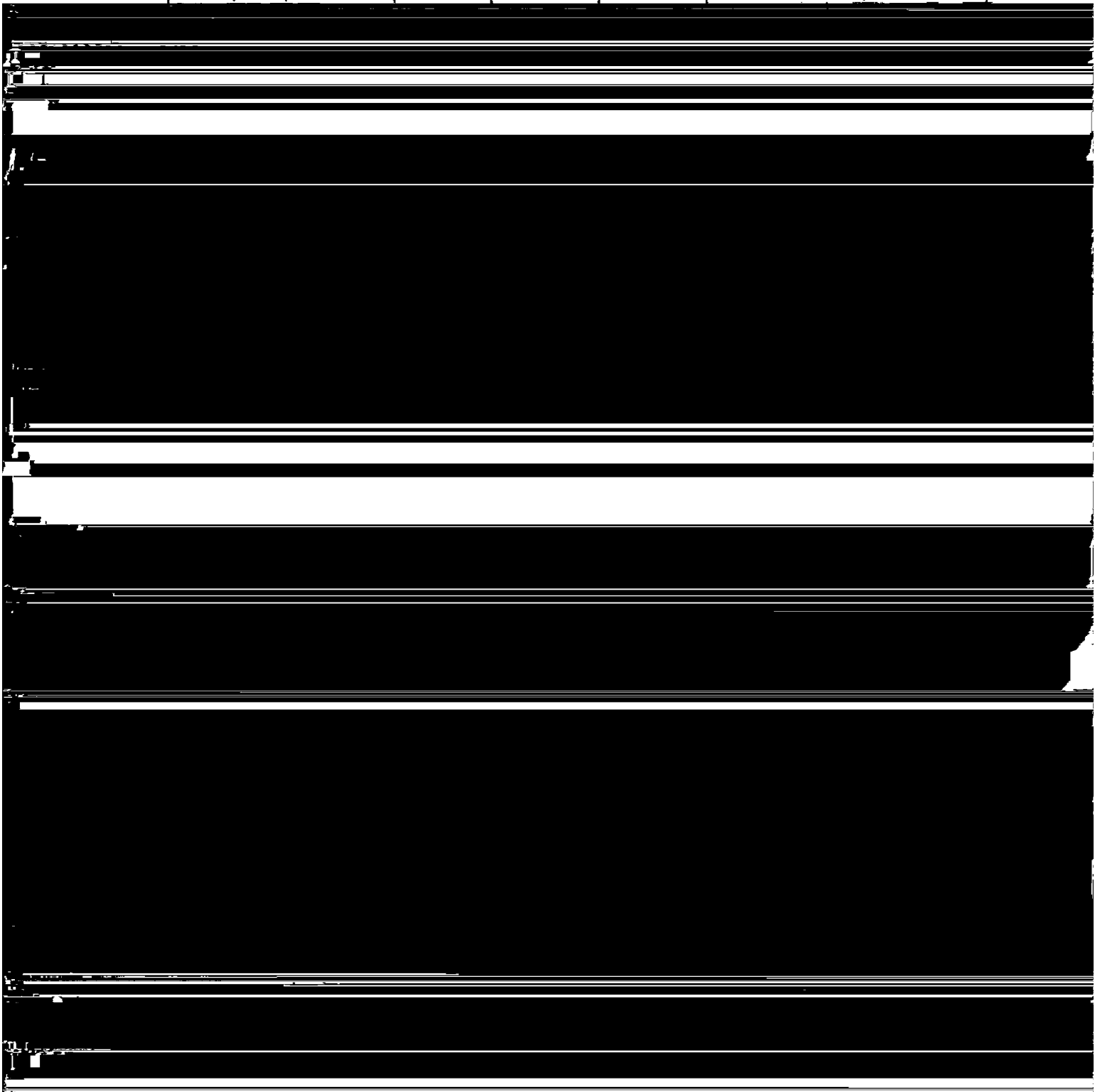
REMARKS: \* = Only odd numbered exposures were used on this flight line.  
The stages of tide indicated for the photography are based on predicted tides using the Sitka Alaska Gauge as the Mainstation and Subordinate stations as indicated:  
P.A. = Port Althrop (Mean Range of Tide = 8.6 Ft, MHW = 10.1 Ft)

MAP COMPILATION SOURCES for PROJECT CM-8410

MAP TP-01331      MAP SCALE = 1:10,000

PHOTOGRAPHY

YEAR (TYPE) NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
---------------------	------	------	-------	-------------------------





**APPENDIX H**

GEOGRAPHIC NAMES

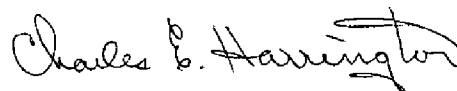
FINAL NAME SHEET

CM-8410 (Cross Sound, Alaska)

TP-01327

Annoksek Creek  
Brady Glacier  
Dundas Bay  
Fern Harbor  
Graves Harbor  
Murk Bay  
North Trick Lake  
South Trick Lake  
Taylor Bay  
Taylor Island

Approved:



Charles E. Harrington  
Chief Geographer  
Nautical Charting Division  
Charting and Geodetic Services

GEOGRAPHIC NAMES

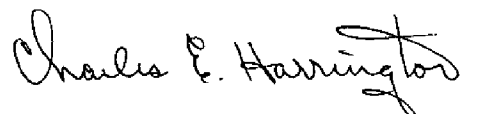
FINAL NAME SHEET

CM-8410 (Cross Sound, Alaska)

TP-01328

Dundas Bay  
Dundas, Point  
Dundas River  
Fern Harbor  
North Inian Pass  
Taylor Island  
Wimbledon, Point

Approved:



Charles E. Harrington  
Chief Geographer  
Nautical Charting Division  
Charting and Geodetic Services

GEOGRAPHIC NAMES

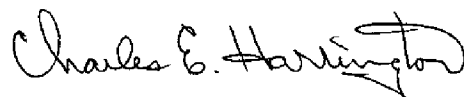
FINAL NAME SHEET

CM-8410 (Cross Sound, Alaska)

TP-01329

Alaska, Gulf of  
Cross Sound  
Dicks Arm  
Graves Harbor  
Graves Rocks  
Murphy Cove  
Polka Peninsula  
Polka Rock  
Spencer, Cape  
Table Mountain  
Taylor Bay  
Villaluenga, Point  
Zip Rock

Approved:



Charles E. Harrington  
Chief Geographer  
Nautical Charting Division  
Charting and Geodetic Services

GEOGRAPHIC NAMES

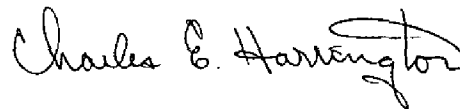
FINAL NAME SHEET

CM-8410 (Cross Sound, Alaska)

TP-01330

Althorp Peninsula  
Althorp, Port  
Chichagof Island  
Column Point  
Cross Sound  
Dad Rock  
Earl Cove  
Fox Creek  
Gaff Rock  
George Islands  
Granite Cove  
Inian Cove  
Inian Islands  
Inian Peninsula  
Lacy Cove  
Lavinia, Point  
Lucan, Point  
Margret Creek  
North Inian Pass  
Port Althorp (abandoned)  
Salt Chuck Bay  
South Inian Pass  
South Rock  
Three Hill Island

Approved:



Charles E. Harrington  
Chief Geographer  
Nautical Charting Division  
Charting and Geodetic Services

GEOGRAPHIC NAMES

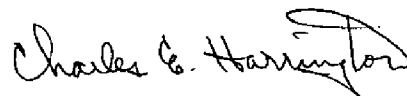
FINAL NAME SHEET

CM-8410 (Cross Sound, Alaska)

TP-01331

Althorp, Port  
Althorp Rock  
Chichagof Island  
Elfin Cove  
Elfin Cove (locale)  
Inian Peninsula

Approved:



Charles E. Harrington  
Chief Geographer  
Nautical Charting Division  
Charting and Geodetic Services

**APPENDIX I**

## CARTOGRAPHIC FEATURES OF CHARTING INTEREST

Page 1 of 1

COSATAL MAPPING PROJECT: CM-8410; Alaska, Cape Spencer to Dundas Bay,  
Cross Sound

NOS Nautical Charts Affected: 17301, 17302

Geodetic Datum: North American Datum of 1927

The following charted cartographic features and newly identified cartographic features of possible landmark value have been identified and measured during photogrammetric operations. Refer to Nautical Charting Division Standard Digital Data Exchange Format documentation for quality code (QC) criteria and clarification of cartographic codes (CC). Please note cartographic code 993 is a photogrammetric source code for cartographic features of possible landmark value. Descriptions in upper and lower case are for internal use.

FEATURE DESCRIPTION	NCD CC	GEOGRAPHIC POSITION(°-'-")		NCD QC	DATE OF LOCATION
		LATITUDE	LONGITUDE		
Map TP-01327: GRAVES HARBOR DAYBEACON 2	224	58-17-08.8	136-41-29.9	7	059/1989
Map TP-01329: CAPE SPENCER LIGHT	200	58-11-57.6	136-38-18.8	7	059/1989
Map TP-01330: THREE HILL ISLAND LIGHT 1	200	58-09-14.0	136-22-58.6	7	059/1989
GEORGE ISLAND LIGHT 2	200	58-12-43.724	136-22-46.007	4	001/1938
Map TP-01331: ALTHROP ROCK LIGHT 3	200	58-09-59.689	136-21-27.021	4	001/1938
ELFIN COVE ENTRANCE LIGHT 2	200	58-11-42.378	136-20-59.599	4	001/1938
ELFIN COVE OUTER LIGHT	200	58-11-50.13	136-20-57.65	4	001/1988

- end -

Listing approved by:

*[Signature]*  
Final Reviewer

*[Signature]*  
Date