11991

Diag. Cht. No. 4116.

Form 504

U. S. DEPARTMENT OF COMMERCE
CDAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey SHORELINE (PHOTOGRAMMETRIC)

Field No. Ph-6012 Office No. T-11991

LOCALITY

State Hawaii

General locality Maui Island

Locality Keanae

1960-1963

CHIEF OF PARTY

H. J. Seaborg, Honolulu District Office
W. E. Randall, Baltimore District Office

LIBRARY & ARCHIVES

USCOMM-DC 5087

13 1133 . 7, 133

1967

_	_	RM		~		c	C.	1	Ω	1	_
F	О	RM	٠	•	ч	u	Э-	,	u	•	u

U.S. DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY

·	DESCRIPTIVE REPO	ORT - DAT	A RECORD		
	T	-11991			
PROJECT NO. (13): PH-6012 (21034)			·····		
FIELD OFFICE (II):			CHIEF OF PARTY	· - ·	
Honolulu, Hawaii			H. J. Seabor	'g	
PHOTOGRAMMETRIC OFFICE (III):			OFFICER-IN-CHAR	GE	
Baltimore, Maryland			W. E. Randal	11	
INSTRUCTIONS DATED (II) (III):				<u> </u>	
	14 November 1960 28 November 1960 13 June 1961 16 January 1962				
METHOD OF COMPILATION (III):					,
Kelsh PlotterMANUSCRIPT SCALE (III):		STEREOSC	OPIC PLOTTING INS	TRUMENT SC	ALE (III):
1:5,000	•	1:5,000	0		
DATE RECEIVED IN WASHINGTON OF	FICE (IV):	DATE REPO	ORTED TO NAUTICA	L CHART BRA	ANCH (IV):
APPLIED TO CHART NO.		DATE:		DATE REGIS	TERED (IV):
GEOGRAPHIC DATUM (III):		<u></u>	VERTICAL DATU	4 (911): MSL	· · · · · · · · · · · · · · · · · · ·
Old Hawaiian			MEAN SEA LEVEL Elevations shown a Elevations shown a i.e., mean low water	ns (25) refer to us (<u>5</u>) refer to	mean high water sounding datum
REFERENCE STATION (III):					
PAUWALU (HGS), 1877,	1929				
20° 51° 43.286°	156° 08' 03.880"		ADJUSTED MADJUSTED	· · · · · · · · · · · · · · · · · · ·	
PLANE COORDINATES (IV):			STATE		ZONE
= 192,319.31	×= 681,722.52		Hawaii		_ 2

ROMAN NUMERALS INDICATE WHETHER THE ITEM IS TO BE ENTERED BY (II) FIELD PARTY, (III) PHOTOGRAMMETRIC OFFICE, OR (IV) WASHINGTON OFFICE.

WHEN ENTERING NAMES OF PERSONNEL ON THIS RECORD GIVE THE SURNAME AND INITIALS, NOT INITIALS ONLY.

DESCRIPTIVE REPORT - DATA RECORD

FIELD INSPECTION BY (II):		DATE:
J. C. Lajoye		Jan. 1962
MEAN HIGH WATER LOCATION (III) (STATE DATE	AND METHOD OF LOCATION):	
Mean high water-line located aided by field inspection not	by Kelsh Plotter from October 196 tes.	0 photography
PROJECTION AND GRIDS RULED BY (IV):		DATE
A. E. Roundtree		4-3-62
PROJECTION AND GRIDS CHECKED BY (IV):		DATE
A. E. Roundtree		4-4-62
CONTROL PLOTTED BY (III):		DATE
L. A. Senasack		5-7-62
CONTROL CHECKED BY (III):		DATE
L. O. Neterer		5-7-62
RADIAL PLOT OR STEREOSCOPIC CONTROL EXT	ENSION BY (III):	DATE
Aerotriangulation - Washington	n office	2-62
STEREOSCOPIC INSTRUMENT COMPILATION (III):	PLANIMETRY	DATE
	E. L. Williams	5-62
	CONTOURS	DATE
E. L. Williams	Inapplicable	
MANUSCRIPT DELINEATED BY (III):		DATE
D. M. Brant		5-62
SCRIBING BY (III):	。	DATE
PHOTOGRAMMETRIC OFFICE REVIEW BY (III):		DATE
D. M. Brant		5-62

REMARKS:

FIELD EDIT - 1963 - DSC &GSS PATH FINDER

FORM C&GS-181e

U.S. DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT - DATA RECORD

CAMERA (KIND OR SOURCE) (III):

^{#W#} Camera

	PHO	OTOGRAPHS (III)		
NUMBER	DATE	TIME	SCALE	STAGE OF TIDE
51 W 841 & 842 50 W(C) 3122 thru 3124	2h Sept.1961 19 Oct. 1960	0906 0754	1:15,000 1:10,000	0.2 Ft. Above MLLW 0.3 Ft. Above MLLW
Tides computed fro	m Predicted Tid	e fables.		Diurnal

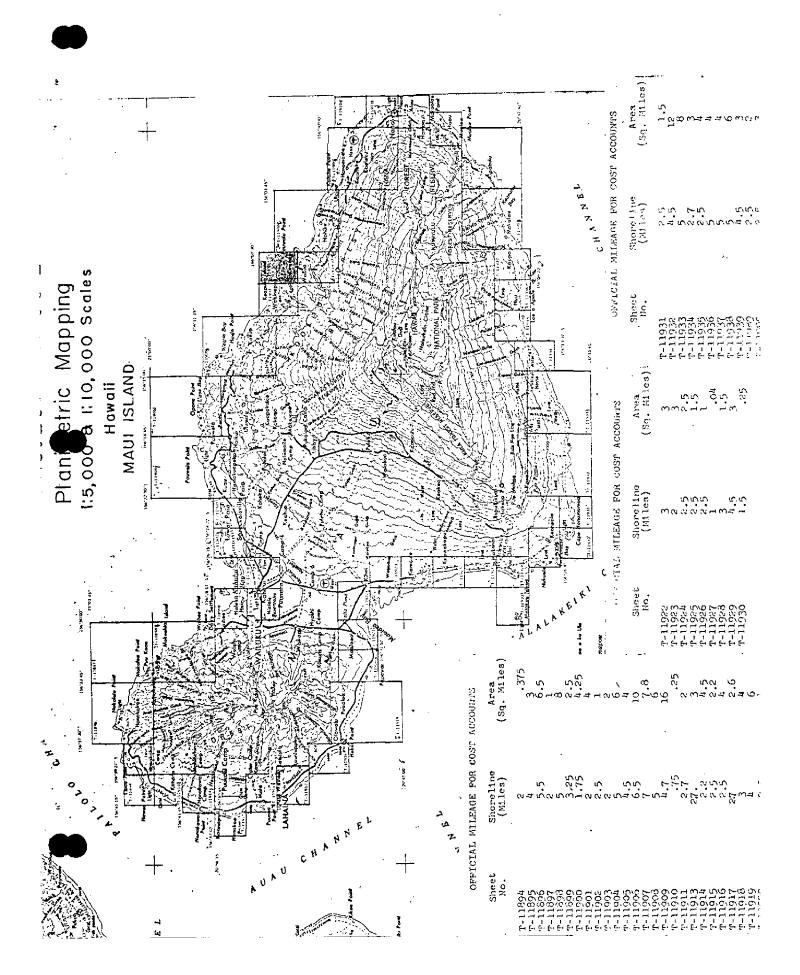
			9
· · <u></u>			
<u> </u>			
To the second se			
No continu			
,		•	
#			2
1 Annay			
AF GEG INC.			
N. A. S.			
<u> </u>		 	
77			
#			
T			
7 - Parisan			<u>*</u>
	7 B.		

REMARKS

•	Alongshore area for hydr	ro.	January 1962			
	Final Compilation	1	March 1964	·		
					·	
1						
						i.
			, ·			

COMPLETION DATE

COMPILATION RECORD



SUMMARY TO ACCOMPANY DESCRIPTIVE REPORT T-11991

Shoreline manuscript T-11991 is one of forty-nine similar maps at either 1:5,000 or 1:10,000 scale which cover the shoreline of Maui Island. This was a Kelsh project in advance of hydrographic surveys which were made in the area. The field operations preceding compilation included recovery and identification of horizontal control and field inspection. The Kelsh compilation was at 1:5,000 scale from which a cronar positive showing shoreline, alongshore features and shoreline pass points was furnished for preparation of the boat sheet. 1:25,000 scale photographs taken in October 1960 were used for compilation. Ratio prints of 1:15, 000 scale photography obtained in 1961 were provided for hydro support and field edit purposes. The compilation manuscript is a vinylite sheet 2 minutes 22.5 seconds in latitude by 1 minute 52.5 seconds in longitude from which the smooth map was re-produced on cronaflex for photogrammetric review. One cronar positive and one cronar negative are provided for record and registry after final review.

PROJECT PM-6012 MAUI ISLAND, HANAII

2. AREAL PIRLD INSPECTION:

The area covered by this report encompasses the whole of the Island of Maui, second largest of the Hawaiian Islands. It is /between, formed by two mountains with a fertile valley devoted to the cultivation of sugar cane and pineapple. The island is shaped like a Shinto priest in prayer with the head at the western end formed by the West Maui range of mountains and the body at the eastern end formed by Mt. Haleakala which rises over 10,000 feet above sea level.

The climate varies from the tropical rain forest at the eastern end of the island near Hana, to the barren lava fields along the south slopes of Mt. Haleakala. Rain seldom falls on the south coasts and thus the disintegration of the lava is a slow process.

Shoreline conditions vary from the stark lava bluffs around Mt. Maleakala and on the east side of the West Maui Range, to the sandy beaches along the valley between the mountains and on the wastern or lee shores of the island.

The area is cooled by trade winds from the north and east accentuated by the Venturi effect caused by the valley between the mountains and, in the exposed areas, waves beat continuously on the rocky cliffs. On the western shores around Lahaina and on Madlaea Bay, only a "kona" or southerly storm infrequently disturbs this peaceful area.

Kahului is the principal port on the island. It is protected by a breakwater and serves as a port of call for large ocean going

	vasgale which hring in	fraight and law	ad out processed	nineannle_and	
	4				
1.1			- -		
				Th _n .	
¥					
,					
					,
=					
1 II					
1,00	1(8.				
~ 5- -					
	<u>k</u>				

3. HORIZONTAL CONTROL

(a) The following marked or recoverable intersection stations were located by triangulation as mautical aids, aeromautical aids, or as additional photogrammetric control:

Kahului	Harbor	Entrance	East	Dreakwater	Light	d.B.D.
Kahùlui	Ha rbo r	Entrance	Hes t	Breakwater	Light	d.m.m.
Kahului	Harbor	Entrance	Range	e, Front Ligh	nt.	d.n.m.
Kahului	Harbor	Entrance	Range	a, Rear Light	t.	d.n.m.
Kahului	Airport	control	Tower	r, Beacon		d.n.m.
V O R (Lahaina E (USE)		ouso				d.n.m. d.m.m. d.m.
EAST PO	int					d.m.
WEST PO	INT					d.b.

The following temporary stations were established for supplemental control of aerial photographs and were not marked:

Anple (temp)	State (temp)
Camp (temp)	Grove (temp)
Ditch (temp)	Pau (temp)
Malay (temp)	Fower (temp)

Pau and Fower were established to determine a position for Lahaina Lighthouse.

The following hydrographic signals were located by theodolite cuts either to establish signals in obscured areas or to provide a check on signal sites established by photogrammetric methods:

Hydro Sig. 2301 Hydro Sig. 2303 Hydro Sig. 2305

POL CASI MAY

RED	Hydro Sig. 2401	HAY
PAR	OBEL	VON
BGG	CAR	NAHUNA 2
DAEI	ΓAR	eab
JOB	ELVR	000

- (b) There were no datum adjustments made by the field party.
- (e) All control was either established by the Coast and Geodetic Survey or was tied to Coast Survey control by previous surveys.
- (d) All stations required by the project diagram were recovered and identified except where specific permission was received from the Mashington Office to substitute one station for another.
- (e) Control adjacent to the shoreline and that within the area of photogrammetric coverage was searched for and Form 526 has been submitted for all stations. Stations outside the area covered by the photographs were not searched for due to heavy brush and undergrowth in the interior of the island.
- (f) Control station identification cards were submitted for all stations required by the project diagrams.

4. VERTICAL CONTROL

Tidal bench marks at Kahului, Lahaina, Mala Wharf, Mihei, and Makena were searched for and recovered.

Tidal bench marks at Hana were searched for but due to changed in the area, they were not recovered.

No vertical points were required for stereoscopic mapping.

(c) The foreshore in the bluff areas is confused due to many along shore rocks. The continuous surf along the north, east and south sides of the islands served to confuse the high waterline on the photographs. In the sandy areas of the western and northern shore, the beach is protected by a coral reef which was found by the hydrographer, and which is visible on the photograph. In the Kihei area, offshore rock piles, the remains of old fish pond walls, are visible on the photographs. Offshore rocky reefs are found in some areas and, where seen, were noted on the field photographs.

(d) Pluffs and cliffs form the largest portion of the shoreline, althouth Maui is represented as having more beach area than any other of the Mawaiian Islands. From a few miles north of Kahului to Honolua Bay the shore is composed of high cliffs and led rocky bluffs. From Honolua Bay, through Lahaina and slightly south of Olowalu the shore is low with sandy beaches between rocky headlands. From the beginning of the cliffs at the south end of the West Maui Range to Mc Gregor Point, the shore is again rocky and precipitous. At Maalaea, and continuing south past Makena to about a mile south of Puu Olai, the shore is protected and sandy with a few rocky projections which act as groins to hold the sand.

From the recent lava flow south of Puu Olai and continuing south and east toward Hana, the shoreline is rocky with bluffs ranging from 10 to 150 feet. In the area near Kaupo, Kipahulu, and Puuiki High vertical bluffs predominate. The only sand beach in the ontiro area is located several miles southeast of the village of Hana.

From Hana west to Kuau, or into sheet T-11903 the vertical cliffs range from 50 to 200 feet in height and there are no beach areas and no place to approach the high waterline from the beach side except at Keanae or Nahiku except by decending the vertical bluffs by ropes.

(e) Kahului Harbor, as mentioned in the Areal Description, is the principal and only commercial port in the island. It has recently been dredged, is well jettied and has wharfage and facilities for crean going vessels.

Hana Marbor is partially protected by natural rock projections but is open to some trade directions. It was used as a stop for interisland steamer traffic, and prior to World War 2, when the sugar plantation at Mana was under cultivation, cargo was loaded out of this port. Since the discontinuing of steamer traffic between the islands, only an occasional fuel barge or fishing boat use the large concrete pier located here.

Mala Wharf, located a few miles north of Lahaina, was used to load sugar and pineapple during the days of staumer traffic but the large concrete wharf is in poor repair and has been closed by the Board of "arbor Commissioners.

Lahaina, once the seat of the Hawaiian wings, and the oldest town in the island, is the site of a protected small boat harbor. Fuel, food, and nousing are available here.

Maalaea is the site of a small boat harbor used mainly by fishing boats. It is well jettied and fuel and supplies are available.

In the olden days, when steamers made the rounds of the island

and water transportation was at its height, there were other place: where cargo was unloaded by boom and where whaleboat landings were made. Principal among these were Nuu Landing, Kaupo, and Nahiku. These have now been abandoned and only the remains of the old concrete foundations and the old mooring bolts remain.

- (f) There are no overhead or submarine cables in the area covered by the project.
 - (g) There are no other shoreline structures.

8. OFFSHORE FEATURES

No offshore rocks were actually visited by the photogrammetric party party. It was noted on the field photographs that the hydrographic be asked to determine the heights of offshore rocks. Where heights were indicated on the photographs, they were estimated from shore.

9. HANDMARKS AND AIDS.

Landmarks, nautical and aeronautical aids in Strips 1 to 7 were listed on Form 567 and forwarded with the field inspection photos. Other landmarks should be reported by the hydrographic party.

10. BOUNDARIES, MONUMENTS and LINES.

Investigation of boundaries, monuments and lines were not included in the instructions for the project.

11. OTHER CONTROL

No recoverable topographic stations were established. Where hydrographic or photogrammetric control by geodetic methods was required, only temporarily marked stations were used.

In areas which were inaccessible to the field party, hydro signal sites were not selected. It was requested that the hydrographic

party make a launch available to the photogrammetrist for the inspection of shoreline and the selection of hydro signal sites in these areas.

12. OTHER INTERIOR FEATURES

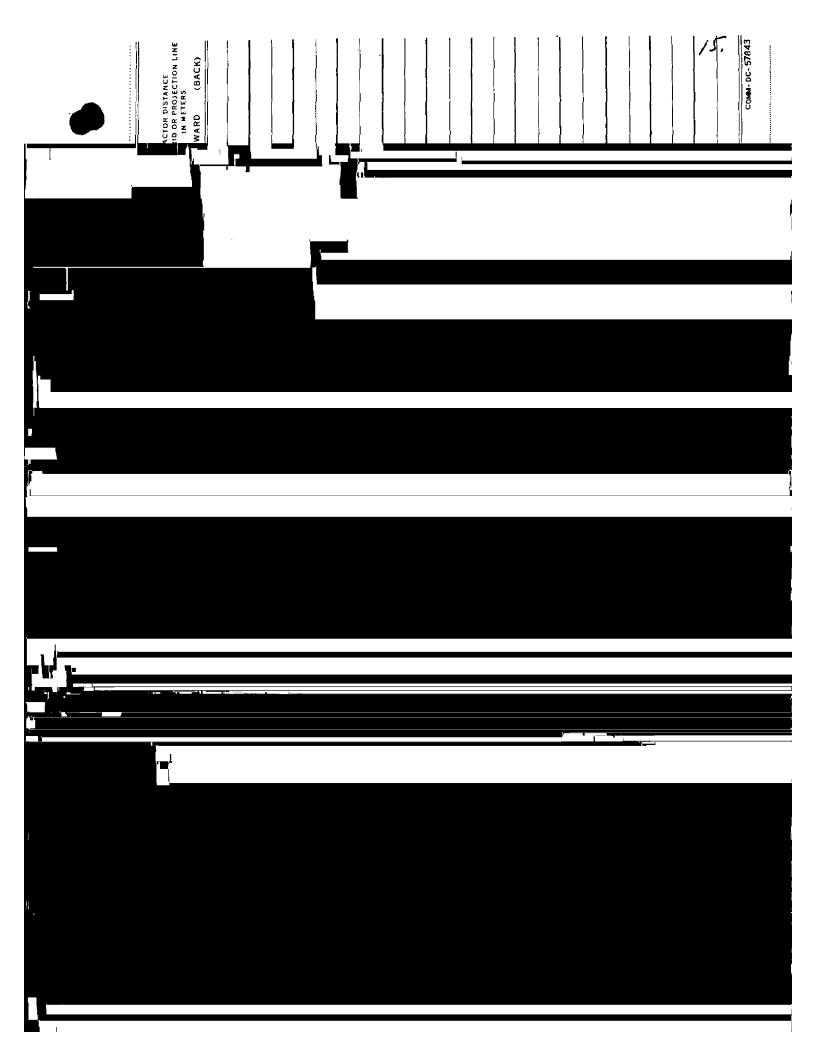
Roads within the area adjacent to the shoreline were classified as dfl, ddl and sdl. Class l structures were not noted. Class 2 structures, churches and public buildings were noted.

The principal airport, Kahului Airport, is located about 3 miles east of Mahului Harbor. There is a paved airstrip at Hana used by D C 3 and small private aircraft. A small dirt strip is located as Kaanarali, about 6 miles north of Lahaina and is used by small private aircraft. The abandoned Naval Airstrip at Puu Hene is not used.

There are no bridges or cables over navigable waters. No trace was found of the shore ends of any submarine cables.

13. GEOGRAPHIC NAMES





COMPILATION REPORT T-11991

For additional data pertaining to this survey please refer to the Photogrammetric Plot Report bound with T-11807.

Items 31 thru 36

Please refer to the Compilation Report bound with T-11896

37. LANDMARKS AND AIDS

There are no landmarks, aids to navigation, or aeronautical aids within the compilation limits of this map.

38. CONTROL FOR FUTURE SURVEYS

No control for future surveys was established during compilation.

39. JUNCTIONS

Satisfactory junctions were made with T-11907 on the west and with T-11992 on the south. The Pacific Ocean is to the north and east.

46. COMPARISON WITH EXISTING MAPS

Comparison was made with U.S.G.S. Keanae, Hawaii quadrangle, 1:24,000 scale, 12th edition of 1957.

47. COMPARISON WITH NAUTICAL CHARTS

Comparison was made with nautical chart 4116, 1:250,000 scale, 12th edition, August 17, 1964.

ITEMS TO BE APPLIED TO CHARTS IMMEDIATELY

None

ITEMS TO BE CARRIED FORWARD

None

Respectfully submitted:

For: Donald M. Brant

Approved:

O. Holls
OJ. Bull
Capt. C&GS
Norfolk Regional Officer

GEOGRAPHIC NAMES

T-11991

Hahaha Bay
Kawee Point
Kauwalu
Keanae
Keanae Point
Manahoa Rock
Moku Hala
Moku Mana
Moku Holua
Nuaailua Bay
Ohia Stream
Pacific Ocean
Paepaemoana Point
Pauwalu Point
Waialohe Pond

a. J. Wraight

A. J. Wraight Chief, Geographic Branch

PH-6012 T-11991 and T-11992

49. NOTES TO HYDROGRAPHER

Incomplete copies of the above surveys have been furnished for photo hydro support. Included is a set of ratio photos with selected shoreline pass points there on. Hydrographic signal sites selected by the field inspection party have been located and shown by name and number. A listing of these follows:

· ·	T-11991	
Signal No.	Description	Photo Number
9101	High point of island	2512
9102	Flag on point	2512
9103	Rag on lauhala tree	2512
9104	Rag on ironwood tree	2512
9105	Church steeple	2512
9106	Rag on small tree	2512
9107	Northeast corner of landing	2512
	T-11992	
9201	End of rock point	2513
9202	Rag on lauhala tree	2513
9203	Catholic church steeple	2513

FORM 182 (8-61)		PHOTOGRAMMETRIC OF			DEPARTMENT OF COMMERCE DAST AND GEODETIC SURVEY
PROJECTION GRIDS	AND 2 TITLE	3		3. 0	MANUSCRIPT 4. MANUSCRIP NUMBERS SIZE
CONTROL STATIONS	5. HORIZONTAL CONTRI OR HIGHER ACCURACE J.B., 7. PHOTO HYDRO STATI			ACCURACY (L STATIONS OF LESS THAN TOPOGRAPHIC STATIONS) 10. PHOTOGRAMMETRIC PLOT REPORT
	None	None	None		S.F.B.
	L.J.B.				<u></u>
ALONGSHORE AREAS	12. SHORELINE	None	14. ROCKS, SHOAL	_\$, ETC.	15. BRIDGES Non e
(Nautical Chart Data)	16. AIDS TO NAVIGATION	17. LANDMARKS	1 00. 77	18. OTHER FEATUR	ALONGSHORE PHYSICAL
- -	None 19. OTHER ALONGSHORE	Non e		0.5%	Ý
•	20. WATER FEATURES		21. NATURAL GRO	OUND COVER	
PHYŞICAL FEATURES	22. PLANETABLE CONTO	23. STEREOSCOPIC INSTRUMENT CONTOURS			
	Mone 24. CONTOURS IN GENER	AL	25. SPOT ELEVATO	ON &	
	None 26. OTHER PHYSICAL FE	ATURES	Hon		
	27. ROADS	28. BUILDINGS		29. RAILRO	PADS
CULTURAL FEATURES	30. OTHER CULTURAL F	EATURES FAR		No	ne
•	J.J. BOUNDARY LINES		32. PUBLIC LAND	LINES	11.49.TV-04
BOUNDARIES	None		Non-		
MISCEL- LANEOUS	33. GEOGRAPHIC NAMES LB 35.LEGIBILITY OF THE MA	ANUSCRIPT 36. DISCREPANCY	OVERLAY	34. JUNCTH	ONS
,	£#B	J. 113.	20 500	LI	<i>B</i> .
	38. FIELD INSPECTION P	7773	39. FORMS SIGNATURE OF SU	LTB PERVISOR, R Steint	EVIEW SECTION OR UNIT
FIELD COM pletion surv	PLETION ADDITIONS AND vey have been applied to	CORRECTIONS TO THE MANUS the manuscript. The manuscri	CRIVT Additions and	corrections	furnished by the field com-
JOSEAN AL		ald M.Brant	SIGNATURE OF SU	embero	γ .

FIELD EDIT REPORT T-11991

No formal Field Edit Report was received. Please refer to the two following Memorandums concerning the Field Edit of this manuscript.

United states government

IVICTORYCOCOCCIONO

COAST AND GLODETIC SURVEY 21

· · · · · ·

The Director

Coast and Gardeth's Survey V.S.Dapartment of Commerce Madification 25, D.C.

TROM : Commanding Collicer USCOCK Pathings

705 Folliel Critico Duilding

· Contain, Machington

WBJECT: Field Edit Report - CFR-419

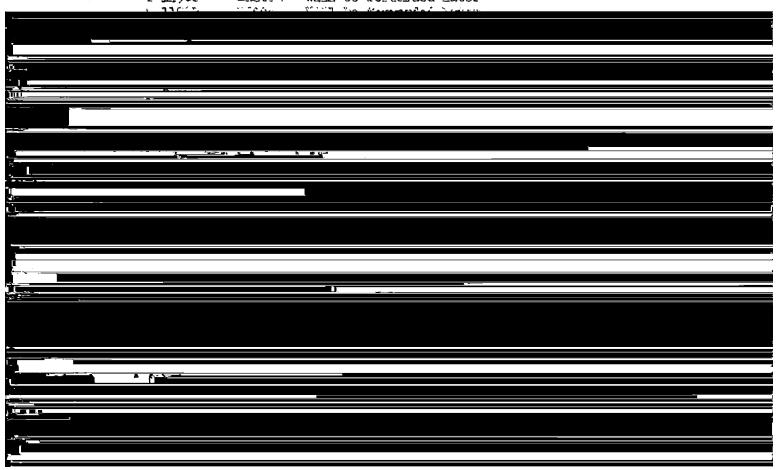
DATE: 8 July 1963

During the first balf of the 1963 field scapes, Pathfinder paracanal field officed the annual right limited below for the same and on plotteness will not conside the got have been notice on the blockfine inproducting in red and green into the companion to be to year reliable with carry minor descriptions.

Form manuscripts with netted changes are being forwarded to the Rechingson Ciffes on Unity 9. These manuscripts with no recommended changes have been nested below. The remaining manuscripts will be forwarded as even as we have had an opportunity to compare them with the bear above new in Radiagram for photographying.

2-11907 - 20000 - 10 di 2000

2-11903 Listil - Mill to formarios later



U.S. DEPARTMENT OF COMMERCE COALT AND GEODETIC SURVEY

Marca Drawa March

REVIEW REPORT T-11991 SHORELINE

61. GENERAL STATEMENT

See Summary accompanying Descriptive Report

62. COMPARISON WITH REGISTERED TOPOGRAPHIC SURVEYS

A visual comparison was made with Registered Planetable Surveys 3273 and 3274, 1:20,000 scale, dated March 30, 1914.

Shoreline manuscript T-11991 supersedes these prior surveys and should be used for nautical chart construction.

63. COMPARISON WITH MAPS OF OTHER AGENCIES

Comparison was made with U.S.G.S. Keanae, Hawaii $7\frac{1}{2}$ minute quadrangle, 1:24,000 scale, edition of 1957. The shoreline of these two surveys are in good general agreement.

64. COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS

Comparison was made with copies of boat sheets H-8720-PF-10-3-63, scale 1:10,000 and H-8723, FF scale 1:5,000. There is a small discrepancy between this manuscript and the shoreline on the 1:10,000 scale boat sheet. (See comparison print)

65. COMPARISON WITH NAUTICAL CHARTS

Comparison was made with nautical chart 4116, scale 1:250,000, 12th edition, August 17, 1964. Because of the extreme difference in scale between the chart and manuscript only a visual comparison was made.

66. ADEQUACY OF RESULTS AND FUTURE SURVEYS

This survey complies with the instructions and meets the National Standards of Map Accuracy.

* Refer to page 25

Approved by:

Approved by:

Approved by:

Approved by:

Approved by:

Chief, Cartographic Branch

Chief, Chart Division

Chief, Operations Branch

Chief, Operations Branch

NOTES TO VERIFIER H-8720 and H-8723 (Comparison with T-11991)

(1968)

Differences between the surveys in MHW line, apparently resulting from error in application of shoreline survey MHW line to the boat sheets, were noted on the comparison print by the shoreline survey reviewer.

Due primarily to a procedure used by the hydro party for furnishing a field edit sheet; i.e., providing a poor black and white copy of the original cronaflex field edit sheet; application of field edit information was found to be incomplete upon examination of T-11991 in the Washington office (prior to registering the map). The Marine Chart Division file copy of the boat sheet for H-8723 (BP-64291) was found to reflect field edit information. Application of edit changes has been made and, with the exception mentioned in the 1st paragraph and one additional exception, the surveys are in agreement.

A rock awash shown on T-11991, off Moku Mana Island, at latitude 20°51'45.3" and longitude 156°07'45.7" is not shown on H-8720 (BP-64394). The following note is included on the comparison print: visible on photos 61-W-842 and 843 - computed height is 0.2 feet above MLLW.

T-11991 was reproduced prior to registration - subsequent to application of the correction discussed in the 2nd paragraph.

W. A. Review Unit

FORM COC3-0302 (3-25-63)

NAUTICAL CHART DIVISION

