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PHOTOGRAMMETRY BRANCH  
COASTAL MAPPING PROGRAM

PROJECT CM-8710  
COMPLETION REPORT

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

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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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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

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  
COASTAL MAPPING PROGRAM

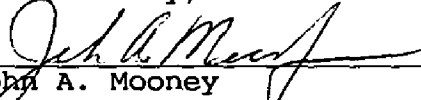
PROJECT CM-8710  
COMPLETION REPORT

NORTH CAROLINA  
CORE SOUND-PAMLICO SOUND  
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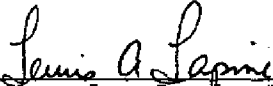
Clearance and Approval

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.

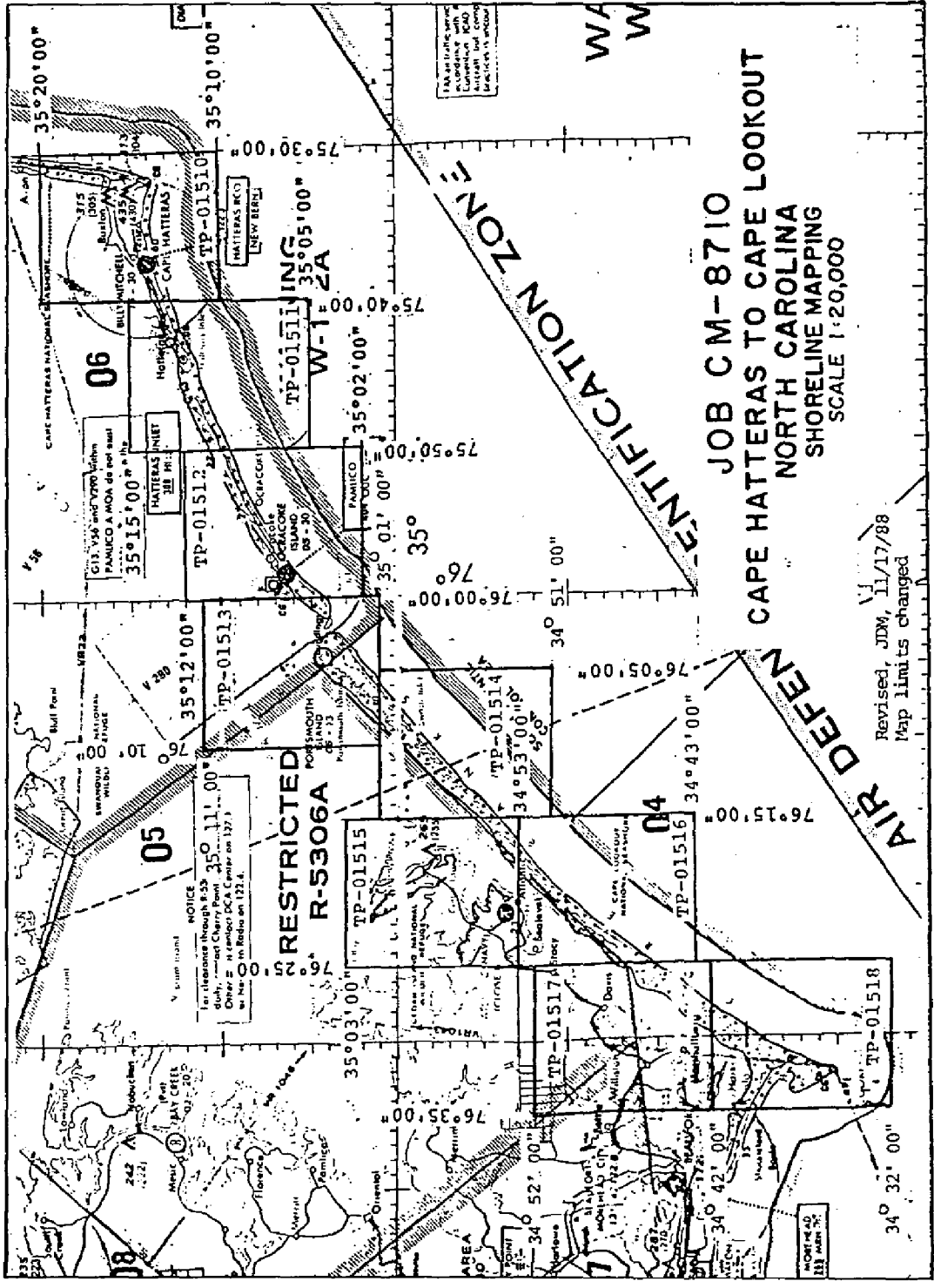


FIGURE 1. Project Diagram

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

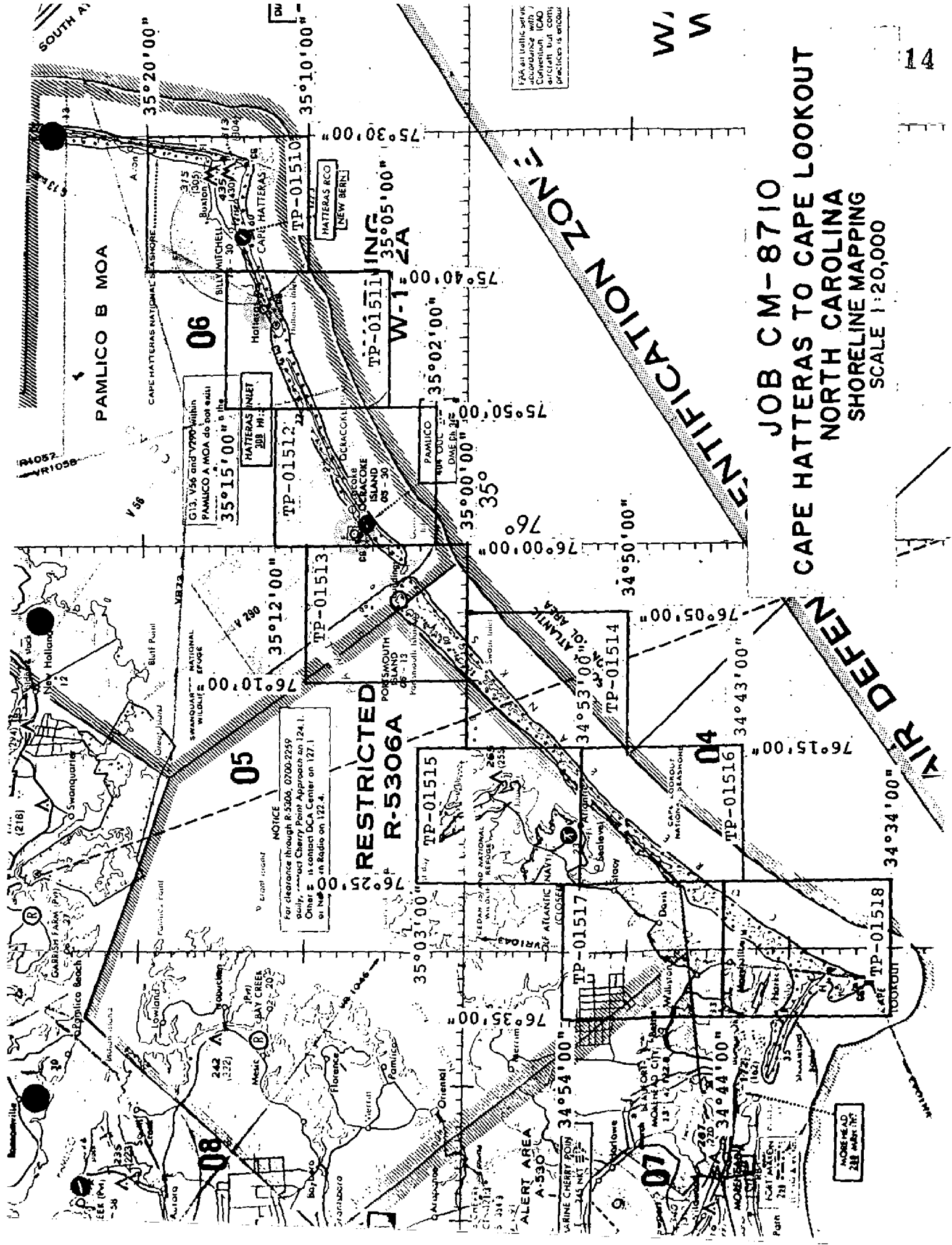
All costs incurred on this assignment shall be charged to Task 8K6C01.

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



**JOB CM-8710  
CAPE HATTERAS TO CAPE LOOKOUT  
NORTH CAROLINA  
SHORELINE MAPPING  
SCALE 1:20,000**

FAA an traffic servk  
according with  
Convention, ICAO  
aircraft but com  
practices is encour

W  
W

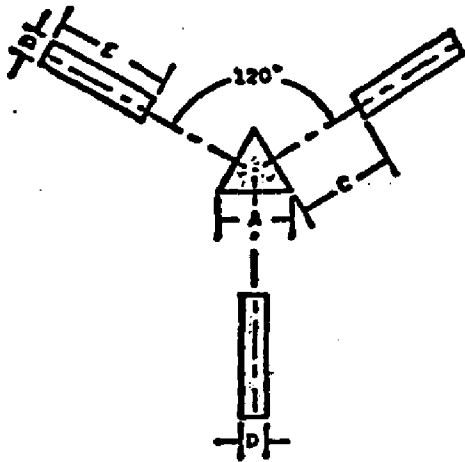
**NOTICE**  
For clearance through R-5306, 0700-2259  
daily, contact Cherry Point Approach on 124.1.  
Other E, contact DCA Center on 127.1  
or NDB on 122.4.

**MOA HEAD**  
248 MSL/100  
AGL

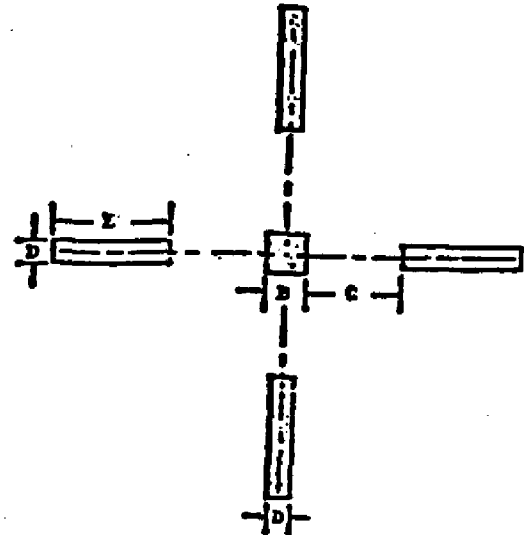
**MOA LOOKOUT**  
248 MSL/100  
AGL

**SPECIFICATIONS FOR PREHARKING CONTROL STATIONS**  
 Revised November 23, 1976

**ARRAY NO. 1**



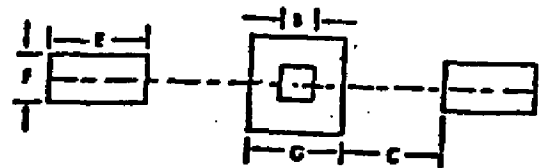
**ARRAY NO. 2**



**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*

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## 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

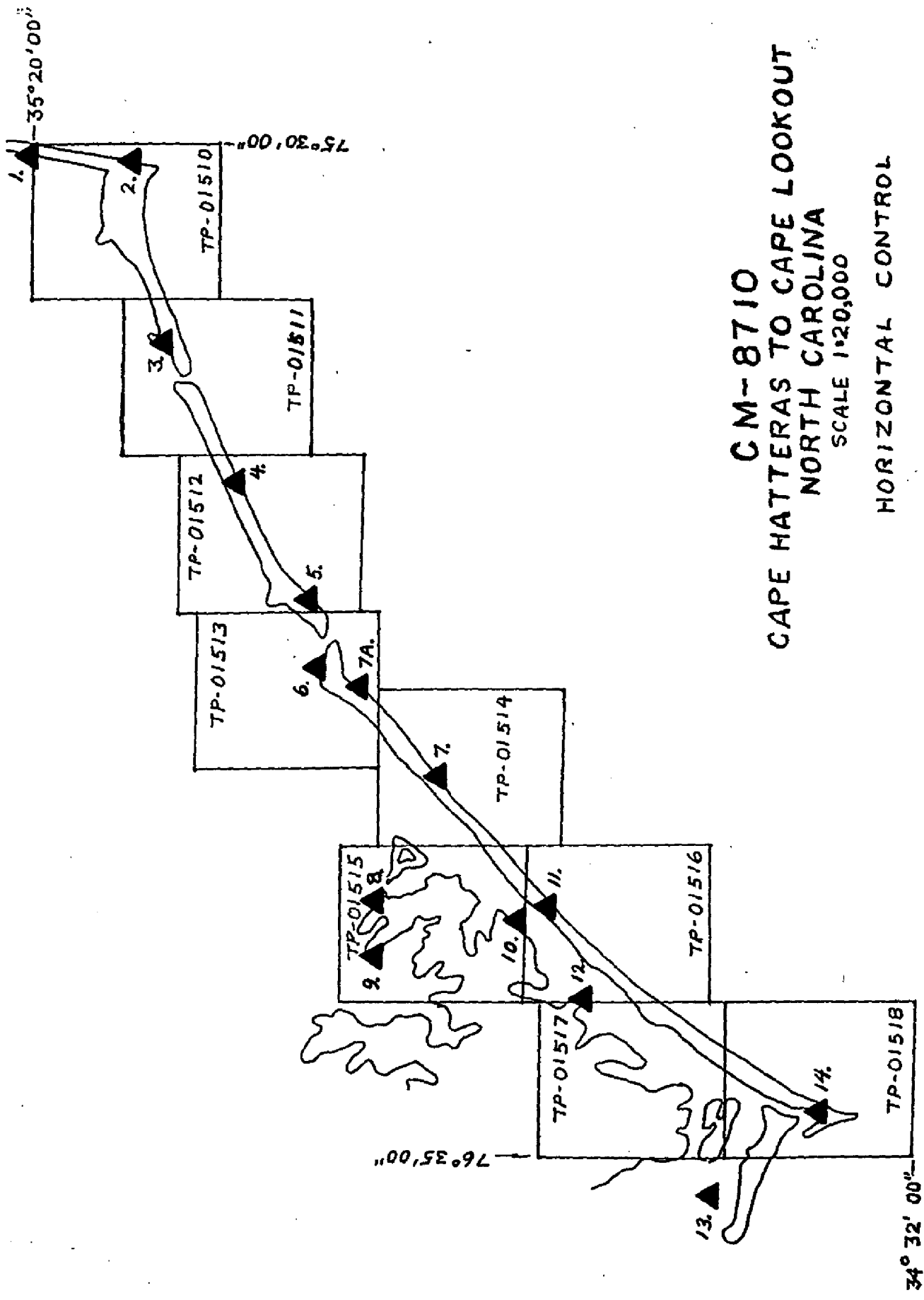
<u>1:30,000-scale bridging photographs</u>	<u>Ratio Value</u>
88 B(CN) 9269 through 9276	1.49
88 B(CN) 9294 through 9314	1.49
<u>1:50,000-scale bridging photographs</u>	
88 B(CN) 9159 through 9164	2.46
88 B(CN) 9172 through 9183	2.46
88 B(CN) 9187 through 9191	2.46
88 B(CN) 9195 through 9212	2.46
<u>1:50,000-scale 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

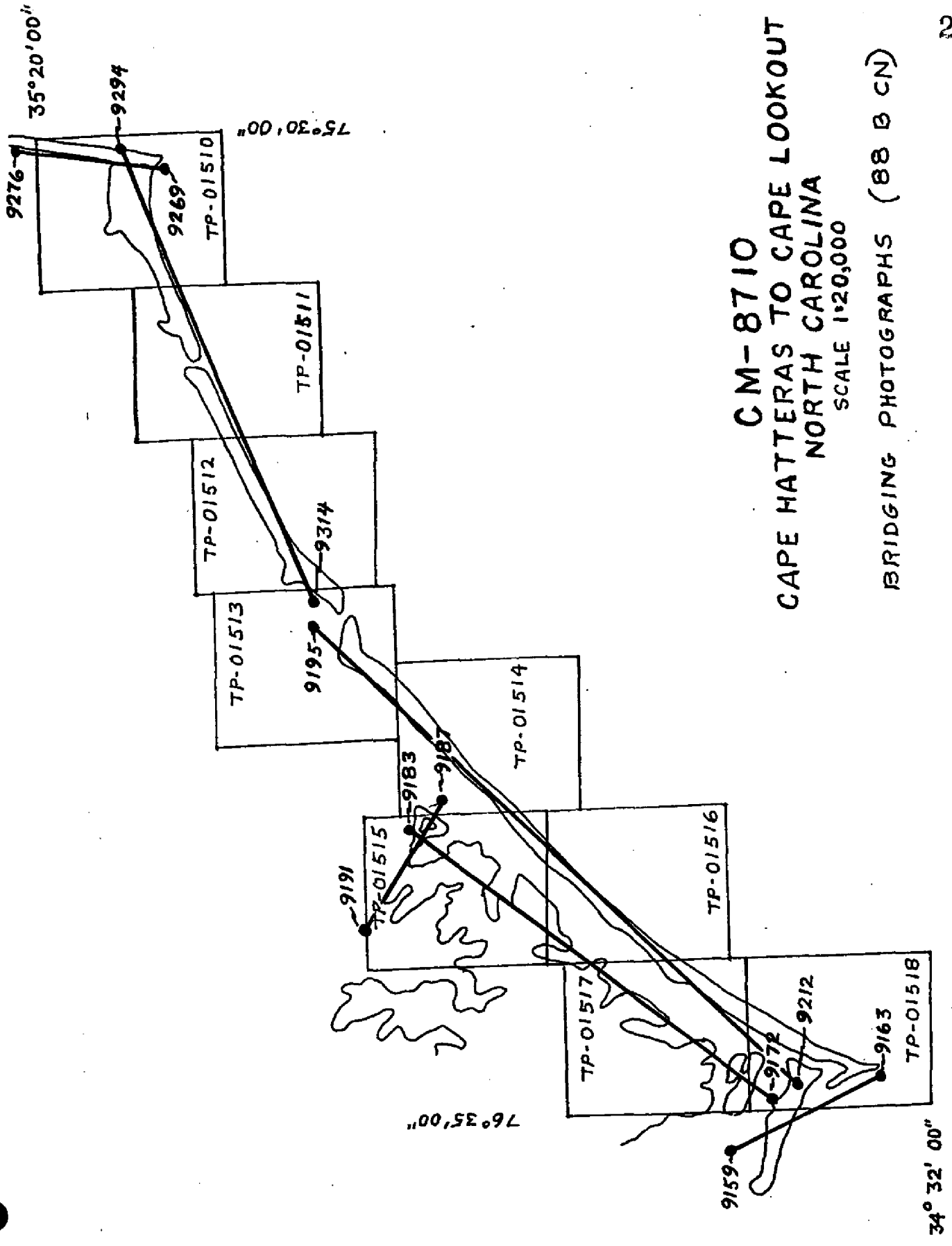
▲ = control held in adjustment  
 □ = aids or landmarks not held in adjustment

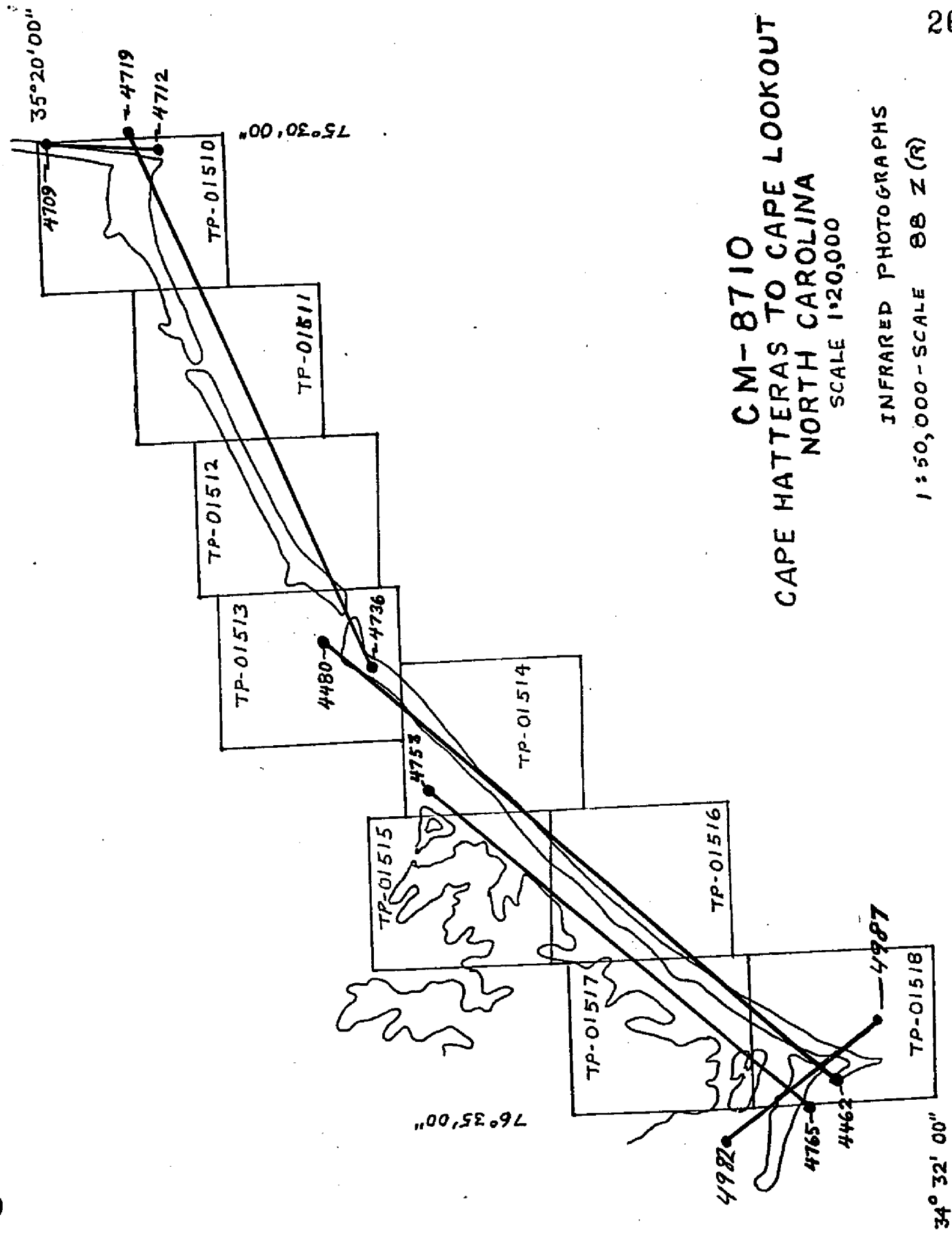
	<u>STATION NAMES</u>	<u>POINT NO.</u>	<u>VALUES IN FEET</u>	
			<u>X</u>	<u>Y</u>
▲	1. AVON 1962, PANEL 1	276101	-0.2	-0.2
▲	2. CAPE HATTERAS LORAN M., PANEL 2	270101	+0.6	-0.2
▲	3. H-1-NC 1979, PANEL 3	301101	-0.7	+1.1
▲	4. KING 1962, PANEL 4	308101	+0.5	-0.8
▲	5. OCRY 1988, PANEL 5	314100		
	(strip 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

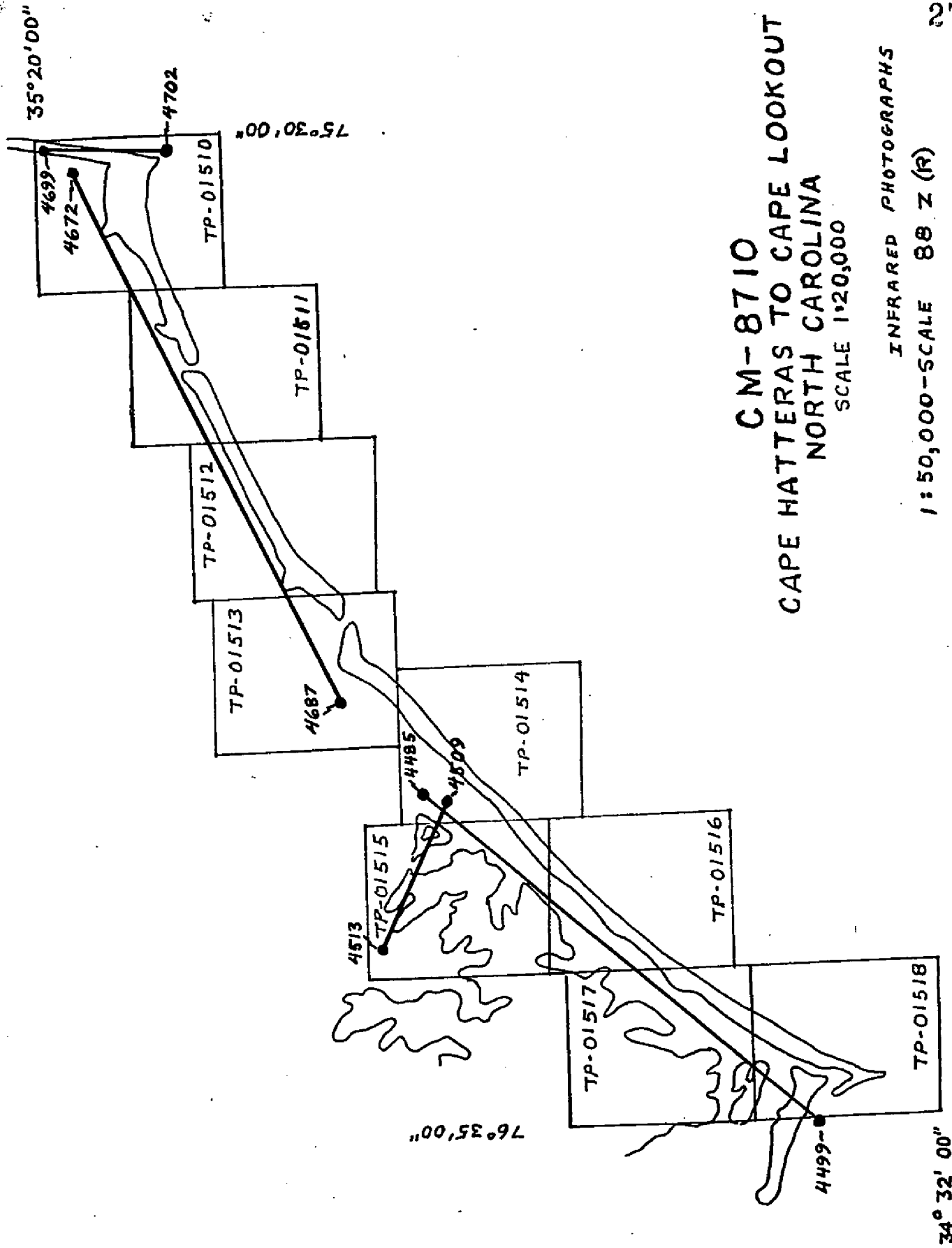






CM-8710  
 CAPE HATTERAS TO CAPE LOOKOUT  
 NORTH CAROLINA  
 SCALE 1:20,000

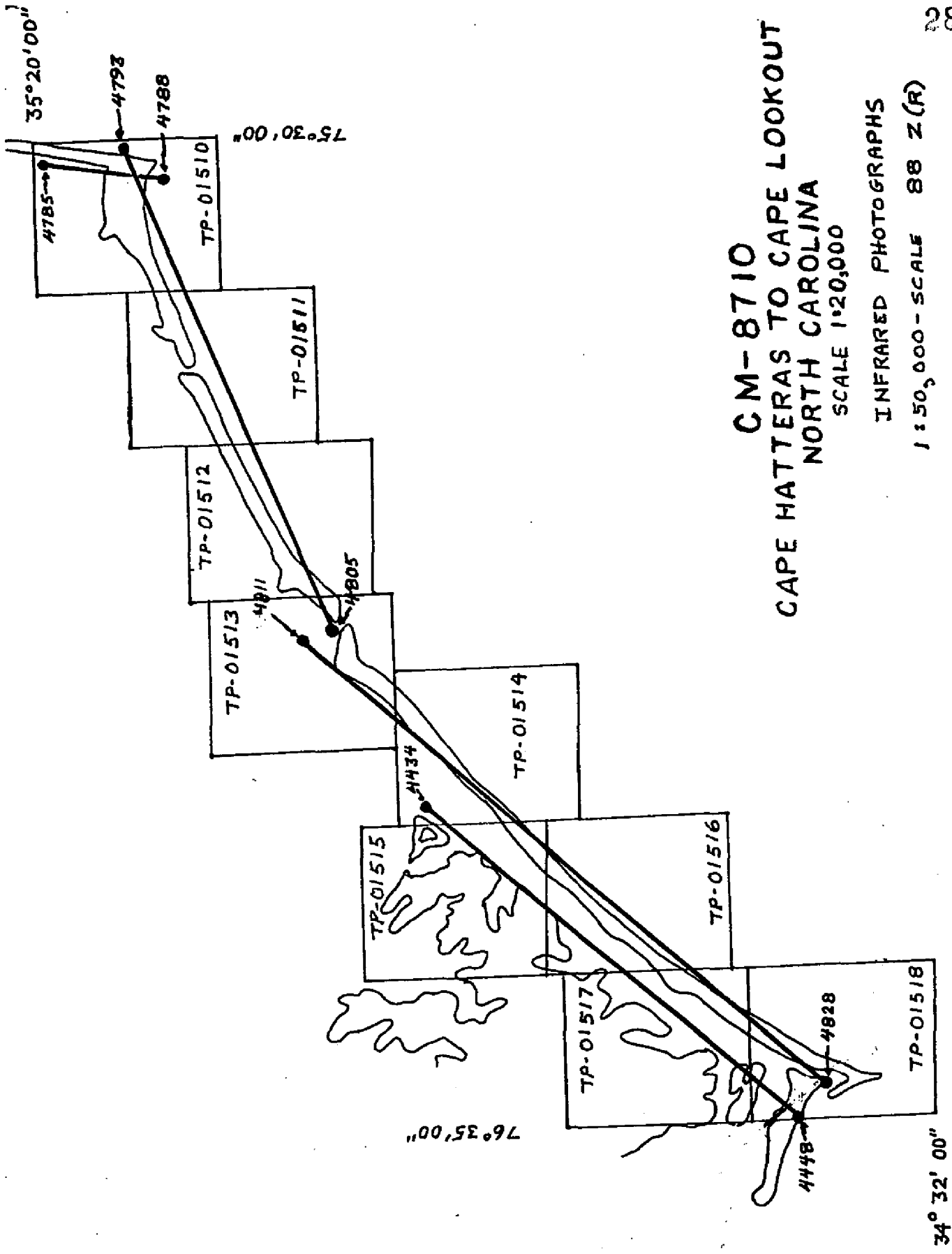
INFRARED PHOTOGRAPHS  
 1:50,000 - SCALE 88 Z (R)



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)

CM 8710-PC.87

NOAA FORM 76-41  
(6-75)

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	JOB NO.	GEODETTIC DATUM		ORIGINATING ACTIVITY			
		STATION NAME	SOURCE OF INFORMATION (Index)	AEROTRIANGULATION POINT NUMBER	COORDINATES IN FEET STATE <i>N. Geodetic</i> ZONE	GEOGRAPHIC POSITION φ LATITUDE λ LONGITUDE	REMARKS
	<i>CM-8710</i>				<i>NAD 83</i>		
1		<i>AVON, 1962</i>	<i>Field Data</i>	<i>276100</i>	<i>x= 3 011 229.375 ✓ y= 603 698.119 ✓</i>	<i>φ 35 21 29.830 ✓ λ 75 30 07.104 ✓</i>	
		<i>AVON, 1962 PANEL 1</i>	"	<i>276101</i>	<i>x= 3011252.501 ✓ y= 603770.860 ✓</i>	<i>φ 35 21 30.541 ✓ λ 75 30 06.794 ✓</i>	
2		<i>CAPE MATTERS LORAN MAST, 1949</i>	"	<i>270100</i>	<i>x= 3 005 340.067 ✓ y= 560 674.315 ✓</i>	<i>φ 35 14 26.568 ✓ λ 75 31 36.342 ✓</i>	
		<i>CAPE MATTERS LORAN M. PANEL 2</i>	"	<i>270101</i>	<i>x= 3005355.727 ✓ y= 560724.835 ✓</i>	<i>φ 35 14 27.062 ✓ λ 75 31 36.132 ✓</i>	
3		<i>HING, 1979</i>	"	<i>301100</i>	<i>x= 2 952 272.130 ✓ y= 546 955.859 ✓</i>	<i>φ 35 12 28.838 ✓ λ 75 42 21.314 ✓</i>	
		<i>HING, 1979 PANEL 3</i>	"	<i>301101</i>	<i>x= 2 952 447.632 ✓ y= 547068.400 ✓</i>	<i>φ 35 12 29.893 ✓ λ 75 42 19.155 ✓</i>	
4		<i>KING, 1962</i>	"	<i>308100</i>	<i>x= 2 907 080.490 ✓ y= 525 329.133 ✓</i>	<i>φ 35 09 09.511 ✓ λ 75 51 33.940 ✓</i>	
		<i>KING, 1962 PANEL 4</i>	"	<i>308101</i>	<i>x= 2 909 518.423 ✓ y= 526 186.624 ✓</i>	<i>φ 35 09 17.225 ✓ λ 75 51 04.265 ✓</i>	
5		<i>OCRY, 1988 PANEL 5 (DIRECT)</i>	"	<i>314100</i>	<i>x= 2 866 750.729 ✓ y= 496 780.206 ✓</i>	<i>φ 35 04 39.589 ✓ λ 75 59 49.845 ✓</i>	<i>Doppler Station</i>
6		<i>SMOTH, 1960</i>	"	<i>197100</i>	<i>x= 2 848 726.153 ✓ y= 492 837.971 ✓</i>	<i>φ 35 04 05.934 ✓ λ 76 03 27.441 ✓</i>	
		COMPUTED BY		DATE	COMPUTATION CHECKED BY	DATE	
		LISTED BY <i>Don O. Norman</i>		<i>DATE 1/988</i>	LISTING CHECKED BY <i>B. Thurt</i>	DATE <i>12-8-88</i>	
		HAND PLOTTING BY		DATE	HAND PLOTTING CHECKED BY	DATE	

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	JOB NO.	GEODETTIC DATUM		ORIGINATING ACTIVITY		REMARKS
		STATION NAME	AEROTRI- ANGULATION POINT NUMBER	COORDINATES IN FEET STATE <i>N. Carolina</i> 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	<i>Don O. Norman</i>		DATE	LISTING CHECKED BY	DATE	
HAND PLOTTING BY			DATE	HAND PLOTTING CHECKED BY	DATE	

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.		JOB NO.		GEODEIC DATUM		ORIGINATING ACTIVITY		REMARKS	
		CM-8710		NAD 83					
STATION NAME	SOURCE OF INFORMATION (Index)	AEROTRI-ANGULATION POINT NUMBER	COORDINATES IN FEET STATE <i>N. Carolina</i> ZONE	φ LATITUDE	λ LONGITUDE				
DEY USE 1943	Field Data	172100	X= 2 684 212.161 ✓ Y= 357 305.195 ✓	34 42 29.375 ✓		0			
PANEL DIRECT				76 37 05.946 ✓					
CAPE LOOKOUT LTH., 1886	NAD 83 pamphlet Beaufort	163100 ✓	X= 2 713 162.788 ✓ Y= 326 920.013 ✓	34 37 21.889 ✓					
CAPE LOOKOUT LTH. PANEL 14	Field Data	163101 ✓	X= 2708408.295 ✓ Y= 322198.393 ✓	34 36 36.366 ✓					
CAPE HATTERAS L.H., 1933	"	1	X= 3 006 967.852 ✓ Y= 565 900.320 ✓	35 15 17.666 ✓					
HATTERAS INLET LIGHTHOUSE	Field Data	2	X= 2 935 372.758 ✓ Y= 566 577.762 ✓	35 31 14.520 ✓					
HATTERAS WATER TANK	Field Data	3	X= 2 960 563.050 ✓ Y= 550 529.295 ✓	35 45 37.162 ✓					
			X=	φ					
			Y=	λ					
			X=	φ					
			Y=	λ					
			X=	φ					
			Y=	λ					
			X=	φ					
			Y=	λ					
COMPUTED BY		DATE	COMPUTATION CHECKED BY			DATE			
LISTED BY <i>Don O. Norman</i>		DATE <i>9-19-88</i>	LISTING CHECKED BY <i>B. Thoms</i>			DATE <i>12-8-88</i>			
HAND PLOTTING BY		DATE	HAND PLOTTING CHECKED BY			DATE			

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

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	JOB NO.	SOURCE OF INFORMATION (Index)	AEROTRI-ANGULATION POINT NUMBER	COORDINATES IN FEET STATE <u>N. C.</u> <u>IND</u> ZONE	GEODETIC DATUM <u>NAD 83</u>	ORIGINATING ACTIVITY	REMARKS
				GEOGRAPHIC POSITION $\phi$ LATITUDE $\lambda$ LONGITUDE			
	<u>CM-8710</u>		<u>4</u>	<u>X= 2698985.467</u> <u>Y= 362894.201</u>	<u><math>\phi</math> 34-43-21.103</u> <u><math>\lambda</math> 76-34-07.396</u>		
<u>Gaskill 1933</u>	<u>GEOD. CONTROL DATA</u> <u>BEAUFORT</u>		<u>5</u>	<u>X= 3010459.364</u> <u>Y= 601544.484</u>	<u><math>\phi</math> 35-21-08.809</u> <u><math>\lambda</math> 75-30-17.311</u>		
<u>Avon Water Tank</u>	<u>"</u> <u>MANTEO FIELD BOOIC</u>		<u>6</u>	<u>X= 3008918.312</u> <u>Y= 589397.957</u>	<u><math>\phi</math> 35-19-09.273</u> <u><math>\lambda</math> 75-30-41.058</u>		
<u>KINNA 1962</u>	<u>"</u>		<u>5</u> <del><u>7</u></del>	<u>X= 3,010,459.364</u> <u>Y= 601,544.484</u>	<u><math>\phi</math> 35-21-08.809</u> <u><math>\lambda</math> 75-30-17.311</u>		
<u>AVON WATER TANK</u>	<u>GEOD. CONTROL DATA</u> <u>MANTEO</u>		<u>8</u>	<u>X= 2,869,301.578</u> <u>Y= 510,671.678</u>	<u><math>\phi</math> 35-06-56.173</u> <u><math>\lambda</math> 75-59-14.093</u>		
<u>OCRAKORE CG STATION CUPOLA</u>	<u>"</u>		<u>9</u>	<u>X= 2,977,127.081</u> <u>Y= 557,054.659</u>	<u><math>\phi</math> 35-14-00.414</u> <u><math>\lambda</math> 75-37-17.792</u>		
<u>UNIDENTIFIED B MIT TANK 1</u>	<u>"</u>			<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
				<u>X=</u> <u>Y=</u>	<u><math>\phi</math></u> <u><math>\lambda</math></u>		
COMPUTED BY			DATE	COMPUTATION CHECKED BY		DATE	
LISTED BY <u>B. Thorton</u>			DATE <u>10-27-88</u>	LISTING CHECKED BY <u>J. McNeil</u>		DATE <u>12/8/88</u>	
HAND PLOTTING 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> <sup>1</sup>	<u>PHOTOGRAPHY</u> <sup>2</sup>	<u>DATE</u>	<u>TIME</u> <sup>3</sup>	<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. Schrad Date 11/6/90

MAP COMPILATION SOURCES for CM-8710

<u>MAP NUMBER</u> <sup>1</sup>	<u>PHOTOGRAPHY</u> <sup>2</sup>	<u>DATE</u>	<u>TIME</u> <sup>3</sup>	<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:

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 NUMBER</u> <sup>1</sup>	<u>PHOTOGRAPHY</u> <sup>2</sup>	<u>DATE</u>	<u>TIME</u> <sup>3</sup>	<u>SCALE</u>	<u>TIDE STAGE (Feet)</u> <sup>4</sup>
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

MAP NUMBER <sup>1</sup>	PHOTOGRAPHY <sup>2</sup>	DATE	TIME <sup>3</sup>	SCALE	TIDE STAGE (Feet) <sup>4</sup>
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
<u>- TP-01518</u>					
<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
- TP-01515					
<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	200	35-02-08.60	76-20-54.24	6	087/988
MARKER	086	35-02-09.55	76-21-50.17	6	087/988
LIGHT 4WB	200	35-02-10.48	76-23-02.59	6	087/988
LIGHT 3	200	35-02-07.82	76-24-15.23	6	087/988
(Lighted Mile Marker 3)					
LIGHT 11WB	200	34-56-32.09	76-23-16.52	6	087/988
LIGHT 13WB	200	34-56-23.63	76-23-06.47	6	087/988
LIGHT 15WB	200	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</u>					
<u>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
CUPOLA COAST GUARD (OCRACoke COAST GUARD STATION CUPOLA 1960)					
TANK	086	35-06-56.17	75-59-14.09	4	087/988
		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



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

**GENUINE PRESSBOARD**