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PHOTOGRAMMETRY BRANCH  
COASTAL MAPPING PROGRAM

PROJECT CM-8306  
COMPLETION REPORT

ALASKA

UNALASKA ISLAND of the ALEUTIAN ISLANDS

Cape Cheerful to Erskine Point  
including Dutch Harbor  
TP-01356, TP-01357, TP-01358, TP-01359

Agency Vault - Original Report

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Cape Cheerful to Erskine Point including Dutch Harbor  
TP-01356, TP-01357, TP-01358, TP-01359

Year of Source - 1983

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

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Unalaska Island of the Aleutian Islands  
Cape Cheerful to Erskine Point including Dutch Harbor  
TP-01356, TP-01357, TP-01358, TP-01359

Clearance and Approval

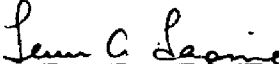
This report summarizes the photogrammetric operations related to project completion and is submitted for approval. The maps, associated project data, and this report meet the requirements and standards of the Photogrammetry Branch Coastal Mapping Program. Clearance for project registration is requested.

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

COMPLETION REPORT

iii

COASTAL MAPPING PROGRAM PROJECT CM-8306  
Alaska  
Unalaska Island of the Aleutian Islands  
Cape Cheerful to Erskine Point including Dutch Harbor

TABLE OF CONTENTS

Clearance and Approval .....	ii
Introduction .....	1
Planning .....	1
Field Operations	
Field Surveying .....	1
Photography .....	1
Aerotriangulation .....	1
Compilation .....	4
Final Review .....	5
Dissemination of Project Data .....	5
FIGURES	
1. Project Site Location Diagram .....	2
2. Project Diagram .....	3
LISTINGS	
1. Project Geodetic Control .....	7
APPENDICES	
A. Planning Phase Summary Memorandum .....	8
B. Field Operations Instructions .....	9
C. Field Operations Report .....	13
D. Aerotriangulation Instructions .....	17
E. Aerotriangulation Report .....	22
F. Office Instructions .....	29
G. Map Compilation Sources Pages .....	37
H. Approved Geographic Names .....	39
I. Cartographic Features of Charting Interest .....	43

## COASTAL MAPPING PROGRAM PROJECT CM-8306

### Introduction

Coastal Mapping Program Project CM-8306 was planned to provide four coastal survey maps depicting the shoreline and other cartographic features of mapping interest in the coastal zone of the north coast of Unalaska Island from Cape Cheerful easterly to Erskine Point including Dutch Harbor. The survey included the offshore islands located in bays within the project's geographic limits. Refer to FIGURE 1 for a graphic reference of the project site.

The maps were assigned map identifiers TP-01356 through TP-01359. All maps were prepared at 1:10,000 scale with the Lambert conformal conic projection based on the North American Datum of 1983. A supplemental Lambert conformal conic projection based on the North American Datum of 1927 is depicted on the maps with projection ticks. 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. A new charting scheme is scheduled for the Dutch Harbor area using the maps of this project as a new base for chart construction.

### Planning

An abbreviated summary of the planning and field operations phases of the project is bound in Appendix A. Refer to the summary for general information on the planning phase for this project.

### Field Operations

Field operations in support of this project are partially summarized in a memorandum bound in Appendix A. The formal field operation instructions were issued on April 7, 1987 and are bound in Appendix B. The field operations report was filed by the Chief, Pacific Marine Center Photo Party and is bound in Appendix C.

Project photographs are adequately discussed in the aforementioned reports and in the Aerotriangulation Report which is bound in Appendix E.

### Aerotriangulation

Formal instructions for the aerotriangulation phase were issued on February 22, 1988 and are bound in Appendix D. Standard procedures for the completion of the aerotriangulation phase were executed in March/April 1988 by the Aerotriangulation Unit, headquarters office. The Aerotriangulation

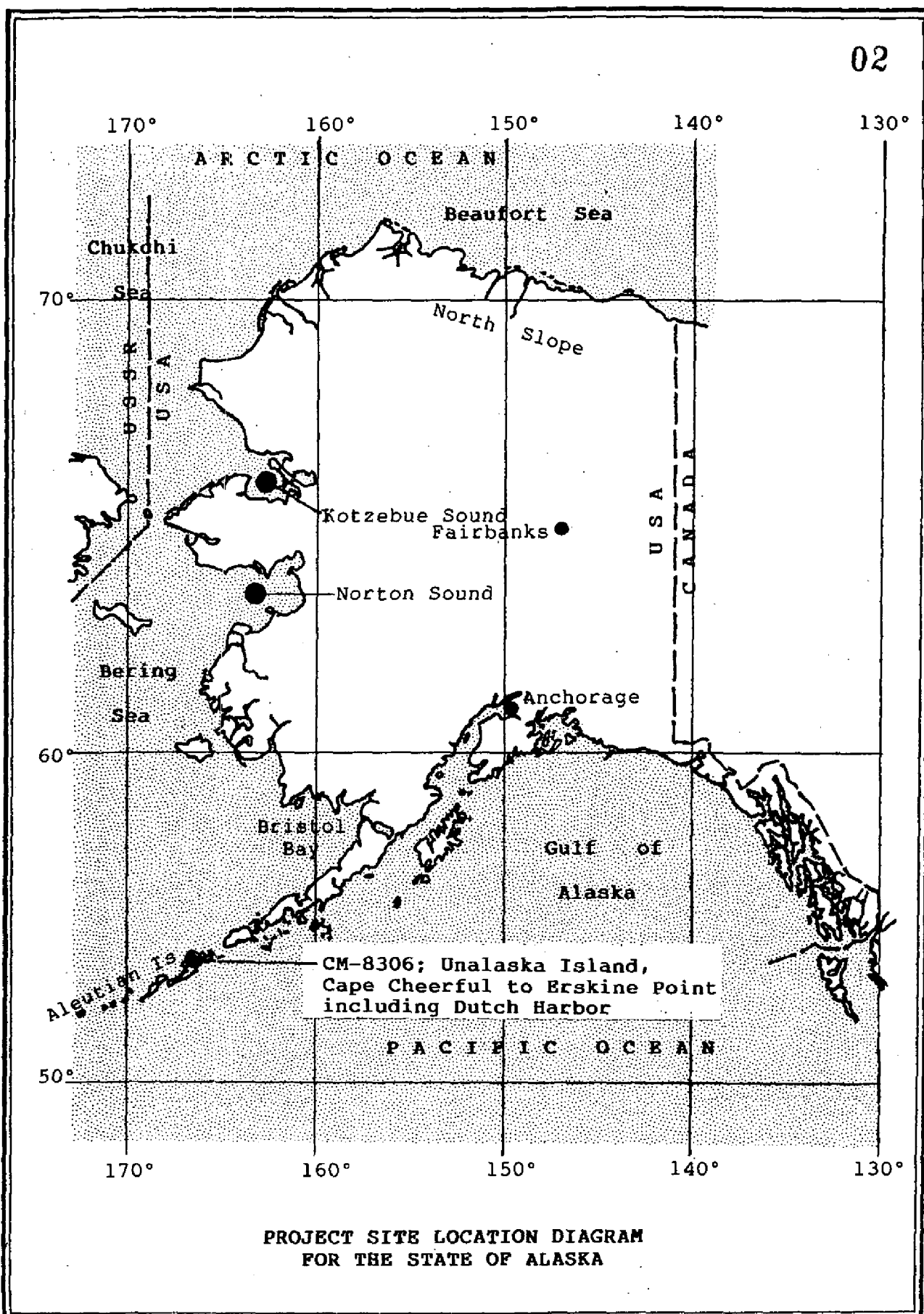
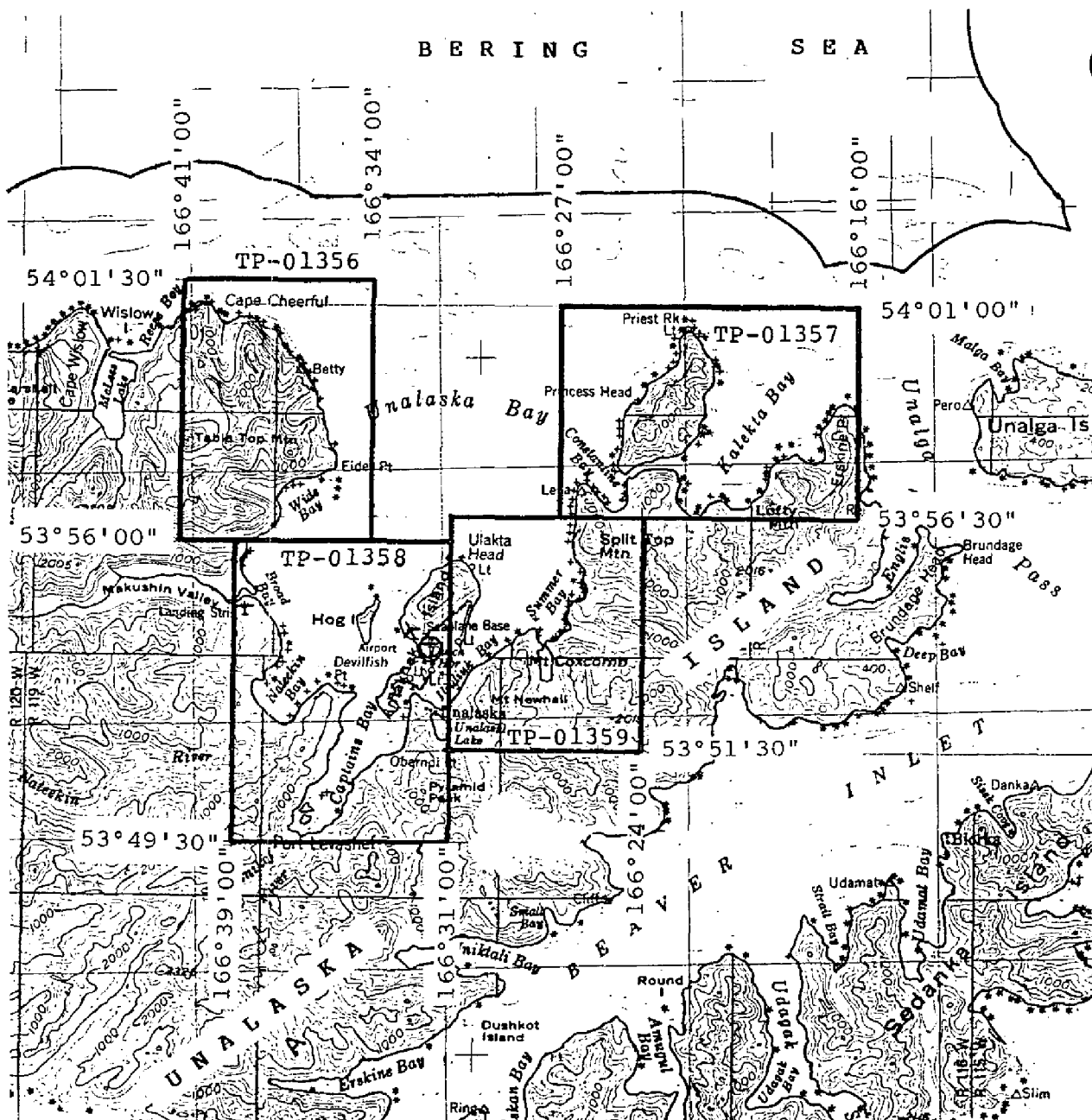


FIGURE 1. Project Site Location Diagram



PROJECT CM-8306

ALASKA

Unalaska Island of the Aleutian Islands  
Cape Cheerful to Erskine Point including Dutch Harbor

Coastal Mapping Program  
Maps @ 1:10,000 scale

FIGURE 2. Project Diagram

Report is bound in Appendix E and contains information on the placement of horizontal control, photographs selected for data acquisition, fit to control statement.

### Compilation

Formal instructions for the office phase were issued May 20, 1988 and are bound in Appendix F. Standard procedures for analog compilation were executed in the completion of the project. Shoreline delineation (MHW) is based on office interpretation of source photography indicated in Appendix G. The MLLW Line was not compiled. The source photography for this survey is not adequate for delineation of the MLLW tidal datum line. 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 August 1988 by the Coastal Mapping Unit, headquarters office. The photogrammetric work station utilized in data acquisition was a Wild B-8 Stereoplotter (S/N 1167). 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.



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 April 1989 in the Coastal Mapping Unit, headquarters office. All maps and associated products were judged acceptable to program criteria. The results of the comparison against the NOS nautical charts of the area were annotated on the Chart Maintenance Print for each map. Comparisons were made against the following NOS Nautical Charts:

- 16530, 4th Edition (Apr 30, 1977), 1:10,000 scale
- 16529, 11th Edition (June 23, 1984), 1:10,000 scale
- 16528, 13th Edition (Mar 17, 1984), 1:40,000 scale
- 16518, 4th Edition (May 10, 1975), 1:40,000 scale

#### **Final Review**

The final review phase was initiated in April 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 F, 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-8306 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) - 6 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 NOS Nautical Chart 16528 with control station locations annotated
- One envelope containing 12 black and white contact prints with control station photoidentification annotation
- One field data binder titled "Project Report CM-8306" containing assorted project related forms
- One copy of Cartographic Features of Charting Interest listing

**Agency Archives**

Registration Copy of Each Map

Original Project Completion Report

**Photogrammetric Electronic Data Library**

There is no digital data of this project maintained in the library

**Reproduction Branch, Aeronautical Charting Division**

8X Reduction Negative of Each Map

**Mapping and Charting Branch**

Chart Maintenance Print of Each Map

All final project data and products were forwarded to the Production Requirements Unit, Headquarters office for registration and dissemination of products.

## PROJECT GEODETIC CONTROL LISTING

Page 1 of 1

**PROJECT:** CM-8306; Cape Cheerful to Erskine Point including Dutch Harbor,  
Unalaska Island, Aleutian Islands, Alaska

**GEODETIC DATUM:** North American Datum of 1983

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. QQQQQSSSSSS.

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

STATION NAME	STA ID	Geodetic Coordinates("'-")		QC	Location Day/Year
		Latitude	Longitude		
DUTCH HBR CO FLAGSTAFF	531664110004	53-53-25.829	166-32-09.405	3	001/1896
DUTCH HBR DOLPHIN	531664110003	53-54-06.243	166-30-26.882	3	001/1951
DUTCH HBR GREEN TANK	531664110024	53-54-44.068	166-30-17.441	3	001/1951
DUTCH HBR WATER TANK	531664110025	53-53-18.606	166-32-00.244	3	001/1951
KIN	531664110001	53-53-32.127	166-37-13.297	2	001/1934
KIND	531664140001	53-53-02.513	166-37-44.403	2	001/1934
MORRIS	531661440015	53-55-33.561	166-26-26.949	3	001/1951
NORTH RADIO TOWER	531664110006	53-53-11.964	166-32-06.505	3	001/1934
PRIEST ROCK	541662330001	54-00-29.453	166-22-36.929	3	001/1934
RUSSIAN CHURCH	531664110008	53-52-32.432	166-32-10.943	3	001/1938
SOUTH BASE 2	531664110022	53-53-50.824	166-30-54.457	2	001/1934
SOUTH RADIO TOWER	531664110032	53-53-07.802	166-32-10.405	3	001/1934
SPLITHEAD LIGHT	531664110040	53-53-50.640	166-30-55.229	3	001/1951
TAC	UNKNOWN	53-57-39.255	166-36-07.287	3	001/1943
ULAKTA HEAD LIGHT	531664110005	53-55-27.384	166-30-31.353	3	001/1951
UNALASKA AC CO FLAGSTAFF	531664110013	53-52-37.846	166-32-17.225	3	001/1896
UNAL CHURCH LOWER CROSS	531664110031	53-52-32.188	166-32-10.436	3	001/1896

- end -

**Remarks:** The aforementioned stations were recovered in 1987 by the Pacific Marine Center Photo Party or confirmed during the aerotriangulation and compilation phases.

Listing approved by:

Final Reviewer

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

January 27, 1988 N/CG2313:JDM

08

MEMORANDUM FOR: The Record  
FROM: *James D. McNamara*  
James D. McNamara  
Acting Chief, Coastal Planning Unit  
Nautical Charting Division  
SUBJECT: Review and wrap-up Job CM-8306, Dutch Harbor, Cape Cheerful to Erskine Point, Alaska

This coastal mapping project was scheduled for the summer 1987. The Pacific Marine Center (PMC) photo field party worked this job between July 23 and July 31, 1987. The photo field party worked this project out of Dutch Harbor, Alaska with the support of the NOAA helicopter, and a NOAA owned carryall truck that was available in Dutch Harbor.

This project required the identification of 10 stations for photo-identification along with the related substitute stations, in preparation of the aerotriangulation of the existing photography. G. Frederick, chief of the photo party was able to recover 8 of the existing stations. Five new stations were positioned with the Magnavox Geociers, to meet the requirements of this project.

The Airport Survey Party positioned three substitute stations in the vicinity of the airport on photograph GS-VFJH 10-20, this eliminated duplication of effort in this area.

The photography for this project was obtained from the U.S. Geological Survey. This is 1:24,000 scale Black and White photography. There was no tide-coordinated Black and White Infrared photography or compilation photography for this project. The flight lines for this project were orientated northeast-southwest, not along the shoreline as the usual photogrammetric projects. The aerotriangulation unit indicated that it could bridge this photography, in spite of that difficulty.

The data set for this shoreline mapping project will consist of the following data: black and white bridging photography, project field report, NAD 27 offset data, and a copy of the camera calibration.



## APPENDIX B





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

09

April 7, 1987

N/CG2313:JDM

Chief, Program Services Division  
Pacific Marine Center

PROJECT INSTRUCTIONS: FIELD - Job CM-8306, Dutch Harbor, Cape  
Cheerful to Erskine Point, Alaska, Shoreline Mapping

1.0. PURPOSE

These instructions provide specifications for photoidentifying  
horizontal control stations required for aerotriangulation.

2.0. AREA

Mapping at 1:10,000 and 1:20,000 scales will cover the shoreline  
and adjacent waterways in the vicinity of Dutch Harbor from Cape  
Cheerful to Erskine Point, including Unalaska Bay and Kalekta  
Bay.

3.0. PHOTOGRAPHY

Aerotriangulation photography at 1:24,000<sup>7,500</sup> scale has been obtained  
using panchromatic film.

4.0. ASSIGNMENT

You are assigned all field operations required to photoidentify  
horizontal control stations on 1:24,000<sup>7,500</sup>-scale photography.

5.0. HORIZONTAL CONTROL

5.1. The horizontal datum for this project is NAD 83.

5.2. Horizontal control stations will be recovered or  
established and photoidentified in the areas indicated on the  
control requirements diagram which has been furnished.  
Identification shall include two substitute stations for each  
control station and shall conform with requirements of  
Photogrammetric Instruction No. 22, Revised September 30, 1965.  
Prepare and submit a NOAA form 76-53 for each station identified.  
Contact prints of the 1:24,000<sup>7,500</sup>-scale panchromatic photography  
will be furnished.

5.3. 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.



5.4. New control stations, where needed, shall be established by triangulation, trilateration, traverse, satellite positioning, or a combination of the four methods, in accordance with Third-Order, Class I specifications provided in Standards and Specifications for Geodetic Control Networks, dated September 1984.

5.5. Notify 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. SCHEDULE

Scheduling will be at your earliest opportunity after completion of CM-8309, Shelikof Strait, Cape Kumlik to Jack Point, Alaska.

7.0. REPORT

A field operations report covering all pertinent information as to field work performed is required within 30 days after completion of the field phase of the project.

8.0. RECORDS

All field data observed and collected will be forwarded to N/CG2313.

9.0. MODIFICATIONS OF INSTRUCTIONS

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

10.0. COSTS

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

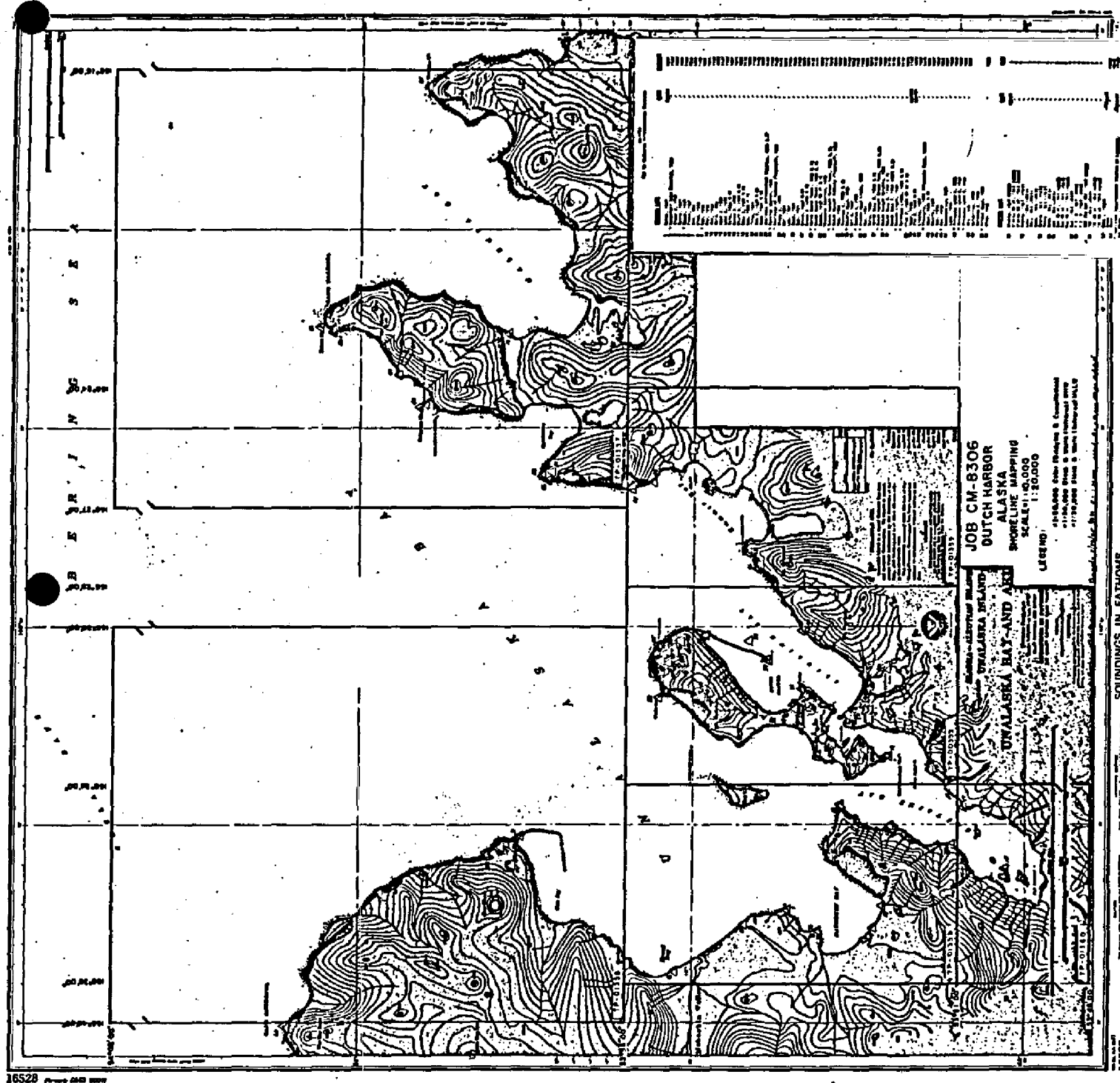
11.0. RECEIPT

Acknowledge receipt of these instructions.

Robert L. Sandquist  
Director  
Pacific Marine Center

*Christian Andreassen*  
Christian Andreassen  
Chief, Nautical Charting Division  
Charting and Geodetic Services






RECEIVED  
1987 APR 22 A 9:57  
NAUTICAL CHARTING DIVISION

R E C E I P T

TO: N/CG2 - Christian Andreasen  
ATTN: N/CG23.

THRU: N/MOP - Robert L. Sandquist

Receipt of Project Instructions FIELD - Job CM-8306, Dutch Harbor, Cape Cheerful to Erskine Point, Alaska, Shoreline Mapping, dated April 7, 1987, is acknowledged.

  
Chief, Program Services Division  
Pacific Marine Center

4/13/87  
Date

## APPENDIX C

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE  
PACIFIC MARINE CENTER  
PACIFIC PHOTO PARTY  
PROJECT REPORT CM-8306  
DUTCH HARBOR, 1987  
ALEUTIAN ISLANDS, ALASKA

I. AUTHORITY

By instruction of the Director, Pacific Marine Center.

II. DATES

Field work was accomplished between July 23 and July 31, 1987.

III. PURPOSE

The purpose of this project was to photo identify horizontal control in accordance with Project Instructions: Field - Job CM-8306, Dutch Harbor, Cape Cheerful to Erskine Point, Alaska, Shoreline Mapping dated April 7, 1987.

IV. TERRAIN AND WORKING CONDITIONS

The terrain within the bounds of this project is very rugged. The shoreline is composed of narrow boulder strewn rock beaches. High bluffs extend straight up inshore from the beach in many areas making landings by either boat or helicopter difficult. The entire area above the beach is covered with tundra type moss and few trees or large bushes exist.

Due to the steepness of the bluffs and the horizon this created, satellite observations were difficult to obtain.

The weather was relatively good during this project in that little rain or wind was encountered. However, extremely low cloud cover did prevented use of control at higher elevations. The arrival of the NOAA helicopter was delayed for one day due to subminimum visibility, but the Photo Party was able to accomplish reconnaissance via truck for that day.

Accommodations and helicopter fuel were available in Dutch Harbor. Most supplies, batteries, tools etc. can be purchased in Dutch Harbor or Unalaska.

V. PERSONNEL

J. Gary Fredrick	(NOS, Pacific Photo Party)
David P. Butler	(NOS, Photogrammetry Br.)
Dennis R. McConnel	(NOS, Airport Surveys Unit)
Richard A. Roberts	(NOS, Airport Surveys Unit)
Helicopter Pilot	(NOAA, OAO) J. Michael Barnhill, Cdr.
Helicopter Mechanic	(NOAA, OAO) Roy Dehart

VI. EQUIPMENT

Wild T-2 Theodolite  
 Hewlett Packard 3808A EDM  
 3-Prism Retro Reflectors  
 Wild adjustable tripods  
 30 meter steel tape  
 Magnavox 1502 Transit Satellite Receivers  
 Bell 212 Helicopter

A NOAA owned carryall truck is available in Dutch Harbor. This vehicle was shared between the Photo Party, Airport Party and the RAINIER.

Although the Helicopter developed a hydraulic oil leak, operations continued by having an adequate supply of hydraulic fluid on hand to replace what was leaking. Repairs were not made due to the lack of parts.

#### VII. FIELD METHODS

Both the scale and quality of the 9x9 black and white contact prints used in this project were very good for making ground-photo interpretations in the field. Due to the age of the photographs (June 1983) some changes were noted.

Eight (8) existing control points were recovered and six (6) of these points were identified directly on the photography. Ten (10) additional substitute stations were identified and located by standard azimuth, angle, distance measurements from the eight (8) recovered horizontal control points. Five (5) photo points were positioned with the Magnavox Geocisers by translocation from SOUTH BASE 2 1934 which is a second order traverse station. None of the photo points were monumented.

At the direction of the Rockville office, the Airport Survey Party from Atlantic Marine Center, which was working at the Unalaska Airport during this time frame, photo identified three of the substitute stations mentioned in the previous paragraph. Using their data (Directions and Distances) geographic positions in NAD83 were computed for these three points. The photo on which they identified the substitute stations and their supporting data is included with the data for this job.

#### VIII. STATISTICS

NUMBER OF STATIONS RECOVERED	8
NUMBER OF STATIONS IDENTIFIED DIRECT	6
NUMBER OF SUBSTITUTE STATIONS IDENTIFIED	10
NUMBER OF DOPPLER PHOTO POINTS	5

#### X. RECORDS

All photo points identified by the Photo Field Party have been described and sketched on CSI cards. The black and white 9x9 contact prints have been pricked and annotated. In addition, 35mm hand held oblique photographs of all but two sites (circled areas 10 and 11) that were photoidentified are attached to the CSI cards.

The Airport Survey Party provided a data package comprised of a cover letter, a copy of a FIELD SURVEY SKETCH, a copy of an AIRPORT LIST OF DIRECTIONS AND DISTANCES, three pages of HORIZONTAL CONTROL DATA from quads 531661 and 531664, a one page MIEN listing of inverse and Direct computations and one (1) contact photograph (GS-VFJH 10-20) on which three (3) substitute stations are identified. This data package will be included with the Data submitted by the Photo Field Party.

# XI. RESULTS

The following list of NAD 1983 geographic positions is the result of the operations described in this report.

SITE NO.	STATION NAME	LATITUDE	LONGITUDE	METHOD
1	BELL 1936	54,01,02.370 ✓	166,40,36.715 ✓	DIRECT
2	Sub Pt 1A	54,00,57.513 ✓	166,40,47.013 ✓	AZ DST
2	Photo Pt 2	54,00,20.602 ✓	166,37,43.740 ✓	SAT
3	TAC 1943	53,57,39.255 ✓	166,36,07.287 ✓	DIRECT
3	TAC 1943 RM 1	53,57,39.137 ✓	166,36,07.483 ✓	DIRECT
3	Sub PT 3A	53,57,37.675 ✓	166,36,12.825 ✓	AZ DST
3	Sub Pt 3B	53,57,39.269 ✓	166,36,08.625 ✓	AZ DST
4	Photo Pt 4	53,55,27.353 ✓	166,38,57.296 ✓	SAT
4	Sub Pt 4A	53,54,18.826 ✓	166,37,46.064 ✓	AZ DST
4	EXTRA 1934	53,56,25.956 ✓	166,37,44.403 ✓	DIRECT
5	Photo Pt 5	53,49,59.230 ✓	166,36,20.787 ✓	SAT
6	KIND 1934	53,53,02.513 ✓	166,37,44.403 ✓	DIRECT
6	Sub Pt 6A	53,53,02.491 ✓	166,37,45.338 ✓	AZ DST
6	Sub Pt 6B	53,53,02.726 ✓	166,37,43.418 ✓	AZ DST
7	Photo Pt 7	53,55,13.970 ✓	166,26,13.161 ✓	AZ DST
8	PRIEST ROCK	54,00,29.453 ✓	166,22,36.929 ✓	DIRECT
9	Photo Pt 9	53,58,55.998 ✓	166,16,29.852 ✓	SAT
10	Photo Pt 10	53,57,29.597 ✓	166,24,44.769 ✓	SAT
11	SS#1 (SB2)	53,54,10.151 ✓	166,31,42.797 ✓	AZ DST
11	SS#2 (SB2)	53,54,11.704 ✓	166,31,38.709 ✓	AZ DST
11	SS#3 (SB2)	53,53,50.688 ✓	166,30,55.130 ✓	AZ DST

Station TAC 1943 and TAC 1943 RM1 were transformed from NAD 27 to NAD 83 using the same shift as station KIN 1934. Various combinations were tried but this was the only shift that satisfies the check angle observed at station TAC 1943.

JKF ✓

**APPENDIX D**





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

February 22, 1988

17

Chief, Aerotriangulation Unit  
Photogrammetry Branch  
Rockville, Maryland 20852

**PROJECT INSTRUCTIONS: AEROTRIANGULATION - Job CM-8306, Dutch Harbor, Cape Cheerful to Erskine Point, Alaska, Shoreline Mapping**

**1.0. PURPOSE**

This project will provide contemporary shoreline and other photogrammetric data in support of the nautical charting program. These instructions indicate the basic aerotriangulation requirements that will provide the network of control necessary for compilation. The accuracy of aerotriangulated control shall meet the requirements of National Standards of Map Accuracy.

**2.0. GENERAL**

**2.1. Scope.** Four 1:10,000-scale maps depicting the shoreline area of Dutch Harbor and vicinity will be produced; TP-01356 through TP-01359. 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 83.

**2.2. Field Operations.** Field work consisted of the recovery, establishment, and photoidentification of geodetic control necessary for aerotriangulation. There was no field inspection of the shoreline.

**2.3. Photography.** Aerial photographs were obtained for the United States Geological Survey.

<u>Type</u>	<u>Scale</u>	<u>Camera</u>	<u>Date</u>
Panchromatic	1:27,500	Zeiss RMK A 15/23	6/6/83

**2.4. Charts Affected.** Charts 16518, 16522, and 16528 through 16530 will be affected by this survey. Two small-scale charts (1:300,000-scale), 16500 and 16520, depict areas common to this survey.



### 3.0. DATA FURNISHED

- a. Control data
- b. USGS quadrangles
- c. Nautical charts
- d. Project diagrams
- e. Color contact prints and film positives
- f. Field data

### 4.0. AEROTRIANGULATION OPERATIONS

4.1. Analytic aerotriangulation is required for the 1:27,500-scale panchromatic photographs. Pugging methods are required to allow analog methods to be used in the map compilation phase. Field photo-identified geodetic control will be provided. Establish tie points between strips and/or use office identified geodetic intersection stations as supplemental control. Elevations from U.S. Geological Survey quadrangles will be used as the vertical control.

4.2. Locate all visible landmarks and fixed aids to navigation during bridging.

4.3. Establish shoreline points on all strips of the bridging photographs and determine ratio values necessary to prepare enlargement prints at map scale. Include values as part of the Aerotriangulation Report.

4.4. Perform the final adjustment of aerotriangulated points to ground on NAD 83.

4.5. Base manuscripts will be prepared depicting the following based on NAD 83:

- a. Lambert Conformal Conic Projection
- c. Recoverable geodetic control
- d. Aerotriangulated and field established control points

Refer to memorandum instructions "Implementation of the North American Datum of 1983 (NAD 83) in the Coastal Mapping Program of the Photogrammetry Branch," dated October 2, 1987. One additional base for each map depicting only the primary and supplemental projection is also required. Manuscript coordinates are identified on the project diagram.

### 5.0. SCHEDULE

Schedule aerotriangulation operations to be completed by May 1, 1988. The assignment and schedule for map production will be determined when the aerotriangulation phase is completed.

6.0. MODIFICATION OF INSTRUCTIONS

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

7.0. COST

Charge all costs to 8K6C01.

8.0. RECEIPT

Acknowledge receipt of these instructions.

*A. Y. Bryson*

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





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

21

R E C E I P T

TO: N/CG23 - Commander A. Y. Bryson

THRU: N/CG232 - Ivey O. Raborn

Receipt of Project Instructions AEROTRIANGULATION - Job CM-8306,  
Dutch Harbor, Cape Cheerful to Erskine Point, Alaska, Shoreline  
Mapping, dated 2/22/88, is acknowledged.

Don C. Norman  
Chief, Aerotriangulation Unit  
Photogrammetry Branch

2/23/88  
Date



**APPENDIX E**

AEROTRIANGULATION REPORT  
CM-8306  
DUTCH HARBOR, CAPE CHEERFUL TO ERSKINE POINT,  
APRIL 1988

AREA COVERED

This report covers the Dutch Harbor, Alaska area from Cape Cheerful to Erskine Point. The project consists of four 1:10,000-scale sheets; TP-01356 through TP-01359.

METHOD

Seven strips of 1:27,500-scale panchromatic photographs were bridged by analytic aerotriangulation methods and adjusted to ground using the General Integrated Analytical Triangulation Program (GIANT). Photo-identified points were used as horizontal control. In addition, office identified geodetic intersection stations were used as supplemental control. The photographs were measured using the National Ocean Service Analytic Plotter (NOSAP) under control of the Integrated Digital Photogrammetric Facility Software (IDPF). Common points were transferred between strips to ensure adequate junctioning.

Ratio values were determined for the bridging photographs. A copy of these values and a sketch of the photo coverage are attached to this report.

The base manuscripts were plotted on the Kongsberg plotter. The positions are in the Alaska State Plane Coordinate System, Zone 10. This is a Lambert conformal conic projection. All positions are based on NAD 1983. In addition, 10 mm ticks depicting NAD 1927 projection intersections were plotted at twice the interval of the NAD 1983 projection intersections.

ADEQUACY OF CONTROL

The control was adequate and meets the National Ocean Service requirements. A listing of closures to control is attached.

South Base 2, SS#1 would not fit in the adjustment. It's position was in error by approximately 70 feet in X and 26 feet in Y.

The published NAD 83 positions of Bell 1936 and Skum 1934 were not used. They were in error and could not be resolved by the Geodesy Division without additional field observations. Both stations were well outside the computed NAD 27 to NAD 83 datum shift in the area. This average datum shift in the immediate area as computed by Geodesy was -3.155 seconds in latitude and +6.809 seconds in longitude. The datum shift of Bell 1936 (NAD 83) from Bell 1936 (NAD 27) was -2.981 seconds in latitude and +5.933 seconds in longitude. The datum shift of Skum 1934 (NAD 83) from Skum 1934 (NAD 27) was -2.819 seconds of latitude and +10.137 seconds of longitude. An approximate NAD 83 position for Bell 1936 was determined by applying the average datum shift of -3.155 seconds in latitude and +6.819 seconds in longitude to the published NAD 27 position of Bell 1936. This position was used as a horizontal control station in the adjustment. An approximate NAD 83 position for Skum 1934 was not determined. It was used as an azimuth station in computing the position of Bell 1936 Sub station. The image of that sub station was washed out on the photographs and its position was not needed in the adjustment.

#### SUPPLEMENTAL DATA

USGS topographic quadrangles were used to obtain vertical control for bridging. NOS nautical charts were used to locate fixed aids and landmarks.

#### PHOTOGRAPHY

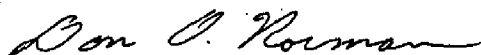
The coverage, overlap, and quality of the photographs were adequate for the job. The photography was obtained by the United States Geological Survey. The camera, a Zeiss RMK A 15/23 (serial number 127765), had a nominal focal length of 6 inches.

Submitted by,



Vic McNeel

Approved and Forwarded



Don O. Norman  
Chief, Aerotriangulation Unit



FIT TO CONTROL

▲ = control held in adjustment  
 △ = control not held in adjustment  
 □ = aids or landmarks not held in adjustment

	<u>STATION NAMES</u>	<u>POINT NO.</u>	<u>VALUES IN FEET</u>	
			<u>X</u>	<u>Y</u>
▲ 1.	BELL 1936	419100A	-1.5	+2.4
△ 2.	BELL 1936, SUB PT 1A	419101	(not computed)	
▲ 3.	PHOTO PT 2	322101B	-1.7	+1.6
▲ 4.	TAC 1943, SUB PT 3A	222101	-1.9	-4.8
▲ 5.	TAC 1943, SUB PT 3B	222102	-1.8	+0.1
△ 6.	EXTRA 1934	223100A	-0.2	0.0
▲ 7.	PHOTO PT 4	117101	+2.3	+0.7
▲ 8.	PHOTO PT 4A	117102	+0.2	-0.9
△ 9.	KIND 1934, SUB PT 6A	040101	+6.1	+0.7
▲ 10.	KIND 1934, SUB PT 6B	040102	+1.1	+1.4
▲ 11.	PHOTO PT 5	912101	-1.7	+0.4
△ 12.	SOUTH BASE 2, SS#1	037101	-70.4	-25.8
▲ 13.	SOUTH BASE 2, SS#2	037102	+0.5	-1.0
△ 14.	SOUTH BASE 2, SS#3	037103	-0.4	-0.5
▲ 15.	PHOTO PT 7	034101	+3.5	+1.3
▲ 16.	PHOTO PT 10	123101	-0.9	+0.6
▲ 17.	PRIEST ROCK 1934	126100	-0.3	-0.1
▲ 18.	PHOTO PT 9	029101	-0.7	-0.7
□	ULATKA HEADLIGHT 1951	036501	-1.5	+2.8
□	DUTCH HARBOR DOLPHIN 1951	036502	+0.7	-0.3
□	RUSSIAN CHURCH 1938	915402	-0.2	-0.5
□	DUTCH HARBOR WATER TANK	916401	-1.7	-2.6

RATIO VALUES  
CM-8306

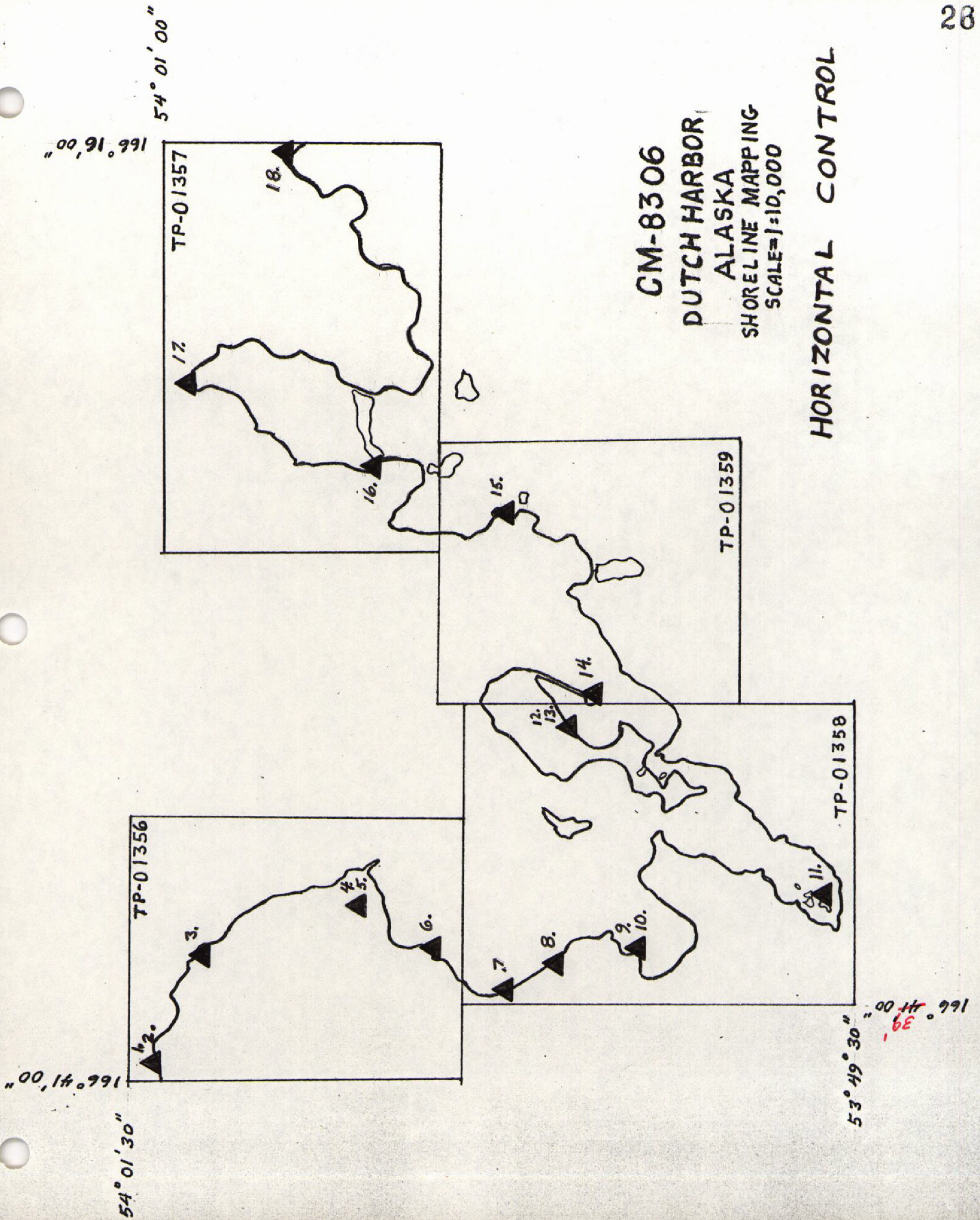
1:27,500 Bridging Photographs

Ratio Value

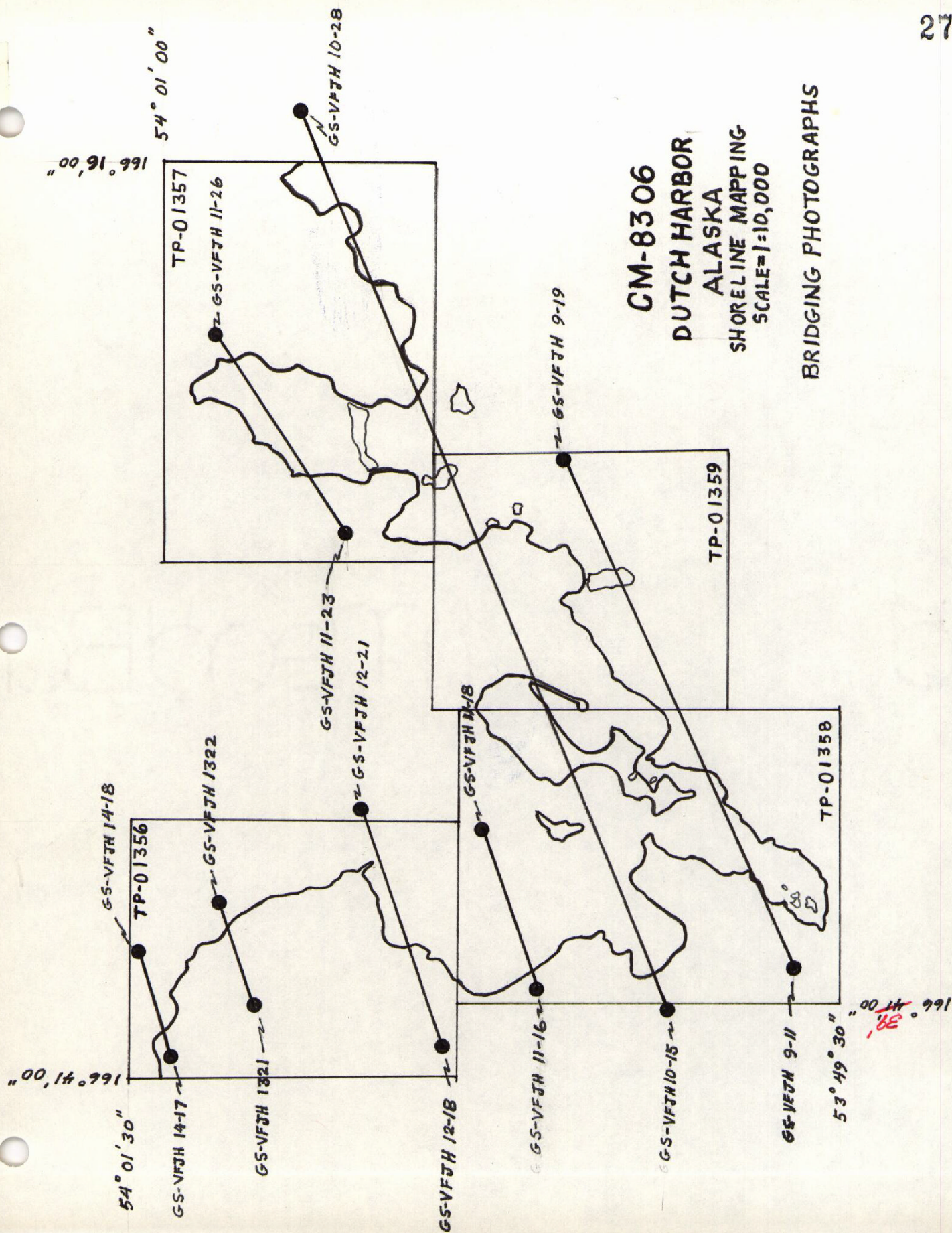
83 GS-VFJH 9-11 through 9-19	2.75
83 GS-VFJH 10-15 through 10-21	2.75
83 GS-VFJH 10-22 through 10-23	2.72
83 GS-VFJH 10-24 through 10-28	2.67
83 GS-VFJH 11-16 through 11-18	2.76
83 GS-VFJH 11-23 through 11-26	2.74
83 GS-VFJH 12-18 through 12-21	2.76
83 GS-VFJH 13-21 through 13-22	2.77
83 GS-VFJH 14-17 through 14-18	2.74

CM-8306  
DUTCH HARBOR  
ALASKA  
SHORELINE MAPPING  
SCALE=1:10,000

HORIZONTAL CONTROL







PHOTOGRAMMETRIC POSITIONS OF LANDMARKS

<u>PT. NO.</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>DESCRIPTION</u>
118401	53 55 59.124	-166 38 28.478	top of waterfall
915401	53 53 05.152	-166 32 41.769	water tower
915403	53 52 39.962	-166 32 19.882	flag tower

**APPENDIX F**



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

May 20, 1988

29

Chief, Coastal Mapping Unit  
Photogrammetry Branch  
Rockville, Maryland 20852

PROJECT INSTRUCTIONS: Office - Job CM-8306, Dutch Harbor,  
Cape Cheerful to Erskine Point, 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. Four 1:10,000-scale maps depicting the shoreline area of Dutch Harbor and vicinity will be produced; TP-01356 through TP-01359. 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 83.

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

2.3. Photography. Aerial photographic coverage indicated below was obtained from the United States Geological Survey; a duplicate roll of this photography was processed for this agency and will be on file in N/CG2314 for future reference.

<u>Type</u>	<u>Scale</u>	<u>Camera</u>	<u>Date</u>
Panchromatic	1:27,500	Zeiss RMK A 15/23	6/6/83



2.4. Aerotriangulation. Seven strips of the 1:27,500-scale photographs were bridged using analytical aerotriangulation methods. Geodetic control used was field photoidentified. 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 83.

2.5. Charts Affected. Charts 16518, 16522, and 16528 through 16530 will be affected by this survey. Two small-scale charts (1:300,000-scale), 16500 and 16520, depict areas common to this survey.

2.6. Datums. The horizontal datum requirement is NAD 83; 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.

### 3.0. ASSIGNMENT

You are assigned all office operations necessary to effect shoreline mapping and the preparation of the data sets required in support of nautical charting and hydrographic activities.

### 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 83, will depict the Lambert Conformal Conic Projection (full line); NAD 27 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 three decimal places; positional data determined using approved photogrammetric methods as described in NCD SDDEF, appendix D, shall be reported to two decimal places.

5.5.4. The medium for reporting information concerning charted navigational aids investigated and not compiled will be the Chart Maintenance Print.

5.6. Bluffs and Cliffs. Compile prominent bluffs and cliffs. Delineate with a dashed line and label.

5.7. Rocks, Reefs, and Ledges. Symbolization shall be in accordance with the eighth edition (November 1984) of Nautical Chart Symbols and Abbreviations, Chart No. 1, Section O, Dangers. Refer to section 2.6.

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), is 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 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 5.10.

<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 information that is reported on each of the corresponding Chart Maintenance Prints shall be included.

### 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

R E C E I P T

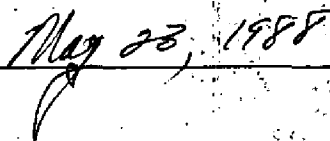
TO: N/CG23 - Commander A. Y. Bryson

THRU: N/CG232 - Ivey O. Raborn

Receipt of Project Instructions OFFICE - Job CM-8306,  
Dutch Harbor, Cape Cheerful to Erskine Point, Alaska,  
Shoreline Mapping, dated May 20, 1988 is acknowledged.

  
Chief, Coastal Mapping Unit  
Photogrammetry Branch

Date

  
May 23, 1988

Feb. 16, 1990

## MEMORANDUM FOR THE RECORD

FROM: JAMES W. MASSEY

SUBJECT: PEAK ELEVATIONS DEPICTED ON SHORELINE MAPS OF PROJECT  
CM-8306, UNALASKA ISLAND, 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 G**

## MAP COMPILATION SOURCES for PROJECT CM-8306

MAP TP-01356 MAP SCALE = 1:10,000

## PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
83(P)14-17 & 14-18	06/06/83	1744	1:27,500	+2.0 FT MLLW/D.Harbor
83(P)13-21 & 13-22	06/06/83	1727	1:27,500	+1.9 FT MLLW/D.Harbor
83(P)12-18 - 12-21	06/06/83	1724-1725	1:27,500	+1.9 FT MLLW/D.Harbor

Photography Types: (P) = Panchromatic

Standard Time is referenced to Alaska Time Zone (Meridian = 165°)

Office Reviewer -

James W. Massey

Date

REMARKS: The stage of tide for all photographs is based on predicted stages referenced to the Dutch Harbor tide gage. The mean range of tide is 3.4 feet. The 1983 panchromatic photographs were acquired through the USGS and have "GS-VFJH" as a prefix to the number.

\*\*\*\*\*

MAP TP-01357 MAP SCALE = 1:10,000

## PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
83(P)11-22 - 11-26	06/06/83	1706-1707	1:27,500	+1.9 FT MLLW/D.Harbor
83(P)10-23 - 10-28	06/06/83	1702-1704	1:27,500	+1.9 FT MLLW/D.Harbor

Photography Types: (P) = Panchromatic

Standard Time is referenced to Alaska Time Zone (Meridian = 165°)

Office Reviewer -

James W. Massey

Date

REMARKS: Refer to REMARKS for TP-01356.



MAP COMPILATION SOURCES for PROJECT CM-8306

MAP TP-01358 MAP SCALE = 1:10,000

PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
83(P)11-16 & 11-18	06/06/83	1708-1709	1:27,500	+1.9 FT MLLW/D.Harbor
83(P)10-15 & 10-20	06/06/83	1648-1700	1:27,500	+1.9 FT MLLW/D.Harbor
83(P)09-11 - 09-15	06/06/83	1640-1642	1:27,500	+1.9 FT MLLW/D.Harbor

Photography Types: (P) = Panchromatic.

Standard Time is referenced to Alaska Time Zone (Meridian = 165°)

Office Reviewer -

James W. Massey

Date

REMARKS: The stage of tide for all photographs is based on predicted stages referenced to the Dutch Harbor tide gage. The mean range of tide is 3.4 feet. The 1983 panchromatic photographs were acquired through the USGS and have "GS-VFJH" as a prefix to the number.

\*\*\*\*\*

MAP TP-01359 MAP SCALE = 1:10,000

PHOTOGRAPHY

YEAR(TYPE)NUMBERS	DATE	TIME	SCALE	STAGE OF TIDE/TIDE GAGE
83(P)10-19 - 10-23	06/06/83	1649-1702	1:27,500	+1.9 FT MLLW/D.Harbor
83(P)09-15 - 09-18	06/06/83	1638-1640	1:27,500	+1.9 FT MLLW/D.Harbor

Photography Types: (P) = Panchromatic

Standard Time is referenced to Alaska Time Zone (Meridian = 165°)

Office Reviewer -

James W. Massey

Date

REMARKS: Refer to REMARKS for TP-01358.

## APPENDIX H

GEOGRAPHIC NAMES

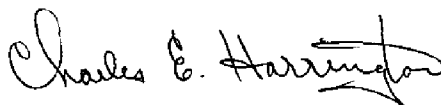
FINAL NAME SHEET

CM-8306 (Dutch Harbor, Alaska)

TP-01356

Bering Sea  
Cheerful, Cape  
Eider Point  
Unalaska Bay  
Unalaska Island  
Wide Bay

Approved:



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

GEOGRAPHIC NAMES

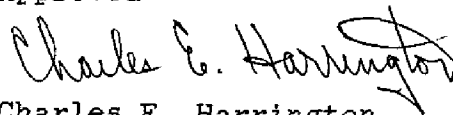
FINAL NAME SHEET

CM-8306 (Dutch Harbor, Alaska)

TP-01357

Bering Sea  
Constantine Bay  
Erskine Point  
Kalekta Bay  
Kalekta, Cape  
Lofty Mountain  
Priest Rock  
Princess Head  
Unalaska Bay  
Unalaska Island

Approved:



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

## GEOGRAPHIC NAMES

## FINAL NAME SHEET

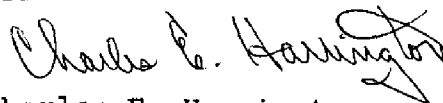
CM-8306 (Dutch Harbor, Alaska)

TP-01358

Agnes Beach  
Amaknak Island  
Arch Rock  
Ballyhoo, Mount  
Broad Bay  
Captains Bay  
Devilfish Point  
Dutch Harbor  
Dutch Harbor (locale)  
East Channel  
Expedition Island  
Hog Island  
Iliuliuk Bay  
Iliuliuk Harbor  
Iliuliuk Reef  
Levashef, Port  
Margaret Bay

Makushin Valley  
Nateekin Bay  
Nateekin River  
Needle Rock  
Obernoi Point  
Rocky Point  
Shaishnikof River  
South Amaknak Rocks  
South Channel  
Spithead  
Unalaska  
Unalaska Bay  
Unalaska Island  
Unalaska Lake

Approved:



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

GEOGRAPHIC NAMES

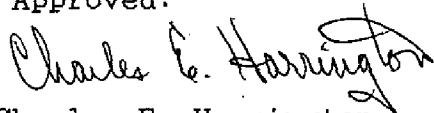
FINAL NAME SHEET

CM-8306 (Dutch Harbor, Alaska)

TP-01359

Coxcomb, Mount  
Dutch Harbor  
Iliuliuk Bay  
Morris Cove  
Newhall, Mount  
Spithead  
Split Top Mountain  
Summer Bay  
Ulakta Head  
Unalaska  
Unalaska Bay  
Unalaska Island

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-8306; Alaska, Unalaska Island of the Aleutian Islands, Cape Cheerful to Erskine Point including Dutch Harbor

**NOS Nautical Charts Affected:** 16528, 16529, 16530

**Geodetic Datum:** North American Datum of 1983

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		
<b>Map TP-01356:</b>					
CASCADE (N of Eider Pt)	086	53-58-55.25	166-36-12.87	6	158/1983
<b>Map TP-01357:</b>					
HIGHEST POINT OF ROCK	086	53-58-59.54	166-24-29.21	6	158/1983
<b>Map TP-01358:</b>					
CASCADE (N of Broad Bay)	086	53-56-58.91	166-38-28.39	6	158/1983
WATER TOWER (SW Dutch Harbor)	086	53-53-05.15	166-32-41.77	4	158/1983
SIGNAL TOWER (E Dutch Harbor)	198	53-53-21.08	166-32-01.85	6	158/1983
RADIO TOWER (North)	198	53-53-11.964	166-32-06.505	3	001/1934
RADIO TOWER (South)	198	53-53-07.802	166-32-10.405	3	001/1934
BELFRY TOWER (Unalaska)	086	53-52-32.432	166-32-10.943	3	001/1938
Radar Dish (Unalaska)	993	53-52-39.96	166-32-19.88	4	158/1983
WATER TOWER (E Dutch Harbor)	086	53-53-18.606	166-32-00.244	3	001/1951
BAILEY LEDGE DAYBEACON	944	53-51-35.88	166-33-33.47	6	158/1983
Antenna (N of airstrip)	993	53-54-17.52	166-32-54.72	6	158/1983
Antenna (N of 3, Exped. Is.)	993	53-52-39.12	166-33-04.42	6	158/1983
Antenna (C of 3, Exped. Is.)	993	53-52-38.56	166-33-04.28	6	158/1983
Antenna (S of 3, Exped. Is.)	993	53-52-37.95	166-33-03.87	6	158/1983
Antenna (E Dutch Harbor)	993	53-53-19.71	166-31-58.70	6	158/1983
Tower (S of 3, Hog Is.)	993	53-53-59.66	166-34-29.77	6	158/1983
Tower (E of 3, Hog Is.)	993	53-54-01.78	166-34-23.63	6	158/1983
Tower (N of 3, Hog Is.)	993	53-54-05.40	166-34-27.20	6	158/1983
Antenna (S of Makushin Val)	993	53-54-13.87	166-37-25.67	6	158/1983
Tower (SE of 2 - S Mak Val)	993	53-54-11.00	166-37-24.63	6	158/1983
Tower (NW of 2 - S Mak Val)	993	53-54-14.45	166-38-00.60	6	158/1983
<b>Map TP-01359:</b>					
ULAKTA HEAD LIGHT	200	53-55-27.384	166-30-31.353	3	001/1951
SPITHEAD LIGHT 4	200	53-53-50.640	166-30-55.229	3	001/1951
TANK (Dutch Harbor Green Tk)	086	53-54-44.068	166-30-17.441	3	001/1951

-end-

Listing approved by:

Final Reviewer

Date

4/16/80