

TP-01507
TP-01508
TP-01509

TP-01507
TP-01508
TP-01509

PHOTOGRAMMETRY BRANCH
COASTAL MAPPING PROGRAM

PROJECT CM-8708
COMPLETION REPORT

ALASKA

NORTH SLOPE - CAMDEN BAY

Flaxman Island to Barter Island
Maps: TP-01507, TP-01508, TP-01509

Agency Vault - Original Report

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

Agency Vault - Original Report

PHOTOGRAMMETRY BRANCH
COASTAL MAPPING PROGRAM

PROJECT CM-8708
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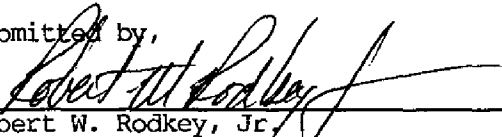
Alaska
North Slope - Camden Bay
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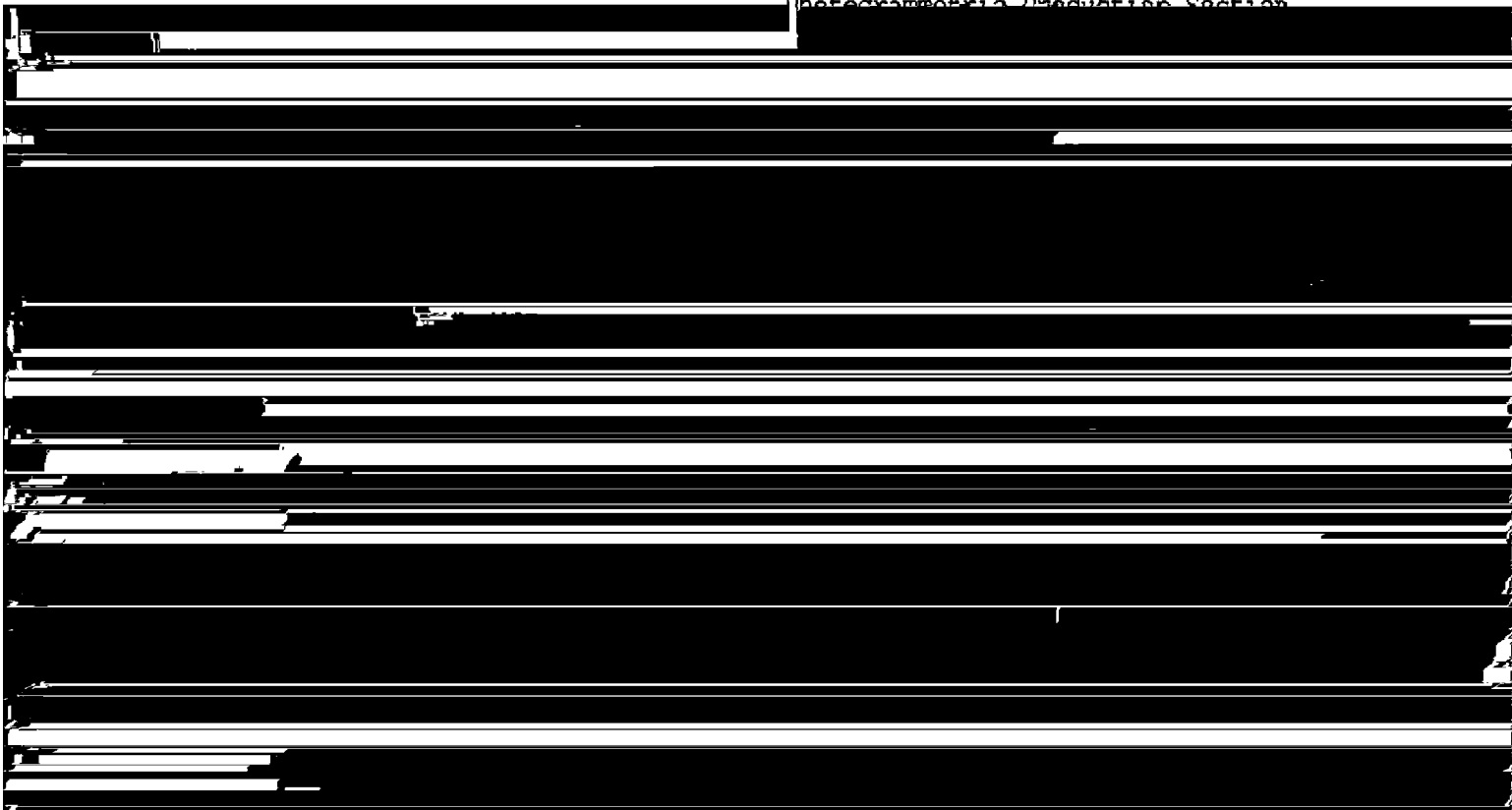
Approvals and Clearance

The maps, this report and associated project data meet the requirements and standards of the Photogrammetry Branch Coastal Mapping Program.

This report summarizes the photogrammetric operations related to the completion of the project and is submitted for final approval. Clearance for project registration is requested.

Submitted by,


Robert W. Rodkey, Jr.
Chief, Coastal Mapping Unit
Photogrammetric Production Section



COMPLETION REPORT

COASTAL MAPPING PROGRAM PROJECT CM-8708

Alaska

North Slope - Camden Bay

Flaxman Island to Barter Island

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COASTAL MAPPING PROGRAM PROJECT CM-8708

Introduction

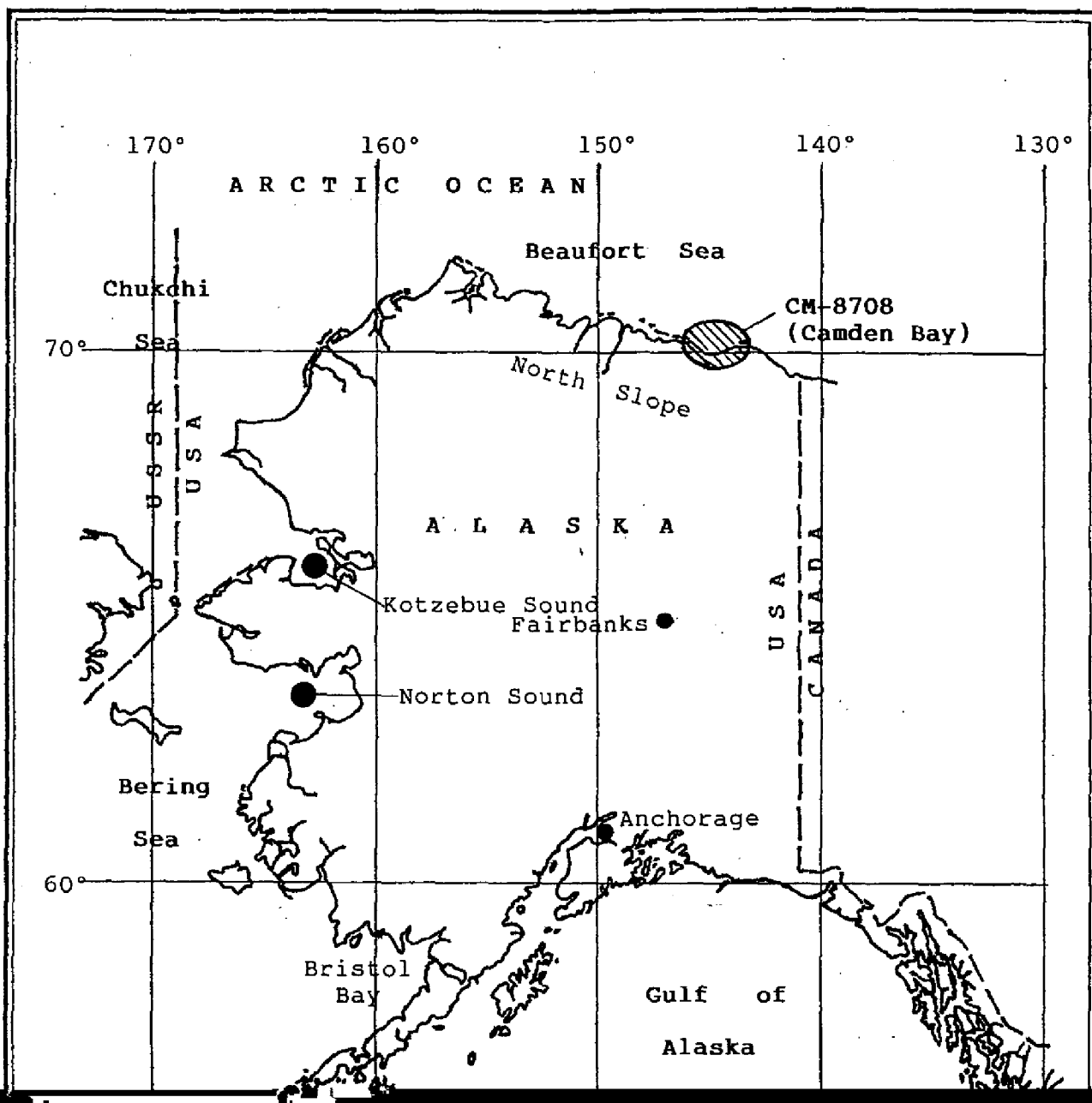
Coastal Mapping Program Project CM-8708 was planned to provide three coastal survey maps depicting the shoreline and cartographic features of mapping interest in the coastal zone of the Northern Slope region of Alaska from the Canning River Delta eastward to Barter Island, which includes Camden Bay. Refer to FIGURE 1 for a graphic reference of the project site location.

The maps were assigned map identifiers TP-01507, TP-01508, TP-01509. Map TP-01507 depicts the coastal area from Flaxman Island easterly to Konganevik Point, which includes the Canning River Delta. Map TP-01508 depicts the coastal zone adjacent to the main portion of Camden Bay. Map TP-01509 depicts the coastal zone adjacent to the eastern portion of Camden Bay easterly to Barter Island. The inland portion of the coastal zone surveyed for this project is the general northern limit of the Arctic National Wildlife Refuge. All maps were prepared at 1:50,000 scale with the transverse Mercator projection based on the North American Datum of 1983 (NAD 83) with North American Datum of 1927 projection ticks provided as a supplemental projection per Photogrammetry Branch policy on the implementation of NAD 83. Refer to FIGURE 2 for coordinate information and a larger scale diagram of the project site.

The purpose of the 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. The project data will also be of interest to special interest groups concerned with boundary studies within the North Slope region of Alaska. This project site was identified as one of priority importance to both the State of Alaska and the Department of Interior. Please refer to Appendix A for a copy of a survey requirement letter written to Mr. Paul Wolff, Assistant Administrator for Ocean Sciences and Coastal Zone Management from Mr. William Bettenberg, Director of the Minerals Management Service of the Department of Interior.

Planning

Mr. James McNamara, Acting Chief, Coastal Planning Unit, initiated the planning phase for this project in April 1987 based on approved priority status and tentative field activities scheduled for July 1987. The National Geodetic Survey Division (NGSD) was to conduct all horizontal control activities. The Flight Operations Unit of the Photogrammetry Branch was assigned the task of providing the proper conditions for the aerial photographer to acquire the necessary photographic coverage. No formal field instructions were issued for this project, but Mr. McNamara coordinated the field operations phase through constant communication with all participants to assure adherence to standard procedures.



143° 30'

BARTER ISLAND
BARROW

BARBER ISLAND DE
051


5.2 AFS 288.4
ARTER ISLAND
00 BTI 208
(200)

Field Operations

Field operations for this project consisted of aerial photography and the recovery, establishment and placement of geodetic control necessary for aerotriangulation. No formal instructions were issued for the field operations phase nor a documented report filed on the completion of the field operations phase.

The recovery, establishment and placement of horizontal control was accomplished in July 1987 by personnel of the NGSD. Logistical support for the field operation was provided by the Minerals Management Service of the United States Department of Interior. All horizontal control required for aerotriangulation was paneled. All the panels were in place during the aerial photography phase. Geodetic positions of the horizontal control were determined through application of the Global Positioning System and were based on NAD 83. The geodetic field data was processed by personnel of NGSD and adjusted coordinates were furnished for the new geodetic stations. Refer to LISTING 1 for information on the horizontal control used in this project.

A Cessna Citation aircraft piloted by LT Peter Connors and copiloted by LT Robert McCann of the NOAA Corps was used for the photographic operation. The photography required for this project was acquired by Mr. Harvey Carlson, aerial photographer, on August 2, 1987 between 2354 and 2400 hours Coordinated Universal Time and on August 3, 1987 between 0013 and 0023 hours Coordinated Universal Time. The photographs were acquired at 1:70,000 scale using a Wild RC-10 camera with "B" cone which has a calibrated focal length of 152.74 mm. Panchromatic film was used in the photographic operation. The aerial photographs of the project site were reviewed by Mr. James McNamara on



PROJECT GEODETIC CONTROL LISTING

Page 1 of 1

PROJECT: CM-8708; North Slope - Camden Bay, Flaxman Island to Barter Island, Alaska

GEODETIC DATUM: North American Datum of 1983

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

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

STATION NAME	STA NO	Geodetic Coordinates (°-'-")		Location	
		Latitude	Longitude	QC	Day/Year
ANDERSON 1948	2330001	70-00-54.399	144-28-37.203	3	001/1948 ✓
BARBARA 2 GPS 1987	unknown	70-02-13.295	144-09-04.517	3	181/1987 ✓
BARTER ASTRO 1948	3220004	70-07-14.779	143-37-09.572	3	001/1948 ✓
FRAN GPS 1987	unknown	69-55-31.950	144-51-45.318	3	181/1987 ✓
LEFFINGWELL 1949	2210003	70-11-07.288	146-03-04.640	3	001/1949 ✓
MAYBELL 1950	4410002	69-58-13.261	144-47-32.040	3	001/1950 ✓
NOD 2 GPS 1987	unknown	70-05-59.399	145-40-01.316	3	181/1987 ✓
NOON 1950	1440001	69-58-58.432	145-25-19.944	3	001/1950 ✓
- end -					

Remarks:

All geodetic survey operations were performed by NGSD personnel in July, 1987.

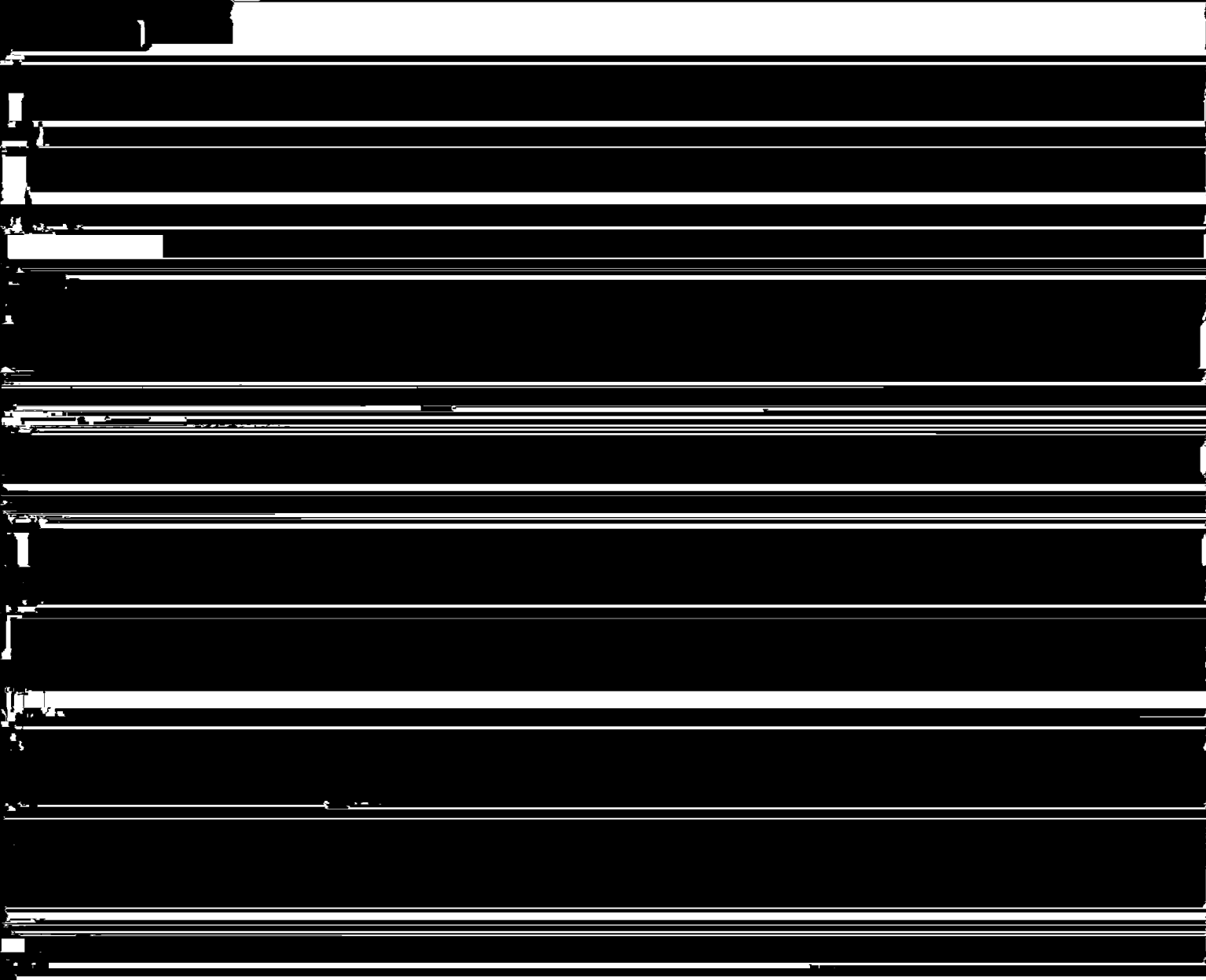
Listing approved by:

Final Reviewer

Date

LISTING 1. Project Geodetic Control

Analytical Triangulation program resident within IDPF. Common points were transferred between strips to ensure an adequate junction. Parameter data for each aerotriangulated photograph was stored in the IDPF database for recall during the compilation phase. Based on an analysis of the adjusted data, the fit to horizontal control was within the allowable tolerance for

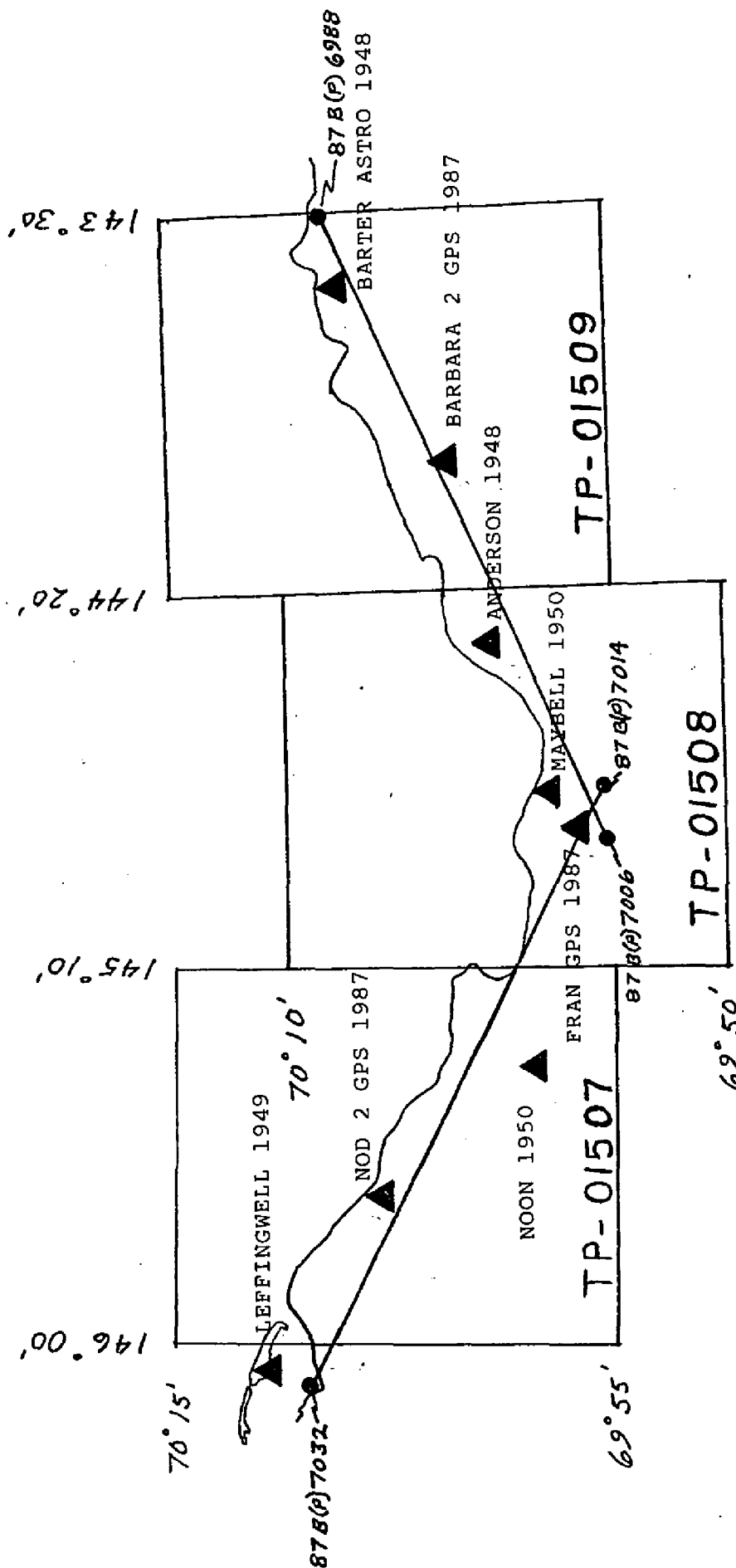


Refer to FIGURE 3 for information on the photographs selected for aerotriangulation and the placement of geodetic control within the project site. Not every photograph of the project site was processed through the aerotriangulation phase due to the 80% endlap of the photographs of both strips.

The base manuscripts and final map bases were plotted on a Kongsberg plotter with GC300 Controller by Mr. McNeel in September 1987.

Compilation

Formal instructions were not issued for the compilation and review phase of this project. As a result, basic procedures and requirements of the coastal



CM-8708

CAMDEN BAY

FLAXMAN ISLAND TO BARTER ISLAND

ALASKA

MAP SCALE 1:50,000

▲ = PANELED STATIONS

FIGURE 3. Horizontal Control and Bridging Photographs

The final maps were smooth drafted except for the application of annotation and labeling which was completed through the use of waxed back stripper film. Labeling of discrete point features was executed in accordance with Coastal Mapping Program Production Procedure Memo No. 1, a copy of which is bound in this document as Appendix C. The pertinent NOS nautical charts were used as a reference for the selection and placement of geographic names.

Final Review

The final review phase was initiated in September 1987 by Mr. Robert Rodkey. The coastal survey maps and associated discrete point data of this project were evaluated as meeting the requirements of the National Standards of Map Accuracy. Refer to LISTING 2 for the final listing of discrete point data for application in the nautical charting program. The coastal survey maps and project data sets comply with the general requirements of a standard coastal mapping project. Standard procedures, except where noted in this report, were adhered to for the compilation, drafting and reproduction of the coastal survey maps of this project. All source data and photogrammetric measurement instruments meet the standards of accuracy established for the disciplines of field surveying and photogrammetry.

After the completion of the final review phase, a comparison was made against the following NOS nautical charts:

16043, 6th Edition (October 25, 1986), 1:50,819 scale,
16044, 6th Edition (September 15, 1984), 1:50,819 scale,
16045, 6th Edition (October 20, 1984), 1:50,615 scale

The results of the chart comparison were annotated on the Chart Maintenance Print of each map which were forwarded to the Marine Chart Branch.

Dissemination of Project Data

The dissemination of project data is in accordance with the following:

NATIONAL ARCHIVES/FEDERAL RECORDS CENTER

Brown Jacket containing:

- Printout of the IDPF database parameters for TP-01509
- One collection of NGSD NAD 83 shift data printouts
- One copy of the project diagram
- One copy of the Aerotriangulation Report
- One copy of Project Geodetic Control (NOAA Form 76-41)
- One copy of listing of Aerotriangulated pass points et al.
- One copy of this Project Completion Report

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

MARINE CHART BRANCH

Chart Maintenance Print of each map

Copy of the Cartographic Features of Charting Interest listing

REPRODUCTION BRANCH, AERONAUTICAL CHARTING DIVISION

8X Reduction Negative of Each Map

STATE OF ALASKA

Advance copy of each map forwarded on September 30, 1987

Copy of each final map forwarded on October 7, 1987

MINERALS MANAGEMENT SERVICE, U.S. DEPARTMENT OF INTERIOR

Advance copy of each map forwarded on September 30, 1987

Copy of each final map forwarded on October 7, 1987

All final project data and materials were forwarded to Mr. Gregory L. Fromm, Acting Chief of the Production Control Unit on October 28, 1987 for registration and dissemination.

CARTOGRAPHIC FEATURES OF CHARTING INTEREST

Page 1 of 1

COASTAL MAPPING PROJECT: CM-8708; North Slope - Camden Bay, Alaska

NOS Nautical Charts Affected: 16043 and 16045

GEODETIC DATUM: North American Datum of 1983 (NAD 83)

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 that cartographic code 993 is a photogrammetric source code for cartographic features of possible landmark value.

<u>FEATURE DESCRIPTION</u>	<u>NCD CC</u>	<u>GEOGRAPHIC POSITION(°-'-")</u>		<u>NCD QC</u>	<u>DATE OF LOCATION</u>
		<u>LATITUDE</u>	<u>LONGITUDE</u>		
Chart 16043:					
WRECK	086	70-08-08.57	143-35-12.57	4	213/1987✓
Radar Dish (Westerly of 2)	993	70-07-40.48	143-37-59.18	4	213/1987✓
Radar Dish (Easterly of 2)	993	70-07-40.06	143-37-52.48	4	213/1987✓
Elevated Water Tank	993	70-07-49.45	143-38-21.25	4	213/1987✓
TANK	086	70-07-50.64	143-37-11.27	4	213/1987✓
MOUND	086	70-03-12.21	143-51-46.19	4	213/1987✓
AERO BEACON (Light)	200	70-08-08.57	143-35-22.79	4	213/1987✓
Chart 16045:					
BUILDING	086	70-09-45.67	145-51-10.81	7	213/1987✓
- end -					

Listing approved by:

Final Reviewer

Date

LISTING 2. Cartographic Features of Charting Interest

APPENDIX A
Mapping Request Memorandum



Rec'd
JUN 30 1987
MMS

FYI cc: WOLFF/CAREY/EHLER

6-73

11

United States Department of the Interior

MINERALS MANAGEMENT SERVICE
WASHINGTON, DC 20240

JUL 24 1987

Mr. Paul M. Wolff
Assistant Administrator for Ocean
Sciences and Coastal Zone Management
National Oceanic and Atmospheric
Administration
Washington, D.C. 20230

Dear Mr. Wolff:

I am writing to request your assistance in obtaining photogrammetric manuscripts from this summer's cooperative surveys in the Beaufort (BF) Sea. Although I am aware that this request may place an unanticipated workload on your Agency, it is made because the data are critical to the successful completion of proposed Federal Oil and Gas Lease Sale 97, scheduled for January 1988.

As you are aware, the Minerals Management Service (MMS), the State of Alaska, and the National Ocean Service (NOS) will survey large segments of the BF coastline during the months of June, July, and August 1987. The time available between the completion of the surveys and the deadlines for executing certain prelease actions for the sale is very limited. For example, supplemental block diagrams depicting the offshore leasing line cannot be revised until the photogrammetric manuscripts are received by the MMS Offshore Survey Group (MOSG) in Denver, Colorado. As you can see, the assistance of the NOS is vital to carrying out the prelease activities for this sale.

We request that the manuscripts (in North American Datum 1927) be provided in the following order to the MOSG by the dates listed:

<u>Priority</u>	<u>Area</u>	<u>Approx. location</u>	<u>Date</u>
1	Canning River Delta	145°20'W to 146°00'W	10/19/87
2	Camden Bay	144°00'W to 145°20'W	10/19/87
3	Oliktok to Colville Delta	149°45'W to 151°20'W	11/02/87
4	Peard Bay	158°00'W to 159°30'W	11/16/87
5	Canning River to Oliktok	146°00'W to 149°45'W	03/01/88

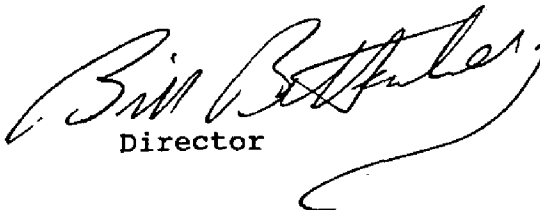
Another reason for requesting your timely assistance is that the U.S. Supreme Court may rule in the BF boundary lawsuit, United States v. Alaska, in its 1987-1988 term. We believe the Court will ask the Federal Government and the State of Alaska to determine an offshore leasing line and the survey data obtained from the NOS will be used to comply with this request.

Mr. Paul M. Wolff

2

We appreciate your efforts toward expediting the production of these photogrammetric manuscripts. If you anticipate any problems in providing this information, I would appreciate receiving a telephone call from you as soon as possible. My number is 343-3500. Mr. Alan Powers, Regional Director, Alaska OCS Region, is also available if you should have questions or require additional information. His telephone number is (907) 261-4010.

Sincerely,


Director

APPENDIX B
Aerotriangulation Report

AEROTRIANGULATION REPORT
CM-8708
CAMDEN BAY, FLAXMAN ISLAND TO
~~BARTER ISLAND, ALASKA~~

SEPTEMBER 1987

21. AREA COVERED

This report covers the Camden Bay, Alaska area from Flaxman Island to Barter Island. The project consists of three 1:50,000-scale sheets; TP-01507 through TP-01509.

22. METHOD

Two strips of 1:70,000-scale panchromatic photographs were bridged by analytic aerotriangulation methods and adjusted to ground using the General Integrated Analytical Triangulation Program (GIANT). Pre-marked control stations were used as horizontal 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 3. This is a transverse Mercator projection. All positions are based on NAD 1983. In addition, 10mm ticks, depicting NAD 1927 projection intersections were plotted at twice the interval of the NAD 1983 projection intersections.

23. ADEQUACY OF CONTROL

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

24. SUPPLEMENTAL DATA

USGS Topographic Quadrangles were used to obtain vertical control for bridging. NOS Nautical Charts were used to locate aids and landmarks.

25. PHOTOGRAPHY

The coverage, overlap, and quality of the photographs were adequate for the job.

Submitted by,



Vic McNeel

Approved and Forwarded:



Don O. Norman
Chief, Aerotriangulation Unit

RATIO VALUES

CM-8708

1:70,000 Bridging Photographs

	<u>Ratio Value</u>
87 B(P) 6988	1.360
87 B(P) 6990-6998 (even only)	1.361
87 B(P) 7000	1.360
87 B(P) 7002	1.361
87 B(P) 7004-7006 (even only)	1.360
87 B(P) 7014-7022 (even only)	1.360
87 B(P) 7024	1.359
87 B(P) 7026	1.360

FIT TO CONTROL

<u>STATION NAMES</u>	<u>POINT NO.</u>	<u>VALUES IN FEET</u>	
		<u>X</u>	<u>Y</u>
1. Barter Astro 1948	88100	+0.3	+0.4
2. Barbara 2,1987 GPS	96100	+0.5	+0.2
3. Anderson 1948	100100	0.0	-0.6
4. Maybell 1950	104100	+0.4	+0.3
5. Fran GPS 1987	106100	-0.5	+0.4
6. Noon 1950	122100	-1.0	-0.5
7. Nod 2, 1987 GPS	126100	+1.1	+0.1
8. Leffingwell 1949	132100	-0.2	0.0

87 B (P) 6988

143.30'



RECEIVED

APPENDIX C
Procedure Departure

Coastal Mapping Program Production Procedure Memo No. 1



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

December 10, 1986

MEMORANDUM FOR: Members of the Coastal Mapping Unit

FROM: Robert W. Rodkey, Jr. *Robert W. Rodkey, Jr.*
Chief, Coastal Mapping Unit
Photogrammetry Branch, NCD

SUBJECT: COASTAL MAPPING PROGRAM PRODUCTION PROCEDURE MEMO NO. 1 -
The Labeling of Fixed Aids to Navigation, Charted
Landmarks, Cartographic Features of Possible Landmark
Value and Geodetic Stations on Coastal Survey Maps

PURPOSE

The purpose of this Production Procedure Memo (PPM) is to establish a more contemporary method of annotating fixed aids to navigation, charted landmarks, cartographic features of possible landmark value and geodetic stations on shoreline maps. The procedures outlined in this memo have greater clarity and are more in concert with established charting practices than previous photogrammetric methods.

Authority for the establishment of this PPM is specified in Section 7.0., MODIFICATIONS of each project office instructions.

This memo supersedes the corresponding sections of Photogrammetric Instruction No. 78, Memorandum Instruction "Listing and Plotting of Control Stations on Shoreline Maps", dated July 23, 1968 and Memorandum Instruction "Labeling Triangulation Station Field Positions on NOS Maps and in NOS Descriptive Reports", dated November 3, 1978.

RULES OF COMPILATION

Lettering:

1. Lettering shall be applied using waxed back stripper film. Only in special cases or situations will lettering be applied via hand drafting.
2. The size of the lettering shall be no larger than 8 point. Usually 7 point presents the best image in contemporary size.



Fixed Aids to Navigation:

1. The designated charting name will comply with that specified in the United States Coast Guard Light List for the year of the photography.
2. The designated charting name shall be depicted in vertical capital letters. Refer to Figure 1 for an example.
3. The channel or range identifier shall be included with the fixed aid to navigation identifier, in vertical capital letters, for the first and last aid of said channel or range within the limits of the map. Refer to Figure 2 for an example.
4. If the fixed aid to navigation is also a geodetic station, the full National Geodetic Service(NGS) data base name shall be depicted under the charting name in vertical capital letters with the year of establishment, if known, enclosed in parenthesis. Refer to Figure 3 for an example.

Charted Landmarks:

1. The designated charted name must agree with that specified in the data base, AIS or DIP.FIL, and on the nautical chart.
2. The designated charting name shall be depicted in vertical capital letters. Refer to Figure 4 for an example.
3. If the charted landmark is also a geodetic station, the full NGS data base name shall be depicted under the charting name in vertical capital letters with the year of establishment, if known, enclosed in parenthesis. Refer to Figure 5 for an example.
4. Clarifying descriptions of landmarks, especially in congested areas, is encouraged and completed by adding a descriptive phrase depicted in vertical upper and lower case letters, enclosed in parenthesis. Refer to Figure 6 for an example.

Cartographic Features of Possible Landmark Value(PLM):

1. The designated charting name shall be clear and concise based on interpretation of mapping photography. The compiler and office reviewer must agree on the nomenclature.
2. The designation of a cartographic feature as a PLM shall be based on a stereographic analysis of the feature's prominence as perceived to be viewed from the area of nautical navigation.

3. The charting name shall be depicted in vertical upper and lower case letters. Refer to Figure 7 for an example.
4. If the PLM is a geodetic station, the full NGS data base name shall be depicted in vertical capital letters with the year of establishment, if known. The NGS name shall be enclosed in parenthesis and placed under the charting name. Refer to Figure 8 for an example.
5. Clarifying descriptions of PLMs shall be depicted in vertical upper and lower case letters enclosed in parenthesis. Refer to Figure 9 for an example.
6. In order to avoid confusion with abbreviated charted landmark names, the charting name for PLMs may not be abbreviated. If the charting name can not be fully displayed, the lettered objects option is automatically invoked.

Geodetic Stations:

1. All geodetic stations recovered during photogrammetric operations must be depicted on the appropriate shoreline maps as well as accounted for in the Descriptive Report documentation.
2. The designated NGS data base name shall be depicted in vertical capital letters with the year of establishment, if known. Refer to Figure 10 for an example.
3. Geodetic stations established during field operations, which have an unadjusted position at the time of report, shall have the descriptor "Field Position", enclosed in parenthesis, added to the proper name. "Field Position" will be depicted in vertical upper and lower case letters. Refer to Figure 11 for an example.

Cartographic Features Mapped But Not of PLM Value:

There are occasions when a compiler determines selected discrete point features should be mapped even though they may not be of PLM value. Examples of such features are transmission towers, telephone poles and light standards. The rule of compilation is "the charting name shall be depicted with vertical lower case letters". Refer to Figure 12 for an example.

DESCRIPTION OF SYMBOLS

A charted landmark, fixed aid to navigation or PLM confirmed and measured during the aerotriangulation or compilation phases shall be symbolized on shoreline maps with a 2.5 mm diameter circle with center dot. The line weight shall be equal to .13 mm. This is an established specification.

A charted landmark, fixed aid to navigation or PLM, which is a geodetic station, confirmed during any photogrammetric operational phase or established in the field, shall be symbolized on shoreline maps with an equilateral triangle with center dot. The sides of the triangle shall be equal to 4.5 mm in length and have a line weight equal to .13 mm. Within a reasonable tolerance, the center dot shall have a diameter equal to .13 mm. This is an established specification.

An elevated object mapped which does not meet the definition of charted landmark, fixed aid to navigation or PLM shall be symbolized on shoreline maps with a 1 mm diameter circle. The line weight shall be .13 mm. This is an established specification.

PROCEDURE IMPLEMENTATION

Production procedures specified in this memo shall be implemented as of the date of this memo and shall be applied to all projects in the compilation




Figure Reference	CASE	EXAMPLE OF SYMBOL AND NOMENCLATURE
1	Photogrammetrically Located Fixed Aid to Navigation	⊙ LIGHT 10
2	Fixed Aid to Navigation Nomenclature with Designated Range or Channel Name	⊙ NORFOLK SHIP CHANNEL LIGHT 10
3	Fixed Aid to Navigation which is also a geodetic station	△ NORFOLK SHIP CHANNEL LIGHT 10 (SHIP CHANNEL LIGHT 10 1984)
4	Photogrammetrically Located Charted Landmark	⊙ STACK
5	Charted Landmark which is also a geodetic station	△ STACK (NORFOLK BRICK CO STACK 1934)
6	Charted Landmark Nomenclature with Annotation	⊙ STACK (Most Northern of Six)
7	Photogrammetrically Located Cartographic Feature of Possible Landmark Value (PLM)	⊙ Stack
8	PLM which is also a geodetic station	△ Stack (NORTH SHORE REFINERY 1945)
9	PLM Nomenclature with Annotation	⊙ Stack (Northerly of Two)
10	Geodetic Station recovered during photogrammetric field operations (not an aid, landmark or PLM)	△ MARTIN 1947
11	Geodetic station established during operations; whose position is "unadjusted"	△ MARTIN 1986 (Field Position) or △ MARTIN 1986 (Field Position)
12	Elevated Cartographic Feature mapped which is not a charted landmark, aid or PLM	° light standard

TABLE OF FIGURES FOR PRODUCTION PROCEDURE MEMO NO. 1