
PHOTOGRAMMETRY BRANCH
COASTAL MAPPING PROGRAM

PROJECT CM-8710
COMPLETION REPORT

NORTH CAROLINA
CORE SOUND TO PAMLICO SOUND
CAPE HATTERAS TO CAPE LOOKOUT

TP-01510, TP-01511, TP-01512, TP-01513
TP-01514, TP-01515, TP-01516, TP-01517
And TP-01518
Agency Vault-Original Report

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TP-01510, TP-01511, TP-01512, TP-01513, TP-01514,
TP-01515, TP-01516, TP-01517, and TP-01518

Year of Source-1988

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

Agency Vault - Original Report

PHOTOGRAMMETRY BRANCH
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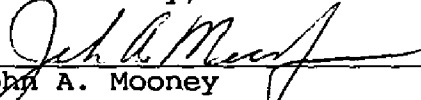
PROJECT CM-8710
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CORE SOUND-PAMLICO SOUND
Cape Hatteras to Cape Lookout
TP-01510, TP-01511, TP-01512, TP-01513, TP-01514,
TP-01515, TP-01516, TP-01517, and TP-01518

Clearance and Approval

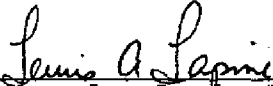
This report summarizes the photogrammetric operations related to project completion and is submitted for approval. The maps, associated data, and this report meet the requirements and standards of the Photogrammetry Branch Coastal Mapping Program. Clearance for project registration is requested.

Submitted by,



John A. Mooney
Chief, Compilation Section B
Photogrammetry Branch, NCD

Approved by,



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

2/20/91
Date

COMPLETION REPORT

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COASTAL MAPPING PROJECT CM-8710
NORTH CAROLINA
CORE SOUND-PAMLICO SOUND
CAPE HATTERAS to CAPE LOOKOUT

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COASTAL MAPPING PROGRAM PROJECT CM-8710

Introduction

Coastal Mapping Program Project CM-8710 consists of nine coastal survey maps depicting the shoreline and other cartographic features of mapping interest in the coastal zone area of Cape Hatteras to Cape Lookout, North Carolina at a scale of 1:20,000. The assigned map identifiers for this project were TP-01510 through TP-01518. Refer to FIGURE 1 for information on area coverage and geographic limits of the maps. Final map manuscripts depict the Lambert Conformal Conic Projection. The North American Datum of 1983 is shown by full line projection; the North American Datum of 1927 is shown by unlabeled offset ticks plotted at twice the interval of the NAD 1983 projection.

The purpose of this project is to provide contemporary coastal zone survey data for the maintenance of the National Ocean Service Nautical Charting Program.

Planning

The Coastal Planning Unit, headquarters office, initiated the planning phase for this project in May 1988. Refer to Appendix A. The Atlantic Marine Center Coastal Surveys Unit was assigned all horizontal control activities. Aerial photography was the responsibility of the Flight Operations Unit, headquarters office. Field instructions were issued in March 1988. A copy of these instructions are bound in Appendix B.

Field Operations

Field operations were conducted between March 14 and April 1, 1988 and consisted of aerial photography and the recovery, establishment and identification (premarking) of horizontal control necessary for aerotriangulation. Water levels were taken at three tide staff locations for tide-coordinated photographs. Field operations were summarized by the Chief of Party in a report bound in Appendix C. Refer to Appendix C for information on the horizontal control related to this project.

A Cessna Citation II aircraft (N52RF) was used for the photographic operations. Photographs utilized for this project were taken in March 1988. Color Negative photographs were acquired for aerotriangulation and map compilation at 1:50,000 and 1:30,000 scales using a Wild RC-10 camera with the "B" cone which has a calibrated focal length of 152.71 mm. Infrared photographs were acquired for map compilation at 1:50,000 scale using a Wild RC-10 camera with the "Z" cone which has a calibrated focal length of 152.71 mm.

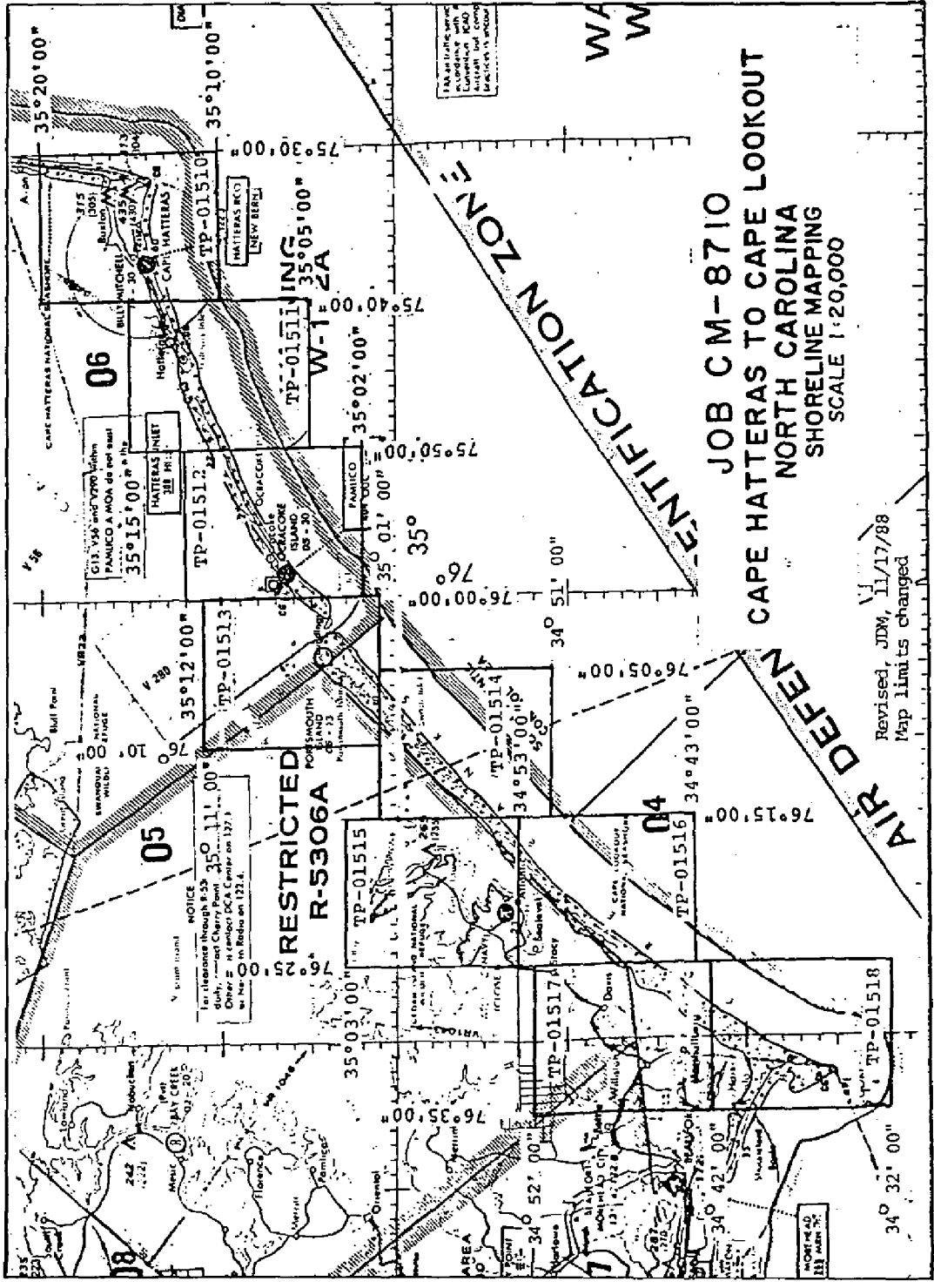


FIGURE 1. Project Diagram

The aerial photographs of the project site were reviewed in March 1988 by the Coastal Planning Unit, headquarters office, for proper endlap, horizontal control, target visibility and adequate coverage of the project site. The photographs were examined in April and May 1988 by the Quality Control Unit, headquarters office, for proper qualities required for mapping photographs as defined in the quality assurance program.

Aerotriangulation

The aerotriangulation phase was completed in July 1988 by the Aerotriangulation Unit, headquarters office. The Aerotriangulation Report is bound in Appendix D and contains information on placement of horizontal control, photographs selected for data acquisition, fit to control statistics and a summary of the procedures employed.

Compilation

Compilation is based on aerotriangulation that has met the requirements for National Standards of Map Accuracy and on office interpretation of aerial photographs. Compilation, processing, and dissemination of all applicable amending NOS Photogrammetric Instruction and data is in accordance with the C&GS Topographic Manual, Part II, and approved sections of the new Coastal Mapping Operation Manual.

The compilation phase was initiated in March 1990 and completed in August 1990 by Compilation Section B, headquarters office. The photogrammetric work stations utilized in data acquisition were Wild B-8's (S/N's: 1132, 1167, 1540, 5014, 5597). Compilation was accomplished through the application of standard analog compilation techniques and graphic compilation in the application of MHW and MLLW using infrared photographs. Refer to Appendix E for tide information for this project.

For information on the photographs used in the compilation phase, refer to the control photographs diagram of the Aerotriangulation Report. Map Compilation Sources (MCS) pages also provide information on the photographs used in the completion of each map and are bound in Appendix F.

The final maps were smooth drafted except for the application of annotation which was accomplished by using waxed back stripper film. Geographic names depicted on the maps were acquired from corresponding NOS nautical charts and USGS quadrangles and applied after approval from the NOS Staff Geographer. The Final Geographic Names listings are bound in this report as Appendix G.

Office review of the project products was conducted in August 1990 by Compilation Section B, headquarters office. The results of a comparison against the NOS nautical charts of the area were annotated on the Chart Maintenance Print and Notes to Hydrographer Print for each map.

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Comparisons were made against the following NOS nautical charts:

11545 53rd Edition (February 13, 1988), 1:40,000 scale
(inset 1:20,000 scale)
11548 32nd Edition (September 2, 1989), 1:80,000 scale
11550 23rd Edition (November 28, 1987), 1:40,000 scale
11555 32nd Edition (May 12, 1990), 1:80,000 scale

Comparisons were made against the following Coastal Mapping Projects:

CM-7219 Cape Fear to Cape Lookout
CM-7305 Cape Hatteras to Cape Lookout

A significant change in the shoreline was noted when comparing CM-7219 and CM-7305 to the current manuscripts.

Final Review

The final review phase was initiated in August 1990 by the Compilation Unit B, headquarters office. 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 Appendix H for the final listing of cartographic features of charting interest for application in the nautical charting program. The coastal survey maps and project data sets comply with the general requirements for a standard coastal mapping project. All source data, photographic devices, surveying and photogrammetric measurement instruments 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 acquired. A Chart Maintenance Print and a Notes to Hydrographer Print was generated for each map within the project.

This project completion report is the authoritative summary for project CM-8710 and is in compliance with Section 14, Project Completion Report of the Photogrammetry Branch 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 Administration

Copy of this Project Completion Report Brown Jacket containing:

- Field Data Binder titled "Original Field Data" containing Control Station Identification forms, numerous computational forms and diagrams
- One copy of the project diagram (page size)
- One copy of the Aerotriangulation Report
- One copy of the Cartographic Features of Charting Interest listing
- One copy of NOAA form 76-52, Observations of Horizontal Directions
- Field Data Binder titled "CM-8710 Tide Data" containing tide staff sketches, copies of NOAA forms: 75-29, 76-77, 76-186, 77-12 77-45, and NOAA form 490, Tidal Bench Marks descriptions and Tidal Bench Mark Elevation work sheets.
- One NOAA Form 75-29
- Two NOAA Forms 76-52 (books)
- Five NOAA Forms 76-77 (books)
- One NOAA Form 76-156 (book)
- 17 NOAA Forms 76-186
- Three NOAA Forms 77-12
- Three NOAA Forms 77-53 (books)

Agency Archives

- Registration Copy of Each Map
- Original Project Completion Report

Photogrammetric Electronic Data Library

There is no project digital data maintained in the library

Reproduction Branch, Aeronautical Charting Division

- 8X Reduction Negative of each Map

Marine Chart Branch

- Chart Maintenance Print of Each Map
- Abbreviated Copy of this Project Completion Report

All final project data and products were forwarded to the Production Control Unit, headquarters office for registration and dissemination.

APPENDIX A



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

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NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852
May 20, 1988 N/CG2313:JDM

MEMORANDUM FOR: The Record
FROM: *James D. McNamara*
James D. McNamara
Acting Chief, Coastal Planning Unit
Photogrammetry Branch, NCD

SUBJECT: Review and wrap-up Job CM-8710, Cape
Hatteras to Cape Lookout, North Carolina,
Shoreline Mapping

This coastal mapping project was scheduled for early spring of 1988. The Atlantic Marine Center (AMC) photo field party began the work on this project March 14, 1988. The PROJECT INSTRUCTIONS : FIELD, dated March 16, 1988 specified the photo panels to be in place by March 25, 1988.

This project was planned in support of nautical charts and was worked in conjunction with a concurrent project undertaken for the National Marine Fisheries Service (NMFS).

On March 16, 1988, Air Photo Mission 1 (APM-1) started securing photography of the job site. The photo panels were not in place and the supplemental compilation was taken. The supplemental compilation photography is 1:24,000 scale. This scale is the same as work done for NMFS.

This project required three tidal staffs to be occupied for tide-coordinated photography. The staff at Hatteras (Frisco) Pier is an operating ETG and ADR. This gage was used to control the photography for the outside or coastline of the barrier islands. The mean high water (MHW) and the mean lower low water (MLLW) black and white infrared (B&W IR) photography was secured based on this gage.

The other two sites were "historic" staffs that had to be reoccupied and temporary staffs set for the project. The staff at Ocracoke, North Carolina, U.S.C.G. Station Silverlake was occupied to secure the infrared photography for the inside or back bay area of Pamlico Sound. The Hydrographic and Marine Boundary Unit (HMBU) indicated this area was not considered tidal, with a range less than a foot. This area was flown at Mid Water Level \pm .3 foot.



The third staff occupied was at Calico Jack's Marina at Harkers Island, North Carolina. This staff was used to coordinate the B&W IR photography within Core Sound. This area is considered an inside staff. There is limited "historical" tide data within Core Sound and the tide decreases as it progresses northward to Pamlico Sound. The personnel of HMBU felt it would be best to fly not only MHW and MLLW but also Mean Water Level off this staff.

Two complete sets of B&W IR photography were taken as an IR exposure test. Unfortunately, they were improperly exposed. Processing, however, improved the exposure to a proper level.

The personnel of the AMC photo field party did an exemplary job of working up the tide staff data. This data was given to The Hydrographic and Marine Boundary Unit N/OMA123 for incorporation into their tide station information folder.

On March 28, 1988, the bridging photography was secured. The review of the photography indicated all of the photo panels were in place at that time. The more northern lines, 30-1, 30-2, and 30-3 were taken at 1:30,000 scale due to the narrowness of the barrier islands. Photo panels #6, #7, and #11 were targeted at 1:50,000 scale, as they were used for both 1:50,000 and 1:30,000 scale bridging photography.

The B&W IR photography was all tide coordinated. All of the lines were properly observed and recorded at all three tide staffs. The data set for this project includes the Bridging and Compilation photography, the B&W IR photography taken at MHW, MLW, and Mean Water Level, the field data report, the tide observations, and the NAD 27 offset data which will follow at a later date.

CC:

N/CG23 - Bryson
N/CG231 - Brewer
N/CG232 - Raborn
N/CG2321 - Fromm
N/CG2313 - McNamara
N/CG2322 - Norman
N/MOA22 - North

APPENDIX B



UNITED STATES DEPARTMENT OF COMMERCE 8
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

March 16, 1988

N/CG2313:JDM

TO: N/MOA - Ray E. Moses
FROM: N/CG2 - *Christian Andreasen* Christian Andreasen
SUBJECT: PROJECT INSTRUCTIONS: FIELD - Job CM-8710,
Cape Hatteras to Cape Lookout, North Carolina,
Shoreline Mapping

Subject instructions are forwarded for signature and issue to the Chief, Photogrammetry Branch.

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

Attachment





Chief, Photogrammetry Branch
Atlantic Marine Center

PROJECT INSTRUCTIONS: FIELD - Job CM-8710, Cape Hatteras
to Cape Lookout, North Carolina, Shoreline Mapping

1.0. PURPOSE

These instructions provide specifications and a schedule for: (1) placing targets on horizontal control stations in advance of aerial photography and (2) furnishing field support to obtain tide-coordinated infrared aerial photography.

2.0. AREA

The area to be mapped is located in North Carolina from Cape Hatteras to Cape Lookout. Mapping at 1:20,000 scale will cover the shoreline of the barrier islands, intracoastal waterway, and adjacent sounds and bays.

3.0. PHOTOGRAPHY

3.1. Aerotriangulation photography at 1:50,000 and 1:30,000 scales and supplemental compilation photography at 1:30,000 and 1:24,000 scales will be obtained using color negative film. Also, 1:50,000-scale black-and-white infrared photography, that is tide coordinated, will be obtained at mean high water, mean lower low water, and mean water level.

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. The chief of the photo field party will consult with the chief of the air photo mission to determine if this requirement exists.

4.0. ASSIGNMENT

You are assigned all field operations required to:
(1) place targets on horizontal control stations and
(2) provide ground support needed to obtain tide-coordinated photography. The Chief, Air Photo Mission 1, will be responsible for scheduling photography at the required times, based on tide staff observations furnished by radio.



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. New stations will be monumented if they are required for future work in the area needing geodetic control.

5.6. 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, by Overnight Express Service, the 7 1/2' quads and a copy of the CSI card when the quad does not adequately depict the target location. These quads will depict the station location, panel array used, and the panel number. This will assist in the film quality review, target identification, and 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- and 1:30,000-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 specified control stations. Monumented stations (reference marks, azimuth marks) are preferred substitute stations.

6.2.6. Substitute stations will be positioned to the specifications stated in Photogrammetric Instruction No. 22, Revised September 30, 1965, section 4.02.2.

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

7.0. CONTROL STATION IDENTIFICATION CARD

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

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

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

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

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

8.0. TIDE OBSERVATIONS AND RECORDS FOR TIDE-COORDINATED PHOTOGRAPHY

8.1. Tide-coordinated photography will be flown when the stage of tide is mean high water \pm .3 foot, mean lower low water \pm .3 foot, and mean water level \pm .3 foot. Use NOAA Form 77-53, Tides, to record tide staff observations at 15-minute intervals during tide-coordinated photographic flights.

8.2. The existing staff at Cape Hatteras Fishing Pier, North Carolina (865-4400), will be monitored in conjunction with flight lines 50-2, 50-4, and 50-5 on mean high water and mean lower low water. These lines will be flown directly on the staff. Tidal datums and predictions for Cape Hatteras Fishing Pier will be furnished.

8.3. Install a tide staff at Ocracoke, North Carolina (865-1792), and make a level connection to existing tidal bench marks. The staff will only be used for the duration of this project. The staff will be monitored in conjunction with flight lines 50-3, 50-5, and 50-6, which will be flown at mean water level. These lines will be flown directly on the staff. The datum for Ocracoke will be furnished.

8.4. Install a tide staff at Calico Jack's Marina, Harkers Island, North Carolina (865-6612), and make a level connection to existing tidal bench marks. The staff will only be used for the duration of this project. The staff will be monitored in conjunction with flight line 50-1, which will be flown at mean water level, mean high water, and mean lower low water. These lines will be flown directly on the staff. Tidal datums and predictions for Calico Jack's Marina, Harkers Island will be furnished.

8.5. Periods when the tides are predicted to be in range for mean lower low water and for mean high water occur throughout the months of March and April 1988.

9.0. LEVELING

Make a level connection to each tide staff from at least two tidal bench marks. Use NOAA Form 76-77, Leveling Record--Tide Station, to record leveling data.

10.0. SCHEDULE

All stations shall be premarked and ready for photography by March 25, 1988. If premarking is not completed by this date, inform N/CG2313 so this information can be relayed to the air photo mission.

11.0. REPORT

A field operations report covering all pertinent field work performed is required upon completion of the field phase of this project.

12.0. RECORDS

All field records will be sent through N/MOA2222 for review prior to being forwarded to N/CG2313.

13.0. MODIFICATIONS OF INSTRUCTIONS

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

14.0. COSTS

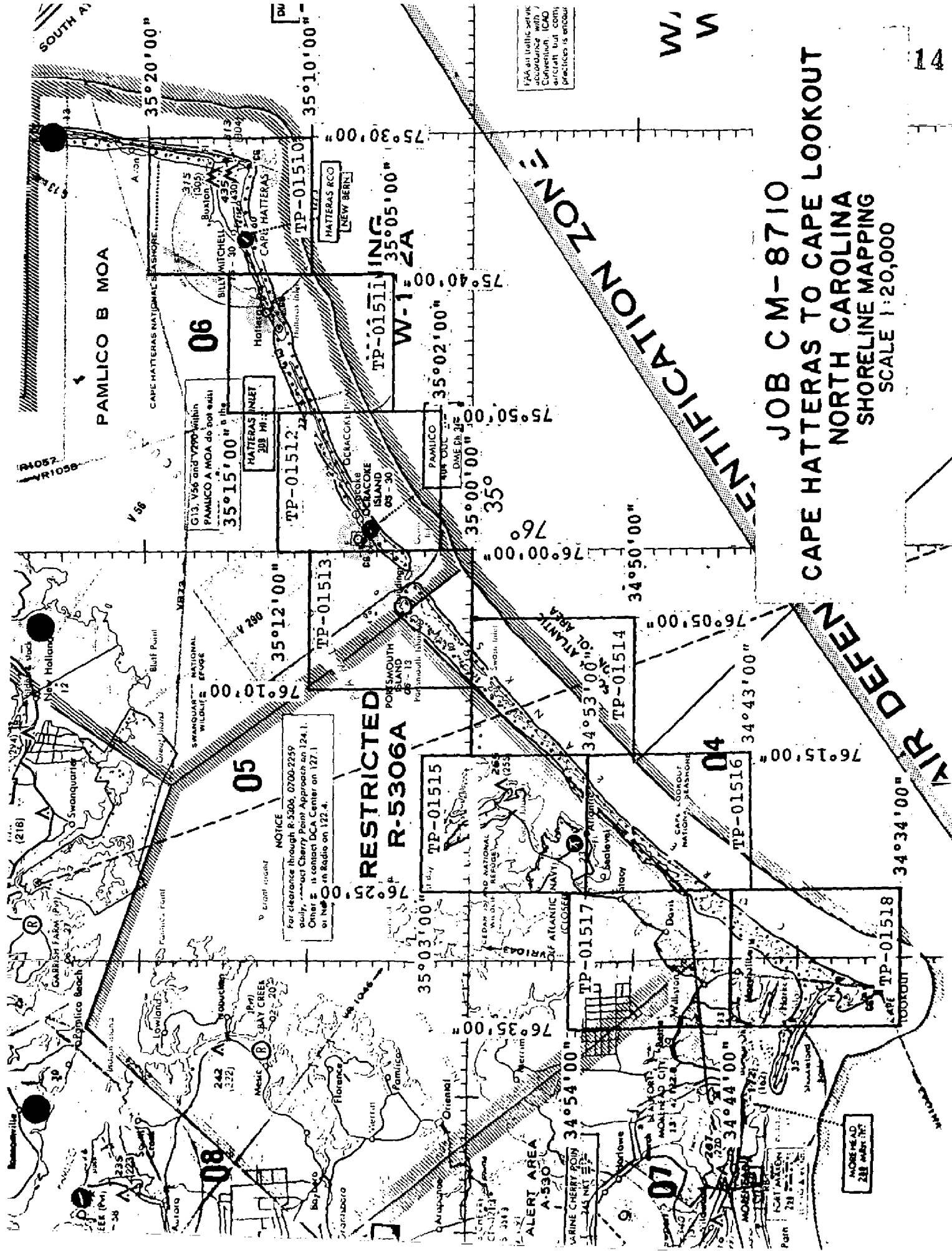
All costs incurred on this assignment shall be charged to Task 8K6C01.

15.0. RECEIPT

Acknowledge receipt of these instructions.

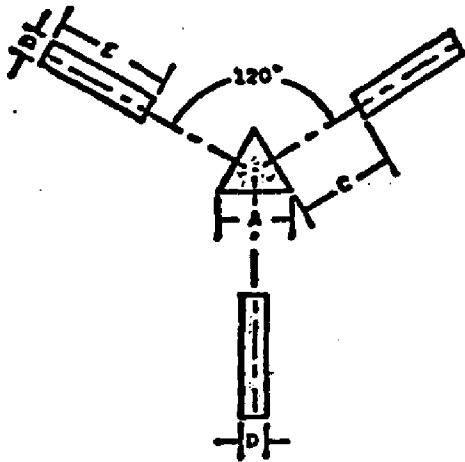
Ray E. Moses
Director
Atlantic Marine Center

Christian Andreasen
Christian Andreasen
Chief, Nautical Charting Division
Charting and Geodetic Services

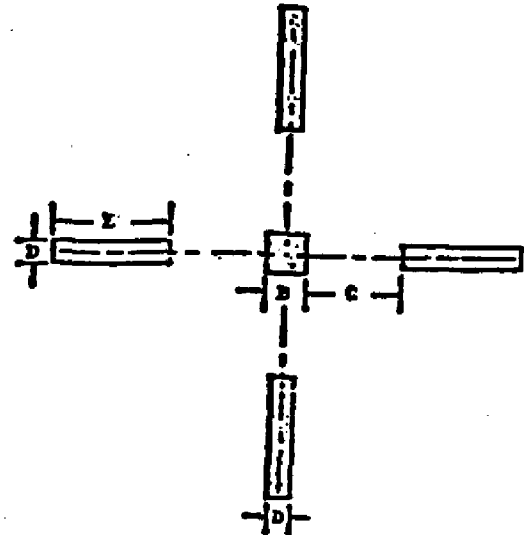


SPECIFICATIONS FOR PREHARKING CONTROL STATIONS
 Revised November 23, 1976

ARRAY NO. 1



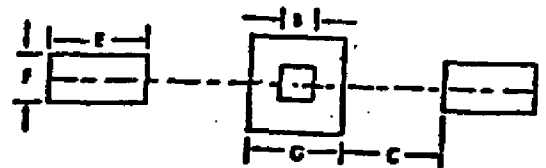
ARRAY NO. 2



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)

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
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 C

NATIONAL OCEAN SERVICE

ATLANTIC MARINE CENTER

COASTAL SURVEYS

PROJECT REPORT

SHORELINE MAPPING - PREFINISHING

CN-8710

CAPE HATTERAS to CAPE LOOKOUT, NORTH CAROLINA

*make a
darker copy
P 16-19 7*

1.0 PURPOSE:

This project was accomplished to provide targets on horizontal control stations required for aerotriangulation and to provide field support for tide-coordinated infrared aerial photography according to PROJECT INSTRUCTIONS: FIELD - Job-8710, Cape Hatteras to Cape Lookout, North Carolina, Shoreline Mapping dated March 18, 1988.

2.0 AREA:

Shoreline mapping is located in North Carolina from the barrier islands near Avon, North Carolina southerly to Cape Lookout including the intercoastal waterway, and adjacent sounds and bays.

3.0 PARTICIPATION:

3.1 Personnel:

Party Chief South Half	R. DeCroix
Assistants	P.B. Walbolt J. Koster

Party Chief North Half	C.S. Middleton
Assistant	D.R. Miller

3.2 Time:

Arrived N.Carolina 3-14-1988
Departed N.Carolina 4-01-1988

3.3 Equipment:

- 2 4x4 carry-all trucks
- 2 Wild T-2 Theodolite
- 2 EDM HP-3808
- 2 NI2 Level
- 6 MX 350 Radios
- 2 Aircraft Radios

4.0 FIELD ACTIVITY:

4.1 FIELD METHODS:

Fifteen (15) stations were paneled for aerotriangulation photography. Each target that was offset was positioned in accordance with Photo Instruction No. 22. Recovery notes are submitted for each horizontal control station used on this project. Each panel was verified as being in position subsequent to the bridging photography. A graphic showing the position of each panel was mailed to the Rockville office.

4.2 CONTROL:

NAD 1983 was the controlling datum.

4.3 DISCUSSION OF RESULTS:

Panels were located using the following methods:

- #1 1:30,000 scale panel was offset from station AVON 1962 and was positioned by direct solar azimuth and taped distance.
LAT N 35-21-30.54115 LON W 97-25-39.81286
- #2 1:30,000 scale panel was offset from CAPE HATTERAS LORAN MAST and in line with CAPE HATTERAS LH 1933. A solar was observed at CAPE HATTERAS LORAN MAST to CAPE HATTERAS LH 1933 to verify the azimuth. The distance from CAPE HATTERAS LORAN MAST to Panel Number 2 was taped.
LAT N 35-14-27.06162 LON W 75-31-36.13182
- #3 1:30,000 scale panel was offset from station H-1-NC-1979. Azimuth was observed to HATTERAS W TANK with an azimuth check of 01.8" observed to HATTERAS INLET LIGHTHOUSE. The distance from H-1-NC-1979 to Panel Number 3 was measured by EDNI.
LAT N 35-12-29.89270 LON W 75-42-19.15521
- #4 1:30,000 scale panel was offset from station KING 1962. A reverse solar azimuth was observed from Panel Number 4 to KING 1962 and the distance was measured by EDNI.
LAT N 35-09-17.22484 LON W 75-51-04.26521
- #5 1:30,000 scale panel was placed directly over new Doppler satellite station, OCRV 1988.
LAT N 35-04-39.589 LON W 75-59-49.845
- #6 1:50,000 scale panel was offset from station SMOTH 1960. A direct solar azimuth and taped distance was observed to Panel Number 6.
LAT N 35-04-07.20467 LON W 76-03-23.11947
- #7 1:50,000 scale panel Doppler station paneled direct.
LAT N 34-57-24.855 LON W 76-11-12.312
- #7A 1:50,000 scale panel Doppler station paneled direct.
LAT N 35-01-40.198 LON W 76-05-30.828
- #8 1:50,000 scale panel Doppler station paneled direct.
LAT N 35-00-47.325 LON W 76-18-21.936

- #9 Doppler station paneled direct.
LAT N 35-01-18.107 LON W 76-21-19.011
- #10 Solar from station Atlantic 2 1962 with short
traverse.
LAT N 34-53-17.567 LON W 76-19-47.251
- #11 Doppler station paneled direct.
LAT N 34-51-36.192 LON W 76-18-42.264
- #12 Solar from station Stacy 1933 with a short
traverse.
LAT N 34-49-53.276 LON W 76-25-11.469
- #13 Paneled directly over station Dey USF 1943.
LAT N 34-42-29.37482 LON W 76-37-05.94639
- #14 Reverse solar and base line using station Cape
Lookout Lighthouse 1886 as the control.
LAT N 34-36-36.366 LON W 76-32-26.616

Levels were run at three tide staff locations:
(See Tide Data.)
865-4400-Cape Hatteras, N.Carolina
865-4792-Ocracoke, N.Carolina
865-6612-Calico Jacks Marina

6.0 STATISTICS:

Number of stations paneled	15
Number of stations recovered	9
Number of tide staffs leveled	3

7.0 RECORDS:

All original records with the exception of the recovery notes and tidal level books will be forwarded to Rockville, Md. N\CG2314. The original recovery notes will be processed through the MTEN format for inclusion into the NGS Data Base. A copy of all field data and this report will be maintained at Atlantic Marine Center's Coastal Surveys Unit, N\NOA2222. Original tidal level books will be forwarded to the Atlantic Operations Group, Norfolk, Virginia for incorporation into the respective historical records.

April 11, 1988
Submitted by:
Robert DeCroix
Robert DeCroix

Approved:
Jim D. Shea
Jim D. Shea
Chief, Coastal Surveys

APPENDIX D

AEROTRIANGULATION REPORT
CM-8710
CAPE HATTERAS TO CAPE LOOKOUT,
NORTH CAROLINA
DECEMBER 1988

AREA COVERED

This report covers the area from Cape Hatteras to Cape Lookout, North Carolina. The project consists of nine 1:20,000-scale sheets; TP-01510 through TP-01518.

METHOD

Two strips of 1:30,000-scale color photographs and four strips of 1:50,000-scale color photographs were bridged by analytic aerotriangulation methods and adjusted to ground using the GIANT program. Pre-marked control stations were used as horizontal control. In addition, office identified geodetic intersection stations were used as supplemental control. The 1:30,000-scale photographs were measured using the National Ocean Service Plotter (NOSAP) under control of the Integrated Digital Photogrammetric Facility software (IDPF). The 1:50,000-scale photographs were measured using the STK comparator. Common points were transferred between strips to ensure adequate junctioning.

Ratio values were determined for the bridging photographs, as well as the 1:50,000-scale MHW, Mean Tide Level, and the MLLW black and white infrared 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 North Carolina State Plane Coordinate System. 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.

CM-8710



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.

Submitted by,


Victor E. McNeel
Brian Thornton

Approved and Forwarded

Don O. Norman
Chief, Aerotriangulation Unit

CM-8710

RATIO VALUES

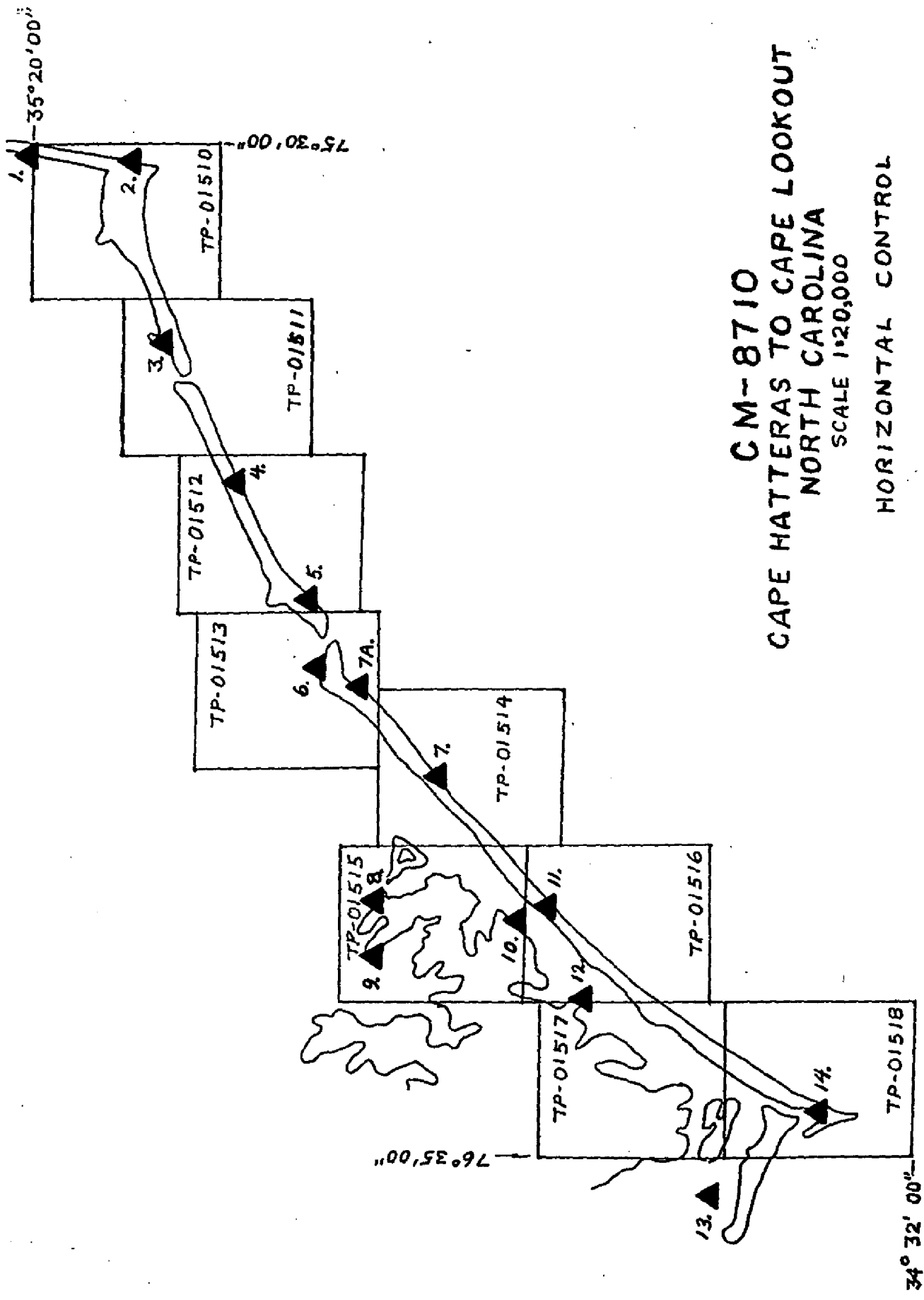
<u>1:30,000-scale bridging photographs</u>	<u>Ratio Value</u>
88 B(CN) 9269 through 9276	1.49
88 B(CN) 9294 through 9314	1.49
<u>1:50,000-scale bridging photographs</u>	
88 B(CN) 9159 through 9164	2.46
88 B(CN) 9172 through 9183	2.46
88 B(CN) 9187 through 9191	2.46
88 B(CN) 9195 through 9212	2.46
<u>1:50,000-scale MLLW black and white infrared photographs</u>	
88 Z(R) 4462 through 4480	2.43
88 Z(R) 4709 through 4712	2.40
88 Z(R) 4719 through 4736	2.41
88 Z(R) 4753 through 4765	2.43
88 Z(R) 4982 through 4987	2.48
<u>1:50,000-scale MTL black and white infrared photographs</u>	
88 Z(R) 4485 through 4499	2.39
88 Z(R) 4509 through 4513	2.41
88 Z(R) 4672 through 4687	2.39
88 Z(R) 4699 through 4702	2.40
<u>1:50,000-scale MHW black and white infrared photographs</u>	
88 Z(R) 4434 through 4448	2.39
88 Z(R) 4785 through 4788	2.41
88 Z(R) 4793 through 4805	2.41
88 Z(R) 4811 through 4828	2.42

CM-8710

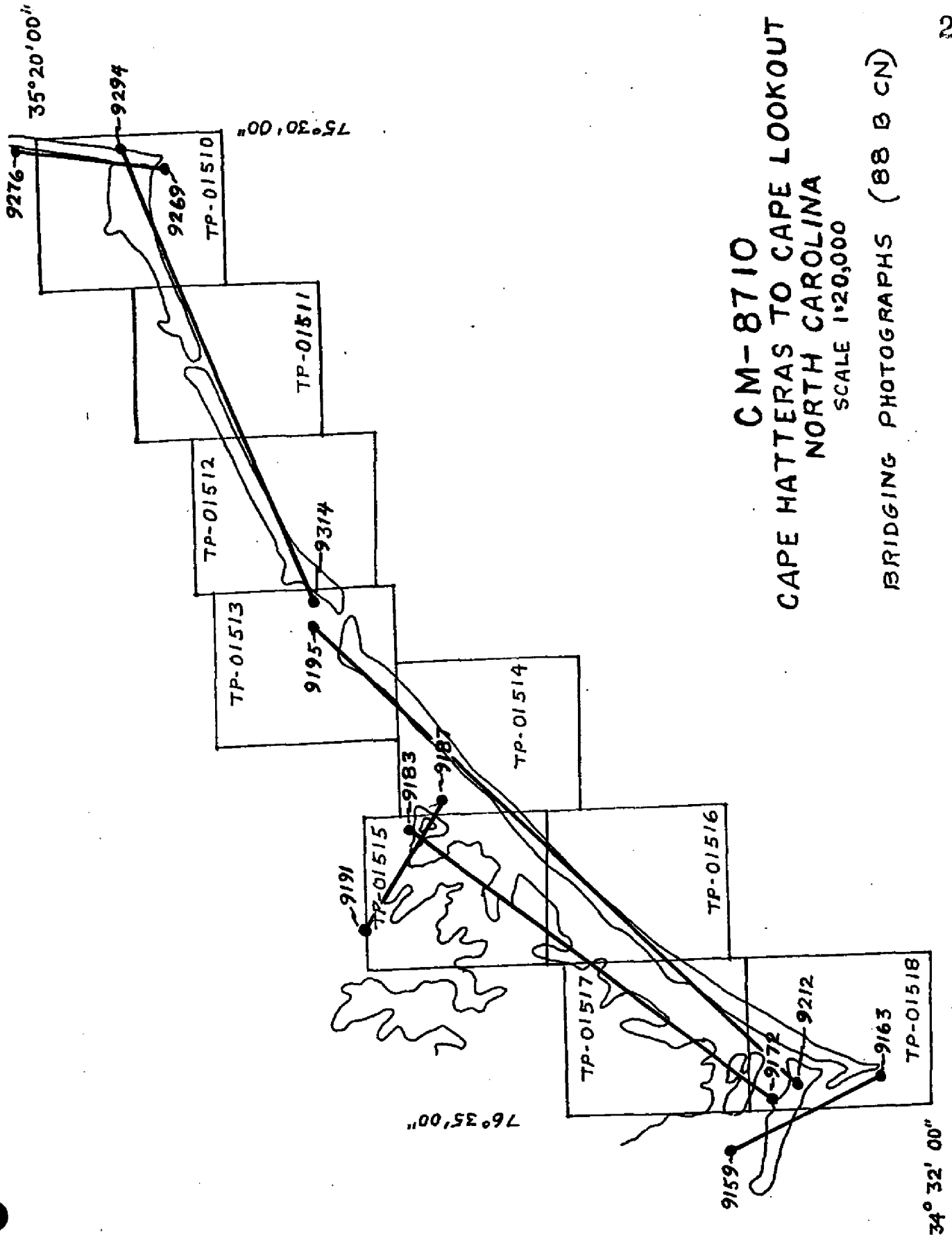
FIT TO CONTROL

▲ = control 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. AVON 1962, PANEL 1	276101	-0.2	-0.2
▲	2. CAPE HATTERAS LORAN M., PANEL 2	270101	+0.6	-0.2
▲	3. H-1-NC 1979, PANEL 3	301101	-0.7	+1.1
▲	4. KING 1962, PANEL 4	308101	+0.5	-0.8
▲	5. OCRY 1988, PANEL 5	314100		
	(strip 30-2)		-0.2	+0.2
	(strip 50-2)		+0.3	+0.2
▲	6. SMOTH 1960, PANEL 6	197101	-1.4	0.0
▲	7. DOPPLER PANEL 7	200100	+0.3	-0.2
▲	7A. DOPPLER PANEL 7A	198100	+1.5	-0.4
▲	8. DOPPLER PANEL 8	189100	+0.1	-1.6
▲	9. DOPPLER PANEL 9	191100	+0.5	-0.2
▲	10. ATLANTIC 2, PANEL 10	204101	+1.6	+1.3
▲	11. DOPPLER, PANEL 11	205100	+1.5	+1.3
▲	12. STACY, PANEL 12	206101	-1.4	+0.9
▲	13. DEY USE 1943, PANEL 13	172100	+0.6	-1.3
▲	14. CAPE LOOKOUT LT H., PANEL 14	163101	-0.4	+0.2
□	CAPE LOOKOUT LT. H. 1986	163100	+5.9	+3.7
□	CAPE HATTERAS LT. H. 1933	1	+0.8	-2.9
□	HATTERAS WATER TANK	3	+2.8	-2.0
□	AVON WATER TANK	7	+0.9	-0.3
□	OCRACOCKE C. G. CUPOLA	8	-2.3	+5.8
□	UNIDENTIFIED B MIT TANK 1	9	+5.5	-3.4

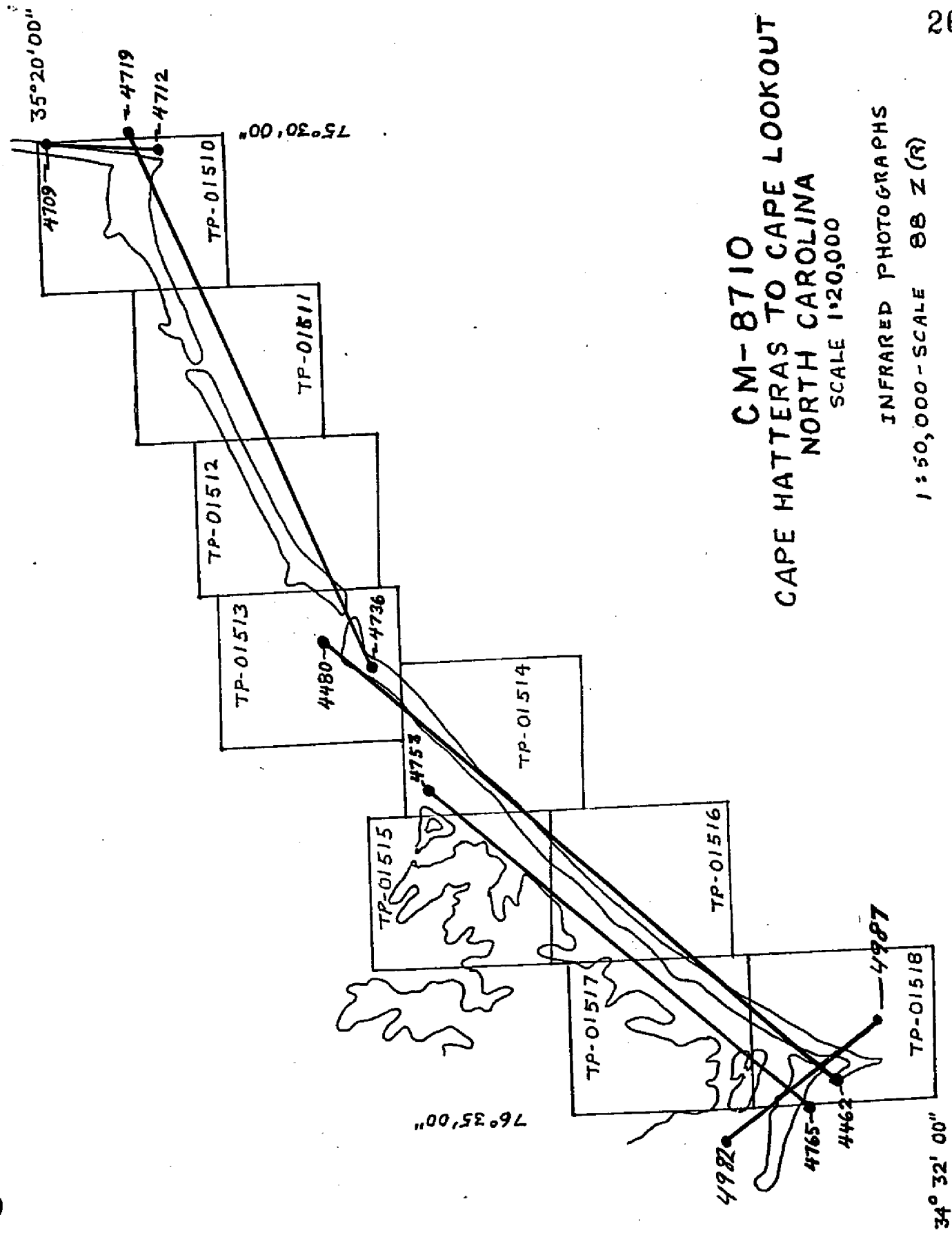


CM-8710
CAPE HATTERAS TO CAPE LOOKOUT
NORTH CAROLINA
 SCALE 1:20,000
 HORIZONTAL CONTROL



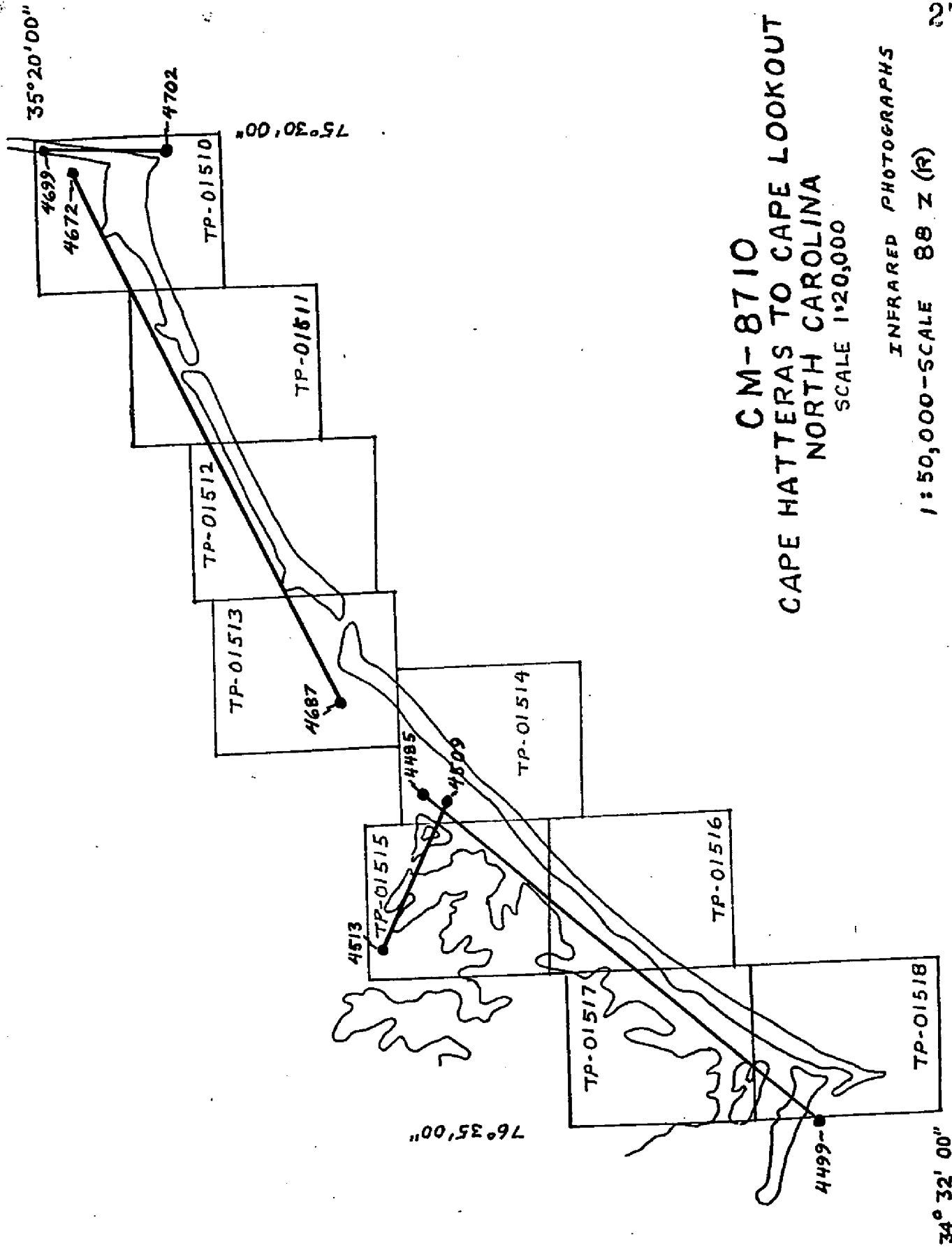
CM-8710
CAPE HATTERAS TO CAPE LOOKOUT
NORTH CAROLINA
 SCALE 1:20,000

BRIDGING PHOTOGRAPHS (88 B CN)



CM-8710
 CAPE HATTERAS TO CAPE LOOKOUT
 NORTH CAROLINA
 SCALE 1:20,000

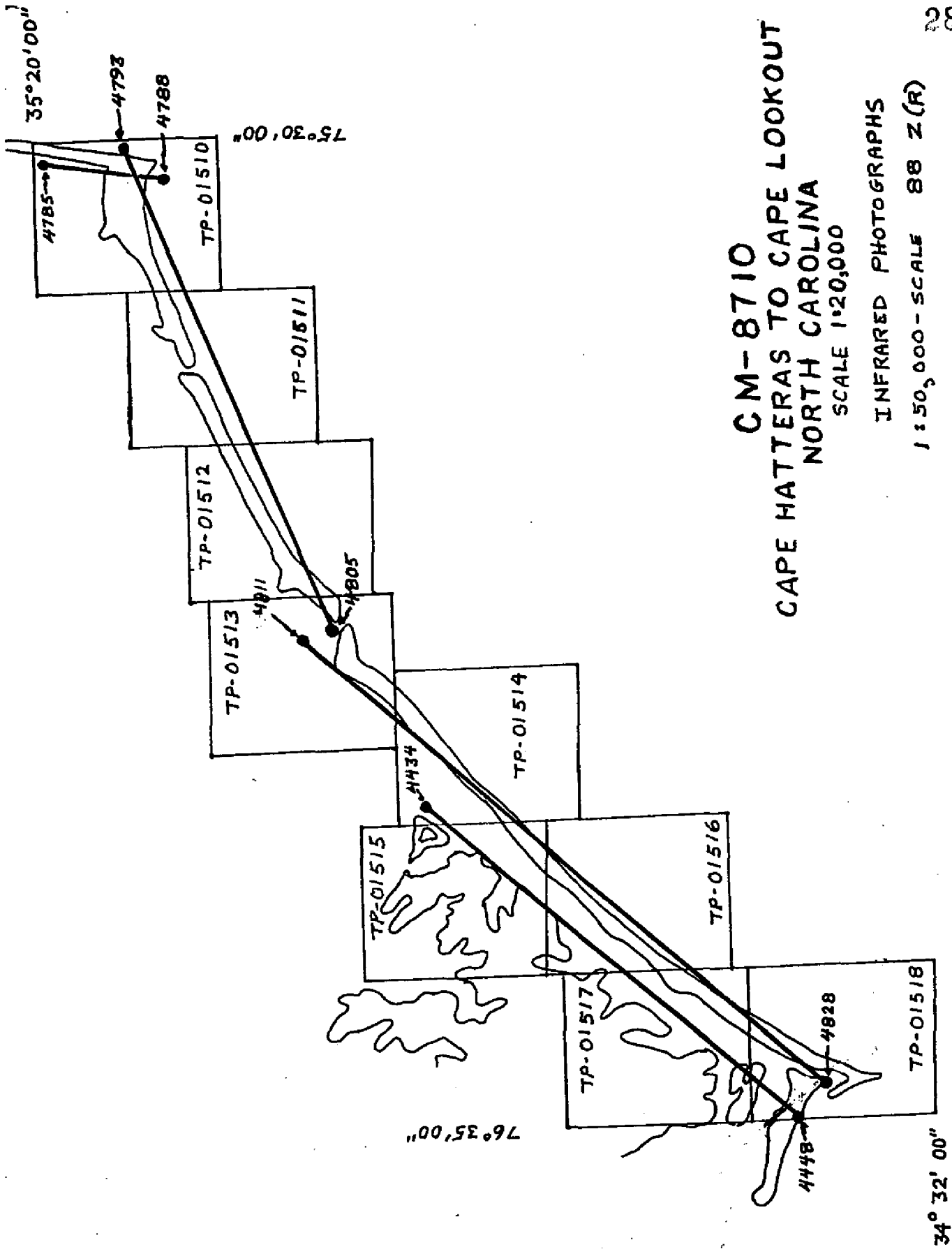
INFRARED PHOTOGRAPHS
 1:50,000 - SCALE 88 Z (R)



CM-8710
 CAPE HATTERAS TO CAPE LOOKOUT
 NORTH CAROLINA
 SCALE 1:20,000

INFRARED PHOTOGRAPHS

1:50,000-SCALE 88 Z (R)



CM-8710
CAPE HATTERAS TO CAPE LOOKOUT
NORTH CAROLINA

SCALE 1:20,000

INFRARED PHOTOGRAPHS

1:50,000 - SCALE 88 Z (A)

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	JOB NO.	GEODETTIC DATUM		ORIGINATING ACTIVITY		REMARKS
		STATION NAME	AEROTRI- ANGULATION POINT NUMBER	COORDINATES IN FEET STATE <u>N. Carolina</u> ZONE	GEOGRAPHIC POSITION φ LATITUDE λ LONGITUDE	
	GM-8710					
		SMOTH, 1960 PANEL 6	197101	X= 2848716.018 ✓ Y= 492964.735 ✓	φ 35 04 07.205 ✓ λ 76 03 28.119 ✓	
		DOPPLER PANEL 7A	198100	X= 2838956.780 ✓ Y= 477809.184 ✓	φ 35 01 40.198 ✓ λ 76 05 30.828 ✓	DOPPLER STATION
		DOPPLER PANEL 7	200100	X= 2811300.844 ✓ Y= 451187.919 ✓	φ 34 57 24.855 ✓ λ 76 11 12.342 ✓	DOPPLER STATION
		DOPPLER PANEL 8	189100	X= 2775004.589 ✓ Y= 470657.008 ✓	φ 35 00 47.325 ✓ λ 76 18 21.936 ✓	DOPPLER STATION
		DOPPLER PANEL 9	191100	X= 2760199.406 ✓ Y= 473371.783 ✓	φ 35 01 18.107 ✓ λ 76 21 19.011 ✓	DOPPLER STATION
		ATLANTIC 2, 1962	204100	X= 2769058.232 ✓ Y= 425005.752 ✓	φ 34 53 17.500 ✓ λ 76 19 48.166 ✓	
		ATLANTIC 2 PANEL 10	204101	X= 2769134.240 ✓ Y= 425014.572 ✓	φ 34 53 17.567 ✓ λ 76 19 47.251 ✓	
		DOPPLER PANEL 11	205100	X= 2774823.100 ✓ Y= 414916.205 ✓	φ 34 51 36.192 ✓ λ 76 18 42.264 ✓	DOPPLER STATION
		STACY, 1933	206100	X= 2742662.643 ✓ Y= 403704.016 ✓	φ 34 49 53.761 ✓ λ 76 25 11.583 ✓	
		STACY PANEL 12	206101	X= 2742673.416 ✓ Y= 403655.250 ✓	φ 34 49 53.276 ✓ λ 76 25 11.469 ✓	
COMPUTED BY			DATE	COMPUTATION CHECKED BY	DATE	
LISTED BY	Don O. Norman		DATE 4/19/88	LISTING CHECKED BY	DATE 8-12-88	
HAND PLOTTING BY			DATE	HAND PLOTTING CHECKED BY	DATE	

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	JOB NO.	STATION NAME	SOURCE OF INFORMATION (Index)	AEROTRI-ANGULATION POINT NUMBER	GEODEIC DATUM		ORIGINATING ACTIVITY		REMARKS
					STATE ZONE	COORDINATES IN FEET	φ LATITUDE	λ LONGITUDE	
	CM-8710				NAD 83				
9		DEY USE 1943 PANEL DIRECT	Field Data	172100	X= 2 684 212.161 Y= 357 305.195	φ 34 42 29.375 λ 76 37 05.946		0	
10		1886 CAPE LOOKOUT L.T.H., PANEL 14	NAD 83 pamphlet Beaufort	163100	X= 2 713 162.788 Y= 326 920.013	φ 34 37 21.889 λ 76 31 28.341			
11		CAPE LOOKOUT L.T.H. PANEL 14	Field Data	163101	X= 2 708 408.295 Y= 322 198.393	φ 34 36 36.366 λ 76 32 26.616			
12		CAPE HATTERAS L.H., 1933	"	1	X= 3 006 967.852 Y= 565 900.320	φ 35 15 17.666 λ 75 31 14.520			
13		HATTERAS INLET LIGHTHOUSE	Field Data	2	X= 2 935 372.758 Y= 566 577.762	φ 35 15 48.325 λ 75 45 37.162			
		HATTERAS WATER TANK	Field Data	3	X= 2 960 563.050 Y= 550 529.295	φ 35 13 01.433 λ 75 40 40.006			
					X=	φ			
					Y=	λ			
					X=	φ			
					Y=	λ			
					X=	φ			
					Y=	λ			
					X=	φ			
					Y=	λ			
					COMPUTATION CHECKED BY				DATE
					LISTING CHECKED BY				DATE
					HAND PLOTTING CHECKED BY				DATE

SUPERSEDES NOAA FORM 76-41, 2-71 EDITION WHICH IS OBSOLETE.

APPENDIX E

TIDE INFORMATION

PROJECT: CM-8710
 LOCATION: OCRACOKE ISLAND,
 NORTH CAROLINA
 GMT ZONE PRIME MERIDIAN PARALLEL

PREDICTED
 TIDE-COORDINATED X
 REFERENCE STATION RECORDS

TIDE STATION: OCRACOKE ISLAND, (SILVER LAKE)
 TIDE RANGE: 0.97 FEET

FLIGHT LINE	TIDE LINE	PHOTOGRAPHS	SCALE	DATE SPOT-NUMBER	TIME CUT/EST LOCAL STD	TIDE STAGE (in Feet)
50-3C	INSIDE	88ZR 4508-4516	1:50,000	3/16/88	1726-1732	MHW(-)0.55
				54-14	1226-1232	MLLW 0.42
50-5C	INSIDE	88ZR 4696-4704	1:50,000	3/17/88	1535-1538	MHW(-)0.8
				54-14	1035-1038	MLLW 0.2
50-6C	INSIDE	88ZR 4670-4694	1:50,000	3/17/88	1505-1519	MHW(-)0.7
				54-14	1005-1019	MLLW 0.3

LOCATION: HARKERS ISLAND, NORTH CAROLINA
 TIDE STATION: CALICO JACK'S MARINA
 TIDE RANGE: 1.80 FEET

50-1A	INSIDE	88ZR 4433-4450	1:50,000	3/16/88	1526-1536	MHW(-)0.3
				54-14	1026-1036	
50-1B	INSIDE	88ZR 4751-4766	1:50,000	3/17/88	1931-1942	MLLW 0.3
				54-14	1431-1442	
50-1C	INSIDE	88ZR 4484-4493	1:50,000	3/16/88	1639-1646	MHW(-)0.7
		88ZR 4494-4500		54-14	1139-1146	MLLW 1.1
					1646-1651	MHW(-)0.8
					1146-1151	MLLW 1.0

REMARK:

APPROVED BY:

James E. Schad
 N/CG235 11/6/90

TIDE INFORMATION

PROJECT: CM-8710
 LOCATION: CAPE HATTERAS,
 NORTH CAROLINA
 GMT ZONE PRIME MERIDIAN PARALLEL

PREDICTED
 TIDE-COORDINATED
 REFERENCE STATION RECORDS

TIDE STATION: CAPE HATTERAS (FRISCO) FISHING PIER
 TIDE RANGE: 3.17 FEET

FLIGHT LINE	TIDE LINE	PHOTOGRAPHS	SCALE	DATE SPOT-NUMBER	TIME CUT/EST LOCAL STD	TIDE STAGE (in Feet)
50-2B	OUTSIDE	88ZR 4460-4482	1:50,000	3/16/88 54-14	1619-1629 1119-1129	MLLW 0.2
50-4B	OUTSIDE	88ZR 4716-4733	1:50,000	3/17/88 54-14	1614-1625 1114-1125	MLLW 0.1
		88ZR 4734-4740			1626-1628 1126-1128	MLLW(-)0.1
50-5B	OUTSIDE	88ZR 4706-4714	1:50,000	3/17/88 54-14	1557-1601 1057-1101	MLLW 0.2
50-7	OUTSIDE	88ZR 4981-4992	1:50,000	3/28/88 54-11	1434-1439 0934-0939	MLLW 0.3
50-2A	OUTSIDE	88ZR 4811-4820	1:50,000	3/20/88 54-14	1438-1444 0938-0944	MHW(-)0.2
		88ZR 4821-4829			1445-1452 0945-0952	MHW(-)0.3
50-4A	OUTSIDE	88ZR 4792-4809	1:50,000	3/20/88 54-14	1411-1426 0911-0926	MHW(-)0.1
50-5A	OUTSIDE	88ZR 4782-4790	1:50,000	3/20/88 54-14	1358-1402 0858-0902	MHW 0.0

REMARK:

APPROVED BY:

James E. Schud
 N/CG235
 11/6/90

APPENDIX F

MAP COMPILATION SOURCES for CM-8710

<u>MAP NUMBER</u> ¹	<u>PHOTOGRAPHY</u> ²	<u>DATE</u>	<u>TIME</u> ³	<u>SCALE</u>
TP-01510	88 B (CN) 9269-9275 88 B (CN) 9292-9300	03/28/88 03/28/88	11:37 12:09	1:30,000 1:30,000
TP-01511	88 B (CN) 9299-9307	03/28/88	12:06	1:30,000
TP-01512	88 B (CN) 9307-9313	03/28/88	12:03	1:30,000
TP-01513	88 B (CN) 9195-9199	03/28/88	10:27	1:50,000
TP-01514	88 B (CN) 9187-9188 88 B (CN) 9198-9203	03/28/88 03/28/88	10:02 10:28	1:50,000 1:50,000
TP-01515	88 B (CN) 9179-9183 88 B (CN) 9188-9191	03/28/88 03/28/88	09:58 10:07	1:50,000 1:50,000
TP-01516	88 B (CN) 9178-9179 88 B (CN) 9203-9207	03/28/88 03/28/88	09:56 10:30	1:50,000 1:50,000
TP-01517	88 B (CN) 9173-9178 88 B (CN) 9207-9210	03/28/88 03/28/88	09:55 10:31	1:50,000 1:50,000
TP-01518	88 B (CN) 9161-9163 88 B (CN) 9172-9173 88 B (CN) 9210-9212	03/28/88 03/28/88 03/28/88	09:35 09:54 10:33	1:50,000 1:50,000 1:50,000

REMARKS:

- All maps were compiled at a scale of 1:20,000.
- Photography type (CN) denotes Color Negative.
- Standard Time is referenced to Eastern Time Zone (Meridian = 075°).

Final Reviewer - James E. Schad Date 11/6/90

MAP COMPILATION SOURCES for CM-8710

MAP NUMBER ¹	PHOTOGRAPHY ²	DATE	TIME ³	SCALE
TP-01510	88 B (CN) 9269-9275 88 B (CN) 9292-9300	03/28/88 03/28/88	11:37 12:09	1:30,000 1:30,000
TP-01511	88 B (CN) 9299-9307	03/28/88	12:06	1:30,000
TP-01512	88 B (CN) 9307-9313	03/28/88	12:03	1:30,000
TP-01513	88 B (CN) 9195-9199	03/28/88	10:27	1:50,000
TP-01514	88 B (CN) 9187-9188 88 B (CN) 9198-9203	03/28/88 03/28/88	10:02 10:28	1:50,000 1:50,000
TP-01515	88 B (CN) 9179-9183 88 B (CN) 9188-9191	03/28/88 03/28/88	09:58 10:07	1:50,000 1:50,000
TP-01516	88 B (CN) 9178-9179 88 B (CN) 9203-9207	03/28/88 03/28/88	09:56 10:30	1:50,000 1:50,000
TP-01517	88 B (CN) 9173-9178 88 B (CN) 9207-9210	03/28/88 03/28/88	09:55 10:31	1:50,000 1:50,000
TP-01518	88 B (CN) 9161-9163 88 B (CN) 9172-9173 88 B (CN) 9210-9212	03/28/88 03/28/88 03/28/88	09:35 09:54 10:33	1:50,000 1:50,000 1:50,000

REMARKS:

1. All maps were compiled at a scale of 1:20,000.
2. Photography type (CN) denotes Color Negative.
3. Standard Time is referenced to Eastern Time Zone (Meridian = 075°).

Final Reviewer - James E. School Date 4/6/90

MAP COMPILATION SOURCES FOR CM-8710

<u>MAP NUMBER¹</u>	<u>PHOTOGRAPHY²</u>	<u>DATE</u>	<u>TIME³</u>	<u>SCALE</u>	<u>TIDE STAGE (Feet)⁴</u>
TP-01510	88 ZR 4709, 10, 12	03/17/88	11:00	1:50,000	MLLW 0.2
	88 ZR 4721, 23	03/17/88	11:17	1:50,000	MLLW 0.1
TP-01511	88 ZR 4725, 28	03/17/88	11:18	1:50,000	MLLW 0.1
TP-01512	88 ZR 4683, 84	03/17/88	10:12	1:50,000	MLLW 0.3 (Pamlico Sound)
	88 ZR 4730, 32	03/17/88	11:25	1:50,000	MLLW 0.1
	88 ZR 4734	03/17/88	11:26	1:50,000	MLLW (-)0.1
TP-01513	88 ZR 4478, 79	03/16/88	11:27	1:50,000	MLLW 0.2
	88 ZR 4485	03/16/88	11:40	1:50,000	MLLW 0.1 (Pamlico Sound)
	88 ZR 4734, 36	03/17/88	11:26	1:50,000	MLLW (-)0.1
	88 ZR 4805	03/20/88	09:24	1:50,000	MHW (-)0.1
	88 ZR 4811	03/20/88	09:38	1:50,000	MHW (-)0.2
TP-01514	88 ZR 4433, 34	03/16/88	10:26	1:50,000	MHW (-)0.3 (Core sound)
	88 ZR 4473, 75, 78	03/16/88	11:24	1:50,000	MLLW 0.2
	88 ZR 4509, 10	03/16/88	12:28	1:50,000	MLLW 0.4 (Core Sound)
TP-01515	88 ZR 4434, 36	03/16/88	10:28	1:50,000	MHW (-)0.3 (Core Sound)
	88 ZR 4471, 73	03/16/88	11:23	1:50,000	MLLW 0.2
	88 ZR 4509, 10, 12, 13	03/16/88	12:29	1:50,000	MLLW 0.4 (Pamlico Sound)
	88 ZR 4755, 57	03/17/88	14:36	1:50,000	MLLW 0.3 (Core Sound)
TP-01516	88 ZR 4467, 69, 71	03/17/88	11:21	1:50,000	MLLW 0.2
	88 ZR 4757, 59	03/17/88	14:37	1:50,000	MLLW 0.3 (Core Sound)
	88 ZR 4821	03/20/88	14:45	1:50,000	MHW (-)0.3

<u>MAP NUMBER</u> ¹	<u>PHOTOGRAPHY</u> ²	<u>DATE</u>	<u>TIME</u> ³	<u>SCALE</u>	<u>TIDE STAGE (Feet)</u> ⁴
TP-01517	88 ZR 4443, 44	03/16/88	10:32	1:50,000	MHW (-) 0.3 (Core Sound)
	88 ZR 4465, 67	03/16/88	11:22	1:50,000	MLLW 0.2
	88 ZR 4759, 61, 63	03/17/88	14:39	1:50,000	MLLW 0.3 (Core Sound)
TP-01518	88 ZR 4444, 46	03/17/88	14:39	1:50,000	MLLW (-) 0.3 (Core Sound)
	88 ZR 4463, 65	03/16/88	11:21	1:50,000	MLLW 0.2
	88 ZR 4763, 65	03/17/88	14:41	1:50,000	MLLW 0.3 (Core Sound)
	88 ZR 4982, 84, 85	03/28/88	09:35	1:50,000	MLLW 0.3

REMARKS:

1. All maps were compiled at a scale of 1:20,000.
2. Photography type (ZR) denotes Z-Cone, BLACK & White 1:50,000 scale photographs enlarged to 1:20,000 scale photographs.
3. Standard Time is referenced to Eastern Time Zone (Meridian = 075°).
4. Refer to Appendices D for tide data.

FINAL Reviewer -

James E. Schmal

11/6/90
Date

APPENDIX G

GEOGRAPHIC NAMES

FINAL NAME SHEET

CM-8710 (Cape Hatteras to Cape Lookout, NC)

TP-01510

Askins Creek
 Atlantic Ocean
 Bald Point
 Boat Creek
 Brigand Bay
 Brooks Creek
 Brooks Point
 Buxton
 Cape Creek
 Frisco
 Great Island
 Hatteras, Cape
 Hatteras Island
 Jennette Sedge
 Joe Saur Creek
 Kings Island (submerged)
 Kings Point
 Long Point
 Long Point Creek
 Pamlico Sound

TP-01511

Atlantic Ocean
 Austin Creek
 Cockrel Creek
 Cockrel Creek Island
 Duck Ponds
 Duncan Point
 Durant Point
 Green Island
 Hatteras
 Hatteras Inlet
 Hatteras Island
 Inlet Peninsula
 Isaac Pond
 Ocracoke Island
 Outer Green Island
 Pamlico Sound
 Quork Hammock
 Sandy Bay
 Shingle Creek
 Slash, The

TP-01512

Atlantic Ocean
 Clark Reef
 Gap Point
 Horsepen Point
 Howard Reef
 Island Creek
 Knoll Creek
 Knoll House Creek
 Little Swash Opening
 Mary Anns Pond
 North Bitterswash Creek
 Northern Pond
 Ocracoke
 Ocracoke Island
 Ocracoke Island Airport
 Old Hammock Creek
 Old Slough
 Pamlico Sound
 Quokes Point
 Sand Hole Creek
 Silver Lake
 South Bitterswash Creek
 Springers Point
 Try Yard Creek
 Windmill Point

TP-01513

Atlantic Ocean
 Baymarsh Thorofare
 Beacon Island
 Casey Bay
 Casey Island
 Core Banks
 Daniel Swash
 Evergreen Island
 Evergreen Slough
 Haulover, The
 High Hills Inlet
 High Hills, The
 North Rock
 Ocracoke Inlet
 Ocracoke Island
 Pamlico Sound

Portsmouth
 Portsmouth Island
 Royal Point
 Royal Point Bay
 Sheep Island
 Shell Castle (island)
 Whalebone Island

TP-01514

Atlantic Ocean
 Camp Point
 Chain Shot Island
 Core Banks
 Core Sound
 Cowpen Point (1)
 Cowpen Point (2)
 Cricket Island
 Cricket Island Point
 Harbor Island
 Hog Island
 Kathryne Jane Islands
 Merkle Hammock
 Mud Island
 Old House Beach
 Oyster Creek
 Oyster Creek Point
 Pamlico Sound
 Passage, The
 Pilonary Islands
 Portsmouth Island
 Sand Island
 Sands, The
 Shell Island
 Wainwright Island

TP-01515

Atlantic
 Atlantic Ocean
 Back Bay
 Barry Bay
 Beach Island
 Beach Marsh
 Bear Hammock
 Cedar Island
 Cedar Island Bay
 Cedar Island Point
 Core Banks
 Core Sound
 Deep Bend
 Deep Bend Point

Drum Pond
 Drum Pond Point
 Dump Island
 End of Island Slough
 Fish Hawk Point
 Fullers Ditch
 Goodwin Hills (locale)
 Goose Bay
 Goose Bay Point
 Grass, Point of
 Great Ditch
 Great Pond
 Green Point (1)
 Green Point (2)
 Green Point Cove
 Hall Point
 Head of Bay
 Hog Island
 Hog Island Narrows
 Hog Island Point
 Horse Island
 Hunting Island
 John Day Ditch
 Lewis Creek
 Lola
 Long Point (1)
 Long Point (2)
 Lookout Point
 Merkle Bay
 Merkle Bay Point
 Merkle Hammock Creek
 Mingo Creek
 Rumley Bay
 Rumley Hammock
 Nameless Bay
 Nelson Bay
 Noras Cove
 North Bay
 Pamlico Sound
 Passage, The
 Roe
 Salters Creek
 Sand Hill Point
 Sand Point
 Ship Point
 Ship Shoal Island
 Snake Gut
 South Island
 South Point
 Southwest Prong
 Thorofare
 Thorofare Bay

Waterbush Point
 West Bay
 West Thorofare Bay
 Western Point
 White Point
 Wolves Den

TP-01516

Annis Run
 Atlantic
 Atlantic Ocean
 Big Marsh
 Big Marsh Point
 Cedar Creek
 Cedar Hammock
 Cedar Inlet
 Cedar Point
 Core Banks
 Core Sound
 Douglas Point
 Drum Inlet
 Drum Point
 Fortin Bay
 Fortin Island
 Fulchers Creek
 Glover Creek
 Great Island
 Great Island Creek
 Green Point
 Gutter Creek
 Head of the Hole
 Horse Island
 Horse Island Cove
 Horse Island Point
 Inner Grass Lump
 Lewis Creek
 Little Port
 Long Point
 Mill Point
 Nelson Bay
 Old Channel
 Outer Grass Lump
 Pasture Creek
 Sealevel
 Sheep Islands
 Sheep Pen Creek
 Short Point
 Steep Point
 Styron Bay
 Styron Creek
 Swash, The

Willis Creek
 Yaupon Hammock Gut

TP-01517

Atlantic Ocean
 Bells Island
 Bells Point
 Big Island
 Brett Bay
 Broad Creek
 Broad Creek Marsh
 Browns Island
 Core Banks
 Core Sound
 Corncrib Point
 Cowpen Island
 Crab Point
 Davis
 Davis Island
 Davis Landing
 Davis Marsh
 Deer Pond
 Ditch Cove
 Douglas Point
 Fishing Point
 Fork Creek
 Fulchers Creek
 Gaskill Landing
 Gaskill Point
 Gillikin Creek
 Gloucester
 Gloucester Point
 Goose Bay
 Goose Island
 Great Creek
 Great Island Bay
 Great March Creek
 Guthrie Hammock
 Harkers Island
 Horse Island
 Horsepen Creek
 Horsepen Point
 Howland Creek
 Howland Point
 Janes Creek
 Jarrett Bay
 Johnson Creek
 Jump Run
 King Point
 King Point Marsh
 Lewis Creek

Lewis Island
 Maria Creek
 Marshallberg
 Middens Creek
 Middens Point
 Mullet Cove
 North Leopard Creek
 Oak Hammock
 Otway
 Oyster Creek
 Pasture Point
 Piney Point
 Procks Point
 Salters Lump
 Sandy Point
 Shingle Point
 Sleepy Creek
 Smyrna
 Smyrna Creek
 South Leopard Creek
 Spit Bay
 Spit, The
 Stone Point
 Straits (locale)
 Straits, The
 Tusk
 Tusk Creek
 Wade Creek
 Wading Point
 Ward Creek
 Westmouth Bay
 White Point
 Whitehurst Creek
 Williston
 Williston Creek
 Zack Creek

Cockle Marsh Island
 Codds Creek
 Core Banks
 Core Sound
 Cow Island
 Ditch, The
 Eastmouth Bay
 Great Marsh Island
 Gunning Hammock Island
 Harkers Island
 Harkers Island (locale)
 Hogpen Bay
 Horse Island
 Horse Point
 Iron Creek
 Jacks Island
 Johnsons Bay
 Lighthouse Bay
 Lighthouse Channel
 Little Deep Marsh Island
 Lookout Bight
 Lookout, Cape
 Morgan Island
 Onslow Bay
 Power Squadron Spit
 Rawson Creek
 Rush Island
 Shackelford Banks
 Sheep Island
 Sheep Pen Creek
 Shell Point
 Shooting Hammock
 Teal Island
 Try Yard Creek
 Whitehurst Island
 White Shoal Marsh

TP-01518

Atlantic Ocean
 Back Sound
 Bald Hill Bay
 Barden Inlet
 Baregrass Island
 Big Deep Marsh Island
 Blinds Hammock
 Blinds Hammock Bay
 Caggs Creek
 Cape Lookout (locale)
 Cape Point
 Catfish Point
 Cedar Hammock

Approved:

Charles E. Harrington

Charles E. Harrington
 Chief Geographer, Nautical
 Charting Division

APPENDIX H

CARTOGRAPHIC FEATURES OF CHARTING INTEREST

COASTAL MAPPING PROGRAM: CM-8710

NOS NAUTICAL CHART COVERAGE: 11545, 11548, 11550, and 11555

GEODETTIC DATUM: NAD 83

The following features are recommended for charting based on field and photogrammetric observations. 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.

FEATURE DESCRIPTION	NCD CC	GEOGRAPHICAL LATITUDE	POSITION LONGITUDE	NCD QC	DATE OF SOURCE
- TP-01518 <u>LOOKOUT BLIGHT</u> LIGHT 6	200	34-36-56.98	76-32-09.30	4	087/988
<u>BARDEN INLET</u>					
LIGHT 1	200	34-37-27.51	76-32-24.46	4	087/988
LIGHT 19	200	34-38-33.44	76-31-00.32	6	087/988
LIGHT 21	200	34-39-10.52	76-31-09.82	6	087/988
LIGHT 26	200	34-39-52.66	76-31-21.41	6	087/988
LIGHT 32	200	34-40-16.99	76-31-26.03	6	087/988
LIGHT 35	200	34-40-42.38	76-31-35.45	6	087/988
<u>HARKERS ISLAND</u>					
<u>EAST CHANNEL</u>					
LIGHT 2	200	34-41-06.75	76-31-11.28	6	087/988
LIGHT 6	200	34-41-41.85	76-30-38.60	6	087/988
<u>BACK SOUND</u>					
LIGHT 1	200	34-41-00.79	76-32-07.27	6	087/988
LIGHT 3	200	34-41-19.13	76-33-48.61	6	087/988
SPIRE	086	34-41-48.15	76-34-01.54	6	087/988
SPIRE	086	34-41-43.73	76-33-40.98	6	087/988
SPIRE	086	34-41-42.07	76-33-30.67	6	087/988
TANK	086	34-41-50.17	76-33-26.21	4	087/988
CAPE LOOKOUT LIGHTHOUSE 1886	020	34-37-21.889	76-31-28.341	2	087/988

FEATURE DESCRIPTION	NCD CC	GEOGRAPHICAL LATITUDE	POSITION LONGITUDE	NCD QC	DATE OF SOURCE
- TP-01517					
<u>HARKERS ISLAND</u>					
<u>EAST CHANNEL</u>					
LIGHT 10	200	34-42-11.59	76-30-25.15	6	087/988
LIGHT 14	200	34-42-47.09	76-30-04.61	6	087/988
<u>CORE SOUND</u>					
LIGHT 31	200	34-48-54.02	76-25-01.19	6	087/988
LIGHT 33	200	34-48-37.91	76-25-54.39	6	087/988
<u>OYSTER CREEK</u>					
ENTRANCE LT 2	200	34-48-51.22	76-26-45.82	4	087/988
<u>SALTER CREEK</u>					
LIGHT 1	200	34-48-19.29	76-26-56.43	6	087/988
LIGHT 34	200	34-46-32.23	76-27-06.51	6	087/988
LIGHT 35	200	34-45-08.12	76-27-53.73	6	087/980
CHANNEL LT 36	200	34-44-33.53	76-29-27.24	6	087/988
CHANNEL LT 37	200	34-43-31.12	76-28-55.48	6	087/988
LIGHT 39	200	34-43-01.95	76-29-29.89	6	087/988
CHANNEL LT 41	200	34-42-59.53	76-29-58.72	6	087/988
LIGHT 42A	200	34-42-51.45	76-30-54.13	6	087/988
LIGHT 44	200	34-43-12.98	76-31-37.40	6	087/988
LIGHT 46	200	34-42-57.74	76-32-36.82	4	087/988
LIGHT 47	200	34-43-03.60	76-33-10.39	6	087/988
<u>WESTMOUTH BAY</u>					
LIGHT A	200	34-42-12.95	76-33-01.88	6	087/988
SPIRE	086	34-47-49.19	76-27-36.99	6	087/988
SPIRE	086	34-47-07.94	76-30-34.44	6	087/988
TOWER	086	34-45-53.87	76-31-06.88	6	087/988
- TP-01516					
<u>CORE SOUND</u>					
LIGHT 22	200	34-52-38.67	76-19-30.90	4	087/988
<u>ATLANTIC ENTRANCE</u>					
LIGHT	200	34-52-23.80	76-20-20.67	6	087/988
<u>ATLANTIC CHANNEL</u>					
LIGHT 2	200	34-52-49.77	76-20-10.19	4	087/988
LIGHT 24	200	34-51-48.54	76-20-45.79	4	087/988
LIGHT 25	200	34-51-25.40	76-21-10.95	6	087/988
<u>CEDAR CREEK</u>					
LIGHT 1	200	34-52-01.53	76-22-37.70	4	087/988
LIGHT 27	200	34-50-38.24	76-22-00.91	6	087/988
LIGHT 28	200	34-50-32.99	76-22-55.92	6	087/988

<u>FEATURE DESCRIPTION</u>	<u>NCD CC</u>	<u>GEOGRAPHICAL LATITUDE</u>	<u>POSITION LONGITUDE</u>	<u>NCD QC</u>	<u>DATE OF SOURCE</u>
<u>CORE SOUND</u>					
SEALEVEL CHANNEL					
ENTRANCE LIGHT 1	200	34-51-11.02	76-23-08.45	6	087/988
SEALEVEL CHANNEL					
LIGHT 3	200	34-51-21.55	76-23-07.05	4	087/988
NELSON BAY					
LIGHT 1	200	34-51-18.99	76-24-16.93	6	087/988
<u>FULCHERS CREEK</u>					
LIGHT 1	200	34-50-03.51	76-24-29.58	4	087/988
<u>CORE SOUND</u>					
LIGHT 29	200	34-49-09.27	76-24-12.17	4	087/988
Tank	993	34-52-57.91	76-20-13.05	4	087/988
Chimney	993	35-52-58.94	76-20-32.31	6	087/988
Spire	993	34-52-49.01	76-20-28.59	4	087/988
Spire	993	34-51-00.07	76-24-56.82	6	087/988
CHIMNEY	086	34-48-14.42	76-22-31.20	6	087/988
<u>- TP-01515</u>					
<u>CORE SOUND</u>					
LIGHT 18	200	34-56-20.64	76-15-36.49	6	087/988
<u>CEDAR ISLAND</u>					
<u>BAY CHANNEL</u>					
LIGHT 2	200	34-58-04.65	76-15-36.88	4	087/988
LIGHT 6	200	34-59-20.47	76-17-41.34	4	087/988
LIGHT 8	200	34-59-31.67	76-18-16.40	4	087/988
<u>THOROFARE CHANNEL</u>					
LIGHT 1	200	34-55-31.38	76-19-24.76	6	087/988
LIGHT 1A	200	34-55-34.85	76-20-38.94	6	087/988
LIGHT 4	200	34-55-43.24	76-21-28.54	6	087/988
<u>CORE SOUND</u>					
LIGHT 19	200	34-54-59.27	76-16-35.45	6	087/988
LIGHT 19A	200	34-54-17.45	76-17-38.40	4	087/988
LIGHT 20	200	34-53-53.73	76-18-16.73	6	087/988

FEATURE DESCRIPTION	NCD CC	GEOGRAPHICAL LATITUDE	POSITION LONGITUDE	NCD QC	DATE OF SOURCE
<u>WEST BAY</u>					
CEDAR ISLAND FERRY SLIP BREAKWATER					
LIGHT 1	200	35-01-11.13	76-18-41.69	6	087/988
CEDAR ISLAND FERRY SLIP BREAKWATER					
LIGHT 2	200	35-01-13.27	76-18-38.10	6	087/988
CEDAR ISLAND NORTH OBSTRUCTION LIGHT					
MARKER	086	35-02-08.60	76-20-54.24	6	087/988
LIGHT 4WB	200	35-02-09.55	76-21-50.17	6	087/988
LIGHT 3	200	35-02-10.48	76-23-02.59	6	087/988
(Lighted Mile Marker 3)					
LIGHT 11WB	200	35-02-07.82	76-24-15.23	6	087/988
LIGHT 13WB	200	34-56-32.09	76-23-16.52	6	087/988
LIGHT 15WB	200	34-56-23.63	76-23-06.47	6	087/988
		34-56-03.42	76-22-57.50	6	087/988
ANTENNA	086	34-57-20.80	76-16-36.23	4	087/988
TOWER	086	34-57-44.27	76-16-53.93	4	087/988
- TP-01514 <u>CORE SOUND</u>					
LIGHT 2CS	200	35-00-16.39	76-12-11.54	4	087/988
CHANNEL LIGHT 3	200	34-59-50.20	76-12-15.85	4	087/988
CHANNEL LIGHT 5	200	34-59-20.62	76-12-21.54	4	087/988
DAYBEACON 5A	200	34-59-11.19	76-12-30.63	6	087/988
CHANNEL LIGHT 7	200	34-58-59.17	76-12-37.79	4	087/988
CHANNEL LIGHT 9	200	34-58-47.32	76-13-04.37	4	087/988
LIGHT 11	200	34-58-30.63	76-13-14.44	6	087/988
LIGHT 13	200	34-57-18.50	76-13-42.58	6	087/988
LIGHT 15	200	34-56-41.54	76-13-49.39	6	087/988
LIGHT 16	200	34-56-25.02	76-14-50.59	6	087/988
-TP-01513 <u>TEACHES HOLE CHANNEL</u>					
LIGHT 11	200	35-04-57.24	76-00-17.69	4	087/988
SPIRE	086	35-04-10.61	76-03-40.58	6	087/988
PORTSMOUTH COAST GUARD CUPOLA 1909 (ABAND) (BLACK BRANT ROD & GUN CLUB CUPOLA)					
	020	35-04-06.919	76-03-27.093	3	087/98

FEATURE DESCRIPTION	NCD CC	GEOGRAPHICAL LATITUDE	POSITION LONGITUDE	NCD QC	DATE OF SOURCE
- TP-01512 TEACHES HOLE CHANNEL LIGHT 12	200	35-05-30.68	76-59-43.14	4	087/988
<u>OCRACOKE INLET</u>					
<u>SILVER LAKE</u>					
JUNCTION LIGHT	200	35-06-37.57	75-59-30.97	4	087/988
ENTRANCE DYBN 4	224	35-06-52.74	75-59-41.26	6	087/988
ENTRANCE DYBN 6	224	35-07-12.36	75-59-50.85	6	087/988
ENTRANCE LIGHT 7	200	35-06-53.59	75-59-24.39	4	087/988
ENTRANCE LIGHT 9	200	35-06-52.18	75-59-14.66	4	087/988
OCRACOKE LIGHT (OCRACOKE LIGHTHOUSE 1851)	020	35-06-32.310	75-59-09.527	2	087/988
<u>CUPOLA COAST GUARD</u>					
<u>(OCRACOKE COAST GUARD</u>					
<u>STATION CUPOLA</u>					
1960)	020	35-06-56.17	75-59-14.09	4	087/988
TANK	086	35-07-01.69	75-59-01.82	4	087/988
- TP-01511					
<u>HATTERAS INLET</u>					
<u>SOUTH FERRY TERMINAL</u>					
LIGHT 2	200	35-11-39.79	75-45-54.38	4	087/988
DIRECTIONAL LIGHT	200	35-11-41.19	75-45-53.72	4	087/988
<u>SOUTH FERRY TERMINAL</u>					
LIGHT 4	200	35-11-41.71	75-46-14.03	6	087/988
<u>SOUTH FERRY TERMINAL</u>					
LIGHT 6	200	35-11-35.74	75-46-42.50	4	087/988
<u>SOUTH FERRY TERMINAL</u>					
LIGHT 7	200	35-11-33.08	75-46-50.55	4	087/988
LIGHT 9	200	35-11-46.93	75-45-02.17	4	087/988
LIGHT 11	200	35-11-56.29	75-44-20.32	4	087/988
<u>HATTERAS INLET LIGHT</u>					
(TOWER)	200	35-11-51.40	75-43-56.21	6	087/988
LIGHT 13	200	35-12-11.72	75-43-54.95	4	087/988
LIGHT 16	200	35-12-10.15	75-43-36.41	4	087/988
CHANNEL LIGHT 19	200	35-12-16.76	75-43-17.69	4	087/988
CHANNEL LIGHT 21	200	35-12-39.68	75-43-08.18	4	087/988
CHANNEL LIGHT 24	200	35-12-46.03	75-42-45.50	4	087/988
CHANNEL LIGHT 25	200	35-13-07.26	75-42-12.71	4	087/988
JUNCTION LIGHT HR	200	35-13-17.90	75-41-43.35	4	087/988
<u>HATTERAS HARBOR</u>					
LIGHT 2	200	35-13-14.25	75-41-41.27	6	087/988

FEATURE DESCRIPTION	NCD CC	GEOGRAPHICAL LATITUDE	POSITION LONGITUDE	NCD QC	DATE OF SOURCE
<u>ROLLINSON CHANNEL</u>					
LIGHT 30	200	35-13-23.39	75-41-44.89	4	087/988
LIGHT 32	200	35-13-47.23	75-42-02.73	4	087/988
LIGHT 33	200	35-14-09.55	75-42-22.48	6	087/988
AUSTIN CREEK ENTRANCE CHANNEL					
LIGHT 1	200	35-12-37.59	75-42-21.71	4	087/988
AUSTIN CREEK LIGHT 2	200	35-12-33.02	75-42-15.86	4	087/988
<u>DURANT POINT</u>					
LIGHT 2	200	35-14-14.57	75-40-50.39	4	087/988
LIGHT 8	200	35-13-23.82	75-40-29.73	4	087/988
HATTERAS WATER TANK 1978					
	020	35-13-01.43	75-40-40.01	4	087/988
- TP-01510					
<u>PAMLICO SOUND</u>					
<u>AVON CHANNEL</u>					
<u>FRISCO APPROACH</u>					
LIGHT 4	200	35-15-33.02	75-39-12.21	6	087/988
FRISCO LIGHT 9	200	35-15-08.86	75-36-28.76	4	087/988
<u>BUXTON HARBOR</u>					
LIGHT 12	200	35-16-34.99	75-33-57.40	6	087/988
DAYBEACON 14	224	35-16-16.46	75-33-41.41	6	087/988
DAYBEACON 16	224	35-16-05.30	75-33-31.29	6	087/988
LIGHT 17	200	35-16-00.53	75-33-26.58	4	087/988
CAPE HATTERAS LIGHT (CAPE HATTERAS LIGHTHOUSE 1933)					
	020	35-15-17.666	75-31-14.520	2	087/988
Cupola TANK (UNID B MIT					
TANK 1)	020	35-14-00.41	75-37-17.79	4	087/988
Tank	993	35-15-41.32	75-34-17.64	6	087/988
MICRO TOWER	086	35-16-01.14	75-32-36.04	6	087/988
TANK	086	35-15-58.73	75-32-00.66	4	087/988
Tower	993	35-15-41.01	75-32-12.94	6	087/988
Tank	993	35-15-05.51	75-32-22.44	6	087/988
Tower	993	35-14-44.25	75-32-02.21	6	087/988
Yardarm	993	35-14-28.67	75-31-34.60	6	087/988
CAPE HATTERAS LORAN MAST 1949					
TANK	020	35-14-26.57	75-31-14.52	4	087/988
	086	35-15-53.57	75-32-28.75	6	087/988

Listing approved by: James E Schaal 11/6/90
SIGNATURE Date



STOCK NO.	COLOR
C2-20571	Black
C2-20572	Light Blue
C2-20573	Dark Blue
C2-20578	Rust Red
C2-20579	Executive Red

GENUINE PRESSBOARD