8883

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. PF 20-1-66 Office No. H-8883
& PF 20-2-66

LOCALITY

State Hawaii

General locality Molokai Island

Locality Off Southern Coast of Molokai Island

1966

CHIEF OF PARTY

G. L. Short

LIBRARY & ARCHIVES

DATE March 7, 1968

USCOMM-DC 37022-P66

Corrections to be applied to H-8883 ~~[illegible]~~ after verification and review.

1. The plotter card is missing for position 018003 at time 125030. A new card should be made, ~~and the~~ ~~sounding plotted on the coastboat~~

2. The positions from 036400 at time 000400 through 036500 at time 000700 were recomputed, R_1 was revised, and the computer cards corrected but the cards apparently were not put in the deck. These cards should be corrected and entered as such.

Indx. No.	Time.	Day.	R_1	R_2
036400	000400	115	103000	075830
036401	000430	115		
036402	000500	115		
036403	000530	115		
036404	000600	115		
036405	000630	115		
036500	000700	115	100500	079530

Done
Sorted to EPM 4/15/72
Rec'd 4/18/72 GKM

#1

Additional Excess Soundings

Sndg. No.	Sndg.	Y	X Sndg.
089802	00906	05294	11145
089900	00813	05294	11226
089902	00635	05295	11307
090000	00509	05297	11389
090002	00499	05296	11468
090100	00541	05295	11548
090202	00494	05388	11497
091401	00518	05210	11263
069001	00542	05105	11201
069101	00537	05070	11347
069103	00562	05057	11419
069201	00834	05042	11490
069203	00876	05025	11561
067101	00992	05668	09711
037202	01625	03974	09898
037204	01595	03950	09941
046502	01111	04788	11308
086400	01407	04304	05017
005701	02119	01469	08704
005703	01859	01424	08792
005801	01710	01336	08968
005803	01675	01294	09054
005805	01600	01252	09141

Additional Excess Soundings (Cont)

Sndg Nr.	Sndg	Y	X Sndg
005901	01470	01210	09230
005903	01410	01170	09322
006101	01640	01040	09128
006103	01695	01077	09037
006202	01660	01143	08904
007400	01155	01496	09504
007402	01265	01538	09411
007800	02715	02065	08440
009002	01175	04817	06027
010705	03790	03044	07492
011105	02840	02275	08420
011702	01824	03279	09560
012202	01590	04575	10296
012405	01329	05289	10533
012503	01039	05489	10580
016102	00212	06126	05679
024105	01036	05866	06695
029801	02744	03422	08428
030105	01726	02800	09324
030202	01851	02733	09452
030204	01816	02689	09536
030302	01726	02603	09708
030304	01683	02562	09795
030702	00356	02232	10802
030704	00329	02223	10849

Additional Access Soundings (Cont'd)

Sndg. No.	Sndg.	Y	X Sndg
031101	01135	02714	10407
031103	01295	02744	10305
031105	01420	02774	10204
031204	01660	02869	09979
031206	01690	02909	09893
031901	02585	03998	08361
032904	02455	05032	08004
034005	01691	03283	10057
034101	01671	03245	10146
034103	01661	03203	10233
034105	01656	03161	10319
034203	01471	03086	10501
034205	01291	03050	10593
034803	01060	03293	11201
035002	01605	03419	10666
035100	01625	03462	10475
035102	01640	03502	10376
035104	01655	03541	10286
037301	01700	03854	10113
037303	01685	03811	10202
037305	01655	03768	10291
037702	01180	03465	11282
038202	01499	03759	10854
038205	01564	03805	10710

Additional Access Soundings (Cont'd)

Sndg. No.	Sndg.	Y	X Sndg
038301	01584	03839	10615
038303	01604	03878	10521
038305	01624	03917	10428
038401	01644	03958	10336
038405	01664	04044	10154
040301	01665	04275	10117
040401	01625	04138	10387
040403	01620	04100	10478
040405	01595	04062	10568
040501	01575	04025	10660
040503	01555	03989	10751
041201	01515	04124	10932
042901	01564	04489	10522
042903	01544	04447	10613
043203	01016	04189	11469
043603	01458	04513	10923
043605	01488	04550	10828
044104	01358	05364	09630
044203	01188	05555	09448
045501	01491	04840	10640
045503	01481	04800	10731
045505	01481	04760	10822
045601	01481	04725	10914
045603	01451	04695	11008

Additional Excess Sounding (Cont)

Sndg. No.	Sndg.	Y	X Sndg.
047900	01201	05127	10855
047902	01121	05091	10940
048000	01013	05056	11040
053603	01383	05736	06675
061000	01527	04847	04635
063003	01026	04908	04680
063401	01768	04807	05338
063701	01326	04710	05901
066901	00918	05666	10125
067802	00982	05571	09999
068801	01079	05244	10919
069003	00547	05087	11274
069603	01029	04536	11478
074301	01239	02393	09997
075203	00971	02179	09975
075501	01335	02121	09654
076402	01194	01770	09556
076500	01024	01729	09647
077101	01249	01423	09433
077103	01134	01386	09517
077201	00902	01351	09610
077503	00981	01989	09746
078103	02852	03008	08383
078501	01750	02484	09144

Additional Grave Soundings (Cont'd)

Sndg. Pt.	Sndg.	Y	X Sndg.
078701	01468	02231	09636
078703	01323	02195	09722
078705	01209	02159	09808
079303	01209	02308	09928
079305	01354	02348	09831
079401	01575	02390	09736
079403	01700	02432	09643
079405	01777	02474	09550
080003	01580	03009	09324
080103	01827	02909	09524
081001	00425	02555	11109
082303	01655	03004	10212
082305	01665	03042	10118
082403	01700	03123	09931
082405	01730	03164	09839
082700	01700	03446	09344
082904	01907	04219	08970
083501	01737	03518	09957
083503	01717	03479	10042
083505	01682	03440	10128
083601	01672	03405	10215
083603	01652	03372	10303
083605	01652	03340	10392
083904	00976	03112	11179
084802	01067	04418	11424

Additional Excess Soundings (Cont'd)

Sndg. Nr.	Sndg.	Y	X Sndg.
091703	01526	04232	10799
091801	01541	04265	10698
091803	01561	04304	10597
093600	00577	05956	06562
095903	02991	04363	05727

Additional Soundings to be Removed from Chess File

Sndg. No.	Sndg.	Y	x Sndg
037203	01555	03962	09920
032705	01300	05522	07734
080004	01655	02995	09364
082903	01871	04232	08952

#1

The following computer card (row) soundings should be revised:

Time	Day	From	To
		Sdg.	
112700	115	00350	00348
112730	115	00350	00348
142330	115	00475	00473
142500	115	00390	00389
143430	115	00390	00389
205830	116	01140	01440
205900	116	01390	01140
205930	116	01500	01220
210000	116	01520	01450
210030	116	01580	01520
210100	116	01650	01580
210130	116	01730	01700
210300	116	01790	01780
210330	116	01720	01700
210430	116	01030	00990
210500	116	00870	00860
210630	116	00730	00720
210700	116	00755	00730
210730	116	00690	00670
210800	116	00640	00630
210830	116	00615	00590
210900	116	00555	00540

(Computer Card Revisions Cont'd)

Time	Day	Idg. From	To
210930	116	00545	00520
211000	116	00520	00500
211030	116	00495	00480
211100	116	00460	00450
211130	116	00420	00410
211200	116	00400	00380
211230	116	00410	00390
211300	116	00410	00400
211330	116	00415	00390
211400	116	00400	00380
211500	116	00360	00342
211530	116	00350	00342
211600	116	00350	00335
211630	116	00340	00335
211700	116	00345	00335
212100	116	00350	00342
212130	116	00360	00342
212200	116	00365	00352
212230	116	00362	00352
212300	116	00405	00390
212330	116	00445	00430
212400	116	00455	00440
212430	116	00445	00440

(Computer Card Revisions Cont.)

Time	Day	From	To
212500	116	00450	00440 ✓
212530	116	00475	00460 ✓
212600	116	00500	00490 ✓
212630	116	00525	00510 ✓
212700	116	00540	00530 ✓
212730	116	00575	00560 ✓
212800	116	00620	00600 ✓
212830	116	00650	00640 ✓
212900	116	00735	00720 ✓
212930	116	01000	00960 ✓
213000	116	01400	01360 ✓
213030	116	01620	01600 ✓
213100	116	01730	01720 ✓
213130	116	01700	01680 ✓
213200	116	01650	01640 ✓
213230	116	01450	01380 ✓
213300	116	01085	01060 ✓
213330	116	01380	01410 ✓
213400	116	01470	01460 ✓
213430	116	01550	01540 ✓
213500	116	01340	01290 ✓
213600	116	01600	01620 ✓
214100	116	01550	01540 ✓

(Computer Card Revisions Cont.)

Time	Day	From	To
214130	116	01210	01250 ✓
214200	116	00980	01010 ✓
214230	116	00870	00860 ✓
214300	116	00865	00850 ✓
214330	116	00940	00930 ✓
214400	116	01125	01120 ✓
214430	116	01410	01570 ✓
214500	116	01690	01600 ✓
214530	116	01805	01780 ✓
214600	116	01610	01620 ✓
214630	116	01370	01350 ✓
214700	116	01260	01250 ✓
214730	116	00850	00890 ✓
214830	116	00630	00620 ✓
215000	116	00540	00530 ✓
215100	116	00470	00460 ✓
215130	116	00460	00450 ✓
215200	116	00460	00440 ✓
215230	116	00460	00450 ✓
215300	116	00465	00450 ✓
215400	116	00400	00420 ✓
215430	116	00370	00390 ✓
215500	116	00350	00352 ✓

(Computer Card Revisions Cont'd)

Time	Day	From	To
215530	116	00350	00342 ✓
215600	116	00360	00342 ✓
~~215630~~	~~116~~	~~00340~~	~~00332~~
215700	116	00340	00332 ✓
220500	116	00345	00332 ✓
220530	116	00350	00332 ✓
220600	116	00360	00342 ✓
220630	116	00365	00352 ✓
220700	116	00370	00352 ✓
220730	116	00375	00362 ✓
220800	116	00380	00362 ✓
220830	116	00370	00362 ✓
220900	116	00385	00380 ✓
221000	116	00455 ✓	00450 ✓
221030	116	00505	00485 ✓
221100	116	00555	00550 ✓
221130	116	00625	00600 ✓
221330	116	00705	00710 ✓
221400	116	00680	00670 ✓
221430	116	00750	00730 ✓
221500	116	01015	00980 ✓
221530	116	01470	01400 ✓
221600	116	01700	01680 ✓

(Computer Card Revisions Cont.)

Time	Day	From	To
221630	116	01760	01750 ✓
221700	116	01795	01780 ✓
221730	116	01830	01820 ✓
221800	116	01530	01520 ✓
221900	116	01625	01620 ✓
221950	116	01120	01100 ✓
222000	116	01150	01160 ✓
222030	116	01900	01700 ✓
222100	116	02700	02480 ✓
222130	116	03000	02860 ✓
222230	116	03600	03500 ✓
222300	116	03900	03870 ✓
132630	115	00475	00473 ✓
154400	115	00390	00387 ✓
154700	115	00460	00465 ✓
215100	116	00470	00471 ✓
220900	116	00385	00391 ✓
115400	117	00485	00484 ✓

FORM C&GS-537 (8- 8-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-8883

FIELD NO. PF 20-1-66

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

State HAWAII

General locality MOLOKAI ISLAND

Locality OFF SOUTHERN COAST OF MOLOKAI ISLAND

Scale 1:~~20~~40,000 Date of survey 23-27 APRIL, 1966

Instructions dated OPR 419 - 6 DEC., 1965 Project No. 419

Vessel USC&GS SHIP PATHFINDER

Chief of party CDR. G. L. SHORT

Surveyed by SHIP'S OFFICERS

Soundings taken by echo sounder, hand lead, pole DE723, RAYTHEON PFR

Graphic record scaled by SHIP'S PERSONNEL

Graphic record checked by NORFOLK HYDROGRAPHIC PROCESSING BRANCH

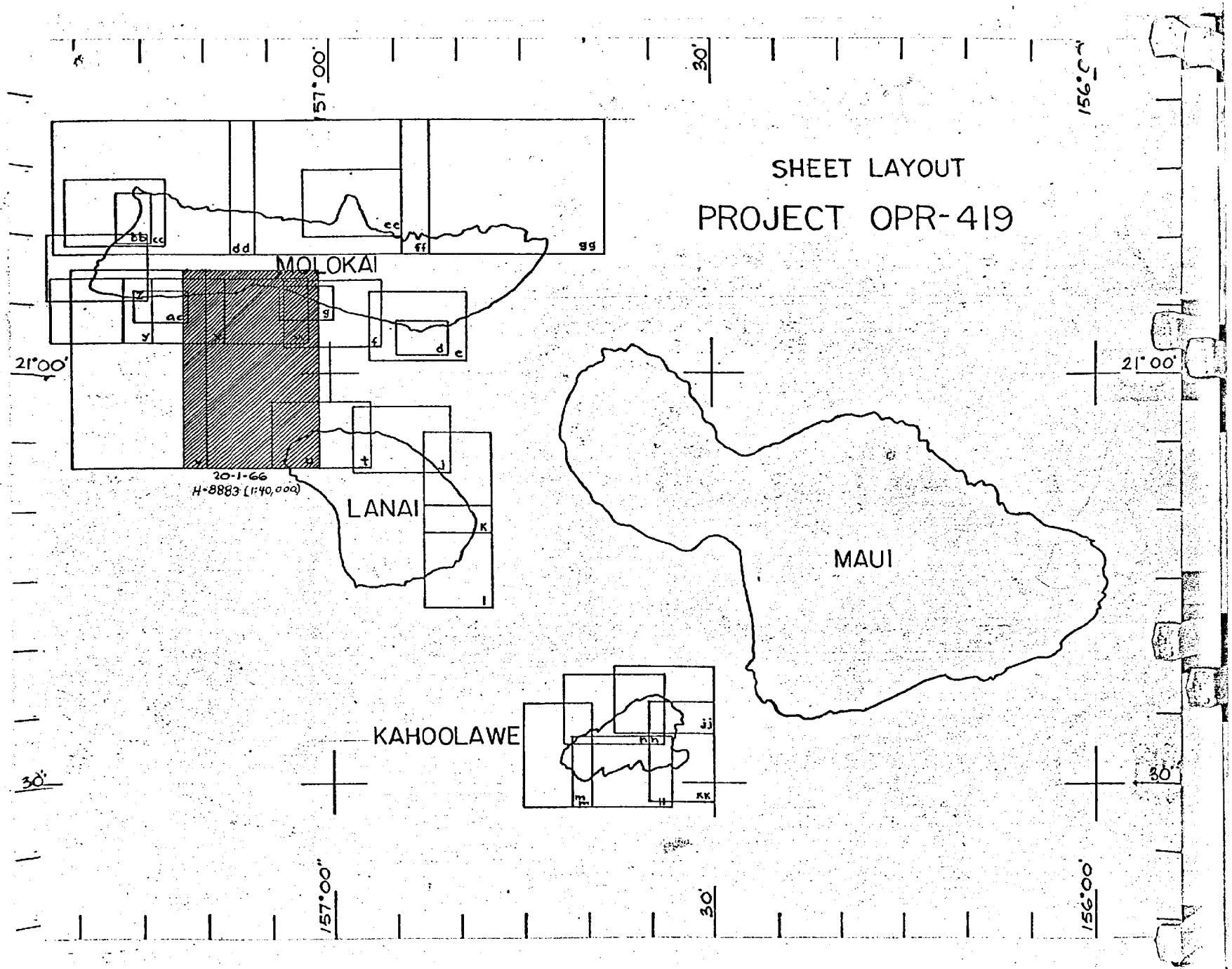
Protracted by _____ Automated plot by EDAT - PACIFIC MARINE CENTER

Soundings penciled by _____

Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW and are true depths

REMARKS: Field surveys PF 20-1-66 and PF 20-2-66 (H-8883) were combined and smooth plotted at a scale of 1:40,000. See letter of Chief, Marine Chart Division dated Oct. 19, 1967, ref: C324.

9.T.G.


SHEET LAYOUT
PROJECT OPR-419
157°00'
30'
156°57'
21°00'
MOLOKAI
LANAI
MAUI
KAHOOLAWE
20-1-66
H-8883 (1:40,000)
30'
157°00"
156°00'

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY
H-8883 FIELD NO. PF 20-1-66 & 20-2-66
USC&GSS PATHFINDER
CDR G. L. SHORT, COMDG
1966
Scale 1:20,000

A. PROJECT

The hydrography on this survey was completed in accordance with "Revised Instructions: Project OPR-419 Hawaiian Islands," dated December 6, 1965. The original instructions for OPR-419, dated October 25, 1960, were sent to the Ship SURVEYOR.

B. AREA SURVEYED The survey limits are bounded by the following points: from lat. 20° 54.00 long. 157° 07.00 to lat. 20 57.00, long 157° 01.00 to lat. 21° 04.00, long 157° 01.00 to lat. 21° 04.20, long. 157° 19.00 to lat. 20° 54.00, long. 157° 07.00.

The survey covers waters of the Kalohi Channel off the southern coast of Molokai Island. The survey limits are as follows: The northern limit is the 21° 04' 15" N line of latitude; the eastern limit is the 157° 01' 00" W line of longitude, and the western limit is the 157° 10' 30" W line of longitude; the survey is approximately bounded on the southwest by a diagonal that intersects the 20° 56' 00" N line of latitude at 157° 10' 00" W, and which intersects the 20° 54' 00" N line of latitude at 157° 07' 40" W. The survey is bounded on the southeast by the 157° 05' 00" W line of longitude, and by a diagonal intersecting the 157° 05' 00" W line of longitude at 20° 55' 24" N, and the 157° 01' 00" W line of longitude at 20° 57' 00" N.

These limits only refer to a portion of the survey

The northern extreme of the survey varies from one to two miles from the south coast of Molokai. The coast in this area is low, and has a narrow sand beach, broken here and there by short stretches of rocky shore. Beyond the shore, the terrain is a bare tableland cut by small gulches, and gradually rises to Mauna Loa, 1400 feet high. From seaward the land presents a smooth and rolling appearance. The southern extreme of the survey is within one mile of the northwest coast of Lanai. The northwest coast is low and rounding. There are stretches of sand beaches backed by a low, narrow strip of land which rises gently to the tableland.

The sheet junctions on the west with contemporary survey H-8884 (PF 20-2-66), Now part of H-8883 (1966) and on the south with contemporary survey H-8836 (1:10,000) 1964. It joins with prior survey H-5309 (1: 20,000) on the north, and has most of its work area in common with prior survey H-5299 (1:80,000) (1930-32). It junctions on the east with survey H-8834 (1: 20,000). 1965 See Par. 5 Review

C. SOUNDING VESSEL

The Ship PATHFINDER was used exclusively on this survey. The PATHFINDER is identified by blue, upper-case letters (on boat sheet only)

G.P.'s

HALE O LONO 2, 1962 :

21	05	27.739	840.8
157	15	09.656	278.7

KAKALAHALE 1885

✓

D. SOUNDING EQUIPMENT

The principal sounding apparatus used on the survey ~~was~~ were model DE-723 Raytheon Fathometers serial #557 #551. This unit was complemented by a Raytheon Precision Fathometer Recorder, which was especially useful when rapid scale changes made reading the 723 difficult. In these areas of steep bottom slope, soundings were taken from the PFR fathogram rather than from the 723 fathogram. Also, because satisfactory phase comparisons were not obtained in areas of extreme depth (approximately greater than 250 fathoms), the PFR soundings were chosen for the final record. PFR soundings were chosen occasionally on steep slopes and in great depths, not exclusively as this paragraph implies.

E. SMOOTH SHEET

Smooth sheet ~~is to be~~ was plotted by PMC's ~~EDP~~. Gerber Digital Plotter.

F. CONTROL

All horizontal control on this survey was by shoran. Two shoran shore stations were occupied. ALE, the rate station was located over existing triangulation station KAKALAHALE (H.G.S.) 1885 (lat. 21° 07' 31.79", long. 157° 00' 01.89") at an elevation of 1000 feet. ONO, the drift station, was located over reference mark HALE O LONO 2 RM No. 3 1962 (lat. 21° 05' 27.85", long. 157° 15' 07.83") at an elevation of 200 feet. (For more shoran information, see the Shoran Report).

G. SHORELINE

There is no shoreline on the survey.

The shoreline of Molokai was estimated on this sheet from 1:10,000 and 1:5,000 scale manuscripts. Inshore hydrography in this area will be conducted on sheets of enlarged scale. The Lanai shoreline was not drawn on the sheet.

H. CROSSLINES

Crosslines constituted ~~30%~~ 37% of the total linear hydrography on this sheet. Crossties were excellent. crossline agreement was good.

I. JUNCTIONS

This registry number now assigned to a Ship McARTHUR survey.

Contemporary survey H-8882 (Now part of H-8883 (1966)) was accomplished at the same time as this survey. (See section "O" of this report.) Agreement in depth at junction with contemporary survey H-8836 and H-8834 was excellent. No adjustments are necessary.

Surveys H-8836 & H-8834 were still in the field at the time of review.

J. COMPARISON WITH PRIOR SURVEYS

All work on this survey is offshore hydrography with soundings in excess of 19 fathoms. There are no significant submerged features to report on. Good agreement was found with prior surveys H-5309 (1930-31) and H-5299. (1930-32)

K. COMPARISON WITH THE CHART

The chart with which this survey is compared is C& GS 4120 (1:80,000) 1st edition March 17, 1942; revised February 4, 1963, and corrected to the date of the survey by Notice to Mariners. Good agreement was ~~gotten~~ obtained between the chart and this survey.

L. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede prior surveys for charting. See Par. 6, Review

M. AIDS TO NAVIGATION

There are several aids to navigation along the approach to Kaunakakai Harbor, but these are beyond the limits of hydrography, and will be covered in the inshore survey of this area. (See sheet layout in index.)

N. STATISTICS

	Sounding Lines Lineal Nau. Miles	Sounding Lines Sq. Naut. Miles	No. of Positions	TOTAL POS. ON H-8883
PATHFINDER	280	80.6	665	979

Four bottom samples were taken on this survey.

O. MISCELLANEOUS

This survey PF 20-1-66 was run at the same time as ~~H-8884~~ PF 20-2-66. Sounding lines were continuous between sheets. ← This survey incorporated into H-8883.

P. RECOMMENDATIONS

None

Q. REFERENCES TO REPORTS

Shoran Report, USC&GS Ship PATHFINDER, OPR-419, 1966
Tide Report, USC&GS Ship PATHFINDER, OPR-419, 1966

A. Arnold Heyman
ENS USCGSS

LIST OF SIGNALS

Name Used in Hydrographic Survey	Origin of Station
ONO	HALE O LONO 2 RM No. 3 1962
ALE	KAKALAHALE (H.G.S.) 1885

TIDE NOTE

A bubbler tide gage, installed at Kaunakakai Harbor, Molokai Island (lat. 21° 05.1', long. 157° 01.8') was used to obtain tide reducers for the smooth plot. MLLW is 3.2 feet above staff zero (see accompanying Memorandum in Separates). Hourly heights were computed by PATHFINDER personnel. Due to a malfunction, no record was gotten for the period between 0300 and 0900 on April 25th. The missing record was inferred from a comparison of predicted and actual tides. (See 1966 Tide Report, OPR 419).

USC&GSS PATHFINDER
G. L. Short, CDR

PHASE CORRECTIONS
PF 20-1-66 & PF 20-2-66

Only good readable phase changes on the fathograms that occurred during a line or in a phase test area were abstracted. To find the mean correction term for each phase change, the abstract was divided into groups by day, fathometer number and similar phase changes, i.e., all A-B and AA-BB changes were grouped together, etc. The mean was found of each group and yielded a mean correction for each phase change of each day.

No error in stylus arm length

The phase corrections were figured accumulatively. That is, if A-B mean corrector was plus 0.3 and B-C was plus 0.2 then the accumulative phase correction applied was plus 0.5 to all C scale soundings. Therefore, the addition of all mean phase correctors down to that scale yields the accumulative corrector.

The mean corrector term corrects the deeper scale to agree with the next shoaler scale. The accumulative corrector term corrects the scale to the A or AA scale.

The accumulated corrector term was logged in the TRA term of the electronic control format along with the initial and draft corrections.

Gary L. Boyack

Gary L. Boyack
ENS USESSA

Form CD-121A (5-63) (Prea. by A.O. 206-10) UNITED STATES GOVERNMENT

Memorandum

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

TO : The Commanding Officer
USC&GS Ship PATHFINDER
1801 Fairview Avenue, East
Seattle, Washington 98102

DATE: August 11, 1966

In reply refer to:
C3312-155-CSS 8

FROM : Chief, Tides Section
Oceanography Division

SUBJECT: Tidal data, OPR-419

Requested hourly heights are enclosed. Honolulu tabulations are furnished in lieu of Kaumalapau observations. The Kaumalapau record showed evidence of a shifting datum and had to be discarded. MLLW, computed from level records, is 1.9 ft. above staff zero.

Mean lower low water at the other stations is:

Kamalo	2.2 ft. on staff No. 1
Kaunakakai	3.2 ft. on staff

Reference to new staff at Kamalo and requested July observations at Honolulu will be furnished as soon as possible.

Martha A. Winn

Martha A. Winn

Enclosures

DATE	DRAFT(ft) mdshps	DRAFT(fms) mdshps	DRAFT CORRECTIONS INITIAL	FATH. INSTR. CORR.	DRAFT CORR. +
Feb. 27	15.0	2.5	2.0	-0.1	0.4
Mar. 12	14.7	2.4	2.0	-0.1	0.3
13	14.5	2.4	2.0	-0.1	0.3
15	14.3	2.4	2.0	-0.1	0.3
16	14.3	2.4	2.0	-0.1	0.3
17	13.9	2.3	2.0	-0.1	0.2
23	15.0	2.5	2.0	-0.1	0.4
24	14.9	2.5	2.0	-0.1	0.4
26	14.8	2.5	2.0	-0.1	0.4
27	14.7	2.4	2.0	-0.1	0.3
28	14.4	2.4	2.0	-0.1	0.3
29	14.2	2.4	2.0	-0.1	0.3
30	14.2	2.4	2.0	-0.1	0.3
Apr. 6	15.1	2.5	2.0	-0.1	0.4
7	15.0	2.5	2.0	-0.1	0.4
8	15.0	2.5	2.0	-0.1	0.4
9	14.9	2.5	2.0	-0.1	0.4
11	14.5	2.4	2.0	-0.1	0.3
12	14.4	2.4	2.0	-0.1	0.3
13	14.3	2.4	2.0	-0.1	0.3
14	14.2	2.4	2.0	-0.1	0.3
21	14.7	2.4	2.0	-0.1	0.3
22	14.6	2.4	2.0	-0.1	0.3
23	14.5	2.4	2.0	-0.1	0.3
24	14.4	2.4	2.0	-0.1	0.3
25	14.2	2.4	2.0	-0.1	0.3
26	14.0	2.3	2.0	-0.1	0.2
27	13.8	2.3	2.0	-0.1	0.2
28	13.7	2.3	2.0	-0.1	0.2

USC&GSS PATHFINDER
G. L. Short, Comdg.
1966

Velocity corrections to be applied to all 1966 hydrography on sheets

PF 10-5-66, ~~PF 20-1-66, PF 20-2-66~~ H-8883 PF 10-3-66, PF 10-4-66, H-8883
PF 10-5-66, PF 10-6-66, PF 10-7-66, PF 10-8-66, PF 20-1-66, PF 20-2-66

TO DEPTH (fms)	CORRECTION +(fms)	TO DEPTH (fms)	CORRECTION +(fms)
0.0 - 3.0	0.00	72.6 - 77.2	3.2
3.1 - 5.3	0.1	77.3 - 82.0	3.4
5.4 - 7.8	0.2	82.1 - 86.7	3.6
7.9 - 10.0	0.3	86.8 - 91.3	3.8
10.1 - 12.3	0.4	91.4 - 95.8	4.0
12.4 - 14.5	0.5	95.9 - 100.5	4.2
14.6 - 16.8	0.6	100.6 - 112	4.5
16.9 - 19.5	0.7	113 - 125	5.0
19.6 - 21.5	0.8	126 - 140	5.5
21.6 - 23.8	0.9	141 - 158	6.0
23.9 - 26.0	1.0	159 - 178	6.5
26.1 - 28.3	1.1	179 - 200	7.0
28.4 - 31.6	1.2	201 - 232	7.5
31.7 - 36.2	1.4	233 - 273	8.0
36.3 - 41.0	1.6	274 - 320	8.5
41.1 - 45.3	1.8	321 - 368	9.0
45.4 - 50.0	2.0	369 - 418	9.5
50.1 - 54.5	2.2	419 - 460	10.0
54.6 - 59.0	2.4	461 - 495	10.5
59.1 - 63.5	2.6	496 - 527	11.0
63.6 - 68.0	2.8	528 - 558	11.5
68.1 - 72.5	3.0	559 - 584	12.0

*All velocity corrections are positive and to be added

SUMMARY OF SHORAN CORRECTIONS

Sta. ONO (Pos.#1-128)		Sta. ONO (Pos.#129-979)	
0.000-		0.800	
	+01005		-0.035
5.000		5.500	
5.001		5.501	
	00.000		-0.040
15.500		9.800	
15.501		9.801	
	-0.005		-0.045
18.000		14.100	
		14.101	
			-0.050
		18.000	

Sta. ALE (Pos.#1-234)		Sta. ALE (Pos.#235-979)	
2.400		2.500	+0.070
	+0.055		
4.100		3.700	
4.101		3.701	
	+0.050		+0.065
5.600		4.900	
5.601		4.901	
	+0.045		+0.060
7.300		6.000	
7.301		6.001	
	+0.040		+0.055
8.900		7.200	
8.901		7.201	
	+0.035		+0.050
10.500		8.400	
10.501		8.401	
	+0.030		+0.045
12.100		9.600	
12.101		9.601	
	+0.025		+0.040
13.700		10.700	
13.701		10.701	
	+0.020		+0.035
15.300		11.900	
15.301		11.901	
	+0.015		+0.030
16.900		13.100	
16.901		13.101	
	+0.010		+0.025
18.000		14.300	

SUMMARY OF SHORAN CORRECTIONS

Sta. ALE (Pos.#235-979)

14.301	
	+0.020
15.400	
15.401	
	+0.015
16.700	
16.701	
	+0.010
18.000	

APPROVAL SHEET

REGISTRY NO. H-8883 (PF 20-1-66) & PF 20-2-66

The field work on this sheet was inspected, and the boat sheet was approved. The records are being prepared on Flexowriter tape, and will be forwarded to PMC for smooth plotting by automatic digital plotter.

The survey is considered complete and adequate for charting purposes; no additional field work is recommended.

DATE Jan 31, 1967

G L Short

G. L. Short
Cdr., USESSA
Comdg. Ship PATHFINDER

SHORAN REPORT
USC&GS SHIP PATHFINDER
1966
CDR. G.L. SHORT, COMDG.

Shoran control was utilized during OPR-419 in conducting the hydrographic survey of Kaholi Channel (the offshore waters between Lanai, Molokai, and Maui). All the work was done by the ship Pathfinder and on boat sheets H-8883 PF 20-1-66 and PF 20-2-66. Shoran operations were conducted between 23 April and 27 April, 1966.

STATIONS:

Two shore stations were occupied for this survey. The rate station was KAKALAHALE (called ALE), located at an elevation of 1,000 feet on a prominent hill northeast of Kaunakakai and 3.0 miles inshore from the coast line. HALE O LONO 2, R.M. No. 3 1962 (called ONO) was used as the drift station. It is located some 181 feet east northeast of station HALE O LONO 2, 1962 on Haleolono Point at an elevation of approximately 200 feet and is .3 miles inland.

All equipment for the two stations was landed by launch and whale boat at Kaunakakai and Haleolono Harbor and moved by truck to the respective sites. The towers at both stations were fifty foot, standard, portable, steel shoran towers. The transmitter, indicator, receiver, and miscellaneous electronic gear at each station were set up inside "O" tents.

CALIBRATIONS:

Calibrations were made by simultaneous shoran and three

point fix observation. The visual fixes were plotted on three mylar calibration sheets of 1:10,000 scale, and the true distances were scaled from the sheet. Comparisons of the electronic distances with these true (scaled) distances led to the correction factors to be applied to the shoran reading. To insure the accuracy of the visual fixes, at least one,and in most cases two check angles were taken.

Three calibration sheets covering three representative areas were used. Area number one was directly south of the harbor at Kaunakakai, giving a "near" calibration for ALE and a "far" calibration for ONO. Area number two was due south of Haleolono Point, affording a "near" calibration for ONO and a "far" calibration for ALE. A third calibration off the northeast coast of Lanai was picked to give a "middle" distance to each station and thus a middle point on the shoran correction curve. For some reason, unexplainable at this time, unreasonable correction values were obtained that could not be correlated with the correction factors obtained at the other two calibration areas. Therefore, these values were omitted in constructing the correction graphs.

CORRECTIONS:

Points on the correction curves were obtained by plotting the average correction factor versus average distance from the station for each set of calibrations. The curve, by theory a straight line, was constructed by drawing the most representative straight line through these plotted points; the straight

line curves therefore connect the set of "near" calibration points with the set of "far" calibration points. A total of four graphs were drawn-one for each of the transmitters at each station. With the exception of those periods immediately after the installment of the four sets of shoran equipment, and before sufficient number of calibrations had been made to construct the curves, all corrections were applied as the work progressed, and thus were reflected in the boat sheet plot. These corrections were figured in intervals of .005 statute miles of correction. Boat sheet positions plotted previous to the corrections were replotted once the correction graphs were made.

The zero check throughout the project indicated that no adjustment for drift was necessary.

CONCLUSIONS:

Shoran signals remained strong throughout the project area of sheets PF 20-1-66 and PF 20-2-66. This, combined with good calibration figures, allowed completion of the hydrography in minimal time. With the exception of the values obtained at Lanai, all calibration values obtained for the same equipment at the same station agreed very well. The slopes of the curves for the two sets of equipment at each station were nearly identical.

RECOMMENDATIONS:

The Lanai calibration sheet was carefully examined for discrepancies in both shoran and horizontal control plotting.

No error could be detected. The horizontal control tie between Lanai and Molokai and the horizontal control net involving stations POLIHUA, 1962; HONO WAE, 1962; and KAENA, 1914 on the north west coast of Lanai should be investigated to resolve the unreasonable calibration figure obtained in the area during the 1966 field season.

MISCELLANEOUS:

Both sites are owned by the Molohai Ranch. Verbal permission was obtained from the Molokai Ranch office located next to the Post Office in Kaunakakai. However, written permission should be obtained from:

Mr. Harrison R. Cooke, President
Honolulu Sporting Goods
1365 Colburn St.
Honolulu, Hawaii

In addition, Honolulu Construction and Drain Company (HC&D) has a sand and gravel dump at Haleolono Point, and verbal permission was obtained from the superintendent, Mr. Mike DeCoite.

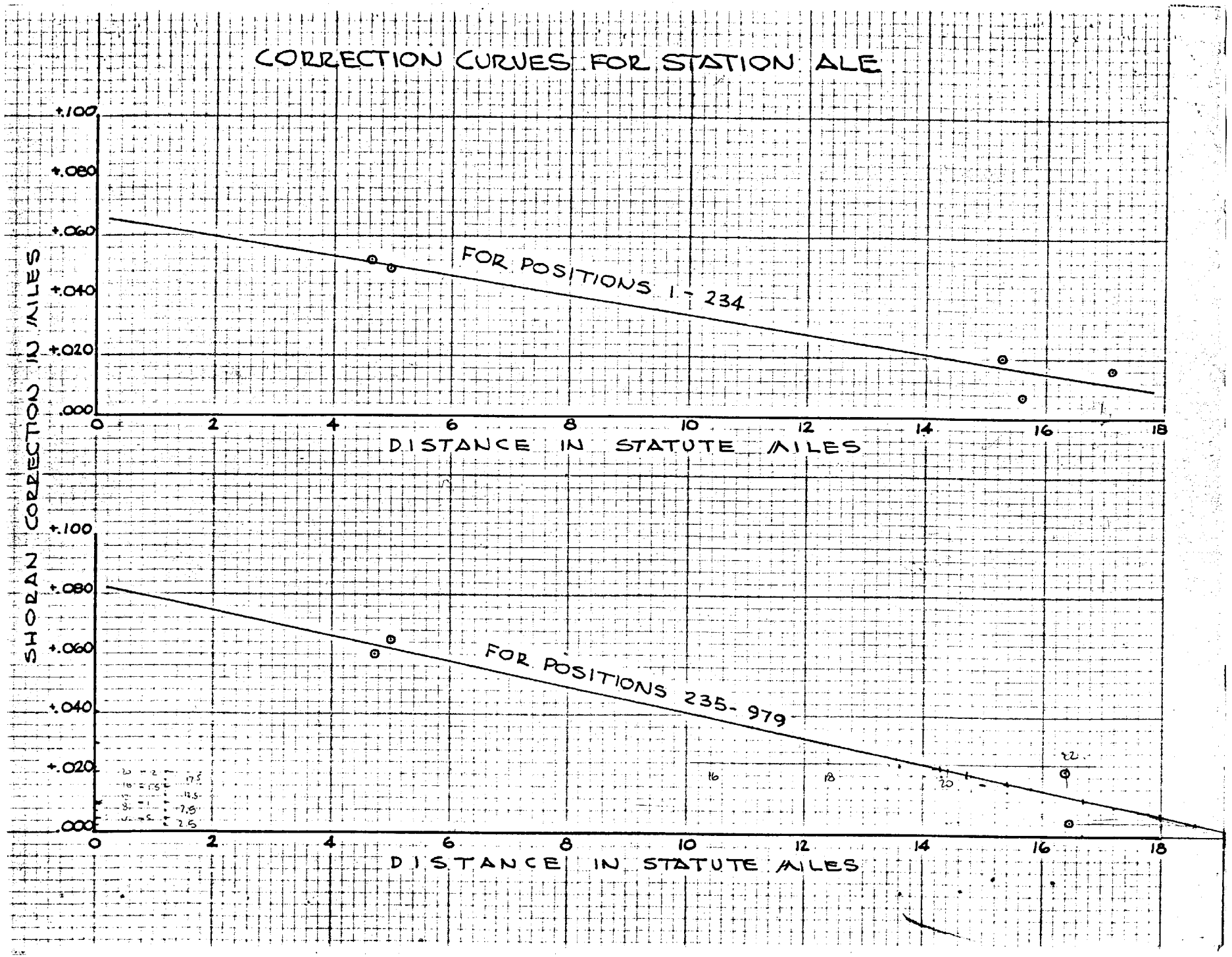
The best accomodations in the area are at Kaunakakai. Kakalahale can be reached by four wheel drive vehicle in about thirty minutes. The trip from Kaunakakai to Holeolono can be made in one hour by conventional vehicle.

Respectfully submitted,

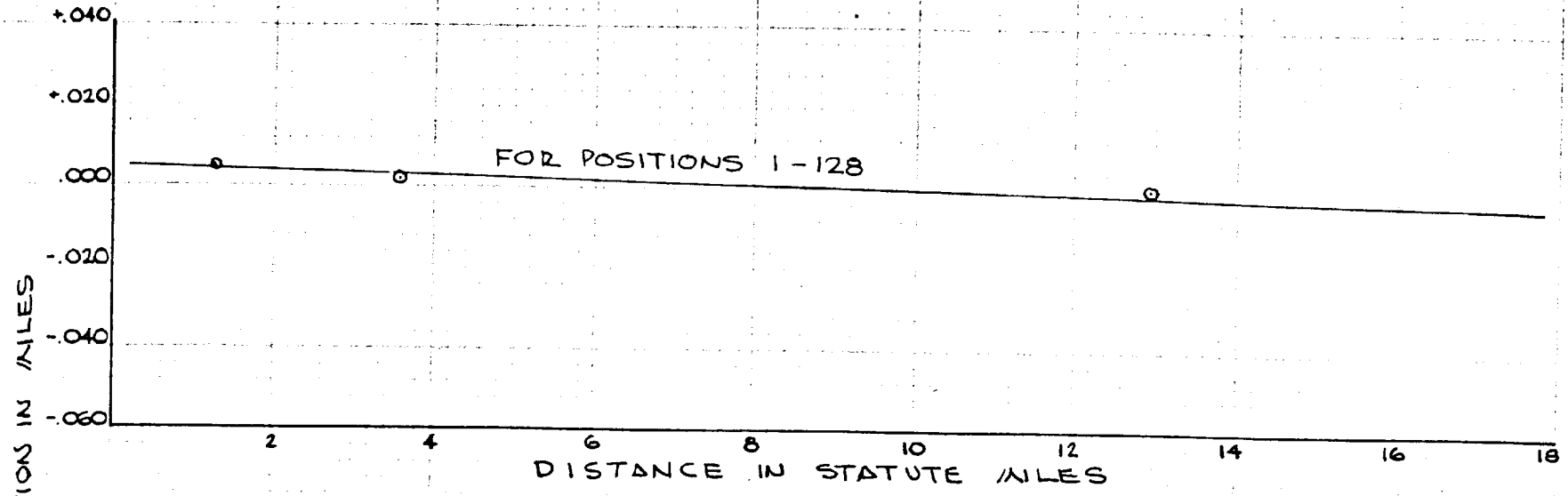
A. Conrad Weymann III
ENS, USESSA

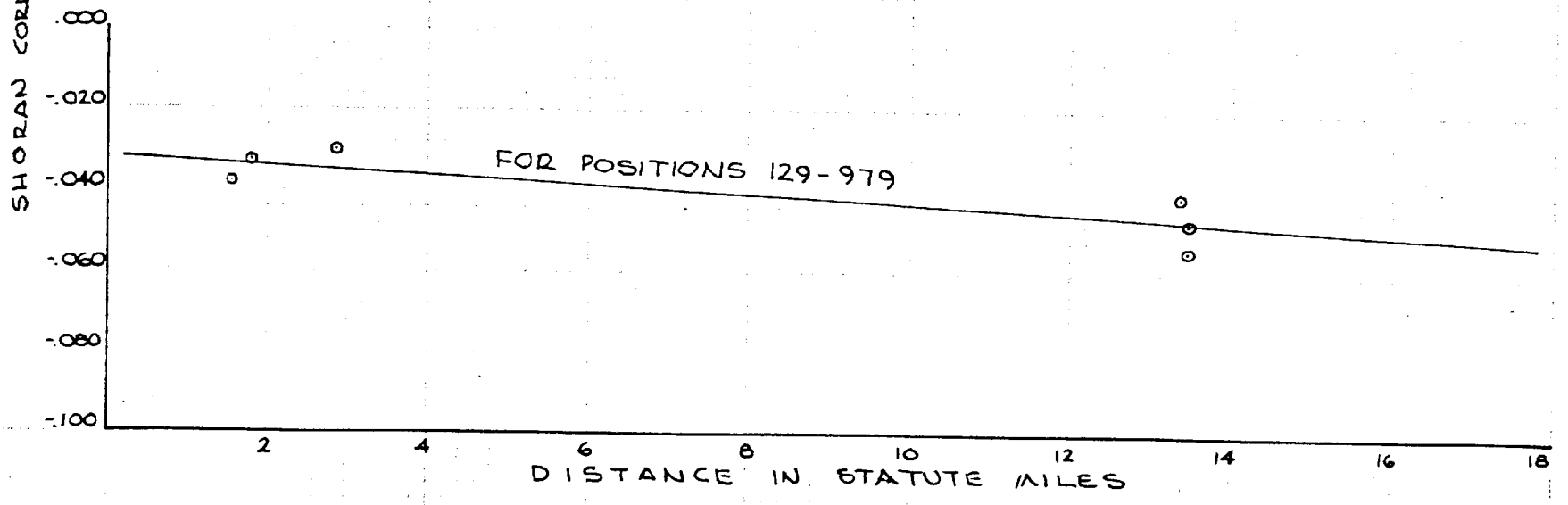
Approved and forwarded,

G. L. Short
CDR, USESSA
C.O. Ship PATHFINDER


CORRECTION CURVES FOR STATION ALE
SHORAN CORRECTION IN MILES
+.100
+.080
+.060
+.040
+.020
.000
FOR POSITIONS 1 - 234
0
2
4
6
8
10
12
14
16
18
DISTANCE IN STATUTE MILES
SHORAN CORRECTION IN MILES
+.100
+.080
+.060
+.040
+.020
.000
FOR POSITIONS 235 - 979
0
2
4
6
8
10
12
14
16
18
DISTANCE IN STATUTE MILES

CORRECTION CURVES FOR STATION ONO





SUMMARY OF SHORAN CORRECTIONS

Sta. ONO (Pos.#1-128)

0.000	
	+0.005
5.000	
5.001	
	0.000
15.500	
15.501	
	-0.005
18.000	

Sta. ONO (Pos.#129-979)

0.800	
	-0.035
5.500	
5.501	
	-0.040
9.800	
9.801	
	-0.045
14.100	
14.101	
	-0.050
18.000	

Sta. ALE (Pos.#1-234)

2.400	
	+0.055
4.100	
4.101	
	+0.050
5.600	
5.601	
	+0.045
7.300	
7.301	
	+0.040
8.900	
8.901	
	+0.035
10.500	
10.501	
	+0.030
12.100	
12.101	
	+0.025
13.700	
13.701	
	+0.020
15.300	
15.301	
	+0.015
16.900	
16.901	
	+0.010
18.000	

Sta. ALE (Pos.#235-979)

2.500	
	+0.070
3.700	
3.701	
	+0.065
4.900	
4.901	
	+0.060
6.000	
6.001	
	+0.055
7.200	
7.201	
	+0.050
8.400	
8.401	
	+0.045
9.600	
9.601	
	+0.040
10.700	
10.701	
	+0.035
11.900	
11.901	
	+0.030
13.100	
13.101	
	+0.025
14.300	

SUMMARY OF SHORAN CORRECTIONS

Sta. ALE (Pos.#235-979)

14.301	
	+0.020
15.400	
15.401	
	+0.015
16.700	
16.701	
	+0.010
18.000	
18.001	
	±0.005
19.200	
19.201	±0.000
20.300	
20.301	
	-.005
21.400	

LIST OF SHORAN EQUIPMENT

Station ALE (Pos.#1-234)

TYPE	APN 3
TRANSMITTER	1004
INDICATOR	1337
RECEIVER	506
ANTENNA	DIPOLE WITH REFLECTORS

Station ALE (Pos.#235-979)

TYPE	CPN 2
TRANSMITTER	39
INDICATOR	38
RECEIVER	506
ANTENNA	DIPOLE WITH REFLECTORS

Station ONO (Pos.#1-128)

TYPE	CPN 2
TRANSMITTER	154
INDICATOR	225
RECEIVER	413
ANTENNA	DIPOLE WITH REFLECTORS

Station ONO (Pos.#129-979)

TYPE	APN 3
TRANSMITTER	825
INDICATOR	457
RECEIVER	413
ANTENNA	DIPOLE WITH REFLECTORS

Ship PATHFINDER

TYPE	APN 3
TRANSMITTER	542
INDICATOR	1117
RECEIVER	745
ANTENNA	MIMI

MOLOKAI SHORAN STATIONS (GP'S)

Sheets PF 20-1-66 and 20-2-66

HALE O LONO 2, RM No. 3

Ø 21° 05' 27.85" N (856.5)

λ 157° 15' 07.83" W (226.0)

KAKALAHALE 1885 (HGS)

Ø 21° 07' 31.79" N

λ 157° 00' 01.89" W

VRMS

SEP 8 1967 Hdat

FORM C&GS-712
(3-9-64)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

9/6/67

~~XXXXXXXXXXXXXXXX~~: Pacific Marine Center

Plane of reference approved in ~~2~~ 1 sheet~~s~~
~~XXXXXXXXXXXXXXXXXXXXXXXX~~

HYDROGRAPHIC SHEET 8883 and ~~8884~~ See Note on Title Sheet-

Locality: Molokai Island

Chief of Party: G. L. Short, 1966

Plane of reference is mean lower low water

Tide Station Used (Form C&GS-681):

K~~ua~~aunakakai Harbor

Height of Mean High Water above Plane of Reference is as follows:

1.4 feet

Remarks

J. M. Symons
Chief, Tides and Currents Branch

USCOMM-DC 6680-P64

H- 8883

A. Additions and corrections have been furnished the plotter center by the verification unit.

Date _____ Signed _____
Title _____

B. Additions and corrections have been added to the survey records and the final smooth sheet forwarded to the verification unit.

Date _____ Signed _____
Title _____

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

Date Feb. 26, 1968 Signed Lloyd L. Griffith
Title Chief, Hydro. Processing Br. AMC

D. Smooth sheet and records forwarded to Rockville, Maryland Office.

Date March 1, 1968.

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-8883

	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	
✓	Haleolono Point										1
✓	Kaena Point										2
✓	Kahanui Point										3
✓	Kalohi Channel										4
✓	Kamiloloa										5
✓	Kaunakakai										6
	Kaunakakai Harbor			← NOT SHOWN ON SMOOTH SHEET							7
✓	Keanapapa Point										8
✓	Kolo										9
	Kolo Harbor	← NOT SHOWN ON SMOOTH SHEET									10
✓	Laau Point										11
✓	Lanai										12
✓	Molokai										13
✓	Pohakuloa Point										14
											15
				Names approved							16
				March 25, 1968							17
				Frank W. Pickett							18
											19
											20
											21
											22
											23
											24
											25
											26
											27

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION	PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR		
B. DISTORTION MARKS PLOTTED		
C. PROJECTION INTERSECTIONS PLOTTED		
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED		
E. OVERLAYS PREPARED BY		
1. POSITION NUMBER		
2. EXCESS SOUNDINGS		
3. PRELIMINARY SMOOTH PLOT		
4. LIST OTHERS		
A.		
B.		
F. SOUNDING SELECTION BY		
G. PLOTTER INPUT PREPARED		
H. CHECKED		
I. DESCRIPTIVE REPORT ADDENDUMS		
PART II SMOOTH SHEET COMPLETION		
	CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE	NOT APPLIED BY PHC	
B. PROJECTION INTERSECTIONS VERIFIED BY	ALLAN K. SCHUGEL	2/8/68
C. PROJECTION LINES RULED BY	ALLAN K. SCHUGEL	2/19/68
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	ALLAN K. SCHUGEL	2/7/68
E. OVERLAYS COMPLETED BY	ALLAN K. SCHUGEL	2/8/67
1. POSITION NUMBER LEADERS ADDED	ALLAN K. SCHUGEL	2/13/68
2. EXCESS SOUNDING OVERLAY COMPARED	ALLAN K. SCHUGEL	2/15/68
3. PRELIMINARY SMOOTH PLOTS COMPARED	W. L. JONES	10/2/67
4. OTHERS UTILIZED		
A.		
B.		
F. DESCRIPTIVE REPORT ADDENDUM	ALLAN K. SCHUGEL	2/26/68
G. CONTROL STATIONS VERIFIED	ALLAN K. SCHUGEL	2/7/68
H. POSITIONS MANUALLY PLOTTED	W. L. JONES	10/3/67
I. MANUAL PLOT VERIFIED	W. L. JONES	10/3/67
J. SHORELINE APPLIED	NONE	
K. BOTTOM CHARACTERISTICS ADDED	ALLAN K. SCHUGEL	2/21/68
L. NOTES AND DEPTH CURVES ADDED	ALLAN K. SCHUGEL	2/21/68

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-8883

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS	2
DESCRIPTIVE REPORT	1	OVERLAYS	11

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	1, FATH. + MISC.		X			
VOLUMES						
BOXES						

T-SHEET PRINTS (List) NONE

SPECIAL REPORTS (List)
1 - SHORAN REPORT

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				993
POSITIONS CHECKED	85			
POSITIONS REVISED	5			
DEPTH SOUNDINGS REVISED			125	
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		NONE		
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS				
JUNCTIONS		None	None	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS	105 hrs			
SPECIAL ADJUSTMENTS			24	
ALL OTHER WORK	41	54	66	
TOTALS	146	54	90	

	BEGINNING DATE	ENDING DATE
PRE-VERIFICATION BY W. L. Jones	10/2/67	10/16/67
VERIFICATION BY Allan L. Schaefer	2/7/68	2/26/68
REVIEW BY Dennis L. Romesburg	5-31-68	6-18-68

USCOMM-DC-

Reg. No. 8883

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 5-13-72 TIME REQ'D 20 hours INITIALS D.J.R

REMARKS:

A list of changes required for cards is filed with the computer card printout.

D.J.R 11-5-68

9.J.G.

OFFICE OF HYDROGRAPHY AND OCEANOGRAPHY

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8883 FIELD NO. PF-20-1-66
PF-20-2-66

Hawaii, Molokai Island, Off Southern Coast of Molokai Island

SURVEYED: April 23-27, 1966

SCALE: 1:40,000

PROJECT NO. OPR-419

SOUNDINGS: DE-723 Depth Recorders, Raytheon Precision Fathometer Recorder

CONTROL: Shoran

Chief of Party.....G. L. Short
Surveyed By.....G. L. Boyack
A. C. Weymann, III
E. M. Gelb
F. T. Smith
R. H. Kerley
R. T. LeRoy
L. M. Larese-Casanova
Protracted By.....Gerber Digital Plotter
Soundings Plotted By.....Gerber Digital Plotter
Verified By.....W. L. Jonns (Norfolk)
A. K. Schugeld (Norfolk)
Reviewed By.....D. J. Romesburg
Date: 6-18-68
Inspected By.....R. H. Carstens

1. Description of the Area

This survey covers a portion of Kalohi Channel off the southwestern coast of Molokai Island from lat. 20°54', long. 157°07' to lat. 20°57', long. 157°01' to lat. 21°04', long. 157°01' to lat. 21°04', long. 157°19' to lat. 20°54', long. 157°07'.

In this area Kalohi Channel is characterized by a predominately mud and clay covered bottom with some sand, coral and broken shells. From the islands of Molokai and Lanai the bottom slopes sharply to maximum depths. The slope of the bottom along the channel is more uniform and gradual from the eastern to the western limits of the survey. A narrow ridge 20 to 40 fathoms in height lying near the 200-fathom curve crosses much of the channel. Several pinnacles rising 15 to 20 fathoms from a relatively flat bottom are found in the area east of the ridge.

2. Control and Shoreline

The origin of the control is given in the Descriptive Report.

There is no shoreline within the limits of this survey. Several 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, except in four areas where a few soundings have been carried forward from H-5299 (1932) to aid in fixing the position of the curves.

C. The development of the bottom configuration is considered adequate.

4. Condition of the Survey

The survey records, automated plotting, and the Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual, as amended by instructions promulgating the Hydrographic Digital Recording System except as follows:

(1) The TRA correction entered for the PFR data did not include a transducer draft correction of 2 fathoms. This was determined and entered where significant to depths by the reviewer.

(2) No record was found that the field party had used simultaneous comparisons in determining or verifying the instrumental corrections of the fathometers. Though the correction would not be significant for most of the depths, it could be applicable in the shoaler areas if found to be sufficiently great.

Several errors were revealed which could have been resolved during Marine Center verification or brought to the reviewer's attention in the verifiers report as follows:

A. North America 1927 was erroneously entered as the datum in the Hydrographic Survey Stamp No. 42.

B. The soundings from position 864 through position 891 were originally taken from the fathogram of a model DE-723 Raytheon Fathometer, No. 551. Poor fathometer returns resulted in many soundings being recorded in error. Incorrect phase correctors were also applied to these soundings. To circumvent these errors, soundings were read directly from the fathogram of a Raytheon Precision Fathometer Recorder which was used as a check to verify the readings of the DE-723 on this survey. The resultant revisions of the soundings were made to the appropriate records and the smooth sheet.

C. The velocity corrections were erroneously logged. As a result, all soundings on the survey are too deep by a small amount which varies from 0.1 of a fathom in the shoalest depths to 0.5 of a fathom in the greatest depths. Sounding revisions, however, were not attempted since it was felt that the relatively small magnitude of the error did not justify the work involved, and does not adversely affect the quality of the survey.

D. The verifier's report was marked improperly. The section pertaining to junctions was checked as if junctions were accomplished during the verification process. No junctions have been made on the present survey at the time of this review since the junctional surveys have not as yet been verified.

E. The aids to navigation locations and the heights of rocks awash were checked as having been verified. No rocks awash or aids to navigation exist on this survey.

5. Junctions

Junctions with earlier surveys were not required as specified in the project instructions. Two contemporary surveys, H-8834 (1965) and H-8836 (1964) which join this sheet on the east and south respectively, have not been received from the field. The junctions between the present survey and the above surveys will be discussed in the reviews of those surveys.

6. Comparison with Prior Surveys

H-3433	(1:60,000)	1913 & AD.WK.1926
H-3653	(1:60,000)	1914
H-4655b	(1:247,000)	1927
H-5292	(1:20,000)	1931-32
H-5299	(1:80,000)	1930-32
H-5309	(1:20,000)	1930-31
H-5310	(1:20,000)	1930-31

These prior surveys, taken together, cover the area of the present survey. Because of the relatively stable character of the bottom in this area, general agreement between the present and prior surveys is very good. In the isolated instances where substantial differences were noted, these differences can probably be attributed to errors in reading the flashing light type fathometers used on the surveys of the 1930's. For example, a section of sounding line (Pos. 1-11D) on H-5299 (1930-32) from lat. 21°02'.3, long. 157°08'.8 to lat. 20°55'.7, long. 157°09'.2 is about 10 to 20 fathoms too deep when compared to the present survey. The Descriptive Report of H-5299 states that discrepancies of up to 12 fathoms occurred at some crossings caused by fathometer reading errors. The inference can be drawn, therefore, that errors probably occurred not only on crossings but in other areas as well.

Six soundings were brought forward to the present survey from H-5299, one to provide the least depth on a feature (98 fathoms in lat. 21°01'42", long. 157°13'12") and the others to help fix the positions of depth curves in sparsely sounded areas.

With the addition of the above soundings, the present survey is adequate to supersede the prior surveys within the common area.

7. Comparison with Chart 4120, 2nd ED., Dec. 20, 1965

The charted hydrography originates with the previously discussed prior surveys which require no further consideration.

The bottom characteristics presently charted originate with BP-9686 (not in microfilm file), probably a 1902 reconnaissance survey by the U.S.F.C. Str. ALBATROSS. If desired, some or all of these bottom characteristics may be retained on the chart by the cartographer to supplement the few characteristics obtained on the present survey.

Except as noted above, the present survey is adequate to supersede the charted hydrography within the common area.

8. Compliance with Instructions

The survey adequately complies with the Project Instructions.

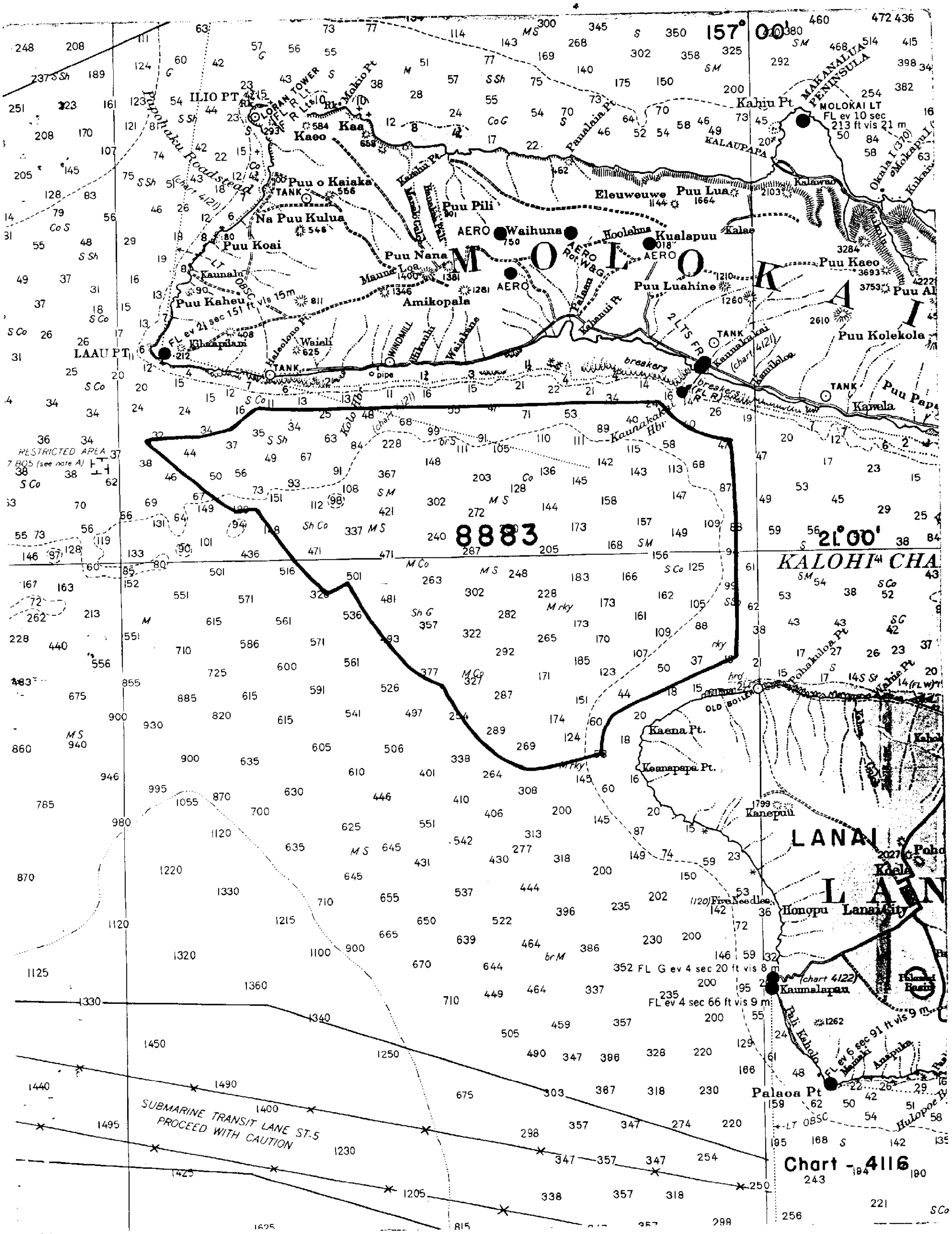
9. Additional Field Work

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

Examined and Approved:

Chief
Marine Chart Division

Associate Director
Hydrography and Oceanography


157° 00'
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KALAUPAPA
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LORAN TOWER
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Puu Kaheu
LAAU PT
RESTRICTED AREA
Puu Pili
Waihuna
AERO
Puu Nana
Kualapuu
Eleuweuwe
Puu Lua
Puu Luahine
Puu Kaeo
Puu Kolekole
Amikopala
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TANK
M O L O K A I
breakers
Kaunakakai Hbr
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8883
21°00'
KALOHI CHA
Kaena Pt.
Keamapapa Pt.
Kanepuu
LANAI
Lanai City
Honopu
Kaumalapau
Palaoa Pt
SUBMARINE TRANSIT LANE ST-5
PROCEED WITH CAUTION
Chart - 4116

Project: H-8883 [redacted]
Entered: DJR
Checked: GAK

HYDROGRAPHIC DATA FORM
MARINE CHART DIVISION

Sheet 1 of 1
Date: 6-11-68

CHART NO.	SOURCE CODE	C & GS FILE NO.	DATE DAY	DATE YEAR	INFO. CODE	SDG. ELEV. FT./FMS.	SDG. ELEV. TENTHS	LATITUDE DEG.	LATITUDE MIN.	LATITUDE SECS.	LONGITUDE DEG.	LONGITUDE MIN.	LONGITUDE SECS.	Explanatory Information	TRANS. CODE		CARTO. CODE	
1 2 3 4 5	6 7	8 9 10 11 12 13	14 15 16	17 18 19	20 21	22 23 24 25 26	27	28 29 30	31 32	33 34 35 36	37 38 39 40	41 42	43 44 45 46	47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68	69 70 71 72	73 74	75 76 77 78	79 80
04120	02	00529 99		932	21	3070		20	57	46 20	157	08	06 00					
04120	02	00529 99		932	21	2430		20	59	24 00	157	10	18 00					
04120	02	00529 99		932	21	3050		20	59	36 60	157	10	34 20					
04120	02	00529 99		932	21	3470		21	02	44 40	157	11	43 20					
04120	02	00529 99		932	21	940		21	01	07 80	157	16	15 60					
04120	02	00529 99		932	21	980		21	01	42 00	157	13	12 00					

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

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8883

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
4102	6/8/68	O. Svendsen	~~Full~~ Part Before ~~After Verification~~ Review Inspection Signed Via
			Drawing No. # 26 (2nd Proof) Survey being reviewed at time of proof study. ~~f Before~~
4120	8/7/68	J. Hogan	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 8 -
4116	4/18/69	O Chapman	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. Applied to dwg # thru Cht 4120 #8 Several sdgs appd directly from survey - GRJ
4000	8/6/69	O. Svendsen	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 12 21°04'14" 157°19'05" Applied 135 fm 20°59'57" 157°06'09" Applied 20 fm Direct from survey
4180	1-22-70	Irene Beeler	Full ~~Part Before~~ After Verification Review Inspection Signed Via 4116
			Drawing No. 15 Complete revision of Sdgs & Curves
4102	2/14/70	O. Svendsen	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 27 thru Chart 4116 Dwg #15
4001	7/29/70	J. Stuart	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 7 Thru Cht 4102
4179	5-2-71	Kennon	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. completely applied thru chart 4180 - Dwg #10 -
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

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

USCOMM-DC 8558-P62