

T-13315

T-13315

NOAA FORM 76-35 (3-76)	
U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SURVEY	
DESCRIPTIVE REPORT	
Map No. T-13315	Edition No. 1
Job No. PH-6703	
Map Classification Final FIELD EDITED MAP	
Type of Survey Shoreline	
LOCALITY	
State Hawaii	
General Locality Hilo Bay, Hawaii Island	
Locality Hilo	
19 75 TO 19 76	
REGISTRY IN ARCHIVES	
DATE	

NOAA FORM 76-36A (3-72)		U. S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMIN.	
DESCRIPTIVE REPORT - DATA RECORD		TYPE OF SURVEY <input checked="" type="checkbox"/> ORIGINAL <input type="checkbox"/> RESURVEY <input type="checkbox"/> REVISED	
PHOTOGRAMMETRIC OFFICE <u>Coastal Mapping Division, Norfolk, VA</u> OFFICER-IN-CHARGE <u>Jeffrey G. Carlen, Cdr.</u>		SURVEY TP. <u>13315</u> MAP EDITION NO. <u>(1)</u> MAP CLASS <u>Final</u> JOB PH. <u>6703</u>	
PHOTOGRAMMETRIC OFFICE <u>Coastal Mapping Division, Norfolk, VA</u> OFFICER-IN-CHARGE <u>Jeffrey G. Carlen, Cdr.</u>		LAST PRECEDING MAP EDITION TYPE OF SURVEY <input type="checkbox"/> ORIGINAL <input type="checkbox"/> RESURVEY <input type="checkbox"/> REVISED JOB PH. _____ MAP CLASS _____ SURVEY DATES: 19__ TO 19__	
I. INSTRUCTIONS DATED			
1. OFFICE		2. FIELD	
Aerotriangulation 10/06/75 Compilation 12/03/75		Premarking 1/15/69 Premarking 6/13/72 Premarking Supplement I 8/27/75	
II. DATUMS			
1. HORIZONTAL: <input type="checkbox"/> 1927 NORTH AMERICAN		OTHER (Specify) <u>Old Hawaiian Datum</u>	
2. VERTICAL: <input checked="" type="checkbox"/> MEAN HIGH-WATER <input type="checkbox"/> MEAN LOW-WATER <input checked="" type="checkbox"/> MEAN LOWER LOW-WATER <input type="checkbox"/> MEAN SEA LEVEL		OTHER (Specify)	
3. MAP PROJECTION <u>Transverse Mercator</u>		4. GRID(S) STATE <u>Hawaii</u> ZONE <u>1</u>	
5. SCALE <u>1:5,000</u>		STATE _____ ZONE _____	
III. HISTORY OF OFFICE OPERATIONS			
OPERATIONS		NAME	
DATE			
1. AEROTRIANGULATION BY METHOD: <u>Analytic</u> LANDMARKS AND AIDS BY		B. Thornton Nov 1975	
2. CONTROL AND BRIDGE POINTS PLOTTED BY METHOD: <u>Coradomat</u> CHECKED BY		Solbeck Nov 1975 Solbeck Nov 1975	
3. STEREOSCOPIC INSTRUMENT PLANIMETRY BY COMPILATION CHECKED BY INSTRUMENT: <u>Wild B-8</u> CONTOURS BY SCALE: <u>1:7,500</u> CHECKED BY		C. Blood Jan 1976 A. C. Rauck, Jr. Jan 1976 NA NA	
4. MANUSCRIPT DELINEATION PLANIMETRY BY CHECKED BY METHOD: <u>Smooth draft</u> CONTOURS BY CHECKED BY SCALE: <u>1:5,000</u> HYDRO SUPPORT DATA BY CHECKED BY		J. Roderick Jan 1976 F. Margiotta Jan 1976 NA NA J. Roderick Jan 1976 F. Margiotta Jan 1976	
5. OFFICE INSPECTION PRIOR TO FIELD EDIT BY		F. Margiotta Jan 1976	
6. APPLICATION OF FIELD EDIT DATA BY CHECKED BY		J. R. Minton Oct 1976 F. Margiotta Oct 1976	
7. COMPILATION SECTION REVIEW BY		F. Margiotta Oct 1976	
8. FINAL REVIEW BY		A. L. Shands May 1978	
9. DATA FORWARDED TO PHOTOGRAMMETRIC BRANCH BY		A. L. Shands May 1978	
10. DATA EXAMINED IN PHOTOGRAMMETRIC BRANCH BY		<u>J. A. Wright</u> <u>June 1978</u>	
11. MAP REGISTERED - COASTAL SURVEY SECTION BY		<u>R. T. Cooper</u> <u>Aug 1978</u>	

T-13315

COMPILATION SOURCES

1. COMPILATION PHOTOGRAPHY

CAMERA(S) <u>Wild RC-8 "E"</u>		TYPES OF PHOTOGRAPHY LEGEND		TIME REFERENCE	
TIDE STAGE REFERENCE		(C) COLOR (P) PANCHROMATIC (I) INFRARED		ZONE	<input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> DAYLIGHT
<input checked="" type="checkbox"/> PREDICTED TIDES <input type="checkbox"/> REFERENCE STATION RECORDS <input type="checkbox"/> TIDE CONTROLLED PHOTOGRAPHY					
				MERIDIAN <u>150th</u>	
NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE	
75TNHY(P)4423 - 4426	02/21/75	11:06	1:15,000	1.1 ft. above MLLW	
75TNHY(P)4413 - 4416	02/21/75	10:52	1:15,000	1.0 ft. above MLLW	

REMARKS

Mean High Water at Hilo is 1.9 ft.

2. SOURCE OF MEAN HIGH-WATER LINE:

This was compiled from the above listed photographs, supplemented by notes from the field editor.

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

None compiled.

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
T-13316	T-13314	No Survey	No Survey
REMARKS			

NOAA FORM 76-36C
(3-72)U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

HISTORY OF FIELD OPERATIONS

I. ☒ FIELD INSPECTION OPERATION☐ FIELD EDIT OPERATION

OPERATION	NAME	DATE
1. CHIEF OF FIELD PARTY	R. Melby	Sep 1975
2. HORIZONTAL CONTROL	RECOVERED BY R. Melby	Sep 1975
	ESTABLISHED BY None	
	PRE-MARKED OR IDENTIFIED BY L. Riggers	Sep 1975
3. VERTICAL CONTROL	RECOVERED BY NA	
	ESTABLISHED BY NA	
	PRE-MARKED OR IDENTIFIED BY NA	
4. LANDMARKS AND AIDS TO NAVIGATION	RECOVERED (Triangulation Stations) BY None	
	LOCATED (Field Methods) BY R. Melby	Sep 1975
	IDENTIFIED BY None	
5. GEOGRAPHIC NAMES INVESTIGATION	TYPE OF INVESTIGATION	
	<input type="checkbox"/> COMPLETE	
	<input type="checkbox"/> SPECIFIC NAMES ONLY	
	<input checked="" type="checkbox"/> NO INVESTIGATION	
6. PHOTO INSPECTION	CLARIFICATION OF DETAILS BY None	
7. BOUNDARIES AND LIMITS	SURVEYED OR IDENTIFIED BY NA	

II. SOURCE DATA

1. HORIZONTAL CONTROL IDENTIFIED

2. VERTICAL CONTROL IDENTIFIED

None

PHOTO NUMBER	STATION NAME	PHOTO NUMBER	STATION DESIGNATION
75TNHY(P) 4424	HALAI(H.G.S.) (U.S.G.S., 1912), 1877		

3. PHOTO NUMBERS (Clarification of details)

None

4. LANDMARKS AND AIDS TO NAVIGATION IDENTIFIED

None

PHOTO NUMBER	OBJECT NAME	PHOTO NUMBER	OBJECT NAME

5. GEOGRAPHIC NAMES: ☐ REPORT ☒ NONE6. BOUNDARY AND LIMITS: ☐ REPORT ☒ NONE

7. SUPPLEMENTAL MAPS AND PLANS

None

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

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(3-72)

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(3-72)U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

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HISTORY OF FIELD OPERATIONS

1. ☐ FIELD INSPECTION OPERATION☒ FIELD EDIT OPERATION

OPERATION	NAME	DATE
1. CHIEF OF FIELD PARTY	R. Spear	Apr 1976
2. HORIZONTAL CONTROL	RECOVERED BY ESTABLISHED BY PRE-MARKED OR IDENTIFIED BY	None None None
3. VERTICAL CONTROL	RECOVERED BY ESTABLISHED BY PRE-MARKED OR IDENTIFIED BY	NA NA NA
4. LANDMARKS AND AIDS TO NAVIGATION	RECOVERED (Triangulation Stations) BY LOCATED (Field Methods) BY IDENTIFIED BY	J. C. Osborn J. C. Osborn J. C. Osborn
5. GEOGRAPHIC NAMES INVESTIGATION	TYPE OF INVESTIGATION <input type="checkbox"/> COMPLETE <input type="checkbox"/> SPECIFIC NAMES ONLY <input checked="" type="checkbox"/> NO INVESTIGATION	
6. PHOTO INSPECTION	CLARIFICATION OF DETAILS BY	J. C. Osborn
7. BOUNDARIES AND LIMITS	SURVEYED OR IDENTIFIED BY	NA

II. SOURCE DATA

1. HORIZONTAL CONTROL IDENTIFIED

2. VERTICAL CONTROL IDENTIFIED

PHOTO NUMBER	STATION NAME	PHOTO NUMBER	STATION DESIGNATION
75TNHY(P) 4426	WAIAKEA LIGHT, 1975		
75TNHY(P) 4414	HILO, HILO SUGAR COMPANY STACK, 1949		

3. PHOTO NUMBERS (Clarification of details)

75TNHY(P)4414 thru 4416 - 75TNHY(P)4423 thru 4426

4. LANDMARKS AND AIDS TO NAVIGATION IDENTIFIED

PHOTO NUMBER	OBJECT NAME	PHOTO NUMBER	OBJECT NAME
75TNHY(P) 4426	WAIAKEA LIGHT	75TNHY(P) 4424	TOWER (Cocoanut Point Light 1975)
75TNHY(P) 4424	COCOANUT POINT LIGHT		
75TNHY(P) 4414	STACK		

5. GEOGRAPHIC NAMES: ☐ REPORT ☒ NONE6. BOUNDARY AND LIMITS: ☐ REPORT ☒ NONE

7. SUPPLEMENTAL MAPS AND PLANS

None

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

1 Field Edit Report, 1 Field Edit Ozalid, 1 Hydro Signal Overlay
4 Forms 76-40

RECORD OF SURVEY USE

I. MANUSCRIPT COPIES

COMPILATION STAGES			DATE MANUSCRIPT FORWARDED	
DATA COMPILED	DATE	REMARKS	MARINE CHARTS	HYDRO SUPPORT
Compilation complete pending field edit	Jan 1976	Class III Manuscript	1/30/76	1/30/76
Field edit applied. Compilation complete	Oct 1976	Class I Manuscript	11/5/76	
Final Review	May 1978	Final	May 1978	

II. LANDMARKS AND AIDS TO NAVIGATION

1. REPORTS TO MARINE CHART DIVISION, NAUTICAL DATA BRANCH

NUMBER	CHART LETTER NUMBER ASSIGNED	DATE FORWARDED	REMARKS
1 ¹		11/8/76	1 Aid to be charted
2 ¹		11/8/76	2 Aids to be revised
2 ¹		11/8/76	2 Landmarks to be charted
2 ¹		11/8/76	2 Landmarks to be revised

2. ☐ REPORT TO MARINE CHART DIVISION, COAST PILOT BRANCH. DATE FORWARDED: November 8, 19763. ☐ REPORT TO AERONAUTICAL CHART DIVISION, AERONAUTICAL DATA SECTION. DATE FORWARDED: _____

III. FEDERAL RECORDS CENTER DATA

1. ☒ BRIDGING PHOTOGRAPHS; ☒ DUPLICATE BRIDGING REPORT; ☐ COMPUTER READOUTS.
 2. ☒ CONTROL STATION IDENTIFICATION CARDS; ☒ FORM NOS ⁷⁶⁻⁴⁰ ~~557~~ 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)

SECOND EDITION	SURVEY NUMBER TP - _____ (2)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	
THIRD EDITION	SURVEY NUMBER TP - _____ (3)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	
FOURTH EDITION	SURVEY NUMBER TP - _____ (4)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	

SUMMARY TO ACCOMPANY
DESCRIPTIVE REPORTS T-13314,
T-13315 and T-13316

This summary covers three of the four maps which comprise Project PH-6703. At this writing the other map in the Project, T-13261, has not been scheduled for compilation. It is anticipated that Map T-13261 will be compiled later in conjunction with Project CM-7712 which is planned to junction with this project. Maps T-13314, T-13315 and T-13316 are each 1:5,000 scale extending two minutes in latitude and two minutes in longitude.

Photography of the area was flown in February, 1975, by private contractor. Scale is 1:15,000 and 1:30,000. Panchromatic film was used with the RC-8 camera. Coverage and quality are adequate. The breakwater forming Hilo Bay was not covered entirely by the photography. Its position was determined by the field editor using field methods.

The area covered is that of Hilo Bay located on the northeast coast of the island of Hawaii. This project originally consisted of seventeen (17) maps at 1:10,000 scale and seven (7) maps at 1:5,000 scale covering the entire northeast coast of the island of Hawaii from Halaula on the north to Waiakahiula on the south. All but four of those maps were cancelled. ~~See correspondence dated April 29, 1977.~~

Field work prior to compilation was limited to the recovery and identification of horizontal control necessary for bridging.

Bridging was done by analytic methods at the Washington Science Center. The maps were compiled at the Atlantic Marine Center in January, 1976, by stereo instrument method.

Field edit was performed in April, 1976, concurrent with hydrography and applied to the maps at the Atlantic Marine Center in October, 1976.

All maps were final reviewed at the Atlantic Marine Center in May, 1978. Pertinent data was forwarded to the Washington Science Center for reproduction and final registration.

FIELD INSPECTION

T-13315

There was no field inspection prior to compilation. Field work accomplished was limited to the recovery and identification of the horizontal control necessary for bridging.

PHOTOGRAMMETRIC PLOT REPORT
HILO BAY, HAWAII
Job PH-6703
November 14, 1975

Area Covered: The area covered in this project ^{is} ~~in~~ the east coast area of the island Hawaii. This area is covered by four 1:10,000-scale sheets, T~~h~~-13259 thru T~~h~~-13262 and three 1:5,000-scale sheets, T~~h~~-13314 thru T~~h~~-13316. Note: T-13259, T-13260 + T-13262 are cancelled A.L.S. 5/24/78

Method: Two strips of 1:15,000 scale black-and-white photography were bridged by analytic aerotriangulation methods. The two strips of bridging photography were controlled by field-identified control.

Common points were located on the bridging photography for ratio purposes. Tie points were used to insure an adequate junction of the strips during the adjustment.

All manuscripts were plotted on the Coradi and the photo requisition for the ratios has been submitted to the photo lab.

Adequacy of Control: The control checked well within map accuracy standards and is more than sufficient for its intended use. See attached sheet for accuracy of control in strip adjustment.

Supplemental Data: USGS quadrangles were used to provide vertical control for the adjustment.

Photography: The coverage, overlap, and quality of the photography was adequate for the job.

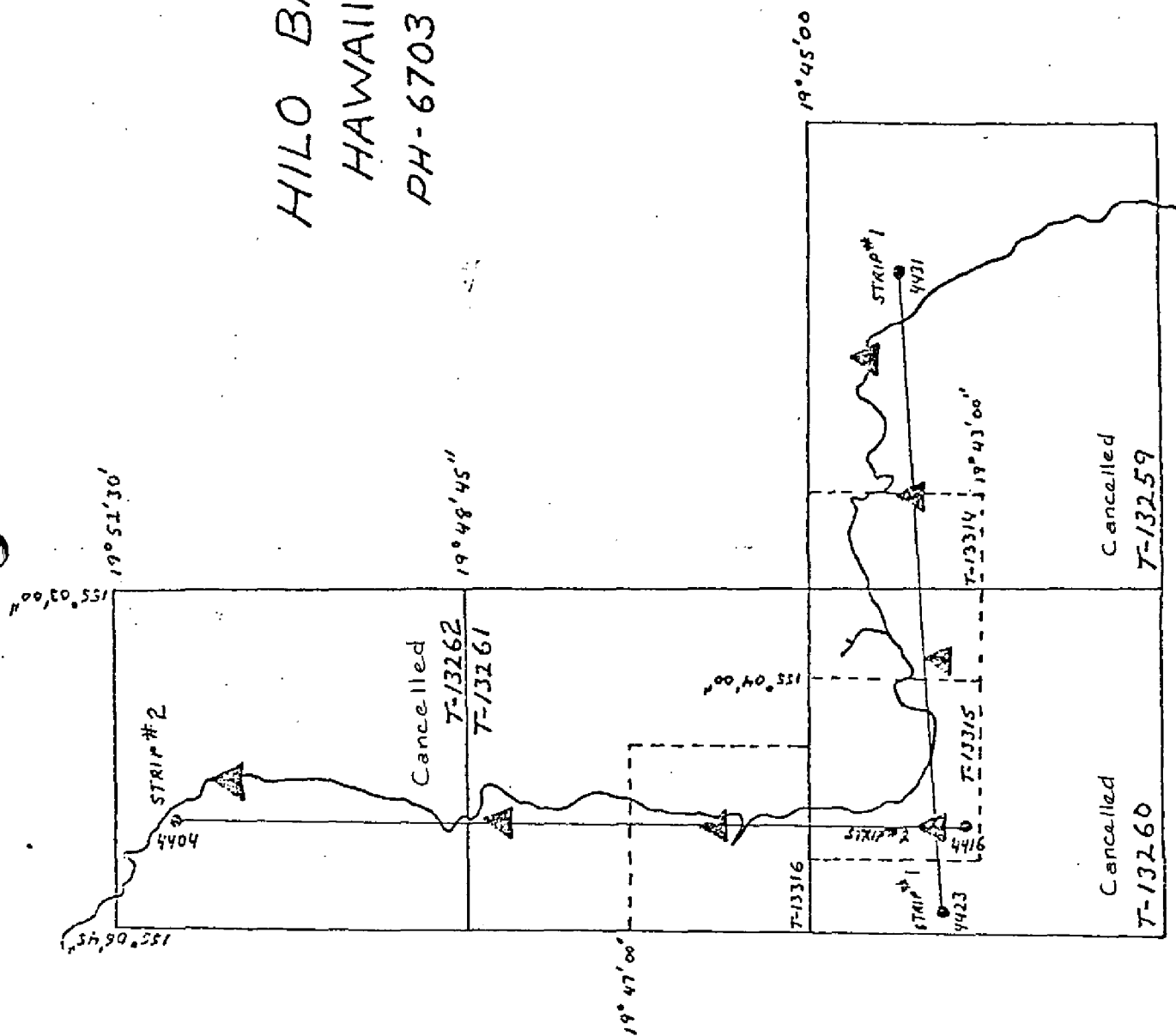
Submitted by,

Brian Thornton

Approved and forwarded:

John D. Perrow, Jr.
Chief, Aerotriangulation Section

HILO BAY HAWAII PH-6703



List & Accuracy of Control Used In Strip Adjustment

Strip #1	Point	X-Error	Y-Error
	416101	-.153	.071
	416102	2.098	2.736
	426101	.476	.187
	426102	.419	-.749
	428110	-.772	-.898
	429101	-.695	.198
	431101	.372	-.082
	431102	.614	-.886
Strip #2	405100	-.259	-.589
	405101	.020	-.002
	409101	-.045	.007
	409102	.490	.093
	412100	-.325	.564
	412101	.035	-.008
	416101	-.031	.004
	416102	2.203	2.786

DESCRIPTIVE REPORT CONTROL RECORD

MAP NO.	STATION NAME	JOB NO.	PH-6703	SOURCE OF INFORMATION (Index)	AEROTRIANGULATION POINT NUMBER	GEODETTIC DATUM		COORDINATES IN FEET STATE _____ ZONE _____	GEOGRAPHIC POSITION		ORIGINATING ACTIVITY	REMARKS
						Old Hawaiian	Division, Norfolk, Va.		ϕ LATITUDE λ LONGITUDE	FORWARD BACK		
	HILLO, HILO SUGAR CO., STACK, 1949			G.P. P.35	59			X= Y=	ϕ 19 44 27.677 λ 155 05 33.837			851.0 (993.9) 985.2 (761.8)
	HILLO, HONGWANJI CHURCH, STEEPLE, 1949			G.P. P.35	55			X= Y=	ϕ 19 43 22.196 λ 155 05 10.144			682.5 (1162.4) 295.4 (1451.8)
	HALAI (H.G.S.), 1877			G.P. P.21	416100			X= Y=	ϕ 19 43 10.832 λ 155 05 57.572			333.1 (1511.8) 1676.5 (70.8)
	HILLO NORTH BASE, 1949			G.P. P.22				X= Y=	ϕ 19 43 14.826 λ 155 04 03.660			455.9 (1389.0) 106.6 (1640.7)
	WAIKAE LIGHT, 1975			Field pos Form 28D	27			X= Y=	ϕ 19 43 42.392 λ 155 04 25.445			1303.5 (541.4) 740.9 (1006.3)
	HILLO RAILROAD NORTH BASE(H.T.S), 1949			G.P. P.40				X= Y=	ϕ 19 43 10.982 λ 155 04 02.352			337.7 (1507.2) 68.5 (1678.8)
	HILLO, RADIO STATION KIMO, TOWER, 1962			G.P. P.133	25			X= Y=	ϕ 19 43 58.123 λ 155 04 07.072			1787.2 (57.7) 205.9 (1541.2)
	HILLO, KHVH TV MAST, ON NANILOA HOTEL, 1967			G.P. P.139				X= Y=	ϕ 19 43 56.983 λ 155 04 03.543			1752.2 (92.7) 103.2 (1643.9)
								X= Y=	ϕ λ			
								X= Y=	ϕ λ			
								X= Y=	ϕ λ			
COMPUTED BY	A. C. Rauck, Jr.				DATE	1/19/76	COMPUTATION CHECKED BY	F. Mauldin	DATE	1/19/76		
LISTED BY	A. C. Rauck, Jr.				DATE	12/3/75	LISTING CHECKED BY	F. Mauldin	DATE	12/8/75		
HAND PLOTTING BY	J. Roderick				DATE	1/19/76	HAND PLOTTING CHECKED BY	D. Butler	DATE	1/19/76		

COMPILATION REPORT

T-13315

31. DELINEATION:

Delineation was by the Wild B-8 stereoplotter. The 1:15,000 scale black and white photography was set on the stereoplotter. The MHW line and interior details were compiled at this time. There was no MLW photography, photo coverage was adequate, but overhanging trees and shadows obscured the shoreline in several areas. The field editor should investigate these portions of the shoreline.

32. CONTROL:

See Photogrammetric Plot Report, dated November 14, 1975.

33. SUPPLEMENTAL DATA:

None.

34. CONTOURS AND DRAINAGE:

Contours are not applicable to the project. Drainage was delineated by office interpretation of the photographs.

35. SHORELINE AND ALONGSHORE DETAILS:

The mean high water line and all alongshore details were delineated from office interpretation of the photographs.

36. OFFSHORE DETAILS:

No unusual problems. The foreshore area should be edited as to classification such as rocks, coral heads, etc.

37. LANDMARKS AND AIDS:

Appropriate copies of Forms 76-40, Landmarks and Non-floating Aids to Navigation, were forwarded to the field editor and hydrographer for further processing.

38. CONTROL FOR FUTURE SURVEYS:

None.

39. JUNCTIONS:

See Form 76-36B, Item #5 of this Descriptive Report concerning junctions.

40. HORIZONTAL AND VERTICAL ACCURACY:

No Statement.

46. COMPARISON WITH EXISTING MAPS:

A comparison has been made with USGS Quadrangle Hilo, Hawaii, scale 1:24,000 dated 1963.

47. COMPARISON WITH NAUTICAL CHARTS:

A comparison has been made with National Ocean Survey Chart 119324, scale 1:10,000, 17th edition, dated August 30, 1975.

ITEMS TO BE APPLIED TO NAUTICAL CHARTS IMMEDIATELY

None.

ITEMS TO BE CARRIED FORWARD

None.

Submitted by:

Joanne Roderick

Joanne Roderick
Cartographer
January 23, 1976

Approved:

Albert C. Rauck, Jr.

Albert C. Rauck, Jr.
Chief, Coastal Mapping Section

April 18, 1978

GEOGRAPHIC NAMES

FINAL NAME SHEET

PH-6703 (Hilo, Hawaii)

T-13315

Alealea Point
Blonde Reef
Cocoanut Island

Cocoanut Point

Haaheo

Hilo

Hilo Bay

Kaulainaiwi Island

Makaoku

Mokupane Point

Pukihae

Puueo

Waiakea

Waiakea Pond

Waialama

Waihonu Pond

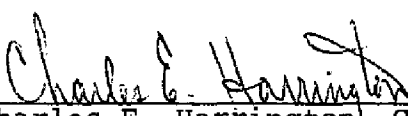
Wailoa River

Wailoa River Park

Wailuku River

Wainaku

Approved by:


Charles E. Harrington, C3x8
Chief Geographer

NOAA FORM 75-74
(7-75)U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

PHOTOGRAMMETRIC OFFICE REVIEW

TP - 13315

1. PROJECTION AND GRIDS FM	2. TITLE FM	3. MANUSCRIPT NUMBERS FM	4. MANUSCRIPT SIZE FM
CONTROL STATIONS			
5. HORIZONTAL CONTROL STATIONS OF THIRD-ORDER OR HIGHER ACCURACY FM	6. RECOVERABLE HORIZONTAL STATIONS OF LESS THAN THIRD-ORDER ACCURACY (Topographic stations) NA		7. PHOTO HYDRO STATIONS NA
8. BENCH MARKS NA	9. PLOTTING OF SEXTANT FIXES FM	10. PHOTOGRAMMETRIC PLOT REPORT FM	11. DETAIL POINTS FM
ALONGSHORE AREAS (Nautical Chart Data)			
12. SHORELINE FM	13. LOW-WATER LINE FM	14. ROCKS, SHOALS, ETC. FM	15. BRIDGES FM
16. AIDS TO NAVIGATION FM	17. LANDMARKS FM	18. OTHER ALONGSHORE PHYSICAL FEATURES FM	19. OTHER ALONGSHORE CULTURAL FEATURES FM
PHYSICAL FEATURES			
20. WATER FEATURES FM	21. NATURAL GROUND COVER NA		22. PLANETABLE CONTOURS NA
23. STEREOSCOPIC INSTRUMENT CONTOURS NA	24. CONTOURS IN GENERAL NA	25. SPOT ELEVATIONS NA	26. OTHER PHYSICAL FEATURES NA
CULTURAL FEATURES			
27. ROADS FM	28. BUILDINGS FM	29. RAILROADS FM	30. OTHER CULTURAL FEATURES FM
BOUNDARIES			
31. BOUNDARY LINES NA		32. PUBLIC LAND LINES NA	
MISCELLANEOUS			
33. GEOGRAPHIC NAMES FM	34. JUNCTIONS FM		35. LEGIBILITY OF THE MANUSCRIPT FM
36. DISCREPANCY OVERLAY FM	37. DESCRIPTIVE REPORT FM	38. FIELD INSPECTION PHOTOGRAPHS FM	39. FORMS FM
40. REVIEWER <i>Frank Margiotta</i> Frank Margiotta 1/76		SUPERVISOR, REVIEW SECTION OR UNIT <i>Albert C. Rauck, Jr.</i> Albert C. Rauck, Jr.	
41. REMARKS (See attached sheet)			
FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT			
42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.			
COMPILER <i>J. R. Minton</i> J. R. Minton 10/15/76		SUPERVISOR <i>Albert C. Rauck, Jr.</i> Albert C. Rauck, Jr.	
Reviewer: <i>F. Margiotta</i> 10/76			
43. REMARKS <i>F. Margiotta</i>			
See Form 76-36C, Items 1, 2, 4, and 8 A.L.S.			

FIELD EDIT: HILO HARBOR

JOB PH-6703

OPR-419-RA-76

MANUSCRIPT NO. TP-13314-13316

RAYMOND L. SPEER
CDR., NOAA

COMMANDING OFFICER

INTRODUCTION & METHODS

Field Edit for Hilo Harbor, JOB PH-6703, OPR-419-RA-76, commenced on April 22nd and was completed on May 18th. One field unit performed all the work. The majority of verification was accomplished by walking the shoreline, with the remainder being taken care of by driving rental vehicles, and RAINIER skiffs 556 and 557. Field edit is complete and thorough for the three 1:5000 scale manuscripts that cover Hilo Harbor.

Field Edit operations began first in the inner Hilo Harbor region near the port piers on T-Sheet TP-13315 in order to facilitate commencement of hydrographic survey operations on H-9612. Work on this sheet progressed westward and then north to its completion at the junction with T-Sheet TP-13316. Field work on TP-13316 then began at its northernmost limits and progressed south to the junction with TP-13315. TP-13316 was the second priority so survey operations could begin on H-9613. After completion of photogrammetric support for initial hydrography, field edit was accomplished for the Wailoa River, Pond, and Park area in order that survey work could be undertaken in this shallower region of H-9612. Finally, work began on T-Sheet TP-13314, at its junction with TP-13315, and progressed eastward to its completion at the manuscript limits. In conjunction with shoreline verification and location of aids, landmarks, and dangers to navigation, simultaneous photo signal inspection and location for visual hydrography on H-9612 was accomplished on TP-13314 and 13315. Questions from the Master Field Sheets requiring geodetic observations for locations were answered during the initial two weeks of RAINIER combined operations.

All deletions, additions, and corrections to the final shoreline appear on the Master Field Edit Sheets and on the processed cronapaque photographs. With the exception of photo-located signal work, the Master Field Edit Sheets are indices of all field edit work carried out. Numerous Field notes, all necessary for proper compilation, required that the photo signal location work be excessed as it would have excessively cluttered the Masters. Separate film ozalids are being submitted that contain the photo signal work with proper references. These separates will be discussed in greater detail later in the text. All discrepancies and questions listed on the Master Field Edit Sheets are completely and thoroughly answered on the Master. Proper references are included for each. Special violet ink field notes on the Master Field Sheets are items that have been verified by field edit. The photograph number for each particular item is given as a reference. Special red ink was used on the Masters to indicate changes or additions found during field edit. Position or location references are included. Finally, those field notes inked in green are deletions from the Manuscripts. References again are included. All notes on the Master Field Edit Sheets which are verified on the cronapaque photographs include the descriptions

or explanation of the feature verified and the photo number on which it was located. All Field Edit information on the smooth boatsheets for H-9612 and H-9613 which was verified by field edit was inked in black. Changes, which include deletions, and (or) additions were inked in special red. Blue, the smooth boatsheet color for unverified items, was not used due to the completeness of verification for all manuscripts.

For a reference of photograph numbers - T-Sheet Manuscripts, refer to "Separates Following the Text". Height data on rocks was estimated to plus or minus 1 foot and on the bluffs of T-Sheet TP-13316 to plus or minus 10 feet. All times are referenced to 0° Longitude.

ADEQUACY OF COMPILATION

The compilation of the Manuscripts for JOB PH-6703 were adequate in accuracy for most regions, and generally complete. Two regions, however, appeared to be inadequately compiled. The first is the region between the Hilo Sugar Mill Stack and the Wailuku River on T-Sheet TP-13315. Excessive distortion is viewed when the manuscript is overlaid with the appropriate photographs of that area (21 FEB 75, 4414, 4415, 4416, 4424, and 4425). Realignment of passpoints and subpoints must be carried out constantly, more than believed should be necessary, to maintain continuity between the shore line of the photographs and the compiled shoreline of the manuscript. This same excess distortion is noted in a second region surrounding the piers on T-Sheet TP-13314. Again, excessive alignment is required to maintain reasonable continuity between the manuscript and photographs (21 FEB 75, 4426 and 4427). It is believed that this lack of continuity is due to excessive compilation from the more distorted outer regions of the photographs. This could be caused by a lack of adequate overlap on the flight lines that cover these areas. This problem will be discussed in greater detail in the PHOTO SIGNALS, ADDITIONAL INFORMATION, and RECOMMENDATIONS sections of the text of this report. The inadequate compilation regions are not gross or in excess, however the reasons for this inadequacy warrant further explanation and discussion.

Compilation of the MHWL was adequate. Changes verified by Field Edit are noted on the Master and on the processed cronapaque photographs. The MLLWL was compiled, wherever physically possible, by Hydrographic Survey Operations. Heavy surf zones on T-Sheets TP-13314 and 13316, and shallow and foul regions on TP-13315 made this a difficult task. For further information on survey operations, Descriptive Reports, H-9612 and H-9613 should be consulted.

SHORELINE SUMMARIES

TP-13314: Field Edit commenced at the tip of Pier I at latitude $19^{\circ}44'12''$ N, longitude $155^{\circ}03'20''$ W, and initially progressed south, then west to the manuscript's junction with TP-13315 at longitude $155^{\circ}04'$ W. Photogrammetric support was given to this particular region so that survey operations could begin here with knowledge regarding dangers to navigation. Later in the project, field work on this manuscript resumed at Pier I, and continued east to the manuscript limits. Field Edit is complete and thorough for TP-13314.

The Hilo Harbor Breakwater has been geodetically located as per instructions. Geographic positions were determined using field survey methods (triangle computations with checks) for five stations. Four of the stations were located at the four bends in the breakwater's shape while the fifth was located at the tip. At each station, measurements were then taped to determine the breakwater's width at the MHWL and at the top, perpendicular to the edge to determine the width at the top. The measurements were taped in meters, and are accurate to one tenth of a meter. In addition, a measurement was taped from the station at the tip to the MHWL. The stations were plotted and distances were scaled. Finally the points were connected. The breakwater location is thorough. For further information, refer to the Master Field Edit Sheet and to the "Separates Following the Text", BREAKWATER STATION COMPUTATIONS AND MEASUREMENTS. For a further discussion of geodetic survey techniques used, refer to Horizontal Control Report: Hilo Harbor, OPR-419-RA-76.

All discrepancies, questions, and notes to the field editor on the Master, as well as all non-floating aids to navigation and landmarks for charts have been thoroughly researched and answered for this manuscript. Refer to the Master and "Separates" FORM 76-40's.

The shoreline compilation west of the harbor piers was generally very good, with only minor changes revised by field edit. The large spit, located on the Hotel Row waterfront at latitude $19^{\circ}43'51''$ N, longitude $155^{\circ}03'52''$ W is actually a smaller spit with an island off its tip. The region between the two is awash.

The three privately maintained daybeacons A, B, and C, in Reeds Bay, were located by 3 point sextant fix. Geographic Positions were then computed for each fix using the Ship PDP-8e computer and program RK-300, UTILITY COMPUTATIONS, VERSION 2/10/76. Printouts of those computations are being submitted. Refer to "Separates Following the Text".

The passage that opens into the small lagoon at latitude 19°43'37" N, longitude 155°03'54" W is extremely shallow and foul at low tide. Small skiffs were seen tied up in the lagoon, however none were seen making the transit. It did appear possible that at high tide a small craft could be poled or paddled, if not powered into the lagoon. Upon inspection from a distance, it appeared that the inlets on the northeast corner of the lagoon extend further under the growth than could be compiled. Due to physical limitations, the area was inaccessible and the recommendation is for retention of the shoreline as compiled on the Master.

The questionable wreck at T-Sheet position 19°43'54" N, 155°03'36" W, was dove on by the RAINIER diving officer and found to be non-existent. Instead, rocks were discovered that are submerged from 4 to 6 feet. The recommendation is for deletion of the wreck and substitution of the hydrographic data. Reference the Master Field Edit Sheet and Descriptive Report, H-9613 for further information.

The pier region, as has been previously mentioned, shows excess distortion when the appropriate photographs and the manuscript are overlaid. The general shapes are correct. In photographic processing of this area, a more than reasonable number of passpoint and subpoint realignments between photograph and T-Sheet were required to maintain acceptable continuity between the photograph and manuscript shoreline. A rushed compilation and lack of sufficient overlap in photographs on the flight line that covered this area is a possible explanation for the distortion viewed. The recommendation is for acceptance of the compiled shoreline unless more detailed examination of the photographs and field notes produces any changes to the MHWL compiled in the field. More discussion on this subject will be forthcoming in a later section of the text.

The tank fields along Kalaniana'ole Drive contain both fences and walls for security. The outer perimeter is surrounded by mesh wire fence approximately 10 feet in height. Individual tanks or clusters of tanks, however, are surrounded by gray brick fire retaining walls that are 10 feet in height and 1 to 2 feet in thickness. Reference the Master for further information.

The shoreline east of the breakwater to the manuscript limits shows numerous minor revisions to the compiled shoreline. They are too great in number to mention individually. Generally the MHWL is more seaward than was compiled and there are numerous rock spits, ledges, ridges, and clusters awash. The shoreline is lava rock that is being constantly pounded by surf and is highly intricate. Reference the Master and the field notes on the cronapaque photographs for a more

complete understanding. All shoreline for this region, whether from the original compilation or newly compiled, is inked in red for ease in interpretation.

TP-13315: Shoreline verification for this manuscript began its junction with TP-13314 at longitude 155°04' W, and progressed west then north to the manuscript's junction with TP-13316 at latitude 15°45' N. Here again, this was done to give the necessary photogrammetric support for hydrographic survey operations on H-9612. At a later date, field work on this manuscript was carried out in the Wailuku and Wailoa Rivers, and in Waiakea Pond. Field Edit is complete and thorough for TP-13315.

All non-floating aids to navigation and landmarks for charts have been thoroughly researched and discussed. Questions, discrepancies, and notes to the field editor have been completely answered. Refer to the Master Field Edit Sheet and "Separates"; FORM 76-40's for the manuscript for further information.

The region between Cocoanut Island and the Hotel Row, in the vicinity of the footbridge, is extremely shallow and foul in nature. Passage at low tide is next to impossible due to the twisted nature of the small passage, the numerous ledges awash and submerged, and the lack of visibility in milky brown waters.

Waiakea Creek Daybeacon has been located by 3 point sextant fix as per instructions. A Geographic Position was computed using RK-300 UTILITY COMPUTATIONS, as previously discussed. A printout of the computation is being submitted. Refer to the "Separates Following the Text".

Waiakea Pond is fresh water in nature although there is inflow from the Wailoa River and it is affected by the tides. The pond is restricted to public fishing use only and is used by local inhabitants. No motors are allowed south of the island in the center of the channel at latitude 19°43'18" N, longitude 155°04'37" W. The waters are generally very shallow in nature. The earthen spits protruding into the center are accurate.

As has been previously discussed, the Wailuku River shows excessive distortion between photograph and manuscript. The general contours of the MHWL are accurate but they require constant readjustment of successive passpoints to maintain a continuous nature to the shoreline and to evenly distribute the excess in distortion to the shoreline of the surrounding area. Here too the error is not gross, and the general shoreline contours are correct as noted on the manuscript. The reasons for this distortion are discussed later in the text. Two changes to the

shoreline were observed in this region. One change is that the river region extends further inland than is shown, and second is the narrow channel that passes underneath the tree growth. This channel was not previously compiled on the manuscript nor was it shown on the chart. Refer to the Master for further information.

The bluffs that cover the entire western shore of Hilo Harbor begin at approximate position $19^{\circ}44'02''$ N X $155^{\circ}05'26''$ W. In general the bluffs are delineated correctly on this manuscript. They are, however, quite steep and should not be set back as far as previously compiled. The base of the bluffs is in most cases the MHWL.

There is a massive bulkhead located just south of Alealea Point at Latitude $19^{\circ}44'25''$ N, longitude $155^{\circ}05'35''$ W. It is approximately 30 feet in height and is of definite landmark value. It is recommended that it be charted as a 30 foot high bulkhead.

The hydrographic investigation of the region centered around position $19^{\circ}44'57''$ N X $155^{\circ}05'16''$ W is complete. For results and discussion, refer to Descriptive Report H-9613.

TP-13316: Shoreline verification for this manuscript commenced at its northern limits at latitude $19^{\circ}47'$ N and progressed south to its junction with TP-13315 at latitude $19^{\circ}45'$ N. Field Edit is complete and thorough for this manuscript.

The MHWL does carry up into Honolii Stream and portions of the stream are navigable, but not from seaward. The entrance from sea is dangerous due to extensive and heavy surf at the mouth of the stream. This area appears to be a very popular beach for local surfers.

Bluffs cover the entire expanse of this manuscript. The delineation appears correct. They should, however, be shifted seaward due to their high vertical nature and the fact that in most cases the bluffs' base is the MHWL. Bluff heights were verified for the entire length of the manuscript. In general, heights compiled averaged approximately 10 feet greater than those estimated by the field editor. Refer to the Master Field Edit Sheet for further information.

The MHWL carries up into the limits of Kapue Stream. There is an extensive sand bar that covers 90% of the stream's mouth, and navigation, except at high tide, is doubtful.

All non-floating aids to navigation and landmarks for charts as well as questions and discrepancies on TP-13316 not previously mentioned in the text have been thoroughly researched and discussed on the Master Field Edit Sheet and in "Separates" (FORM 76-40's) which

can be referenced for further information.

DATA PROCESSING

With the exception of the Geographic Position computations for Daybeacon locations using RK-300, UTILITY COMPUTATIONS, VERSION 2/10/76, no other computer programs were used for automated or non-automated processing of field edit data. For further information on WANG, SERIES 700 and PDP-8e programs used for geodetic location computation and processing, Horizontal Control Report: Hilo Harbor, OPR-419-RA-76, can be referenced.

Some location of rocks submerged and awash that are dangers to navigation was done during the course of hydrographic survey operations. They will not be discussed in this text. For information on hydrographic surveying techniques, data processing, and results, reference Descriptive Reports H-9612 and H9613, and the accompanying smooth boatsheets.

PHOTO-IDENTIFIED SIGNALS

Photo-identified signal inspection and location was a highly integral part of the Hilo Harbor portion of OPR-419-RA-76, H-9612, which was run as a visual survey using digital sextants. Photo identification was also important in regions too shallow for survey launches where whalers and skiffs ran standard visual hydrography and obtained detached positions with 3 point sextant fixes. Separate film ozalids for photogrammetrically located signals are being submitted for T-Sheets TP-13314 and 13315. They are the manuscripts whose shoreline covers H-9612. Information contained on the ozalids are: the number of the signal on the master list, the photograph number used for each ray transferred, and a reference to the "Separates Following the Text", PHOTO SIGNAL COMPUTATIONS. Under the corresponding Master Signal List number will be found the field computations such as: the meters forward and backward that were scaled, conversion to seconds, and latitude and longitude computations. Signal locations are not noted on the Master Field Edit Sheet. The numerous notes necessary for proper field compilation made the addition of Photo Signal notes excess. The Photo Signal Film Ozalids contain all necessary information, with proper references, for the verification of Photogrammetrically located signals.

Individual photograph quality was generally good. There did seem to be more than usual distortion around the perimeters of the photograph.

The clarity and contrast in the central regions facilitated adequate photo identification of objects for signals. Coverage was lacking in some areas, however, most noticeably the upper Wailoa River area of TP-13315, and the Reeds Bay region of TP-13314. Lack of sufficient number of photographs in flight lines, and lack in adequate overlaps forces numerous visual signals to be located with only two positioning rays and others with the third ray being in the excessive distortion regions of the photograph perimeter. Further, the lack of coverage was so evident in the previously mentioned areas that some of the intersections for two rays were less than 10° . These, as well as all other two ray signal locations were made by choosing signals that were easily identifiable on the manuscript and could be located even with poor intersection. It is the belief of the field editor that the Geographic Positions for all photo-identified signals are accurate to the scale of the survey. The lack of adequate photographic coverage is believed to be one of the reasons for the poor compilation noted in the Wailuku River and Hilo Harbor Piers region.

ADDITIONAL INFORMATION AND DISCUSSION

A lack of sufficient overlap in photographic coverage appears to be the most striking direct or indirect reason for the four photogrammetric problem areas previously discussed.

In the first case, this lack directly leads to problems in locating photogrammetrically recoverable points for visual hydrographic signals. With only two photographs to cover a region like the Upper Wailoa River and Reeds Bay, two ray intersection coupled with positive identification on the manuscript was required for photo picking of visual hydrographic signals. Refer to the Photo Signal Film Ozalids, TP-13314 and 13315 for examples of signals with only 2 positioning rays and weak intersection.

Secondly, the lack of complete coverage and efficient photograph overlap is one of the reasons for the less adequate shoreline compilation in the Wailuku River and Hilo Harbor Piers region as mentioned earlier in the text. By forcing compilation to extend out of the central regions of the photographs and in to the perimeter areas, the general shape of the shoreline may be adequate but the photographic distortion remains mirrored in the manuscript. With adequate overlap between photographs, compilation can always remain in the central photograph regions.

The horizontal control work and initial photo location by the compilers was excellent because there was a sufficient number of pass-points and subpoints, as well as the photograph centers, for adequate realignment when the distortion was in excess.

Three other topics are worthy of discussion here. The first is that no flight line manuscript was submitted to the RAINIER as a part of the field edit package. This prevented us from making more definitive statements as to the adequacy of flight lines and photographic coverage.

Secondly, another possible reason for the less than adequate compilation in the Wailuku River and Harbor Piers area could be explained by rushing the compilation. Because this was a critical job, in terms of time, RAINIER is most appreciative of having received both the Hilo Harbor JOB PH-6703, as well as JOB CM-7215 for Kaneohe Bay, early. However, we believe that it was known far enough in advance that the RAINIER's approved schedule called for her to go to Kaneohe first, and then to move on to Hilo Harbor and yet RAINIER received the Hilo data two weeks before the Kaneohe data. Transmittal letters show both jobs as being transmitted on January 30, 1976. With complete knowledge of our schedule of operations perhaps the Hilo Harbor field edit package could have been held for a less hurried compilation, and mailed to the RAINIER in Hawaii.

Finally, another possible reason for the difficulty in locating visual hydrographic signals by photogrammetric techniques was that all photographs taken for JOB PH-6703 may not have been submitted to the field editor. It is our belief that this is not a good policy, especially where visual hydrography will be undertaken as a part of combined operations.

RECOMMENDATIONS

Specific recommendations for shoreline features have been either stated previously in the text or can be referenced on the Master Field Edit Sheet. General recommendations are as follows:

A) Closer supervision of private photogrammetric contracts and/or more specific instructions for future jobs to insure complete coverage. The cost and results of contracts to private firms should continue to be weighed critically against the cost and results of having NOAA fly the photographic jobs themselves. JOB PH-6703 showed a definite lack of complete photographic coverage. Nowhere in the photographs received was there the two thirds photographic overlap that is deemed necessary by our operations.

B) All photographs that are taken in the job should be submitted as a part of the package for the field editor. This is especially necessary where visual hydrography will be undertaken.

C) Closer communication between Coastal Mapping Division and PMC on matters of ship's schedules, the nature of surveying operations and in the long run, for better standardization of field edit data. Improvements have already been observed in new Instructions for Data Requirements, 1976, and the continual updating of the Provisional Photogrammetry Instructions.

D) Submission of Flight Line information in manuscript form so judgements can be made by the field editor in his Recommendations as to the adequacy of coverage.

E) A method of notation on the compiled manuscript is needed to inform the field editor which photograph was used to compile a certain section of the shoreline. It is believed that this might increase the continuity between office compilation and field edit verification.

Respectfully submitted,

John C. Osborn, Jr.

John C. Osborn, Jr.
ENS, NOAA

NOAA FORM 76-40
(8-74)

Replaces CGCS Form 567.

☒ TO BE CHARTED
☐ TO BE REVISED
☐ TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)
Coastal Mapping Div.
A.M.C. Norfolk, Va.

STATE

Hawaii

LOCALITY

Hawaii Island- North Coast

DATE

Oct. 1976

The following objects HAVE ☒ BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS.

OPR PROJECT NO.

419

JOB NUMBER

Ph-6703

SURVEY NUMBER

T-13315

DATUM

Old Hawaiian

POSITION

LATITUDE

19 43

LONGITUDE

155 04

25.445

740.9

DESCRIPTION

(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses)

(Waiakea Light, 1975)

CHARTING NAME

LIGHT

METHOD AND DATE OF LOCATION

(See instructions on reverse side)

OFFICE

75THRY4426(P)
Feb. 21, 1975

FIELD

FW-VLS.
April, 1976

CHARTS AFFECTED

19010
19324

ORIGINATING ACTIVITY

☐ HYDROGRAPHIC PARTY
☐ GEODETIC PARTY
☐ PHOTO FIELD PARTY
☒ COMPILATION ACTIVITY
☐ FINAL REVIEWER
☐ QUALITY CONTROL & REVIEW GPP
☐ COAST PILOT BRANCH
(See reverse for responsible personnel)

14a

To charts 14/5/76

REVIEW REPORT
T-13315

SHORELINE

May 18, 1978

61. GENERAL STATEMENT:

See Summary, page 6 of this Descriptive Report.

Triangulation station, "Hilo, Radio Station KIMO Tower, 1962" is shown on the map without field confirmation of its existence. The tower is not visible on the photography. Its existence is doubtful. *

** Used to establish Hydro signals per "separates" in field report.*

62. COMPARISON WITH REGISTERED TOPOGRAPHIC SURVEYS:

Not applicable.

63. COMPARISON WITH MAPS OF OTHER AGENCIES:

Not applicable.

64. COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS:

Comparison was made with a copy of Final Verified Smoothsheets H-9612 (RA-5-1-76), and H-9613 (RA-5-2-76).

Rocks positioned on the smoothsheet at latitude $19^{\circ}44.9'$, longitude $155^{\circ}05.4'$ submerged 2 ft. and latitude $19^{\circ}43.9'$, longitude $155^{\circ}04.4'$ submerged 3 ft. and two rocks awash shown outside the foul limits at Mokupane Point are not visible on the photography and are not shown on the map. Water penetration in all these areas appear to be greater than 3 ft. In each case there are no discernible breakers in the area. The field editor makes no mention of these rocks. *Submerged rocks mentioned in field report as a hydrographic investigation.*

65. COMPARISON WITH NAUTICAL CHARTS:

Comparison was made with Chart 19324, 1:10,000 scale, 18th edition, dated May 7, 1977.

Rocks shown on the chart at latitude $19^{\circ}44.9'$, longitude $155^{\circ}05.4'$ and latitude $19^{\circ}43.9'$, longitude $155^{\circ}04.4'$ submerged 2 ft. and 3 ft. respectively are not visible on the photographs and were not identified by the field editor. Therefore, they are not shown on the map. See paragraph 64.

Road patterns north of Wailoa River and the small island charted in the river at its junction with the pond do not appear on the photographs.

66. ADEQUACY OF RESULTS AND FUTURE SURVEYS:

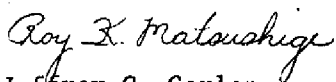
This map complies with the Project Instructions and meets the requirements for Bureau Standards and the National Standards of Map Accuracy.

Submitted by:



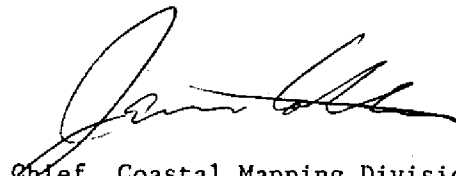
A. L. Shands
Final Reviewer

Approved for forwarding:


for Jeffrey G. Carlen
Chief, Coastal Mapping Division

Approved:


Chief, Photogrammetric Branch


Chief, Coastal Mapping Division