8990

Diag. Cht. No. 4116-2.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. AR-12.5-1-67 *Office No.* H-8990

LOCALITY

State Hawaii

General locality Oahu

Locality Waimanalo Bay

19 67

CHIEF OF PARTY

R. L. Newom

LIBRARY & ARCHIVES

DATE July 18, 1968

USCOMM-DC 37022-P66

8990

FORM C&GS-537 (5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

REGISTER NO.

H-8990

HYDROGRAPHIC TITLE SHEET

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

AR-12.5-1-67

State HAWAII

General locality OAHU

Locality WAIMANALO BAY--Makai Range ← Not a geographic name - Do not add to title.

Scale 1:12,500 Date of survey 15 Nov--8 Dec 1967

Instructions dated 16 October 1967 Project No. PMC/SP-12-67

Vessel USC&GSS McARTHUR (CSS-30)

Chief of party LCDR Ronald L Newsom

Surveyed by R L Newsom, S R Peterson, A P Sibold, M L Smith, R A Sundholm, M E Harbert, J A Lyons

Soundings taken by echo sounder, ~~hand lead, pole~~ Raytheon DE 723 #915

Graphic record scaled by McARTHUR personnel

Graphic record checked by A P Sibold

Protracted by _____ Automated plot by _____

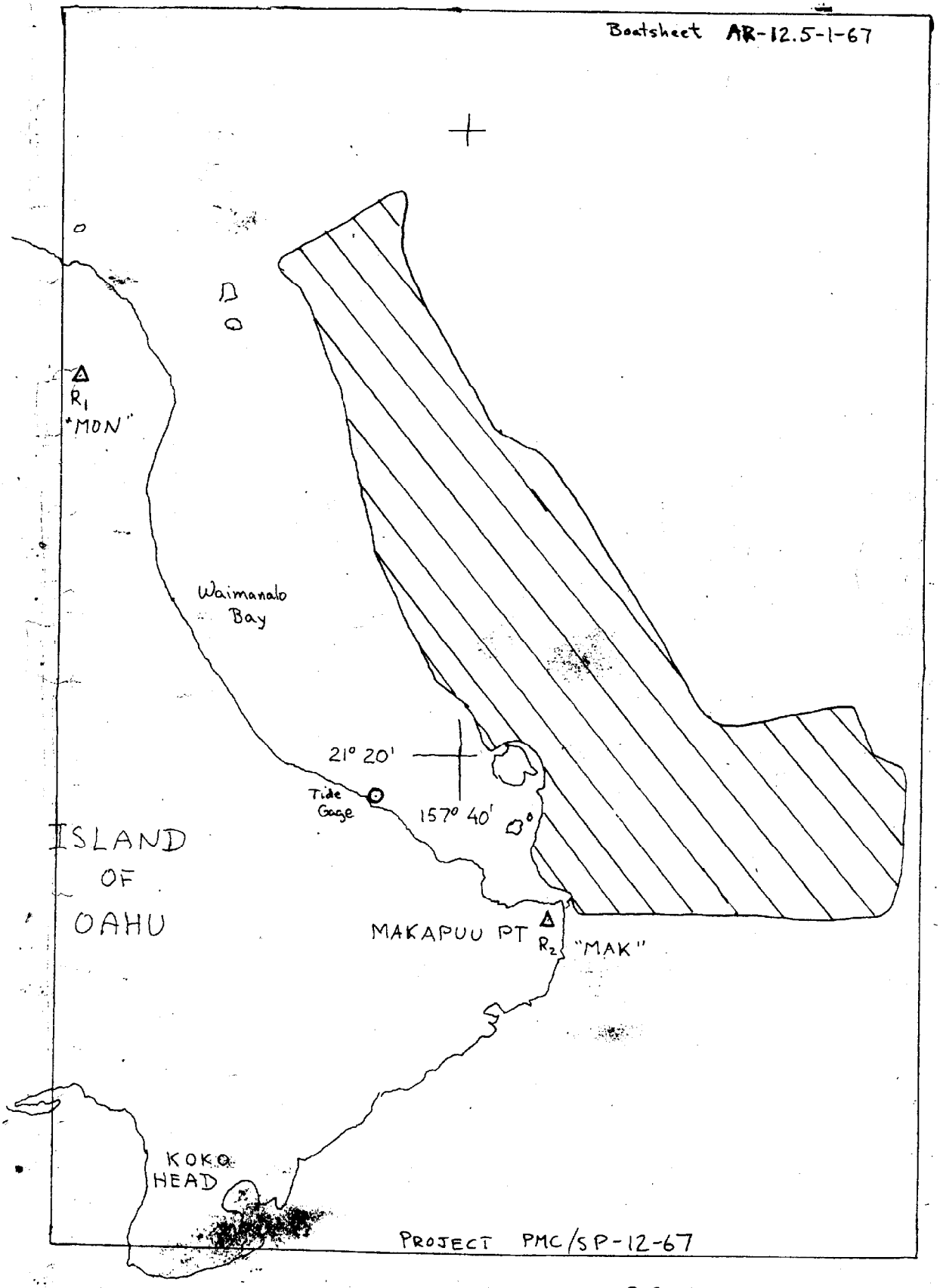
Soundings penciled by _____

Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW

REMARKS: This survey covers the 10 to 150 fathom curve in Waimanalo Bay, Oahu, Hawaii. The project is a special project-Makai Range, Oahu. Not a geographic name.

J. J. G.

USCOMM-DC 37009-P66



Scale of Chart C.S. 4110

DESCRIPTIVE REPORT

to Accompany

Hydrographic Survey AR-12.5-1-67

~~14~~ 15 November to ~~9~~ 9 December 1967

USC&GSS McARTHUR (CSS-30) — Scale 1:12,500

Ronald L. Newsom, LCDR, USESSA — Chief of Party

A. PROJECT:

Hydrography on this sheet was accomplished under Project Instructions PMC/SP-12-67, dated 16 October 1967. Official instructions closing the field season on 15 December meant field work on this project had to cease by 9 December, due to a commitment to San Diego State College to complete a dredging project on Kauai during the period 11-15 December. ✓

B. AREA SURVEYED:

The area surveyed lies immediately ~~NW~~ N of Makapuu Point, at the eastern end of the island of Oahu, Hawaii. The survey covers the area from the 10 fathom curve to approximately the 150 fathom curve, is bounded by 21° 18.5'N and 21° 24.5'N, and covers an area of 13.9 square nautical miles. Near Manana Island and Makapuu Point, the survey did not reach the 10 fathom curve; rather sounding lines were run as close as possible to shore, in some cases reading only 2~~0~~ 8 fathoms. It would have been extremely troublesome to accomplish launch hydrography in this area in order to define the 10 fathom curve. MAKAI RANGE (Oceanic Foundation) officials stated that they did not need the survey extended any closer to Manana Island and Makapuu Point. ✓

Hydrography was accomplished on 9 days during the period ~~14~~ 15 November through ~~9~~ 9 December 1967.

No junctions with prior or contemporary surveys were checked in the field.

C. SOUNDING VESSEL:

All soundings were obtained by the Ship McARTHUR. Violet ink was used ✓ Boat sheet only for position numbers. Position numbers 3000 through 4298 were used, with some duplication of numbers due to fixes being scaled at the beginnings and ends of lines. (4 Duplicate position numbers) ← Several pos. nos. were rejected and not used

D. SOUNDING EQUIPMENT:

A Raytheon Survey Fathometer, Model DE-723, Serial No. 915, located in the chart room, was the sole sounding instrument used during the survey. All soundings are in fathoms and tenths. Fathograms were check-scanned to the nearest 0.2 fathoms. Soundings obtained ranged from ~~7~~ 6 to ~~230~~ 246 fathoms.

No malfunctions or failures were detected while using this fathometer. All fathometer checks indicated that the instrument operated properly and accurately throughout the survey. Fathometer checks are noted on the fathogram record. | See Review Par. 4

The jagged profile on the fathogram was caused partly by the seas and swell, and partly by the irregular bottom. A marked difference in the quality of the bottom trace can be seen between the sounding lines run while heading inshore (heading 245° pgc), and those lines run while heading away from shore (heading 062° pgc). By a simple visual scan of the fathogram record, one can clearly see that the jaggedness is much more pronounced when the Ship headed away from shore (i.e. directly into the seas which varied from 1 to 6 feet during the survey). In fact, the ship pitched considerably when heading into the seas; this increased pitching shows up in the gaps in the fathogram, caused by air getting under the hull. Much difficulty was experienced in scaling and checking the fathograms. Jaggedness up to 1 fathom (6 feet) occurs. When scanning the fathogram, obvious peaks and troughs caused by wave action were mentally smoothed, but in other places considerable difficulty was encountered in determining how much irregularity in the bottom trace was natural and how much resulted from the ship pitching in the swells. The hydrographer check-scanned almost the entire fathogram record; the recorded soundings thus are what he judges to be the correct sounding.

Corrections to echo soundings were determined as follows:

1] Instrument and Velocity corrections were derived from 3 leadline comparisons taken in water 4 to 7 fathoms deep.

2] Velocity corrections were also derived from a temperature-and-salinity cast. The results were combined with the results of the leadline comparisons to obtain a fathometer depth correction curve, which combines instrument, transducer, and velocity corrections. One velocity table is used by the computer to correct soundings.

3] No draft corrections are calculated, as no draft records were kept. From experience, McARTHUR's draft changes less than 0.2 fathoms between fuelings, since the ship always tries to stay "topped off" with fuel.

4] Fathometer initial was maintained at 2.0 fathoms throughout the survey. Divergences from 2.0 fathom initial setting have been entered in the "Transducer/Velocity Tape".

5] No settlement-and-squat tests were run for the ship. ← See Review Par. 4

6] Scale (Phase) comparisons obtained on 8 and 9 December yielded excellent results. Scale correctors are logged on the "Transducer/Velocity Tape".

7] Predicted tides were used to obtain the tide reducers applied to soundings inked on the boatsheet. Actual tides measured at the Waimanalo Bay Portable Tide Gage were used to obtain the tide reducers used by the computer to reduce the soundings to MLLW.

No corrections other than tide reducers were applied to boatsheet soundings.

E. SMOOTH SHEET:

The smooth sheet ~~will be~~ was plotted in the Electronic Data Processing Branch (CFS32) by ~~computer~~ Pacific Marine Center Gerber Digital Plotter. The raw field data is logged onto punched paper tape, using the following formats:

DATA	FORMAT	AUTOMATED SURVEY MANUAL
Positions	Electronic Control Format - Raw Data Tape	Fig 5
Position Correctors	Electronic Control Format Corrector Tape	Fig 6
Soundings	Visual Format - Sounding Tape	Fig 4
Fathometer Correctors	Transducer/Velocity Tape (TV/TI)	Fig 13
Tide Correctors	Tide Tape	Fig 14
Velocity Correctors	Velocity Tape Type No. 1	Fig 11

← No Corrector Tape Printout found in records.

DISREGARD. Corrector Tape Printout sent in by PMC 1/23/69 DEW

F. CONTROL:

This survey was controlled entirely by simultaneous theodolite cuts from two shore observing-stations on Oahu overlooking the survey area. Radio-telephone communication linked the two shore observers with the shipboard personnel and with each other. ✓

The following procedure was used: The fathometer operator in the chartroom was in communication with the radio shack via ship's intercom system. The radio shack was in radio-telephone communication with the shore observers. Thus, by keeping both circuits open in the radio room, the shore stations could both hear and talk directly to the chartroom personnel aboard ship. Also, the fathometer operator could give the "mark" for a fix directly to the shore observers. Each shore station observer kept a record of all ~~azimuths~~ THEODOLITE DIRECTIONS observed, and all initial pointings. The radio shack personnel also kept a record of all ~~azimuths~~ DIRECTIONS and initial pointings relayed through them to the chart room. Further, this position data was recorded in the sounding volumes by the recorder sitting in the chart room. Thus, any questionable ~~azimuths~~ could be checked by comparing the three individually kept position data records. DIRECTIONS ✓ Good procedures!

Position correctors were derived by averaging the initial pointings taken at the beginning and end of sounding lines. ✓

The Station designated as R_1 (MON) is located over triangulation station "U.S. MONUMENT No. 1, 1952." ✓

Latitude 21° 23' 02.854" N
Longitude 157° 43' 20.344" W

The station designated as R_2 (MAK) is located over a temporary mark located by 3rd-order traverse (by ship's officers) from a nearby triangulation station. The triangulation station is named "MAKAPUU POINT, 1872"; the observing station is named "Makapuu Sub-Station No. 1"

Latitude 21° 18' 42.444" N
Longitude 157° 39' 19.883" W

The stations did not initial on each other. MAK station did initial on MON. However, MON initialled on Triangulation Station MAKAPUU POINT 1872. Hence, a correction factor of 000° 08.7' must be added to all R_1 (MON) azimuths (as recorded in the sounding volume) to obtain the correct azimuth from MON.

Azimuths and Initials are recorded in degrees, minutes, and seconds. However, azimuths and azimuth correctors are logged in degrees, minutes, and tenths-of-minutes.

G. SHORELINE:

No shoreline was located in the survey area. The inshore edge of the survey defines the 10 fathom curve, except as noted in section 'B' above.

I. JUNCTIONS:

No contemporary surveys exist with which to make junction.

J. COMPARISON WITH PRIOR SURVEYS:

No comparison with prior surveys was made. No pre-survey review investigations were required.

K. COMPARISON WITH THE CHART:

Selected soundings from Chart C.S. 4131 (5th Ed/Apr '67) were replotted onto the boatsheet, (Blue ink sndgs.). In general, there is poor agreement between charted soundings and the soundings obtained during the survey, even after velocity correctors are applied to the boatsheet soundings. Disagreements from 1 to 2 fathoms at depths less than 50 fathoms were found, and disagreement rapidly got worse as depths increased. Three particularly bad disagreements are listed below:

Chart Sounding	Latitude	Longitude	Surrounding Depths from AR-12.5-1-67
132 fms	21° 20' 28.0"	157° 37' 24.0"	104 fms
154 fms	21° 21' 00.5"	157° 37' 20.0"	218 fms
133 fms	21° 22' 45.5"	157° 39' 45.0"	120 fms

Other disagreements of 6 to 8 fms in depths from 50 to 100 fathoms are found.

The survey's junction with the charted 10 fathom curve seems good, from a preliminary visual inspection, but as stated, the survey will disagree more with the chart as depth increases.

L. ADEQUACY OF SURVEY:

This survey is complete and adequate to supersede prior surveys for charting.

The survey is actually not complete as we desire it. Project instructions call for maximum line spacing of 100 meters. There exist about nine (9) "splits" which should be run to meet 100 meter spacing requirements. However, lack of time prevented picking up these splits. This situation was discussed with MAKAI RANGE (Oceanic Foundation) officials, who stated that the survey as it now stands was entirely satisfactory and acceptable to them.

M. AIDS TO NAVIGATION:

There are no floating aids to navigation within the area surveyed; further, none are needed.

No Report on Landmarks for Charts and Fixed Aids to Navigation is included, as these items were not investigated.

N. STATISTICS:

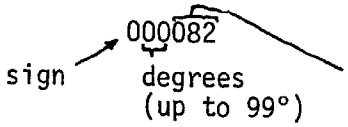
Total Number of Positions	1273
Total Miles of Sounding Lines	329.2
Square Nautical Miles Surveyed	13.9
Bottom Samples	38

O. MISCELLANEOUS

The position Corrector Tape gives the corrections to be applied to the theodolite directions. These theodolite directions have been read off the instrument and recorded in the sounding volume with no correctors applied.

A correction for the initial plate setting has been derived by averaging the initial pointings, one being read just prior to running a sounding line, and the other being read just after finishing a sounding line.

These initial corrections are logged in degrees, minutes, and tenths-of-minutes. The correctors are logged in the R_1 or R_2 columns of the Electronic Control Format - Corrector Tape. The first digit designates the sign of the corrector: 0 if plus, 1 if minus. Thus, the six (6) digits are utilized thus:



The corrector under R_1 applies to the R_1 direction (MON); the R_2 corrector applies to the MAK direction. The correctors are logged by time; when either R_1 or R_2 corrector changes, a new long word is logged. Hence, each corrector applies from its own logged time, up to the logged time of

The proper procedures were followed but no Corrector Tape Printout was found in the records. DISREGARD. Corrector Tape Printouts submitted by PMC 1/23/69

the next corrector, and should be applied to all in between ~~azimuths~~ DIRECTIONS.

For Survey AR-12.5-1-67, the following applies specifically:

1] As the MON station did not initial on MAK station, but rather initialled on a nearby (31 meters away) signal, a constant ~~azimuth~~ corrector will be applied to the R_1 ~~azimuths~~ DIRECTIONS. This corrector has been combined with the R_1 initial corrector, and the sum has been logged onto the position corrector tape. This logged corrector is now the only corrector to be applied to the R_1 ~~azimuth~~ DIRECTION

2] Due to the geometry of the problem, it is desired for the computer to solve the position problem utilizing two angles and the included side. The included side is the baseline between the R_1 (MON) and R_2 (MAK) stations. The angle at the R_2 station is obtained directly by adding R_2 ~~azimuth~~ DIRECTION and R_2 corrector. The angle at R_1 must be obtained by adding R_1 ~~azimuth~~ DIRECTION and R_1 corrector, then subtracting the result from 360°.

P. RECOMMENDATIONS

None

Q. REFERENCES TO REPORTS

1. SEASON REPORT 1967, USC&GSS McARTHUR, LCDR. R. L. Newsom, Cmdg.

Arthur P Sibold

Arthur P. Sibold
LT(jg), USESSA

Approved and Forwarded:

Ronald L. Newsom

Ronald L. Newsom
LCDR, USESSA
Commanding Officer

TIDE NOTE

Field No. AR-12.5-1-67

Tide Station:	Waimanalo Bay Oahu Island, Hawaii Latitude: 21° 19.7' N Longitude: 157° 40.8' W
Plane of Reference:	2.4' on the 1967 tide staff = MLLW
Time Meridian:	150° West
Time Correction:	none
Height Correction:	none
Area Covered:	Entire area of AR-12.5-1-67

MLLW was determined from a 30 day tidal record. Portable Automatic Tide Gage No. T-649 was installed at Waimanalo Bay. Hourly heights were scaled in the field by ship's officers. An abstract of tide correctors is appended to this report.

TIDE TAPE

Survey Field No.	Survey Location	Time Meridian
AR-12.5-1-67	Oahu Island (Makai Range) Hawaii	150 W

Tide Station Used: Waimanalo, Oahu, Hawaii

TIME	Fath. TIDE					
~~072100 00 1002~~	~~0000~~	~~319~~	~~0~~	~~00000~~	~~00000~~	11/05/67
132000 00 1002						
091800 00 1002	0000	320	0	00000	00000	11/16/67
~~160800 00 1002~~						
~~074400 00 1002~~	~~0000~~	~~321~~	~~0~~	~~00000~~	~~00000~~	11/17/67
130300 00 1002						~~11/18/67~~
112000 00 1002	0000	324	0	00000	00000	11/20
~~163700 00 1002~~						
~~073400 00 1004~~	~~0000~~	~~325~~	~~0~~	~~00000~~	~~00000~~	11/21/67
080000 00 1004						
~~103000 00 1003~~						
153500 00 1002						
082100 00 1003	0000	326	0	00000	00000	11/22/67
~~102000 00 1003~~						
123600 00 1002						
110200 00 1002	0000	340	0	00000	00000	12/6/67
~~114000 00 1002~~						
173300 00 1001						
085200 00 1003	0000	341	0	00000	00000	12/7/67
~~110000 00 1003~~						
132000 00 1002						
~~170500 00 1001~~						
~~070000 00 1003~~	~~0000~~	~~342~~	~~0~~	~~00000~~	~~00000~~	12/8/67
110000 00 1003						
~~132000 00 1002~~						
180000 00 1001						

Plane of Reference Approved
Datum Planes Section
Date 4/26/68 cit

Reducers assumed to be in fathoms. wmm cit

ABSTRACT OF TIDE REDUCERS

for

Survey AR-12.5-1--67

DATE	TIME (from - to)		CORRECTION
15 Nov 67	072100	132000	-0.2 fms
16 Nov 67	091800	160800	-0.2
17 Nov 67	074400	130300	-0.2
20 Nov 67	112000	163700	-0.2
21 Nov 67	073400	080000	-0.4
	080001	103000	-0.3
	103001	153500	-0.2
22 Nov 67	082100	102000	-0.3
	102001	123600	-0.2
6 Dec 67	110200	114000	-0.2
	114001	173300	-0.1
7 Dec 67	085200	110000	-0.3
	110001	132000	-0.2
	132001	170500	-0.1
8 Dec 67	070000	110000	-0.3
	110001	132000	-0.2
	132001	180000	-0.1

ABSTRACT OF VELOCITY CORRECTORS

for

Field No. AR-12.5-1-67

FATHOMETER DEPTH (fathoms) From	To	CORRECTOR
00.0 fms	08.7 fms	+0.0 fms
08.8	10.5	0.1
10.6	12.9	0.2
13.0	15.1	0.3
15.2	18.6	0.4
18.7	23.1	0.6
23.2	27.6	0.8
27.7	32.1	1.0
32.2	36.6	1.2
36.7	41.1	1.4
41.2	45.7	1.6
45.8	50.0	1.8
50.1	53.8	2.0
53.9	57.6	2.2
57.7	61.4	2.4
61.5	65.7	2.6
65.8	70.0	2.8
70.1	74.1	3.0
74.2	79.1	3.2
79.2	84.5	3.4
84.6	90.0	3.6
90.1	95.1	3.8
95.2	99.9	4.0
100.0	110.0	4.3 ← Why odd number?
110.1	136.0	5.0
136.1	182.0	6.0
182.1 fms	280.0 fms	+7.0 fms

ABSTRACT OF SCALE COMPARISONS

for

Field No. AR-12.5-1-67

Raytheon Survey Fathometer Model DE-723 (serial no. 915)
(Chartroom--USC&GSS McARTHUR)

Scale	Correction	Total Corrector (for soundings on scale)
B	+0.1 fm	+0.1 fm on B scale
C	+0.2 fm	+0.3 fm on C scale
D	-0.2 fm	negligible on D scale
E	+0.2 fm	negligible on E scale
F	----	negligible on F scale

FORM C&GS-733M (6-66)

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

VESSEL	PROJ. NO.	YEAR	CHECKED BY	DATE CHECKED
USC&GSS MACARTHUR	SP-12-67	1967		

SERIAL NO.	DATE	SAMPLE POSITION LATITUDE	SAMPLE POSITION LONGITUDE	DEPTH (Fathoms)	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
4261	8 Dec 1967	21° 20.6	157° 37.3	116.0	75 lbs	surface			sft wh S	Shipek Sampler	APS
4262	12/8/67	20.0	36.9	47.5					crs wh S; brk Sh		APS
4263		19.5	36.8	43.0					crs wh S; brk Sh		APS
4264		19.0	36.6	38.0					crs wh S; brk Sh		APS
4265		18.5	37.1	33.5					crs wh S; brk Sh		APS
4266		21° 18.8	157° 37.4	30.3					crs wh S; brk Sh		APS
4267		19.3	37.6	31.5					crs wh S; brk Sh		APS
4268		19.8	38.0	32.5					crs wh S; brk Sh	2 containers	APS
4269		20.0	38.1	40.5					crs wh S; brk Sh		APS
4270		20.4	38.3	47.0					med wh S; brk Sh		APS
4271		20.9	38.7	47.8					med wh S; brk Sh		APS
4272		21.3	39.0	54.0					med wh S; brk Sh; blk Spks		APS
4273		21.7	39.2	56.0					crs wh S; brk Sh; blk	Spks	APS
4274		22.1	39.5	56.0					crs wh S, brk sh, blk	Spks	DLC
4275		22.4	39.7	66.0					Brn S; brk Cas Sh		DLC
4276		22.8	40.0	71.5					SF wht Sy; brk Cas Coral		DLC
4277		21° 23.3	157° 40.2	101.0					Med wht Sy		DLC

Use more than one line per sample if necessary.

FORM C&GS-733M
(6-66)

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

2/3

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

VESSEL	PROJ. NO.	YEAR		CHECKED BY	DATE CHECKED
McArthur	SP-12-67	1967			

SERIAL NO.	DATE	SAMPLE POSITION LATITUDE	SAMPLE POSITION LONGITUDE	DEPTH (Fathoms)	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
4278	12/8/67	21° 23.7	157° 40.6	93.0	75 lbs	surface			fne wh M w/S & Clay		APS
4279	12/8/67	21° 24.0	157° 40.8	49.0					fne wh M w/S & Clay		APS
4280		21° 24.0	157° 41.1	19.8					fne wh S w/M & seaweed		APS
4281		23.8	41.0	19.8					fne wh S; brk Sh		APS
4282		23.3	40.9	27.8					med wh S; seaweed		APS
4283		22.8	40.6	25.0					crs wh S; brk Sh		APS
4284		22.5	40.5	21.5					crs wh S; brk Co; M		APS
4285		22.2	40.2	35.0	clamshell snapper				brk Sh; crs wh S	Lost shipek sampler, using clamshell w/7' lead	APS
4286		21.8	39.9	41.0					fne gy S; M		APS
4287		21.4	39.6	45.0					gy M & Clay		APS
4288		21.0	39.4	41.0					gy M & Clay		APS
4289		20.6	39.2	36.0					fne gy S; brk Sh		APS
4290		20.3	39.0	34.0					crs wh S; brk Sh; brk Co		APS
4291		20.1	38.6	36.5					fne gy S; brk Sh		APS
4292		19.8	38.3	35.0					Co		APS
4293		19.3	38.1	30.0					Co		APS
4294	↓	21° 19.0	157° 38.0	26.0	↓	↓			Co		APS

Use more than one line per sample if necessary.

USCOMM-DC 37019-P66

FORM C&GS-733M (6-66)

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VESSEL	PROJ. NO.	YEAR	CHECKED BY	DATE CHECKED
MacARTHUR CSS-30	SP-12-67	1967		

SERIAL NO.	DATE	SAMPLE POSITION LATITUDE	SAMPLE POSITION LONGITUDE	DEPTH (Fathoms)	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
4295	12/8/67	21°20.6'	157 39.3	16.0	clamshell snapper	surface			crs brn S; brk Sh	clamshell snapper - attached to 7 16. lead	APS
4296	↓	21.0	40.0	18.0	↓	↓			crs brn S; seaweed		APS
4297		21.4	40.3	14.3					Co; seaweed		APS
4298	↓	157°-21.7	15°-40.7	11.2	↓	↓			Co		APS

Use more than one line per sample if necessary.

USCOMM-DC 37019-P66

APPROVAL SHEET

Field No. AR-12.5-1-67

The field work on this survey was accomplished under my direct supervision. Frequent inspections of the boatsheet were made as field work and processing progressed.

The boatsheet and other field records have been reviewed by me and are approved. In addition, officials of MAKAI RANGE (Oceanic Foundation), after reviewing the boatsheet, announced that the survey met their requirements, and that they were well satisfied with it.

Ronald L. Newsom

Ronald L. Newsom
LCDR, USESSA
Commanding Officer

DATE: JAN 31. 1968

Approval Sheet

The smooth sheet has been inspected, is complete, and meets the requirements of the General Instructions for automated surveys and Hydrographic Manual. (Note: All exceptions are listed in the verifier,s report).

Examined and approved.

William M. Martin

William M. Martin
Supervisory Carto. Tech.

Approved and Forwarded.

John R. Plaggmier

John R. Plaggmier CDR. USESSA
Acting Chief Processing Division, PMC

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-8990

Name on Survey	A On Chart No.	B On previous survey No.	C On U. S. quadrangle Maps	D From local information	E On local Maps	F P. O. Guide or Map	G Rand McNally Atlas	H U. S. Light List	K	
Hawaii										1
Makapuu Point										2
Manana Island										3
Oahu										4
Wailea Point										5
Waimanalo Bay										6
										7
			Names approved							8
			Nov. 13, 1968							9
			Frank W. Hickox							10
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FORM C&GS-946
(REV. 11-65)
(PRESC. BY
HYDROGRAPHIC
MANUAL 20-2,
6-94, 7-13)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS

HYDROGRAPHIC SURVEY NO. H-8990 AR-12.5-1-67

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS	1
DESCRIPTIVE REPORT	1	OVERLAYS	2

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	1		1			
VOLUMES	9					
BOXES						

T-SHEET PRINTS *(List)*

SPECIAL REPORTS *(List)*

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				1273
POSITIONS CHECKED	I doubt it DEW	811 (1273)	1	
POSITIONS REVISED		39	NONE	
DEPTH SOUNDINGS REVISED		214	13	
DEPTH SOUNDINGS ERRONEOUSLY SPACED		21	—	
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		none	NONE	
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		none	—	
JUNCTIONS		none	—	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		142	2 hrs.	
SPECIAL ADJUSTMENTS		102	—	
ALL OTHER WORK (Incl. Reports)		127	36 hrs.	
TOTALS		371	38 hrs.	

		BEGINNING DATE	ENDING DATE
PRE-VERIFICATION BY			
VERIFICATION BY	R. D. Lynn	2/15/68	7/8/68
REVIEW BY	Dale E. Westbrook	11/5/68	11/18/68

USCOMM-DC 36271-P65

Reg. No. H-8990

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey, the following shall be completed:

CARDS CORRECTED

DATE_____ TIME REQ'D_____ INITIALS_____

REMARKS:

Information for Future Pre-Survey Reviews

When surveys are made which join this one, care should be taken that the junctions are complete. This survey was not squared off in all areas, particularly in the vicinity of the northern and southern portions of the smooth sheet.

Dale E. Westbrook

Dale E. Westbrook

OFFICE OF HYDROGRAPHY AND OCEANOGRAPHY

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO: H-8990 FIELD NO. AR-12.5-1-67

Hawaii, Oahu, Waimanalo Bay (Makai Range)

SURVEYED: November -- December 1967

SCALE: 1:12,500 PROJECT NO: PMC SP-12-67

SOUNDINGS: Raytheon DE-723 Depth Recorder CONTROL: Theodolite cuts from triangulation stations

Chief of Party	R. L. Newsom
Surveyed by	R. L. Newsom
	S. R. Peterson
	A. P. Sibold
	M. L. Smith
	R. A. Sundholm
	M. E. Harbert
	J. A. Lyons
Plotted by	Gerber Digital Plotter
Soundings Plotted by	Gerber Digital Plotter
Verified by	R. D. Lynn (PMC)
Reviewed by	D. E. Westbrook
	Date: 11/18/68
Inspected by	R. H. Carstens

1. Description of the Area

The area covered by this survey lies off the southeast portion of the Island of Oahu, Hawaii, in the vicinity of Waimanalo Bay. Depths on the survey range from about 6 fathoms to 246 fathoms.

This was a special survey, requested by the Oceanic Foundation, Hawaii, requiring a survey scale and procedures which were more stringent than normally necessary in this type of area.

The bottom is comparatively smooth, consisting of mostly white sand and broken shells. However, as is characteristic of offshore depths in the Hawaiian Islands, the bottom drops off rapidly on leaving the coastline. On this survey, depths increase about 1,000 ft. within a distance of about 2 miles.

No dangers to navigation were found within the survey area, and no bottom features of importance were delineated.

2. Control and Shoreline

The control is adequately described in the Descriptive Report.

There is no shoreline within the limits of this survey. A few geographic names; however, have been added to the smooth sheet for orientation purposes.

3. Hydrography

A. Depths at crossings are in good agreement.

B. The usual depth curves were adequately delineated. It was not possible for the ship to fully delineate the 10-fm. curve in some areas because of its proximity to shore.

C. The development of the bottom configuration and determination of least depths are considered adequate.

4. Condition of the Survey

The sounding records, automated plotting, the Descriptive Report, and the Pacific Marine Center verification are adequate and conform to the requirements of the Hydrographic Manual and the Instruction Manual, Automated Hydrographic Surveys.

A few comments follow regarding the records:

A. Contrary to the statements in the Descriptive Report, that missed soundings were due primarily to sea and swell, causing air to lodge beneath the hull,

an examination of the fathograms revealed that much of the difficulty in obtaining readable soundings was caused by a faulty fathometer, which should have been repaired. The fault was apparently not in the accuracy of the fathometer, but in its not always providing a readable trace even when air was not under the hull.

B. The apparent mis-spacing of many of the soundings on the survey stems from the necessity of recording depths at odd time intervals, because of loss of bottom trace.

C. Several soundings were excessed unnecessarily by the computer and had to be added to the smooth sheet by the reviewer.

D. An in-house number (3067) was used on the printouts of this survey by the plotter center instead of the Registry Number, H-8990. No survey should be processed without first having a registry number assigned to it.

E. It was not necessary for the smooth sheet to be 60 inches long. It should have been cut down to the standard length of 54 inches.

F. No settlement and squat corrections were applied on this survey. Tests should have been made, however, to determine their desirability in view of the stringent requirements of the survey.

5. Junctions

There are no adjoining contemporary surveys.

6. Comparison With Prior Surveys

H-3287 (1:20,000) 1910

This survey comprises the only prior survey coverage of the present survey area. Although the Descriptive Report discusses the differences between the present survey and prior survey in some detail, these differences do not appear great when all the factors are considered. In fact, good agreement was noted over most of the area. In some instances, differences of 2-3 fms. in depths less than 50 fms. occur.

Since the bottom is considered to be relatively stable, the differences between the present and prior survey can be attributed primarily to the considerably smaller scale of the prior survey and the lesser accuracy of the survey methods employed in 1910, particularly in deep water.

The present survey supersedes the prior survey within the common area.

7. Comparison With Chart 4131, 5th Ed., April 17, 1967
Chart 4110, 9th Ed., March 25, 1968

Most of the charted hydrography in the present survey area originates with the previously discussed prior survey, which requires no further consideration.

A few charted soundings originate with a 1:200,000 scale U.S. Navy survey (Bp-60514). One of these soundings, a 154-fm. charted in lat. 21°21'01", long. 157° 37'20", is obviously in error and should be disregarded.

In addition, the other charted soundings from the U.S. Navy survey in this area can be disregarded because of this survey's small scale and less accurate methods of control.

The present survey supersedes the charted soundings within the common area.

8. Compliance With Instructions

The present survey does not fully comply with the Project Instructions in that:

1. There are several instances where the line spacing is greater than 100 meters.

2. The 10-fm. depth curve was not fully delineated.

3. The smooth sheet was not plotted in feet.

Correspondence between the Director, Pacific Marine Center and the Oceanic Foundation (Makai Range) indicates that the survey satisfied their requirements, and since the survey is adequate for normal Coast and Geodetic Survey requirements, it is considered fully acceptable on this basis.

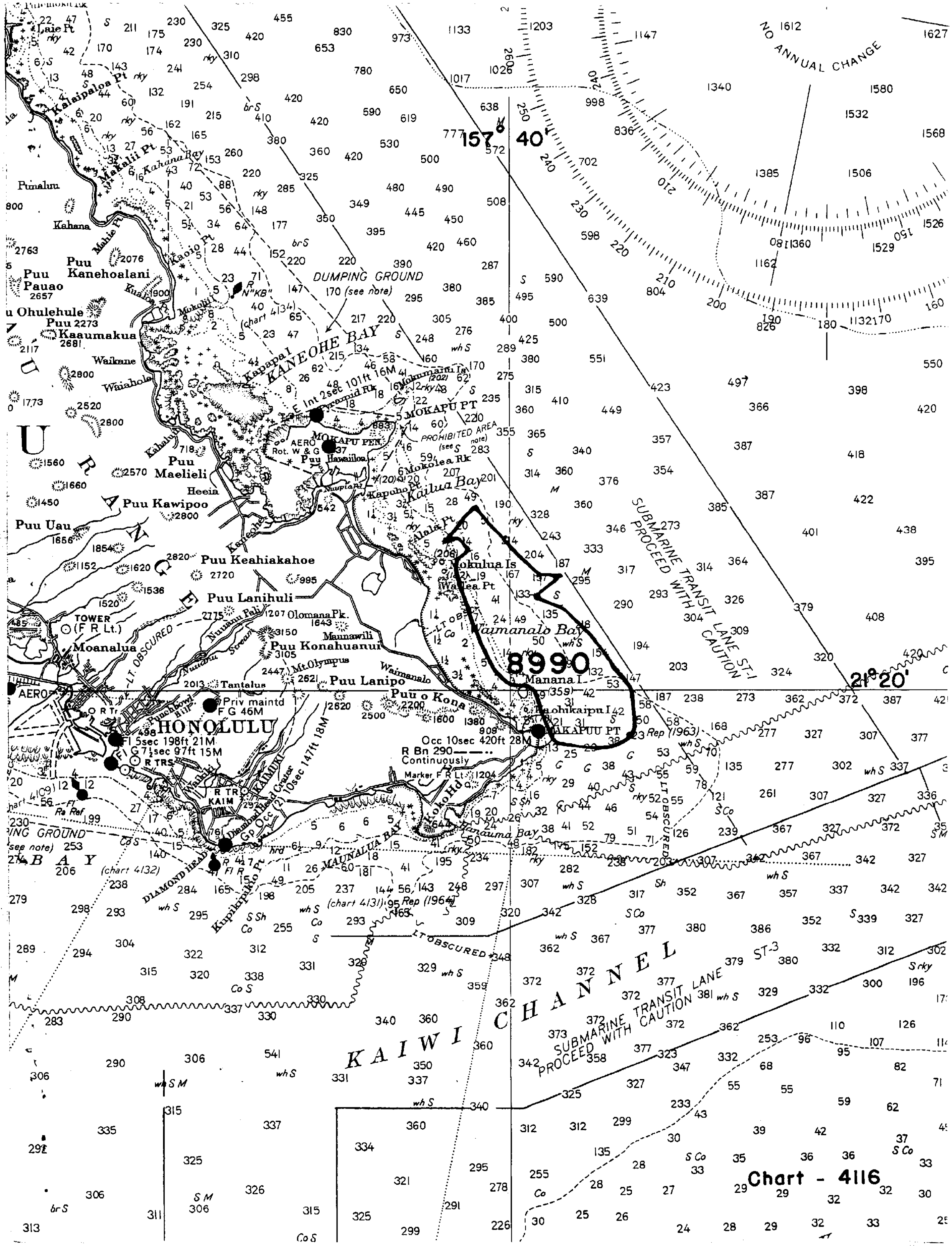
9. Additional Field Work

This survey is considered an excellent basic survey, and no additional field work is recommended.

Examined and Approved:

Chief
Marine Chart Division

Associate Director
Office of Hydrography
and Oceanography



NO ANNUAL CHANGE
157° 40'
21° 20'
Laie Pt
Kalaipaloa Pt
Makalii Pt
Kahana Bay
Punaluu
Kahana
Mahie Pt
Kaoio Pt
Kualoa
Mokolii I
Puu Kanehoalani
Puu Pauao
Puu Ohulehule
Puu Kaaumakua
Waikane
Waiahole
DUMPING GROUND
170 (see note)
(chart 4134)
KANEOHE BAY
Kapapa I
E Int 2sec 101ft 16M
Mokumanu Is
MOKAPU PT
MOKAPU PEN
AERO Rot. W & G
Puu Hawaiiloa
PROHIBITED AREA (see note)
Mokolea Rk
Kapoho Pt
Kailua Bay
Alala Pt
Mokulua Is
Wailea Pt
Waimanalo Bay
Manana I
Kaohikaipu I
MAKAPUU PT
Occ 10sec 420ft 28M
R Bn 290 Continuously
Marker F R Lt
Kahaluu
Puu Maelieli
Heeia
Puu Kawipoo
Puu Uau
Kaneohe
Puu Keahiakahoe
Puu Lanihuli
TOWER (F R Lt.)
Moanalua
LT. OBSCURED
Nuuanu Pali
Olomana Pk.
Maunawili
Puu Konahuanui
Mt Olympus
Tantalus
Puu Lanipo
Waimanalo
Puu o Kona
Priv maintd F G 46M
AERO
HONOLULU
Punchbowl Hill
Fl 5sec 198ft 21M
Fl G 7½sec 97ft 15M
R TRS
Waikiki
KAIMUKI
R TR KAIM
Diamond Head Crater
Gp Occ (2) 10sec 147ft 18M
DIAMOND HEAD
Kupikipikio Pt
MAUNALUA BAY
Koko Hd
Hanauma Bay
(chart 4131)
(chart 4132)
(chart 4109)
Ra Ref
DUMPING GROUND (see note)
BAY
Rep (1963)
Rep (1964)
LT OBSCURED
SUBMARINE TRANSIT LANE ST-1 PROCEED WITH CAUTION
SUBMARINE TRANSIT LANE ST-3 PROCEED WITH CAUTION
KAIWI CHANNEL
8990

Chart - 4116

FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8990

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
4131	12/11/68	Jeffrey Stuart	~~Full~~ Part Before ~~After Verification Review~~ Inspection Signed Via
			Drawing No. 11
4110	12/11/68	Jeffrey Stuart	~~Full~~ Part Before ~~After Verification Review~~ Inspection Signed Via
			Drawing No. thru Ch. 4131 dwg # 11
4116	5/20/69	Oscar Chapman	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. Thru Cht. 4110 dwg. 20
4131	9/10/69	Jeffrey Stuart	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. #1
4180	1-22-70	Irene Beeler	Full ~~Part Before~~ After Verification Review Inspection Signed Via 4116
			Drawing No. 15 see cht 4116 # 16 Hist dwg Thru Paragraph reduction 35.55
4102	2/14/70	O. Svendsen	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 27 thru Chart 4116 Drg # 15
4110	6/10/70	Oscar Chapman	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 21
			No work on this dwg. previous appl. on dwg # 20
4120	8/4/71	C B Samuel	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. Revised small part of 30 Fm curve & 1 sdg.
4179	5/10/71	J. H. Hillan	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 9 appd thru 4180 # 15 several shoal soundings charted
4001	10/1/74	T. Alexander	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. applied thru 4180 (19013) added one 17fms sdg & ~~23 (Rep 1963) fms sdg.~~
19007	3-23-83	L.A. Simmons	Fully Appd after Signature thru 19013 # 10

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8058-P83