PHOTOGRAMMETRY BRANCH

COASTAL MAPPING PROGRAM

PROJECT CM-8309

COMPLETION REPORT

ALASKA

SHELIKOF STRAIT

CAPE KUMLIK TO JACK POINT

TP-00903, TP-00904, TP-00905, TP-00907
TP-00909, TP-00911, TP-00913, TP-00914

1987

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

PHOTOGRAMMETRY BRANCH
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TP-00909, TP-00911, TP-00913, TP-00914

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 National Ocean Service Coastal Mapping Program. Clearance for project registration is requested.

Submitted by

Fay T. Mauldin
Coastal Mapping Unit
Field Photogrammetry Section

Approved

Captain Fidel T. Smith, NOAA
Chief, Field Photogrammetry Section

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

COMPLETION REPORT
COASTAL MAPPING PROGRAM
PROJECT CM-8309
SHELIKOF STRAIT
CAPE KUMLIK TO JACK POINT

TABLE OF CONTENTS

COASTAL MAPPING PROGRAM
PROJECT CM-8309
PROJECT SUMMARY

INTRODUCTION

Project CM-8309, Shelikof Strait, Cape Kumlik to Jack Point, Alaska, consists of eight maps TP-00903 through TP-00905, TP-00907, TP-00909, TP-00911, TP-00913, and TP-00914 at 1:20,000 scale.

All maps are based on North American Datum 1983 (NAD 83) depicted by the Transverse Mercator Projection.

This project is located on the Alaskan Peninsula just south of Shelikof Strait. It extends from north of Cape Kumlik, latitude 56° 45.0', south to Jack Point, latitude 56° 15.0'. In longitude, this project extends from 157° 36.0' west to longitude 158° 40.0'.

PLANNING

This project was planned in support of the Nautical Charting Program. It was determined that eight maps at 1:20,000 scale were needed to meet the project requirements.

Planning also included the selection of twenty-three premarked control stations used as horizontal control in July 1987. These stations were used to control the color photography.

FIELD OPERATIONS

Refer to the Field Project Instructions included in Appendix A, the Field Report in Appendix B, and the memorandum in Appendix F for control information.

The twenty-three premarked control stations were used to control ten strips of color photography at 1:50,000 scale. One strip of color photography at 1:30,000 scale was obtained and forwarded but not used since the area was adequately covered by the 1:50,000 scale color photography.

There were ten strips of black and white infrared photography at 1:50,000 scale taken at mean lower low water based on predicted tide data. All photography was taken in July 1987.

The cameras used for the aquisition of the photography were:

WILD RC-10B, focal length 152.74 millimeters, serial number B-1777.

WILD RC-10Z, focal length 153.15 millimeters, serial number Z-1391.

AEROTRIANGULATION

Refer to the Aerotriangulation Report in Appendix C of this Completion Report for the accuracy of the bridging operation.

COMPILATION

The Wild B-8 stereo instruments B8-2109 and B8-2125 were used to compile the maps by analog methods in September and October 1990.

Mean lower low water infrared ratio photographs, based on predicted tide data, were used to graphically compile the approximate mean lower low water line. On one map, TP-00907, shadows from the mountains obscured the mean lower low water line in some areas.

Refer to the Map Compilation Sources Pages included in Appendix D for the number, type, data, and scale of the photographs used for each map. Unique items and problems relating to each map are also discussed in the remarks section of the Map Compilation Sources Pages.

The maps and descriptive notes were smooth-drafted. The project formats and indexes were applied with wax stickup.

The selection of Geographic Names came from United States Geological Survey (USGS) Quadrangles and National Ocean Service (NOS) Nautical Charts. They were submitted to the Chief Geographer of the Nautical Charting Division and were approved and are listed in Appendix E.

This project meets the requirements for National Standards of Map Accuracy.

FINAL REVIEW

The Final Review of this project was begun in November 1990 and was completed in February 1991.

A comparison was made between the maps and the following National Ocean Service chart:

CHART	EDITION	SCALE	DATE
16566	7	1:77,477	October 28, 1989

Significant differences were noted on the Chart Maintenance Prints. There are two areas where the chart shows an approximate mean high water line. The first is Chignik River, latitude 56° 16.5' and from longitude 158° 38.7' west to longitude 158° 40.0'. The second area is an inlet off Lake Bay, south of latitude 56° 18.0' and west of longitude 158° 18.5'. In both areas, the mean high water line has been located photogrammetrically and should be applied to charts.

Atkulik Island, latitude 56° 16.7', longitude 157° 44.0', on TP-00914, could not be compiled by analog methods due to the physical limitations of the instruments.

There were no Cartographic Features of Charting Interest located photogrammetrically within the limits of this project.

This project meets the requirements for National Standards of Map Accuracy.

DISSEMINATION OF DATA AND PRODUCTS

National Archives/Federal Records Center
- Copy of the Project Completion Report
- Brown Jacket contents, e.g. field data, Aerotriangulation

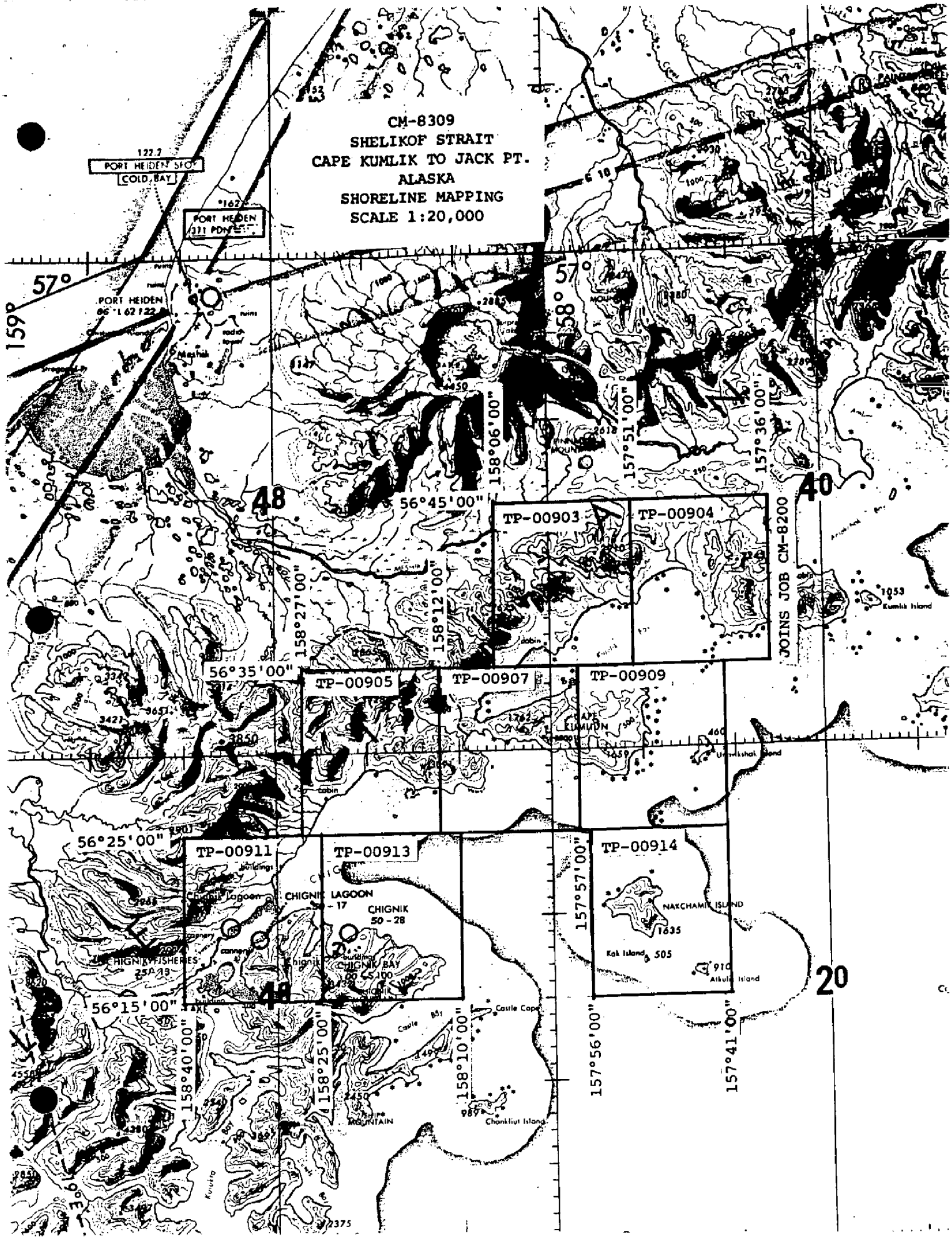
Agency Archives
- The original Projection Completion Report
- Registration copy of each map

Photogrammetric Electronic Data Library
- Not applicable

Reproduction Branch Aeronautical Charting Division
- 8X reduction negative of each map

Mapping and Charting Branch
- Chart Maintenance Prints

Hydrographic Surveys Branch
- Notes to Hydrographer Prints


CM-8309
SHELIKOF STRAIT
CAPE KUMLIK TO JACK PT.
ALASKA
SHORELINE MAPPING
SCALE 1:20,000
TP-00903
TP-00904
TP-00905
TP-00907
TP-00909
TP-00911
TP-00913
TP-00914
JOINS JOB CM-8200
PORT HEIDEN
COLD BAY
CHIGNIK LAGOON
CHIGNIK BAY
NAKCHAMIK ISLAND
Kumlik Island
Castle Cape
Chanliut Island
CAPE KUMLIK
56°45'00"
56°35'00"
56°25'00"
56°15'00"
158°06'00"
158°27'00"
158°12'00"
158°40'00"
158°25'00"
158°10'00"
157°51'00"
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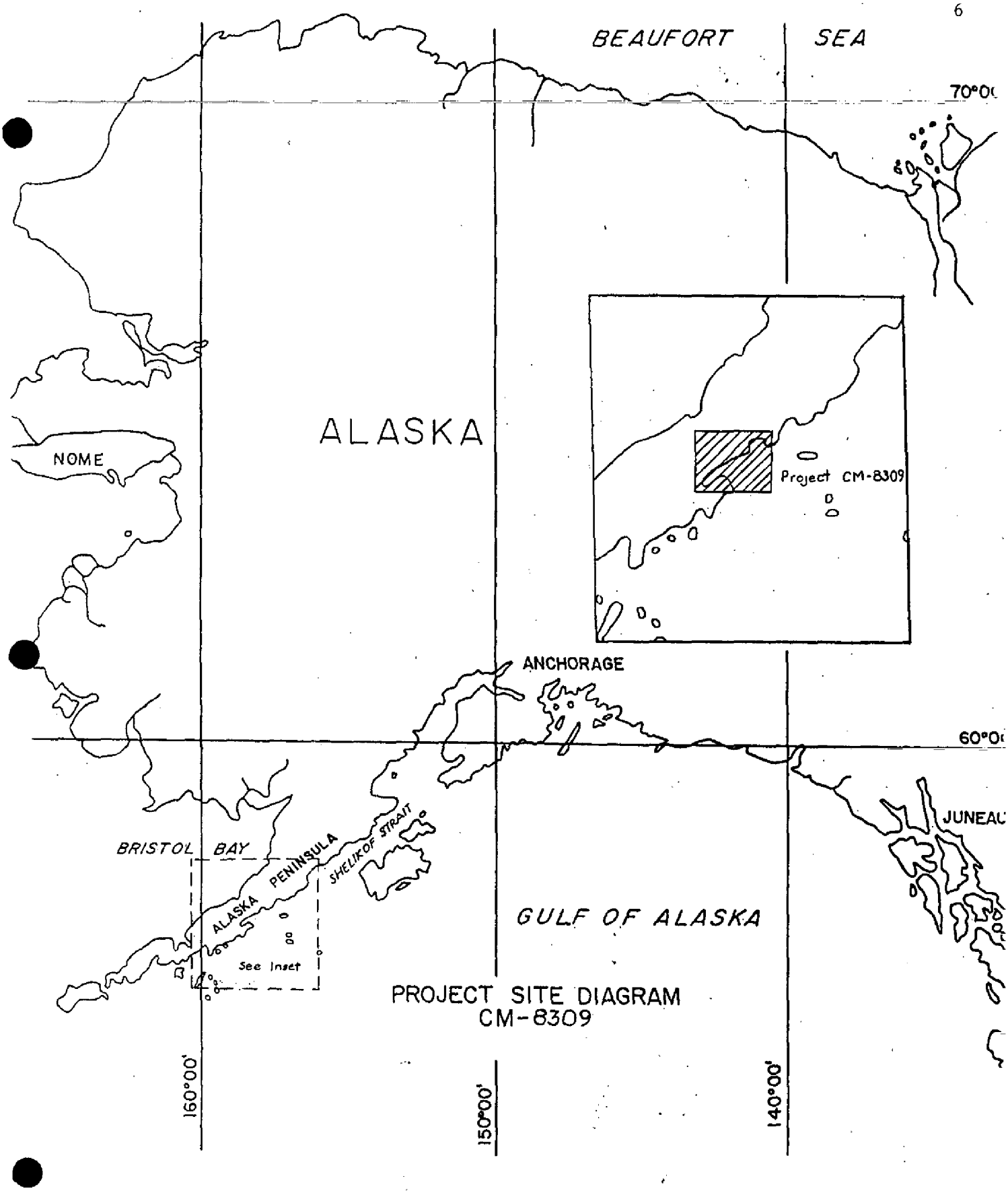
159°
57°
58°
48
40
20



PROJECT SITE DIAGRAM
CM-8309

PROJECT GEODETIC CONTROL LISTING

PROJECT: CM-8309

GEODETIC DATUM: North American Datum of 1983

The following 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 codes (QC) criteria.

GEODETIC COORDINATES (°-'-")

STATION	QUAD	LATITUDE	LONGITUDE	QC	DAY/YR
CHAK, 1987	561574	56 36 30.265	157 40 43.659	4	001/1987
NORTH FORK, 1987	561574	56 40 31.833	157 44 23.325	4	001/1987
KUJU, 1920	561574	56 38 37.566	157 50 29.988	3	001/1920
JULIK, 1920	561574	56 35 49.749	157 59 07.332	3	001/1920
LOON 2, 1987	561574	56 34 18.492	157 54 49.891	4	001/1987
KUMLIUN NORTHEAST, 1987	561574	56 33 31.609	157 49 18.318	4	001/1987
EASY, 1925	561574	56 30 19.158	157 49 31.095	3	001/1925
KUMLIUN, 1920	561573	56 29 56.383	157 53 57.998	3	001/1920
KUM, 1987	561581	56 30 55.132	158 03 09.095	4	001/1987
PORTAGE PASS, 1987	561581	56 32 15.027	158 07 56.940	4	001/1987
HOOK BAY, 1987	561581	56 28 12.639	158 07 52.712	4	001/1987
DRY CREEK, 1987	561582	56 28 45.584	158 20 29.766	4	001/1987
THROUGH CREEK, 1987	561583	56 24 34.133	158 27 03.051	4	001/1987

STATION	QUAD	LATITUDE	LONGITUDE	QC	DAY/YR
BLUFF 2, 1987	561583	56 20 56.031	158 31 17.531	4	001/1987
BOOMER, 1987	561583	56 20 03.956	158 33 49.567	4	001/1987
MUD 2, 1987	561583	56 16 31.575	158 38 06.669	4	001/1987
ONYX, 1920	561582	56 20 28.075	158 26 30.598	3	001/1920
CHIGNIK 2, 1924	561582	56 19 28.097	158 19 45.257	3	001/1924
KITS, 1920	561582	56 17 17.413	158 12 24.130	3	001/1920
NAKCH, 1987	561573	56 20 40.573	157 53 56.265	4	001/1987
NAK, 1920	561573	56 21 50.308	157 50 26.735	3	001/1920
KAK, 1987	561573	56 17 13.725	157 49 57.530	4	001/1987
ATKULIK, 1920	561573	56 16 27.306	157 43 54.445	3	001/1920

Remarks:

All geodetic survey operations were performed by Office of Charting and Geodetic Services personnel in July 1987.

Listing approved by Fay T Mauldin 2-21-91
Final Reviewer Fay T. Mauldin Date

APPENDICES

APPENDIX A

PROJECT FIELD INSTRUCTIONS

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

April 13, 1987 N/CG2313:JDM

TO: N/MOP - Robert L. Sandquist

FROM: N/CG2 - Christian Andreasen

SUBJECT: PROJECT INSTRUCTIONS: FIELD - Job CM-8309, Shelikof Strait, Cape Kumlik to Jack Point, Alaska, Shoreline Mapping

Subject instructions are forwarded for signature and issue 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

April 13, 1987 N/CG2313:JDM

Chief, Program Services Division
Pacific Marine Center

PROJECT INSTRUCTIONS: FIELD - Job CM-8309, Shelikof Strait, Cape Kumlik to Jack Point, 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 Alaska on the west side of Shelikof Strait. Shoreline mapping at 1:20,000 scale will cover the shoreline, offshore islands, and adjacent waterways, including Nakchamik, Kak, Unavikshak, and Atkulik Islands.

3.0. PHOTOGRAPHY

3.1. Aerotriangulation photography at 1:50,000 scale and supplemental bridging and compilation photography at 1:30,000 scale will be obtained using color film. Also, 1:50,000-scale black-and-white infrared photography will be obtained at mean high water and mean lower low water ±0.7 foot based on predicted tides (tide station Anchorage Bay, based on Kodiak, will be used).

3.2. If target configuration and placement necessitate it, target identification photography may be obtained at 1:15,000 scale and may be flown at less than optimum photographic conditions.

4.0. ASSIGNMENT

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

4.2 In addition, you are assigned all field operations required to select, mark, and place targets on possible sites for future hydrographic control stations. Hydrographic control requirements and preliminary site selections should be made at the Pacific Marine Center. Final selection of control points will be made in the field.

5.0. HORIZONTAL CONTROL

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

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

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. PREMARKING OF CONTROL

6.1. As soon as possible after all control stations have been paneled, the field party will forward to 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.

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

6.2. Aerotriangulation Control

6.2.1. Panel each station selected to meet horizontal control requirements in accordance with specifications given on the attached sheet for 1:50,000-scale photography.

6.2.2. 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.

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

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

6.2.5. 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.

6.2.6. 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.

6.3. Hydrographic Control Sites

6.3.1. Establish and panel each hydrographic control station in accordance with specifications for 1:30,000-scale photography. Mark each point selected in some convenient, semipermanent fashion to ensure future recovery by the hydrographer.

6.3.2. Use panel array No. 2 for hydrographic control points. It may be modified, as necessary, to conform with local terrain conditions and space constraints.

6.3.3. The location of the hydrographic control stations must be intervisible with at least one other station.

6.3.4. A distance check from each station to at least one other station shall be made prior to departing the project area.

6.4. Hydrographic Control Quality Assurance Plan

6.4.1. The accuracy of aerotriangulated points may be less than Third-Order because all of the criteria described under section 3.6 of the Standards and Specifications for Geodetic Control Networks, dated September 1984, will not be met due to cost considerations.

6.4.2. The relative horizontal error of the aerotriangulated position provided for each hydrographic control point will be less than 3 meters. The criteria of accuracy will be based on the evaluation of RMS values of photogrammetric measurements, the overall aerotriangulation fit to geodetic control, and comparison with the field-determined distance values.

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. For hydrographic control sites, prepare a description in sufficient detail for the hydrographer to recover the marked station.

e. 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 July 30, 1987. If premarking is not completed by this date, inform N/CG2313 so 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 forwarded to N/CG2313.

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.

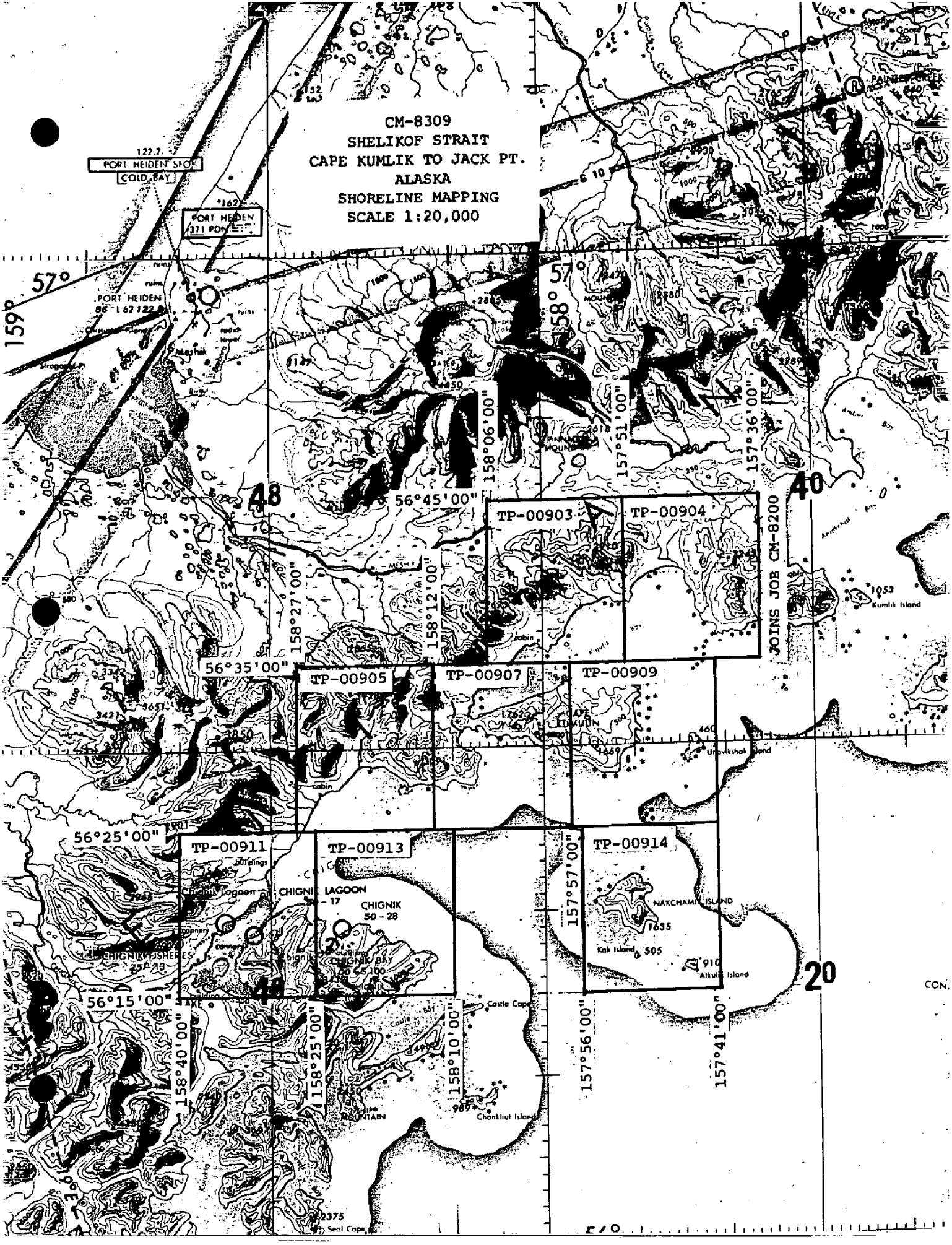
12.0. RECEIPT

Acknowledge receipt of these instructions.

Christian Andreasen

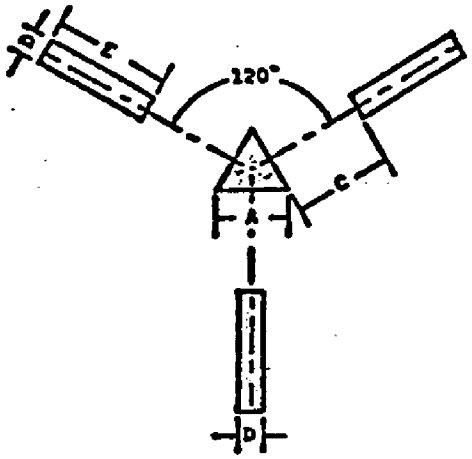
Robert L. Sandquist
Director
Pacific Marine Center

Christian Andreasen
Chief, Nautical Charting Division
Charting and Geodetic Services

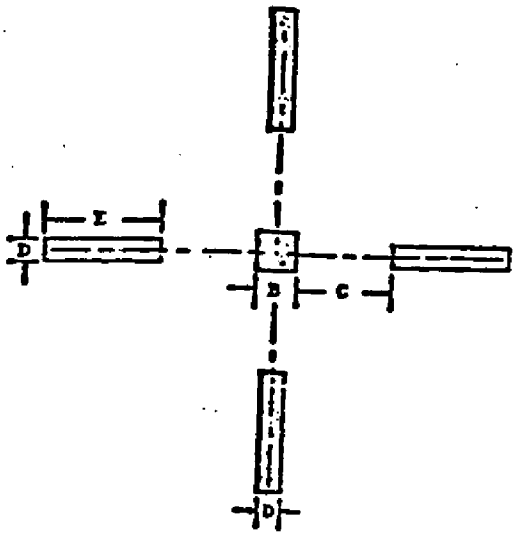

CM-8309
SHELIKOF STRAIT
CAPE KUMLIK TO JACK PT.
ALASKA
SHORELINE MAPPING
SCALE 1:20,000
PORT HEIDEN
COLD BAY
PORT HEIDEN
371 PDN
57°
159°
58°
56°45'00"
56°35'00"
56°25'00"
56°15'00"
158°27'00"
158°12'00"
158°06'00"
157°51'00"
157°36'00"
158°40'00"
158°25'00"
158°10'00"
157°57'00"
157°56'00"
157°41'00"
48
40
20
TP-00903
TP-00904
TP-00905
TP-00907
TP-00909
TP-00911
TP-00913
TP-00914
JOINS JOB CM-8200
Kumlik Island
Unavishat Island
CHIGNIK LAGOON
CHIGNIK
CHIGNIK BAY
NAKCHAMIK ISLAND
Kak Island
Atkulik Island
Castle Cape
Chanliut Island
Seal Cape
CON.

SPECIFICATIONS FOR PREMARKING CONTROL STATIONS
Revised November 23, 1976

ARRAY NO. 1



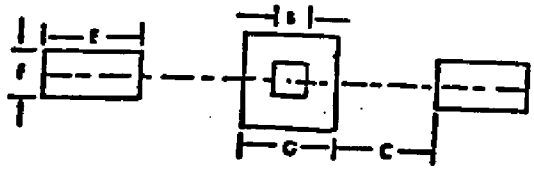
ARRAY NO. 2



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	6.4	4.0	18.2	2.2	10.8	3.6	7.6

APPENDIX B

FIELD OPERATION REPORT

I. AUTHORITY

By direction of the Director, Pacific Marine Center.

II. DATES

Field work and paneling were accomplished during the period of July 3 to July 21, 1987. Removal of panels was accomplished on August 1, 1987.

III. PURPOSE

The purpose of this project was to panel horizontal control stations in support of aerial photography in accordance with CM-8309 Project Instructions, Shelikof Strait, Cape Kumlik to Jack Point, Alaska, Shoreline Mapping, Dated April 13, 1987.

IV. TERRAIN AND WORKING CONDITIONS

The area between Cape Kumlik and Cape Kumliun is Kujulik Bay and from Cape Kumliun to Jack Point is Chignik Bay. There are three islands on the east side of Chignik Bay, Nakchamik Island, Kak Island and Atkulik Island. These islands are barren of trees or brush with tundra being the only vegetation. Nakchamik and Atkulik could be packed from a boat landing but Kak is a 600 foot sheer sided pinnacle that could not be reasonably climbed.

Chignik and Kujulik Bays are similar, with steep bluffs from the water line to as high as 700 feet. The entire area is sparse of vegetation with tundra covering most of the ground and widely scattered alder thickets. All new stations were located at the lowest elevation and as close to the shoreline as possible. This was to keep them below cloud cover and for use as hydrographic control stations.

Many streams dump into both bays and sand beaches are the rule, at their mouths.

The party was based at Port Heiden, on the opposite side of the peninsula from the area worked. This necessitated crossing the Aleutian Mountain Range to access the work area. There are several passes to go through but all are weather dependant. Portage Pass was the shortest route to the middle of the work area. Port Heiden has lodgings with food and jet fuel.

Weather during the period was normal, rain, fog and high winds. The weather on the south side of the peninsula is usually the opposite of that on the north side.

There is a large population of brown bear in this region, no problems were encountered with them.

Most of the shoreline in the project area is part of the Aniakchak National Monument and Preserve, Post Office Box 7, King Salmon, Alaska 99613 (Phone 907-246-3305). A special use permit is required to access the area. Many thanks to Mr. David Manski, Acting Superintendent, for expediting this permit after we had arrived in the work area.

V. PERSONNEL

J. Gary Fredrick (NOS,PMC)
David P. Butler (NOS,Headquarters)
Helicopter Pilot & Mechanic (NOAA,OAO)

VI. EQUIPMENT

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

The failure of one of the three Satellite Receivers caused a significant delay of the project. The Atlantic Marine Center sent one of their receivers to replace the unit that failed. This unit was returned in late July.

VII. FIELD METHODS

Panels were placed directly over 9 existing control points.

Panels were also directly placed over 14 new, Third Order control points. Two of these points were established by terrestrial surveying methods and 12 were established by satellite surveying methods.

Third Order, Class 1 survey methods were used for all observations as specified in "Standards and Specifications for Geodetic Control Networks, Federal Geodetic Control Committee, September 1984", "National Geodetic Survey Operations Manual" and "The Hydrographic Manual, Third Edition".

VIII. STATISTICS

NUMBER OF STATIONS RECOVERED	9
NUMBER OF INTERSECTION STATIONS RECOVERED	1
NUMBER OF STATIONS ESTABLISHED	14
NUMBER OF STATIONS OCCUPIED (Terrestrial)	4
NUMBER OF STATIONS OCCUPIED (Satellite)	14
NUMBER OF TRANSLOCATION SOLUTIONS	17

IX. DISCUSSION OF RESULTS

A traverse starting at NAK 1920, azimuth to ATKULIK 1920, via NATCH and KAK and closing 1:31,000 on ATKULIK 1920 with azimuth check to CINDER PEAK-LONE MTN of 6.6 seconds. Reciprocal zenith distances were observed over these lines and elevations computed. Holding NAK 1920 fixed the elevation computed at the check, ATKULIK 1920, missed the published elevation by 14.4 meters. The newly computed elevation of ATKULIK 1920 was used as the top checks were very good. The triangulation diagram indicates that ATKULIK 1920 is an intersection station.

Two translocation traverses were accomplished. The first was from ONYX 1920 to MUD and BOOMER closing back on ONYX 1920 by 0.211 meters or 1:139,000. The second was from ONYX 1920 to KUJU 1920 via BLUFF, THROUGH CREEK, DRY CREEK, HOOK BAY, KUM, PORTAGE PASS, LOON 2, KUMLIUN NORTHEAST, NORTH FORK, and CHAK. The closure was computed at LOON 2, 0.434 meters or 1:115,000. The baseline KUJU 1920 to ONYX 1920 was also translocated and closed by 0.978 meters or 1:139,000. This was between first and third order control, over 50 kilometers.

Elevations were computed for all Translocated Stations, holding ONYX 1920 fixed. The check on the first traverse was computed as a loop back to ONYX 1920 and the elevation checked by 0.06 meter. The check on the second traverse was computed at station LOON 2 and this checked by 0.57 meter.

IX. RECORDS

All paneled points have been described and sketched on CSI cards. Aerial photographs (35 mm) of all sites with the exception of KUMLIUM 1920 and KUM are attached to the CSI cards. These data are forwarded to N/CG2313.

All data supporting the geographic positions has been digitized into bluebook format. Both the field and digitized data is being forwarded to N/CG17x2, for inclusion into the NGS Database.

X. RESULTS

A table of NAD83 geographic positions follows:

DIRECT STATIONS IDENTIFIED FOR PROJECT CM-8309

NO	STATION	LATITUDE	LONGITUDE
1	CHAK	56,36,30.265	157,40,43.659
2	NORTH FORK	56,40,31.833	157,44,23.325
3	KUJU 1920	56,38,37.566	157,50,29.988
4	JULIK 1920	56,35,49.749	157,59,07.332
5	LOON 2	56,34,18.492	157,54,49.891
6	KUMLIUN NORTHEAST	56,33,31.609	157,49,18.318
7	EASY 1925	56,30,19.158	157,49,31.095
8	KUMLIUN 1920	56,29,56.383	157,53,57.998
9	KUM	56,30,55.132	158,03,09.095
10	PORTAGE PASS	56,32,15.027	158,07,56.940
11	HOOK BAY	56,28,12.639	158,07,52.712
12	DRY CREEK	56,28,45.584	158,20,29.766
13	THROUGH CREEK	56,24,34.133	158,27,03.051
14	BLUFF 2	56,20,56.031	158,31,17.531
15	BOOMER	56,20,03.956	158,33,49.567
16	MUD 2	56,16,31.575	158,38,06.669
17	ONYX 1920	56,20,28.075	158,26,30.598
18	CHIGNIK 2 1924	56,19,28.097	158,19,45.257
19	KITS 1920	56,17,17.413	158,12,24.130
20	NAKCH	56,20,40.573	157,53,56.265
21	NAK 1920	56,21,50.308	157,50,26.735
22	KAK	56,17,13.725	157,49,57.530
23	ATKULIK 1920	56,16,27.306	157,43,54.445

APPENDIX C

AEROTRIANGULATION REPORT

Aerotriangulation Report
CM-8309
Shelikof Strait Cape Kumlik To Jack Point, Alaska
June 1988

Area Covered

This report covers the area from Cape Kumlik, down to Jack Pt., including Nakchamik and Atkulik Islands. The project consists of eight 1:20,000-scale sheets; TP-00903 through TP-00905, TP-00907, TP-00909, TP-00911, TP-00913, and TP-00914.

Method

Ten strips of 1:50,000-scale color photographs were bridged by analytical aerotriangulation methods using the STK comparator. The bridging strips were adjusted to ground using the General Integrated Analytical Triangulation Program (GIANT). Pre-marked control stations were used as horizontal control. Common points were transferred between strips to insure adequate junctioning. One strip, consisting of two photographs, of 1:30,000-scale color photographs was ratioed instead of bridged due to the minute amount of land covered.

Ratio values were determined for the bridging photographs and the 1:50,000-scale MLLW infrared photographs. A copy of these values and a sketch of the coverage are attached to this report. No MHW photographs were obtained.

The base manuscripts were plotted on the Kongsberg plotter. The positions are in the Alaska state plane coordinate system, zone 6. 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.

Adequacy of Control

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

Supplemental Data

USGS topographic quadrangles were used to obtain vertical control for bridging. NOS Nautical Charts were used to locate aids and landmarks within the project area.

Photography

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

Submitted by,

Brian Thornton

Approved and Forwarded:

Don O. Norman
Chief, Aerotriangulation Unit

Fit To Control

Station Names	Point No.	Values In Feet X	Y
Chak,1987	718100	-0.5	1.5
North Fork,1987	547100	1.1	0.3
Kuju,1920	549100	-0.6	0.3
Julik,1920	555100	-1.3	2.2
Loon 2,1987	643100	0.9	-1.0
Kumliun Northeast,1987	639100	-0.6	-0.2
Easy,1925	637100	1.5	1.8
Kumliun,1920	610100	-1.9	1.0
Kum,1987	614100	0.4	-3.4
Portage Pass,1987	559100	1.2	-3.7
Hook Bay,1987	631100	-0.2	-2.2
Dry Creek,1987	646100	-0.2	0.4
Through Creek,1987	652100	1.0	2.8
Bluff 2,1987	654100	0.1	-1.7
Boomer,1987	656100	-1.4	-2.4
Mud 2,1987	660100	0.6	0.4
Onyx,1920	596100	-0.2	0.9
Chignik 2,1924	598100	-0.2	1.8
Kits,1920	602100	0.2	1.3
Nakch,1987	683100	0.1	-0.9
Nak,1920	685100	-0.1	1.2
Kak,1987	687100	0.0	-0.2
Atkulik,1920	693100	0.0	-0.1

CM-8309
Ratio Values

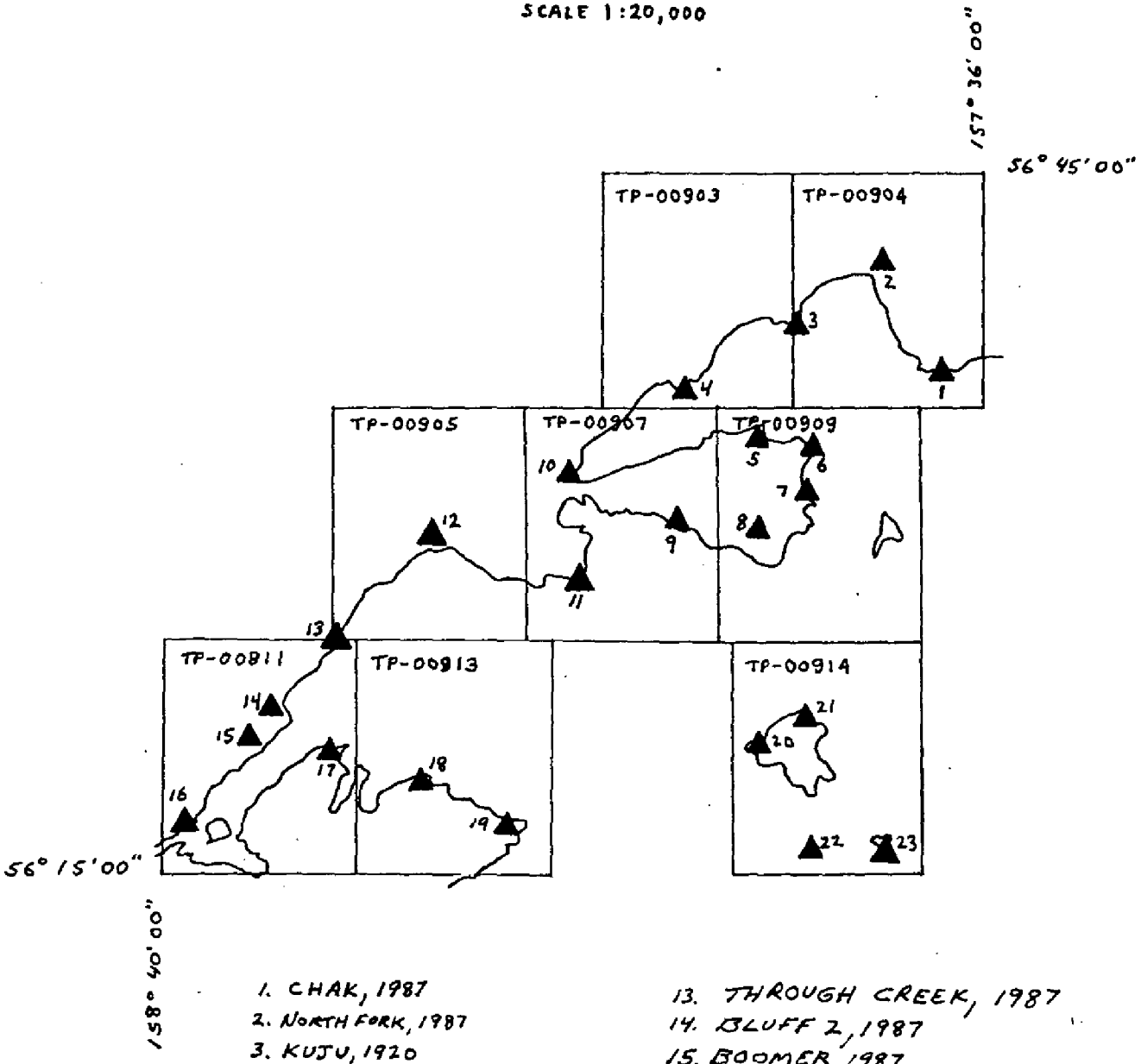
Color Bridging Photographs

87 B CN	6547 thru 6567	Ratio 2.46
	6592 thru 6602	Ratio 2.46
	6608 thru 6618	Ratio 2.45
	6623 thru 6631	Ratio 2.46
	6637 thru 6643	Ratio 2.45
	6646 thru 6660	Ratio 2.46
	6683 thru 6687	Ratio 2.46
	6691 thru 6693	Ratio 2.46
	6696 thru 6700	Ratio 2.45
	6712 thru 6718	Ratio 2.45
	6846 thru 6847	Ratio 1.49

MLLW Infrared Photography

87 Z R	2025 thru 2031	Ratio 2.44
	2041 thru 2046	Ratio 2.45
	2050 thru 2054	Ratio 2.44
	2059 thru 2062	Ratio 2.44
	2066 thru 2069	Ratio 2.44
	2073 thru 2078	Ratio 2.45
	2083 thru 2085	Ratio 2.42
	2088 thru 2089	Ratio 2.47
	2093 thru 2094	Ratio 2.45
	2100 thru 2102	Ratio 2.45

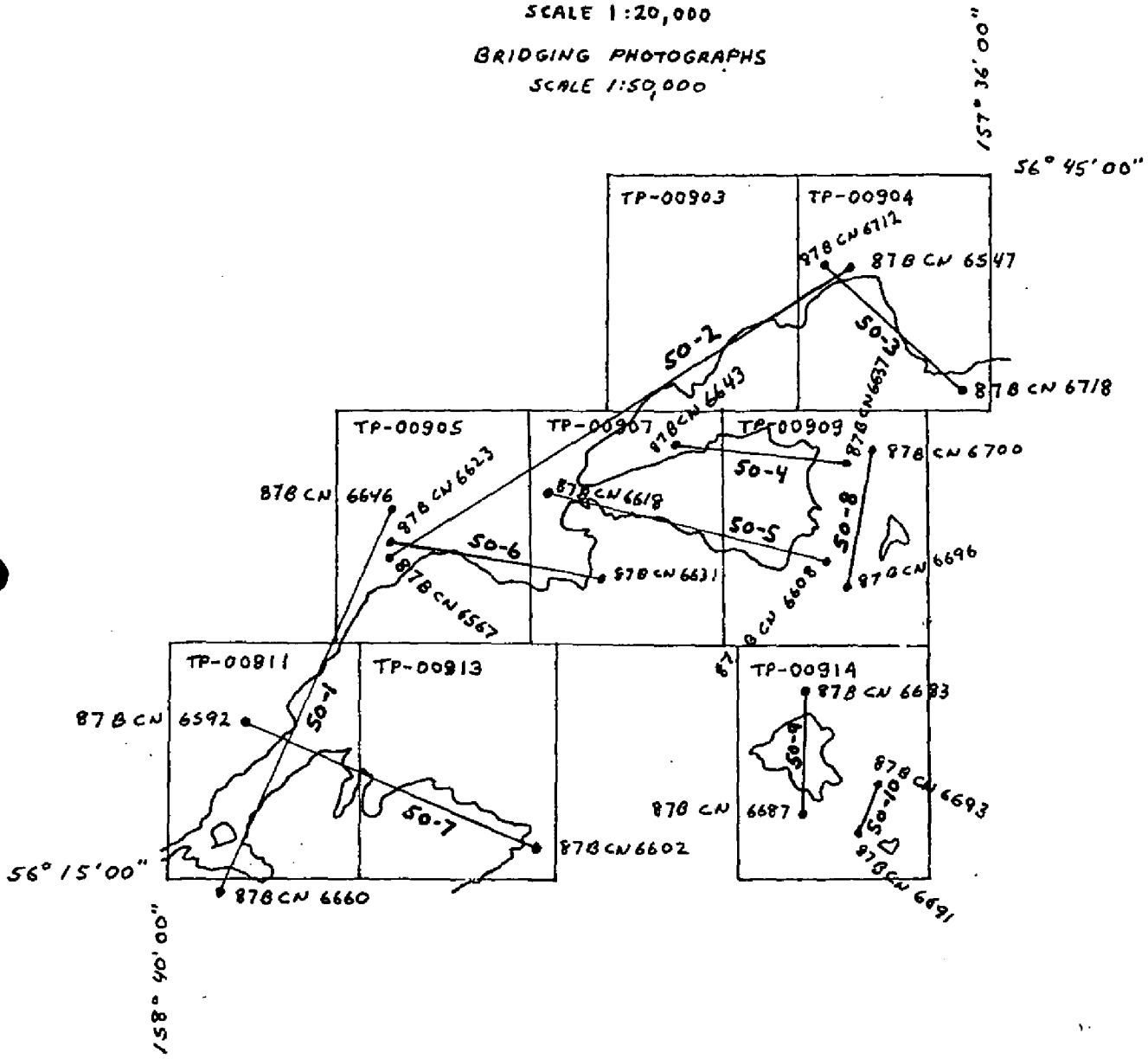
CM-8309
SHELIKOF STRAIT
CAPE KUMLIK TO JACK PT.
ALASKA
SHORELINE MAPPING
SCALE 1:20,000



1. CHAK, 1987
2. NORTH FORK, 1987
3. KUJU, 1920
4. JULIK, 1920
5. LOON 2, 1987
6. KUMLIUN NORTHEAST, 1987
7. EASY, 1925
8. KUMLIUN, 1920
9. KUM, 1987
10. PORTAGE PASS, 1987
11. HOOK BAY, 1987
12. DRY CREEK, 1987
13. THROUGH CREEK, 1987
14. BLUFF 2, 1987
15. BOOMER, 1987
16. MUD 2, 1987
17. ONYX, 1920
18. CHIGNIK 2, 1924
19. KITS, 1920
20. NAKCH, 1987
21. NAK, 1920
22. KAK, 1987
23. ATKULIK, 1920

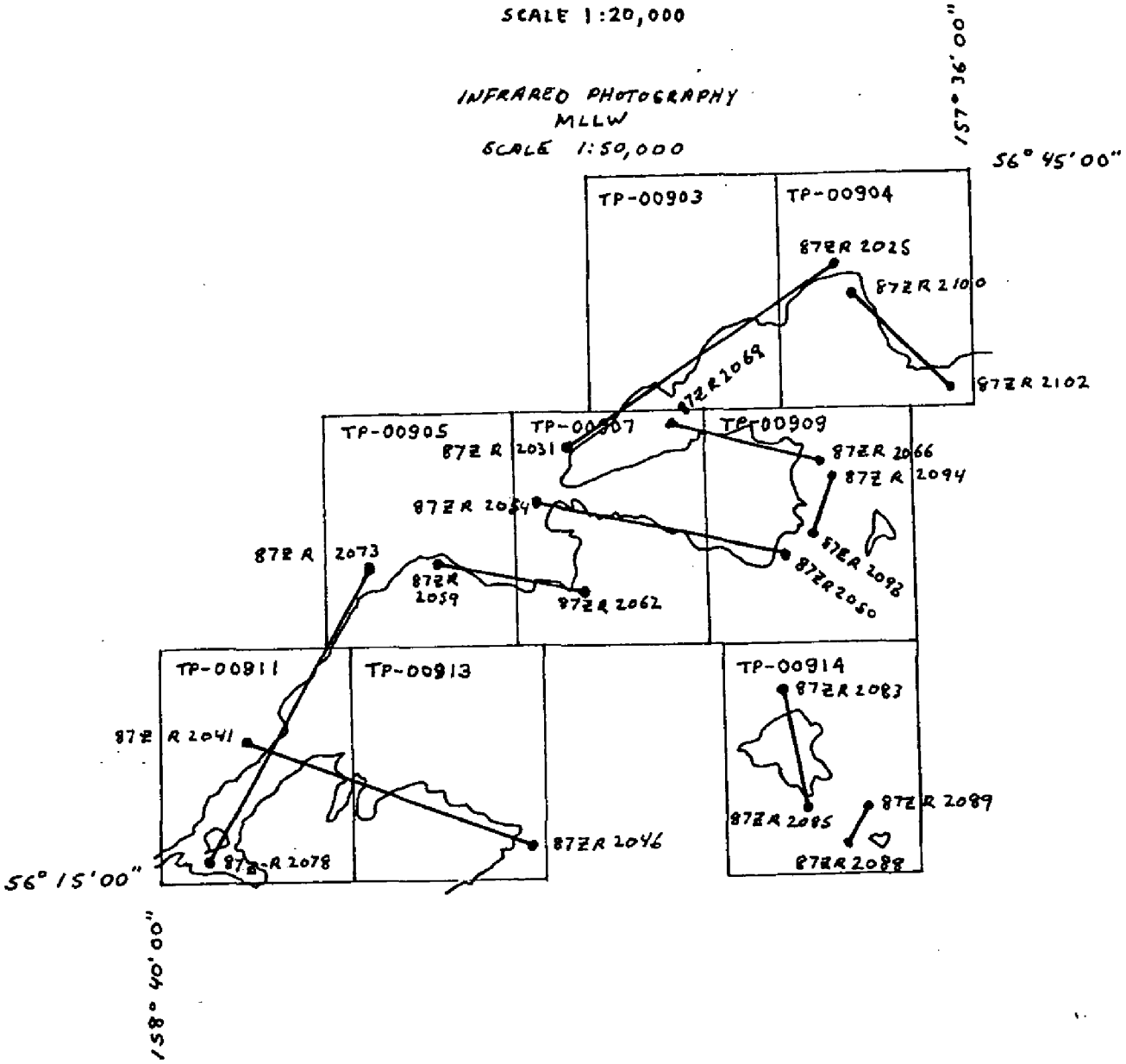
CM-8309
SHELIKOF STRAIT
CAPE KUMLIK TO JACK PT.
ALASKA
SHORELINE MAPPING
SCALE 1:20,000

BRIDGING PHOTOGRAPHS
SCALE 1:50,000



CM-8309
SHELIKOF STRAIT
CAPE KUMLIK To JACK PT.
ALASKA
SHORELINE MAPPING
SCALE 1:20,000

INFRARED PHOTOGRAPHY
MLLW
SCALE 1:50,000



APPENDIX D

MAP COMPILATION SOURCES PAGES

DESCRIPTIVE DATA

CM-8309

TP-00903

MAP SCALE 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6549-6557 ODDS ONLY	07-26-87	0851	1:50,000	-0.6 FT MLLW
87B(CN)6639-6643 ODDS ONLY	07-26-87	0952	1:50,000	-0.5 FT MLLW
87Z(R)2025-2031 ODDS ONLY	07-26-87	0851	1:50,000	-0.6 FT MLLW
87Z(R)2067, 2069	07-26-87	0952	1:50,000	-0.5 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 09-19-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

DESCRIPTIVE DATA

CM-8309

TP-00904

MAP SCALE 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6549, 6551	07-26-87	0852	1:50,000	-0.6 FT MLLW
87B(CN)6712-6718* EVENS ONLY	07-26-87	1048	1:50,000	+0.5 FT MLLW
87B(CN)6639, 6641	07-26-87	0952	1:50,000	-0.6 FT MLLW
87Z(R)2027	07-26-87	0852	1:50,000	-0.6 FT MLLW
87Z(R)2100-2101**	07-26-87	1048	1:50,000	+0.5 FT MLLW
87Z(R)2067	07-26-87	0952	1:50,000	-0.6 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 09-21-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

*Models using this strip of color photography could not be leveled in the Wild B-8 due to the physical limitations of the instrument. Compilation used the best scale solution possible to compile areas covered by these photographs.

**This strip of infrared photography was at the same time as the above mentioned color photography. Ratio photographs would not hold details or common image points. Compilation used the best possible solution to graphically compile the approximate mean lower low water line.

DESCRIPTIVE DATA

CM-8309

TP-00905

MAP SCALE 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6648, 6650	07-26-87	1001	1:50,000	-0.4 FT MLLW
87B(CN)6623-6627 ODDS ONLY	07-26-87	0943	1:50,000	-0.6 FT MLLW
87Z(R)2059, 2061	07-26-87	0943	1:50,000	-0.6 FT MLLW
87Z(R)2072, 2074	07-26-87	1001	1:50,000	-0.4 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 09-25-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

DESCRIPTIVE DATA

CM-8309

TP-00907

MAP SCALE 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6627-6631 ODDS ONLY	07-26-87	0944	1:50,000	-0.6 FT MLLW
87B(CN)6612-6618 EVENS ONLY	07-26-87	0933	1:50,000	-0.7 FT MLLW
87B(CN)6557, 6559	07-26-87	0851	1:50,000	-0.6 FT MLLW
87B(CN)6641, 6643	07-26-87	0952	1:50,000	-0.5 FT MLLW
87Z(R)2031	07-26-87	0851	1:50,000	-0.6 FT MLLW
87Z(R)2052, 2054	07-26-87	0933	1:50,000	-0.7 FT MLLW
87Z(R)2061	07-26-87	0944	1:50,000	-0.6 FT MLLW
87Z(R)2069	07-26-87	0952	1:50,000	-0.5 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 09-21-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

Shadows from the mountains obscured the mean lower low water line in some areas. The mean lower low water line was not compiled in these areas.

DESCRIPTIVE DATA

CM-8309

TP-00909

MAP SCALE: 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6610, 6612	07-26-87	0933	1:50,000	-0.7 FT MLLW
87B(CN)6637-6643 ODDS ONLY	07-26-87	0952	1:50,000	-0.6 FT MLLW
87B(CN)6696-6700* EVENS ONLY	07-26-87	1034	1:50,000	+0.1 FT MLLW
87Z(R)2050, 2052	07-26-87	0933	1:50,000	-0.7 FT MLLW
87Z(R)2067	07-26-87	0952	1:50,000	-0.6 FT MLLW
87Z(R)2093**	07-26-87	1034	1:50,000	+0.1 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 09-25-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

*Models using this strip of color photography could not be leveled using the Wild B-8 due to the physical limitations of the instrument. Compilation used the best possible scale solution to compile the area covered by these photographs.

**This strip of infrared photography was flown at the same time as the above mentioned color photography. Ratio photographs would not details or common image points. The best possible solution uas uaed to graphically compile the mean lower low water line in areas covered by these photographs.

DESCRIPTIVE DATA

CM-8309

TP-00911

MAP SCALE: 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6594, 6596	07-26-87	0922	1:50,000	-0.7 FT MLLW
87B(CN)6652-6660 EVENS ONLY	07-26-87	1001	1:50,000	-0.4 FT MLLW
87Z(R)2041, 2043	07-26-87	0922	1:50,000	-0.7 FT MLLW
87Z(R)2074-2078 EVENS ONLY	07-26-87	1001	1:50,000	-0.4 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 10-01-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

The mean high water line of the Chignik River, latitude 56° 16.5' and longitude 158° 38.7' west to longitude 158° 40.0', has been located photogrammetrically. The chart shows an approximate mean high water line.

DESCRIPTIVE DATA

CM-8309

TP-00913

MAP SCALE: 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6596-6602 EVENS ONLY	07-26-87	0922	1:50.000	-0.7 FT MLLW
87Z(R)2043, 2045	07-26-87	0922	1:50,000	-0.7 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 09-27-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

The mean high water line of the inlet off Lake Bay, south of latitude 56° 18.0' and west of longitude 158° 18.5', has been located photogrammetrically. The chart shows an approximate mean high water line.

DESCRIPTIVE DATA

CM-8309

TP-00914

MAP SCALE: 1:20,000

PHOTOGRAPHY

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
87B(CN)6683-6687 ODDS ONLY	07-26-87	1022	1:50,000	-0.2 FT MLLW
87B(CN)6691-6693 ODDS ONLY*	07-26-87	1030	1:50,000	+0.1 FT MLLW
87Z(R)2084, 2085	07-26-87	1022	1:50,000	-0.2 FT MLLW
87Z(R)2089*	07-26-87	1030	1:50,000	+0.1 FT MLLW
				MHW = 8.0 FT

PREPARED BY: C. BLOOD DATE: 10-01-90

Charles Blood

COMPILATION REMARKS:

The stage of tide for all photography was based on predicted tide data using Anchorage Bay, Shelikof Strait, Alaska. All times refer to Alaskan Standard Time.

*Atkulik Island, latitude 56° 16.7', longitude 157° 44.0', could not be compiled due to the physical limitations of the Wild B-8. The model could not be leveled or scaled using analog methods. The infrared ratio photographs, taken at the same time, did not hold details or common image points and was not used by Compilation.

APPENDIX E

APPROVED GEOGRAPHIC NAMES

GEOGRAPHIC NAMES

FINAL NAMES SHEET

CM-8309 (Shelikof Strait, Cape Kumlik to Jack Pt., Alaska)

TP-00903

Kujulik Bay
Rudy Creek

TP-00904

Kujulik Bay
Kumlik, Cape
North Fork

TP-00905

Anguvik Island
Chignik Bay
Dry Creek
Neketa Creek

TP-00907

Bear Creek
Chignik Bay
Gull Island
Hook Bay
Hook Creek
Kujulik Bay
Kumliun, Cape

TP-00909

Chignik Bay
Kujulik Bay
Kumliun, Cape
Kumliun Creek
Unavikshak Island

TP-00911

Alfred Creek
Boomers Cove
Browns Point
Chignik Bay
Chignik Flats
Chignik Island
Chignik Lagoon
Chignik River
Diamond Point
Green Point
Hume Point
Jerrys Point
Mallard Duck Bay
Marshinlak Creek
Mensis Point
Metrofania Creek
Mud Bay
Mud Hole
Negro Head
Old Ladies Creek
Packers Point
Parallel Creek
Pilerack Point
Rabbit Point
Rocky Point
Schooner Bay
Three Sisters Rock
Through Creek
Whalers Creek

TP-00913

Anchorage Bay
Castle Bay
Chignik
Chignik Bay
Eagle Rock
Jack Bay
Jack Point
Lake Bay
Lumber Bay

TP-00914

Chignik Bay
Kak Island
Nakchamik Island
Pacific Ocean

Approved:

Charles E. Harrington

Charles E. Harrington
Chief Geographer
Nautical Charting Division

APPENDIX F

MEMORANDUM

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

January 7, 1988 N/CG2313:JDM

MEMORANDUM FOR: The Record

FROM: James D. McNamara
Acting Chief, Coastal Planning Unit
Nautical Charting Division

SUBJECT: Review and wrap-up Job CM-8309, Shelikof Strait, Cape Kumlik to Jack Point, Alaska

This coastal mapping project was scheduled for the summer 1987. The Pacific Marine Center (PMC) photo field party worked this job following the projects scheduled in Southeast Alaska. The photo field party worked this project out of Port Heiden, Alaska with the support of the NOAA helicopter.

Twenty-three photo panels were set over geodetic control stations in preparation of the bridging photography. G. Frederick, chief of the photo party, notified the Rockville Office that only 9 of the existing stations were recovered. Fourteen new stations were positioned to meet the requirements of this project. In spite of this difficulty, all of the photo panels were set before the date specified in the Field Instructions.

Air Photo Mission 1 (APM 1) relocated to Anchorage, Alaska in early July to await suitable weather for this project or the North Slope project. All of the color bridging and compilation photography was flown on two days, July 26 and 27, 1987. The Mean Lower Low Water Black and White Infrared (B & W IR) Photography was flown in tandem with the bridging photography on July 26, 1987. Attempts to secure the Mean High Water B & W IR photography were not sucessful due to the lack of suitable weather and tide windows.

The review of the bridging photography indicated that all of the photo panels could be observed. Photo panel #6 could not be observed from line 50-8 as originally planned, as the line was flown slightly off line. Tie points, however, may be used.

The data set is complete with the exception of the MHW B&W IR photography, which was not secured. The positions of the NAD 27 offset has been submitted to the National Geodetic Survey, Mr. Carlson for processing. This information should be available by January 22, 1988.