TP-01063

TP- 01063

NOAA FORM 76-35
(6-80)

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

DESCRIPTIVE REPORT

This Map Will Not Be Field Edited.

Map No. TP-01063	*Edition No.* 1
Job No. CM-8414	
Map Classification Class III	
Type of Survey Photobathymetry Survey	

LOCALITY

State Florida

General Locality Florida Keys, Hawk Channel

Locality Looe Key National Marine Sanctuary

19 85 TO 19

REGISTERED IN ARCHIVES

DATE

* U.S. GOVERNMENT PRINTING OFFICE: 1980-665-115

NOAA FORM 61-29 (12-71)

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

REFERENCE NO.
N/CG2314

LETTER TRANSMITTING DATA

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY (Check):

☐ ORDINARY MAIL ☐ AIR MAIL
☐ REGISTERED MAIL ☐ EXPRESS
☐ GBL (Give number) _____
Messenger

DATE FORWARDED

NUMBER OF PACKAGES
2

TO:

Mr. T. Holt
Vault, N/CG243x1
Data Control Section
Riverdale, Md

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. *This form should not be used for correspondence or transmitting accounting documents.*

REGISTERED MAPS AND DESCRIPTIVE REPORTS

TP-01063	Part 1 of 2	CM-8414
TP-01063	Part 2 of 2	"
TP-01128	Part 1 of 2	CM-8105
TP-01128	Part 2 of 2	"
TP-01129	Part 1 of 2	"
TP-01129	Part 2 of 2	"
TP-01130	Part 1 of 2	"
TP-01130	Part 2 of 2	"
TP-01162		"
TP-01304		CM-8401
TP-01305		"
TP-01306		"
TP-01307		"
TP-01308		"
and TP-01303		"

FROM: (Signature)

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

ROBERT KORNSPAN, N/CG2314
PHOTOGRAMMETRY BR.,
NAUTICAL CHARTING DIVISION
WSC-1, Rm 719
ROCKVILLE, MD 20852

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED.

*U.S.GPO:1983-0-864-005/1192

DESCRIPTIVE REPORT

TP-01063

TABLE OF CONTENTS

NOAA FORM 76-36A (3-72) — U. S. DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMIN.

DESCRIPTIVE REPORT - DATA RECORD

TYPE OF SURVEY: [X] ORIGINAL [ ] RESURVEY [ ] REVISED

SURVEY TP-01063

MAP EDITION NO. 1

MAP CLASS III

JOB ~~PH-~~ CM-8414

PHOTOGRAMMETRIC OFFICE: Photogrammetry Branch, Rockville, Maryland

OFFICER-IN-CHARGE: Ronald K. Brewer, Acting Chief

LAST PRECEEDING MAP EDITION

TYPE OF SURVEY: [ ] ORIGINAL [ ] RESURVEY [ ] REVISED

JOB PH-

MAP CLASS

SURVEY DATES: 19__ TO 19__

I. INSTRUCTIONS DATED

1. OFFICE	2. FIELD
AEROTRIANGULATION, dated July 17, 1985 OFFICE, dated May 21, 1986	FIELD, dated November 2, 1984

II. DATUMS

1. HORIZONTAL: [X] 1927 NORTH AMERICAN — OTHER (Specify)

2. VERTICAL: [ ] MEAN HIGH-WATER [ ] MEAN LOW-WATER [X] MEAN LOWER LOW-WATER [ ] MEAN SEA LEVEL — OTHER (Specify)

3. MAP PROJECTION: Transverse Mercator Projection

4. GRID(S): STATE: Florida; ZONE: 7

5. SCALE: 1:10,000 — STATE; ZONE

III. HISTORY OF OFFICE OPERATIONS

OPERATIONS		NAME	DATE
1. AEROTRIANGULATION	BY	Brian Thorton	Nov., 1985
METHOD: Analytical	LANDMARKS AND AIDS BY	N/A	
2. CONTROL AND BRIDGE POINTS	PLOTTED BY	Brian Thorton	Nov., 1985
METHOD: Calcomp Automated Plotter	CHECKED BY	N/A	
3. STEREOSCOPIC INSTRUMENT	PLANIMETRY BY	Ted Doyle	March, 1986
COMPILATION National Ocean Service	CHECKED BY	Robert Rodkey	March, 1986
INSTRUMENT: Analytical Plotter (NOSAP)	~~CONTOURS~~ BY	Ted Doyle	March, 1986
SCALE: 1:10,000 Photobathymetry	CHECKED BY	Robert Rodkey	March, 1986
4. MANUSCRIPT DELINEATION	PLANIMETRY BY	Ted Doyle	April, 1986
	CHECKED BY	Robert Rodkey	April, 1986
Smmoth Drafting Photobathymetry	BY	Ted Doyle	May, 1986
METHOD: PBATH by automated plotter	CHECKED BY	Robert Rodkey	May, 1986
	HYDRO SUPPORT DATA BY	N/A	
SCALE: 1:10,000	CHECKED BY	N/A	
5. OFFICE INSPECTION PRIOR TO FIELD EDIT	BY	N/A	
6. APPLICATION OF FIELD EDIT DATA	BY	N/A	
	CHECKED BY	N/A	
7. COMPILATION SECTION REVIEW	BY	Robert Rodkey	May, 1986
8. FINAL REVIEW	BY	Robert Rodkey	June, 1986
9. DATA FORWARDED TO PHOTOGRAMMETRIC BRANCH	BY	Robert Rodkey	Feb., 1987
10. DATA EXAMINED IN PHOTOGRAMMETRIC BRANCH	BY	P. Dempsey	Feb 1987
11. MAP REGISTERED - COASTAL SURVEY SECTION	BY	E L DAUGHERTY	MAR 1987

NOAA FORM 76-36A — SUPERSEDES FORM C&GS 181 SERIES

* U.S. G.P.O. 1972-769382/582 REG.#6

NOAA FORM 76-36B
(3-72)

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

COMPILATION SOURCES

TP-01063

1. COMPILATION PHOTOGRAPHY

CAMERA(S)
Wild RC-10(B) (152; 74mm)

TIDE STAGE REFERENCE
- ☐ PREDICTED TIDES
- ☐ REFERENCE STATION RECORDS
- ☒ TIDE CONTROLLED PHOTOGRAPHY

TYPES OF PHOTOGRAPHY LEGEND
- (C) COLOR
- (P) PANCHROMATIC
- (I) INFRARED

TIME REFERENCE
ZONE: Eastern — ☒ STANDARD
MERIDIAN: 75° — ☐ DAYLIGHT

NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE
85B(C)1194 - 1199	1/24/85	13:40	1:15,000	+0.53 ft MLLW
85B(C)1219 - 1225	1/24/85	13:57	1:15,000	+0.64 ft MLLW
85B(C)1241 - 1244	1/24/85	14:18	1:5,000	+0.74 ft MLLW
85B(C)1250 - 1253	1/24/85	14:28	1:5,000	+0.80 ft MLLW
85B(C)1270 - 1273	1/24/85	14:44	1:5,000	+0.90 ft MLLW

REMARKS
All references for tides are based on tide staff observations located at Looe Key reef and reference tide station at Key West, Florida.

2. SOURCE OF MEAN HIGH-WATER LINE:

The compilation of the MHW line does not pertain to this project.

3. SOURCE OF MEAN LOW-WATER OR MEAN LOWER LOW-WATER LINE:

The approximate MLLW line and areas of awash coral reef were delineated through interpretation of the photographs listed under item 1 utilizing the NOS Analytical Plotter and application of digital mapping techniques resident within the Intergrated Digital Photogrammetric Facility.

4. CONTEMPORARY HYDROGRAPHIC SURVEYS *(List only those surveys that are sources for photogrammetric survey information.)*

SURVEY NUMBER	DATE(S)	SURVEY COPY USED	SURVEY NUMBER	DATE(S)	SURVEY COPY USED

5. FINAL JUNCTIONS

NORTH	EAST	SOUTH	WEST
None	None	None	None

REMARKS

NOAA FORM 76-36C
(3-72)

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

HISTORY OF FIELD OPERATIONS

TP-01063

I. [XX] FIELD INSPECTION OPERATION [ ] FIELD EDIT OPERATION

OPERATION		NAME	DATE
1. CHIEF OF FIELD PARTY		James Dunford	Jan/Feb'85
2. HORIZONTAL CONTROL	RECOVERED BY	Coastal Surveys Unit	"
	ESTABLISHED BY	"	"
	PRE-MARKED OR IDENTIFIED BY	"	"
3. VERTICAL CONTROL	RECOVERED BY	"	"
	ESTABLISHED BY	"	"
	PRE-MARKED OR IDENTIFIED BY	"	"
4. LANDMARKS AND AIDS TO NAVIGATION	RECOVERED (*Triangulation Stations*) BY	N/A	
	LOCATED (*Field Methods*) BY	Coastal Surveys Unit	Jan/Feb'85
	IDENTIFIED BY	"	"
5. GEOGRAPHIC NAMES INVESTIGATION	TYPE OF INVESTIGATION: [ ] COMPLETE [ ] SPECIFIC NAMES ONLY [X] NO INVESTIGATION — BY	N/A	
6. PHOTO INSPECTION	CLARIFICATION OF DETAILS BY	N/A	
7. BOUNDARIES AND LIMITS	SURVEYED OR IDENTIFIED BY	N/A	

II. SOURCE DATA

1. HORIZONTAL CONTROL IDENTIFIED

Premarked

PHOTO NUMBER	STATION NAME
85Z(C)1221	H-7, H-8
85Z(C)1225	H-3, H-4, H-5(Looe Key Light 24), H-6
85Z(C)1227	H-1, H-2

2. VERTICAL CONTROL IDENTIFIED

Premarked

PHOTO NUMBER	STATION DESIGNATION
85Z(C)1221	V-4, V-14
85Z(C)1225	V-3, V-5, V-6, V-7, V-8, V-9, V-10, V-11, V-12, V-13
85Z(C)1227	V-1, V-2

3. PHOTO NUMBERS (*Clarification of details*)

N/A

4. LANDMARKS AND AIDS TO NAVIGATION IDENTIFIED

Photoidentified

PHOTO NUMBER	OBJECT NAME
85Z(C)1225	Looe Key Light 24

PHOTO NUMBER	OBJECT NAME

5. GEOGRAPHIC NAMES: [ ] REPORT [X] NONE

6. BOUNDARY AND LIMITS: [ ] REPORT [X] NONE

7. SUPPLEMENTAL MAPS AND PLANS

None

8. OTHER FIELD RECORDS (*Sketch books, etc.* **DO NOT** *list data submitted to the Geodesy Division*)

Refer to listing "Index to Project Data and Material on File", which is bound with this Descriptive Report, for information on this subject.

☆U.S. Government Printing Office: 1975 – 665-661/1110, Region No. 6

NOAA FORM 76-36D
(3-72)

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

RECORD OF SURVEY USE

TP-01063

I. MANUSCRIPT COPIES

COMPILATION STAGES			DATE MANUSCRIPT FORWARDED	
DATA COMPILED	DATE	REMARKS	MARINE CHARTS	HYDRO SUPPORT
Final Reviewed Class III Map	6/86	Chart Maintenance Print	2/87	
Final Reviewed Photobathymetric Data Overlay	6/86	"	2/87	
Preliminary Version of Class III Map	4/86	Notes to Hydrographer Print(Field Use)		4/86
Preliminary Version of Photobathymetric Data O/L	4/86	"		4/86

II. LANDMARKS AND AIDS TO NAVIGATION

1. REPORTS TO MARINE CHART DIVISION, NAUTICAL DATA BRANCH

NUMBER	CHART LETTER NUMBER ASSIGNED	DATE FORWARDED	REMARKS
1 pg.		2/9/87	Charted Landmarks and Aids Listing

2. ☐ REPORT TO MARINE CHART DIVISION, COAST PILOT BRANCH. DATE FORWARDED: N/A
3. ☐ REPORT TO AERONAUTICAL CHART DIVISION, AERONAUTICAL DATA SECTION. DATE FORWARDED: N/A

III. FEDERAL RECORDS CENTER DATA

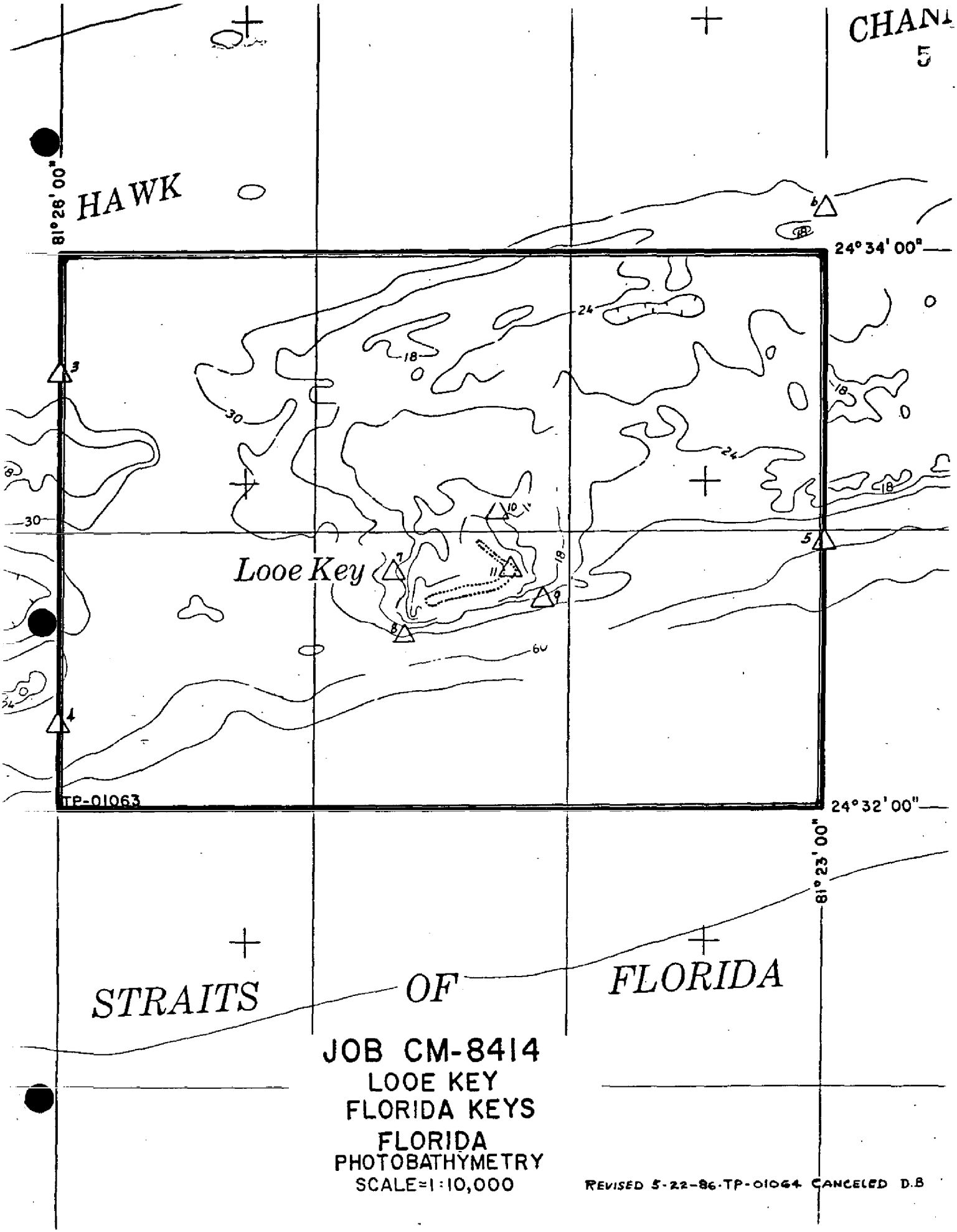
1. ☐ BRIDGING PHOTOGRAPHS; ☒ DUPLICATE BRIDGING REPORT; ☒ COMPUTER READOUTS.
2. ☐ CONTROL STATION IDENTIFICATION CARDS; ☐ FORM NOS 567 SUBMITTED BY FIELD PARTIES.
3. ☒ SOURCE DATA *(except for Geographic Names Report)* AS LISTED IN SECTION II, NOAA FORM 76-36C. ACCOUNT FOR EXCEPTIONS:
4. ☒ DATA TO FEDERAL RECORDS CENTER. DATE FORWARDED: _____

IV. SURVEY EDITIONS *(This section shall be completed each time a new map edition is registered)*

	SURVEY NUMBER	JOB NUMBER	TYPE OF SURVEY
SECOND EDITION	TP - _____ (2)	PH - _____	☐ REVISED ☐ RESURVEY
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	MAP CLASS ☐II. ☐III. ☐IV. ☐V. ☐FINAL
THIRD EDITION	SURVEY NUMBER TP - _____ (3)	JOB NUMBER PH- _____	TYPE OF SURVEY ☐REVISED ☐RESURVEY
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	MAP CLASS ☐II. ☐III. ☐IV. ☐V. ☐FINAL
FOURTH EDITION	SURVEY NUMBER TP - _____ (4)	JOB NUMBER PH - _____	TYPE OF SURVEY ☐REVISED ☐RESURVEY
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	MAP CLASS ☐II. ☐III. ☐IV. ☐V. ☐FINAL

NOAA FORM 76-36D

☆U. S. GOVERNMENT PRINTING OFFICE: 1973--778075/1077 REGION NO. 6



JOB CM-8414

LOOE KEY
FLORIDA KEYS
FLORIDA
PHOTOBATHYMETRY
SCALE=1:10,000

REVISED 5-22-86-TP-01064 CANCELED D.B

SUMMARY

Project CM-8414 was originally planned to consist of two shoreline maps with accompanying photobathymetric data overlays. The map numbers assigned for this project were TP-01063 and TP-01064. The production requirement for TP-01064 was cancelled in May 1986. The production of the 1:10,000 scale map(TP-01063) with accompanying photobathymetric data overlay remained as the primary task. The photogrammetric survey depicts the reef, submerged coral formations and cartographic features of mapping interest within the limits of the Looe Key National Marine Sanctuary, which is located approximately eight nautical miles south-southwest of Big Pine Key, Florida.

The purpose of this project was to determine the bathymetry of the Looe Key National Marine Sanctuary by photogrammetric methods. Areas within the map limits for which bathymetry could not be determined through photogrammetric methods are to be surveyed by conventional hydrographic survey methods. The hydrographic/photogrammetric survey data will be used to prepare a bathymetric map and accompanying series of overlays depicting data for sanctuary management purposes as specified in an interagency agreement with the Office of Ocean and Coastal Resource Management, NOAA. The standard photogrammetric survey products were forwarded in support of the Nautical Charting Program.

Field operations consisted of aerial photography, installation of a tide staff, tidal observations, and the recovery, establishment, and identification of horizontal/vertical control necessary for aerotriangulation and photobathymetry. Natural color photographs required for aerotriangulation and compilation were taken with a Wild RC-10(B) camera at 1:5,000 and 1:15,000 scales.

Five strips of natural color photographs were bridged using analytic aerotriangulation methods; two strips of 1:15,000 scale and three strips of 1:5,000 scale. Aerotriangulation of the 1:15,000 scale photographs was based on field established geodetic control. Tie points were established using these photographs to augment the horizontal control necessary for bridging the 1:5,000 scale photographs and to ensure adequate junctioning between strips. Primary horizontal and vertical control points used were premarked and supplemental points were photoidentified. Aerotriangulated control proved adequate and meets the requirements for photogrammetric control according to the National Standards of Map Accuracy.

Compilation was performed in the Coastal Mapping Unit of the Rockville, Maryland office. Delineation was accomplished using the National Ocean Service Analytical Plotter(NOSAP) through application of digital compilation techniques resident within the Integrated Digital Photogrammetric Facility(IDPF). Delineation was based on an office interpretation of the natural color bridged photographs. All line work on the base map was smooth drafted. Photobathymetric discrete point data was measured, recorded and

processed digitally within the structure of the IDPF. A negative of the final reviewed discrete point photobathymetric data was scribed utilizing a Calcomp automated plotter. Depths are shown in whole feet on the photobathymetric data overlay and are based on National Ocean Service standards for depth depiction. Depth curves were compiled at six foot(one fathom) intervals and were handscribed on the photobathymetric data negative after isobathic and discrete point data analysis. Positives were generated from the photobathymetric data scribe for registration and data dissemination purposes. The photobathymetric discrete point digital data is archived in the Photogrammetric Electronic Data Library(PEDL) and is available to approved users.

Final review was performed in the Coastal Mapping Unit of the Rockville, Maryland office. The base map, photobathymetric data overlay and associated discrete point data of this project meet the requirements of the National Standards of Map Accuracy. The base map, photobathymetric data overlay and reports also comply with the project instructions. The project photobathymetric digital data comply with the Nautical Charting Division(NCD) standards for digital source data structured in NCD Format 13. NCD Format 13 is structured for geographic positions and associated attributes for each data record.

The Descriptive Report prepared for the map contains all the information pertinent to the completion of the map.

CM-8414

LOOE KEY, FLA.

PHOTOBATHYMETRY

FIELD REPORT

The field work was performed in accordance with Project Instruction dated Nov. 2, 1984 N/CG2313:RWW. All field work was conducted between Jan. 8, and Feb. 8, 1985.

Personnel consisted of six members of the Coastal Surveys Unit, with Mr. James Dunford as Chief of Party. Lt. John Novaro, AMC Dive Officer, along with several personnel from the Marine Sanctuary made up the remaining members of the field crew.

LOCALITY:

The project was located at the Looe Key National Marine Sanctuary. The sanctuary is located 7 nautical miles off Big Pine Key. The project was limited to the sanctuary boundaries itself.

PROJECT PLANNING:

Months before the start of the project, Mr. Bob Williams, of the Rockville office sent down a rough outline of the project instructions. He asked for our ideas on this rather unique assignment. A project of this type had never been attempted before. It was unique since, all the horizontal control would be in 20 to 40 feet of water. So, various tests were conducted to determine the best methods for securing a horizontal panel above the water. After several structures were tested, it was decided to use the Raydist Towers. Lightweight, accessibility and ease in erecting, made them the best choice. The towers were fastened to the bottom using sand anchors, and stainless steel cables. (see page 4 of photos) Divers were used to install the towers underwater.

HORIZONTAL CONTROL:

A new position for Looe Key Lt. was determined using Third Order Traverse techniques. Recovery of station, Newfound 1920, revealed that this station was not ground visible from other existing control. Temporary point, Newfound Ecc; was then established by a Spur Traverse, using a reverse solar azimuth. Acceptable check angles were obtained at Newfound Ecc. between American Shoal Lighthouse and Big Pine Shoal Light.

Looe Key Lt. was then established by a Third Order Traverse, beginning at Newfound Ecc. and closing at American Shoal Lighthouse. The closing leg of the traverse was determined by computing the triangle; American Shoal Lighthouse-Newfound Ecc.-Looe Key Lt. An ASA computation was used, holding the reduced EDM distance Newfound Ecc. to Looe Key Lt. Total length of this traverse was 20,536 meters with a closing position check of 1:44,000.

All positions for the horizontal panels (towers) were determined by Third Order Traverse methods, using Looe Key Lt.-American Shoal Lighthouse as starting azimuth.

The Looe Key Marine Underwater Boundary Marks were also traversed to. Using Looe Key-American Shoal Lighthouse as azimuth, a Spur Traverse was completed to each mark. The Hewlett-Packard EDM 3810B was used to turn angles and measure the distances. Since all the marks were underwater, a bouy with prisms attached to it, was floated above the marks: A diver went down, and with a line tied to the buoy, cinched down the buoy to the mark. Another diver at the surface pointed the prisms toward Looe Key Lt. The buoy was vertical over the mark + or - 2.0 ft. It should be noted that a discrepancy was found between

the 1983 private contractors survey and this survey. (see diff. in 1983 and 1985 survey of this text)

Positions for the Looe Key Boundary Buoys were also determined. A Spur Traverse was completed to each buoy during photography. Buoys should be in the same position on the photographs, as they were when traversed too. Therefore, they could be used as extra horizontal control.

VERTICAL CONTROL

Levels were run at Key West on Jan. 18 and 3 marks were leveled, USC&GS 27 1923, 4580A 1978 and 4580B 1984. A tide staff was attached to Looe Key Lt. on Jan. 22. Since levels could not be run at Looe Key, all elevations are referenced to the tide staff at Key West. Comparative readings were made on Jan. 23 and 24 between Looe Key and Key West tide staffs.

Photography was flown on Jan. 24, 1985. Air Mission 1 contacted the field party at 0845 EST, and started photography at 0918 and finished all photography at 0956 EST. All horizontal and vertical panels were in position at the time of photography. The tide staffs at Looe Key and Key West were monitored during all photography. All elevations for the vertical panels are referenced to MLLW on the tide staff at Key West. Horizontal panels (towers) have an elevation above MLLW, measurements were taken on Jan. 24. (see page 1 of vertical control for elevations)

Because of the nature of this project CSI cards were impractical. A sketch showing scaled positions for all vertical and horizontal control is submitted along with this report.

Looe Key Boundary Buoys were also measured, and have an elevation above the water surface. (see page 6 of vertical control) Because of the shape of the buoys, the outer edge should be used for the elevation. There are also many white round mooring buoys scattered along the reef, that may be used for vertical control. Their elevation above the water surface is 1 foot.

Closing levels were run on Jan. 25, at Key West. The same marks were leveled to as before. All closures were good and checked with the published elevations.

GENERAL INFORMATION:

The weather for the most part was warm and sunny. The wind did have an effect on the project. Strong winds and high seas kept the party from getting out to the reef for several days. And consequently, knocked down 3 towers, which were erected the following day. (see page 3 and 8 of photos)

The only other problem encountered was with a 18ft. Monarch. The engine blew out towards the end of the project, which put this boat out of service. Luckily, the Park Service had 2 of their boats assigned to the party and operations continued. No other real delays occured during this project.

It should be said that Janurary and Feburary are traditionally windy months in this area. This should be considered if future projects of this nature are attempted.

In closing this report, I would like to Thank all the members of the field party for their contribution to an unique and challenging project.

SUBMITTED BY

Richard D. James

Aerotriangulation Report
CM-8414
Looe Key, Florida
July, 1985

21. AREA COVERED

This project covers the Looe Key, Florida National Marine Sanctuary. The area is entirely under water and is limited to the sanctuary boundaries. The area is covered by two sheets; TP-01063 a 1:10,000 scale sheet that includes the outer boundaries of the sanctuary area. The second sheet, TP-01064 a 1:2,500 scale sheet, covers the prominent reef area in the center of the project.

22. METHOD

Two strips of 1:15,000 scale photographs and three strips of 1:5,000 scale photographs were bridged by analytical aerotriangulation methods and adjusted to ground as a block with the General Intergrated Analytical Triangulation Program (GIANT). The two scales of photographs were treated as separate blocks. Each block consisted of 12 photographs. The block of 1:15,000 scale photographs consisted of eight premarked control stations with known vertical as well as horizontal positions. Due to the fact that the entire project area is under water, these eight premarked control stations were the only fixed control in the job. The block of 1:5,000 scale photographs consisted of 12 photographs with four of the premarked control stations that appeared on the 1:15,000 scale photographs.

Ratio values were determined from the bridging photographs. A copy of the values is attached to this report.

The base sheets were plotted on the Calcomp 718 plotter using the Florida state plane coordinate system, East zone. This system is based on the Transverse Mercator projection.

The fixed horizontal and vertical control for this project was adequate and meets the National Standards of Map Accuracy and N.O.S. horizontal standards. The supplemental, floating, vertical control was adequate for its intended use and meets the National Standards of Map Accuracy.

23. ADEQUACY OF CONTROL

The project area being entirely underwater, as much as 40 feet, raised unique problems with this job. Lattice towers were erected in the water bottom using sandanchors, with the tops of the towers extending above the water surface. Atop the lattice towers, panels with known horizontal and vertical positions were affixed. These seven stations along with one already established station (Looe Key Lt.), provided the only fixed control in the project area. In addition to the fixed control, bouys marking the sanctuary area as well as floating vertical panels placed by the field party were located over the project area.

It is these floating points that raise the unique problems. Measuring the floating points in a single strip of photographs will yield a specific position for that point. When that same point is measured on another strip of photographs, another position for that same point will be determined which will be within precission tolerances of that strip also, yet when those values are combined within a block adjustment, high precission errors are occurring because the points are shifting with wave action, tide action, etc., during the elapsed time of photographic exposures from flight line to flight line. It is for the same reason that our office is using the field position of the bouys on the day of photography for plotting.

24. SUPPLEMENTAL DATA

All control fixed or floating was determined by the field party.

25. PHOTOGRAPHY

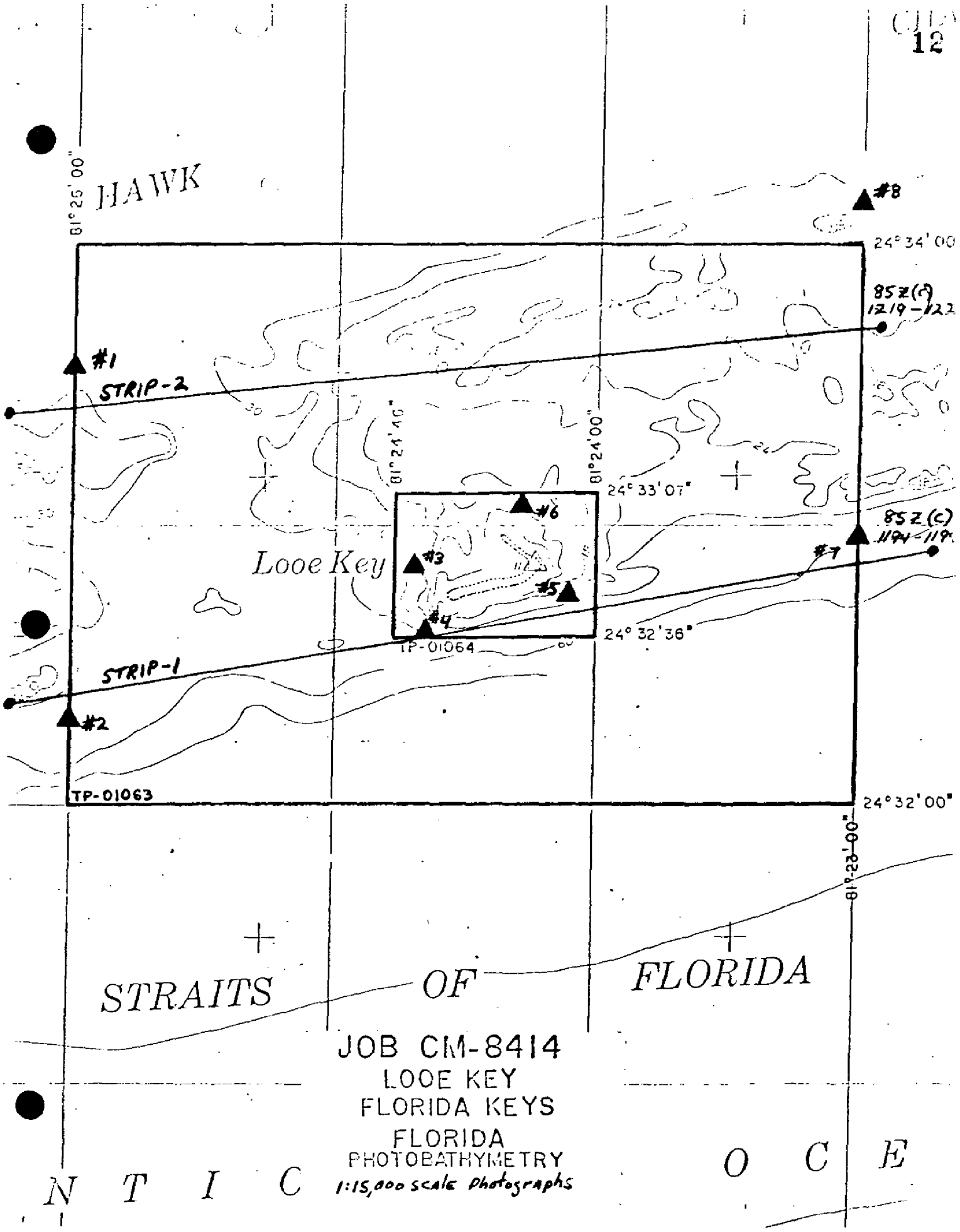
The coverage, overlap, and quality of the 1985Z(c) photographs were adequate for the job.

Submitted by:

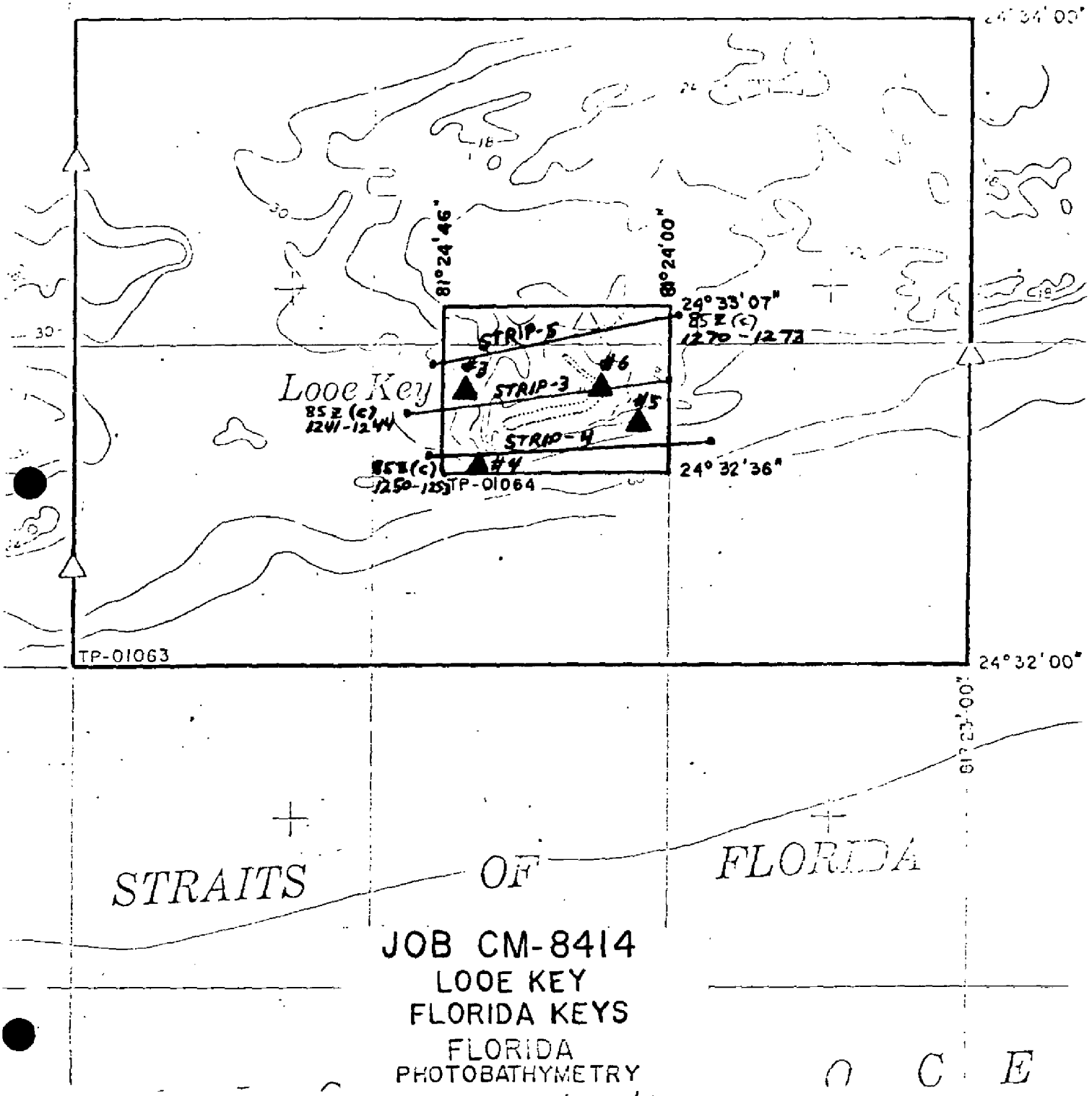
Brian Thornton

Approved and Forwarded:

Don O. Norman
Chief Aerotriangulation Unit



JOB CM-8414
LOOE KEY
FLORIDA KEYS
FLORIDA
PHOTOBATHYMETRY
1:15,000 scale photographs



JOB CM-8414
LOOE KEY
FLORIDA KEYS
FLORIDA
PHOTOBATHYMETRY

1:5,000 scale Photographs

Fit to Control
Strips 1,2
1:15,000 scale Photographs

Station Names	Point No.	Error in Feet x	y	z
Northwest Inner Tower Circle #3	196103	0.5	0	-0.8
Northwest Outer Tower Circle #1	220101	-0.3	0.5	0.3
Northeast Inner Tower Circle #6	197106	0.1	-0.1	-1.1
Northeast Outer Tower Circle #8	224108	0	0.1	0.2
Southeast Outer Tower Circle #7	199107	-0.5	-0.4	0.8
Southwest Inner Tower Circle #4	196104	0.3	0.5	0.2
Southwest Outer Tower Circle #2	194102	0	-0.6	0.5
Looe Key Lt. Circle #5	197100	-4.3	1.3	2.3

Fit to Control
Strips 3,4,5
1:5,000 scale Photographs

Northwest Inner Tower Circle #3	196103	0.3	0.1	0.7
Southwest Inner Tower Circle #4	196104	0.1	-0.1	-0.5
Looe Key Lt. Circle #5	197100	-0.2	-0.5	0.3
Northeast Inner Tower Circle #6	197106	-0.2	0.5	-0.5

Ratio Values
of
Bridging Photographs

85Z(C) 1194 - 1204 (even numbers only)	Ratio 1.484
85Z(C) 1220 - 1230 (even numbers only)	Ratio 1.477
85Z(C) 1241 - 1244	Ratio 2.045
85Z(C) 1250 - 1253	Ratio 2.012
85Z(C) 1271 - 1274	Ratio 1.962

CM-8414
Aerotriangulation Report
Addendum
Looe Key, Florida
May, 1986

This project which consisted of two strips of 1:15,000-scale photographs and three strips of 1:5,000-scale photographs was remeasured using the National Ocean Service Analytic Plotter (NOSAP) under control of the Integrated Digital Photogrammetric Facility Software (IDPF). Since the area is entirely under water, corrections for water refraction were applied to the measurements. This adjustment was used by the compilation unit to complete the project.

A new list of the fit to control is included with this addendum.

Submitted by:

Brian Thornton

Approved and Forwarded:

Don O. Norman
Chief, Aerotriangulation Unit

Fit to Control

Looe Key, Florida
CM-8414

Station Names	Point No.	Error in Feet X	Y	Z
Northwest Inner Tower Circle #3	196103	.01	0.2	-0.8
Northwest Outer Tower Circle #1	220101	0.0	0.0	0.1
Northeast Inner Tower Circle #6	197106	0.0	0.0	0.3
Northeast Outer Tower Circle #8	224108	0.0	0.0	0.8
Southeast Outer Tower Circle #7	199107	0.0	0.0	0.1
Southwest Inner Tower Circle #4	196104	0.6	0.1	0.3
Looe Key Lt. Circle #5	197100	3.5	1.9	3.3

NOAA FORM 76-41
(6-75)

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

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	JOB NO.	GEODETIC DATUM	ORIGINATING ACTIVITY
TP-01063	CM-8414	1927 North American	Coastal Mapping Unit Photogrammerty Branch, Rockville

STATION NAME	SOURCE OF INFORMATION (Index)	AEROTRI-ANGULATION POINT NUMBER	COORDINATES IN FEET STATE Florida ZONE East	GEOGRAPHIC POSITION ϕ LATITUDE λ LONGITUDE	REMARKS
Looe Key Light 1985	Project Fld. Data Binder		x= 366,102.06 y= 77,548.00	ϕ 24-32-46.366 λ 81-24-10.182	Field Position
			x= y=	ϕ λ	
			x= y=	ϕ λ	
			x= y=	ϕ λ	
			x= y=	ϕ λ	
			x= y=	ϕ λ	
			x= y=	ϕ λ	
			x= y=	ϕ λ	
			x= y=	ϕ λ	
			x= y=	ϕ λ	

COMPUTED BY	DATE	COMPUTATION CHECKED BY	DATE
LISTED BY Edward D. Allen	DATE 2/86	LISTING CHECKED BY Robert W. Rodkey, Jr.	DATE 3/86
HAND PLOTTING BY	DATE	HAND PLOTTING CHECKED BY	DATE

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

COMPILATION REPORT

TP-01063

31. Delineation

Delineation was accomplished using the National Ocean Service Analytical Plotter(NOSAP) through application of digital compilation techniques and procedures resident within the structure of the Intergrated Digital Photogrammetric Facility(IDPF). Delineation of the reef and submerged features was based on office interpretation of the 1:5,000 and 1:15,000 scale natural color photographs.

32. Control

As a result of aerotriangulation through IDPF procedures, model reset files were resident on the system disk accessed by NOSAP. Recapture of the orientation for each stereographic model was established through standard procedures within IDPF. The quality of vertical and horizontal control is discussed in the Aerotriangulation Report, dated July 1985, and the Addendum, dated May 1986, both which are bound with this Descriptive Report.

33. Supplemental Data

No survey, map or plan of this agency or of any other organization was used to supplement the compilation photographs in the identification of cartographic features.

34. Contours and Drainage

The compilation of contours and drainage is inapplicable to this project.

35. Shoreline and Alongshore Detail

Refer to the Summary bound with this Descriptive Report for a discussion of the nature of the project area.

36. Offshore Detail

The limits of submerged coral formations, where visible, were delineated from the natural color photographs. These limits indicate the characteristics of the seabed and do not necessarily represent a hazard to navigation.

37. Landmarks and Fixed Aids to Navigation

A geodetic position was established for the one fixed aid to navigation which exists within the limits of the map. There are no charted landmarks within the limits of the map.

38. Control for Future Surveys

Refer to NOAA Form 76-41 bound with this Descriptive Report for information on recoverable control for future surveys.

39. Junctions

Refer to item 5 of NOAA Form 76-36B(Data Record), which is bound with this Descriptive Report, for information on map junctions.

40. Horizontal and Vertical Accuracy

This map and associated data meet the requirements of the National Standards of Map Accuracy. Refer to the Aerotriangulation Report and Addendum for more information on this subject.

41. Photobathymetry

A photobathymetric survey was the primary requirement for this project. Refer to the Summary bound with this Descriptive Report for information on this subject.

42. through 45. Not applicable.

46. Comparison with Existing Maps

Comparison with existing maps was not a requirement of this project.

47. Comparison with NOS Nautical Charts

A comparison was made with the following NOS Nautical Charts:

11445, 23rd Edition, May 4, 1985; 1:40,000 scale
11442, 24th Edition, July 20, 1985; 1:80,000 scale.

A Chart Maintenance Print indicating the results of the comparison will be forwarded to the Marine Charty Branch, Rockville, Maryland. Refer to the print for items to be immediately applied and carried forward.

Submitted by,

Ted Doyle
Cartographer(Photogrammetry)

Approved by,

Robert W. Rodkey,Jr.
Chief, Coastal Mapping Unit

REVIEW REPORT

TP-01063

61. General Statement

Refer to the Summary bound with this Descriptive Report for an overview of the photogrammetric operations related to the production of this map, photobathymetric data overlay and associated data.

62. Comparison with Registered Topographic Surveys

Comparison with registered topographic surveys was not a requirement for this project.

63. Comparison with Maps of Other Agencies

Comparison with maps of other agencies was not a requirement for this project.

64. Comparison with Hydrographic Surveys

Comparison with hydrographic surveys was not a requirement of this project.

65. Comparison with NOS Nautical Charts

Refer to item 47 of the Compilation Report bound with this Descriptive Report for information on this topic.

66. Adequacy of Results and Future Surveys

This map meets the National Standards of Map Accuracy and the requirements specified in the project instructions.

Submitted by

Robert W. Rodkey, Jr.
Final Reviewer

Approved by,

Acting Chief, Photogrammetric Production Section

Ronald K. Brewer
Acting Chief, Photogrammetry Branch

MAY 7 1986

GEOGRAPHIC NAMES

FINAL NAME SHEET

CM-8414 (Looe Key, Florida)

TP-01063

Looe Key

Straits of Florida

Approved

Charles E. Harrington

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

INDEX TO PROJECT DATA AND MATERIAL ON FILE

CM-8414

LOOE KEY, FLORIDA

NATIONAL ARCHIVES/FEDERAL RECORDS CENTER

Brown Jacket:

Twenty Seven NOAA Form 76-77, Leveling Record - Tide Station
Five NOAA Form 77-53, Tides
One envelope containing three natural color photographs annotated with the identification of horizontal and vertical field control.
One Field Data Binder containing NOAA Forms, field photographs, computional listings and project sketches for all horizontal, vertical and special requirements field work.
One envelope containing one copy of the project diagram, copies of NOAA Form 76-41(6 pages), one copy of the Aerotriangulation Report and one copy of the Addendum to the Aerotriangulation Report.

Project Completion Report

AGENCY ARCHIVES

Registration Copy of the Map with accompanying Photobathymetric Data Overlay
Descriptive Report of the Map

PHOTOGRAMMETRIC ELECTRONIC DATA LIBRARY

Photogrammetric Digital Source Data Files of Selected Project Data

REPRODUCTION BRANCH

8X Reduction Negative of Map and Photobathymetric Data Overlay

OFFICE OF THE STAFF GEOGRAPHER

Geographic Names Standard

CHARTED LANDMARKS AND NONFLOATING AIDS TO NAVIGATION

PROJECT NUMBER: CM-8414

PROJECT NAME: Looe Key, Florida

MAP NUMBER: TP-01063

The following charted landmarks and nonfloating aids to navigation have been measured and or confirmed during photogrammetric operations. All geographic positions are based on the N.A. 1927 Datum. Refer to Nautical Charting Division Standard Digital Data Exchange Format documentation for clarification of NCD Quality(Q.C.) and Cartographic(CARTO) Codes.

FEATURE DESCRIPTION	CARTO CODE	GEOGRAPHIC POSITION LATITUDE	LONGITUDE	NCD Q.C.	DATE OF LOCATION
Looe Key Light 24	200	24-32-46.366	81-24-10.182	3	1/11/85
- end -					

Listing approved by: Robert W. Rodkey, Jr. — Final Reviewer

June 17, 1986 — Date

FORM C&GS-8352
(3-29-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. TP-01063

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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