

9852

Diag. Cht. No, 4115

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey ... Hydrographic
Field No. RA-10-3-79
Office No. H-9852

LOCALITY

State Hawaii
General Locality .. Island of Hawaii
Locality Ka Lae to Kaimuuwala

1979

CHIEF OF PARTY

W. L. Mobley

LIBRARY & ARCHIVES

DATE December 3, 1980

2986

AREA-6
CHARTS
1904
1907
1915
14220
540NC

HYDROGRAPHIC TITLE SHEET

H-9852

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.

RA-10-3-79

State Hawaii

General locality Island of Hawaii

Locality Ka Lae to ~~Pa~~ Kaimuuwala

Scale 1:10,000 Date of survey Sept 21 - Oct 20, 1979

Instructions dated July 20, 1979 Project No. OPR-T126-RA-79

Vessel SHIP RAINIER
Launches RA-3 (2123), RA-5 (2125), RA-6 (2126)

Chief of party Captain Wayne L. Mobley

Surveyed by LT R. Morris, LTJG M. McCluskey, LTJG J. Greene

Soundings taken by echo sounder, hand lead, pole Ross Fineline Depth Recorders

Graphic record scaled by RAINIER Survey Department

Graphic record checked by RAINIER Survey Department

Position Verification

~~XXXXXXXX~~ by Russ Davies Automated plot by PMC Xynetics Plotter

Soundings

~~XXXXXXXX~~ by Russ Davies

Soundings in and tenths
fathoms 1 foot at MLW MLLW

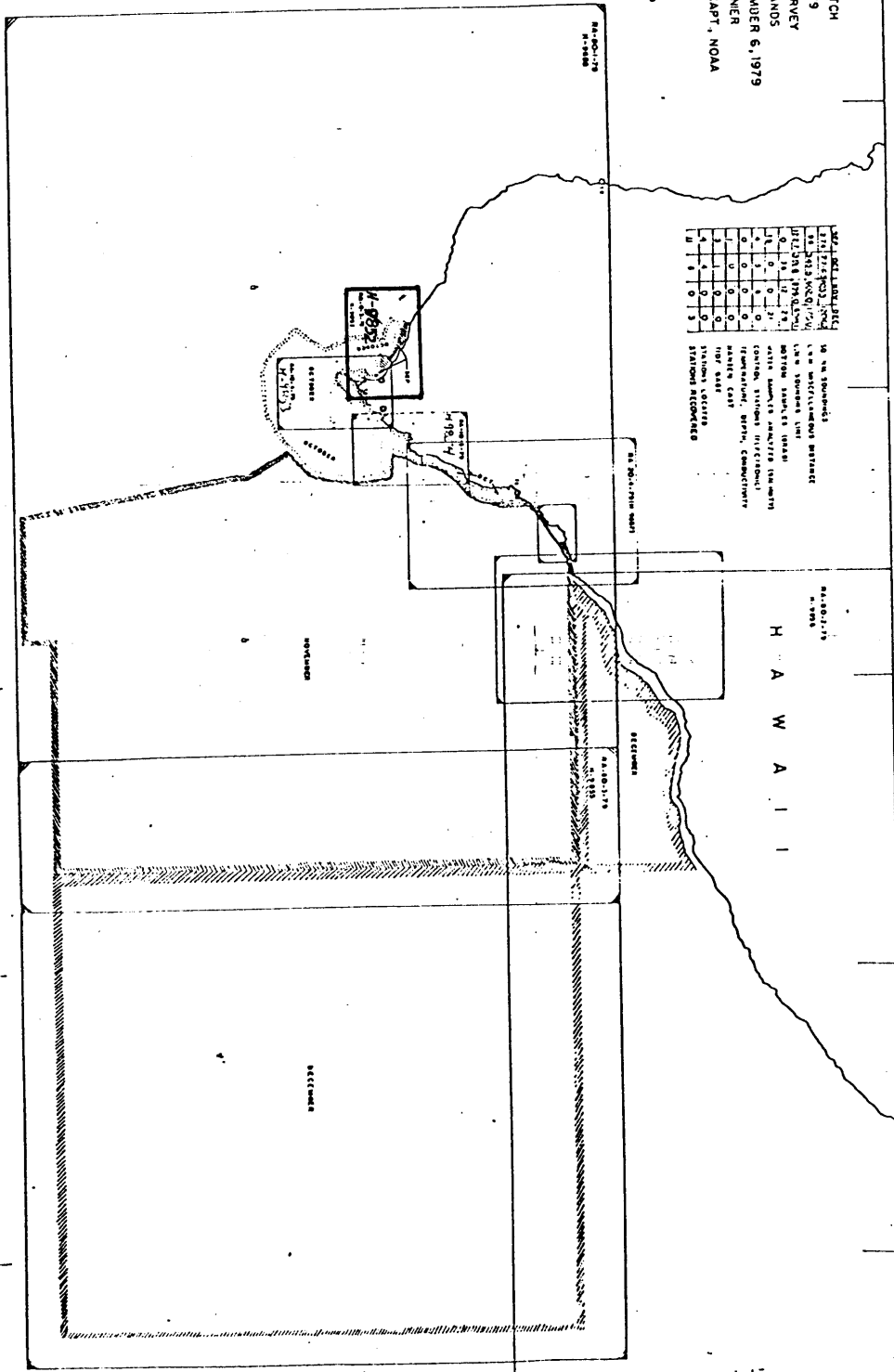
REMARKS: This survey is complete and adequate to supersede prior surveys.

Time Meridian: 0° (GMT)

"Misc data filed with field records"

PROGRESS SKETCH
 OPR-1126-RA-79
 HYDROGRAPHIC SURVEY
 HAWAII, HAWAIIAN ISLANDS
 SEPTEMBER 20 - DECEMBER 6, 1979
 NOAA SHIP RAINIER
 WAYNE L. MOBLEY, CAPT., NOAA
 COMD'G.
 FROM CHART No. 1310

STATION	DATE	TIME	DEPTH	TEMP.	SURFACE	BOTTOM	WIND	WAVE	SEA	SWELL	WIND DIR.	WAVE DIR.	SEA DIR.	WIND S.P.	WAVE S.P.	SEA S.P.	WIND GUST	WAVE PERIOD	SEA PERIOD	WIND VELOCITY	WAVE VELOCITY	SEA VELOCITY
1	9/20	0600	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2	9/20	0700	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
3	9/20	0800	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
4	9/20	0900	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5	9/20	1000	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
6	9/20	1100	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
7	9/20	1200	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
8	9/20	1300	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
9	9/20	1400	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10	9/20	1500	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11	9/20	1600	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
12	9/20	1700	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
13	9/20	1800	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
14	9/20	1900	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
15	9/20	2000	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
16	9/20	2100	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
17	9/20	2200	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
18	9/20	2300	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
19	9/20	2400	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
20	9/20	2500	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
21	9/20	2600	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
22	9/20	2700	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
23	9/20	2800	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
24	9/20	2900	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
25	9/20	3000	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
26	9/20	3100	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
27	9/20	3200	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
28	9/20	3300	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
29	9/20	3400	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
30	9/20	3500	10	20.0	S	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

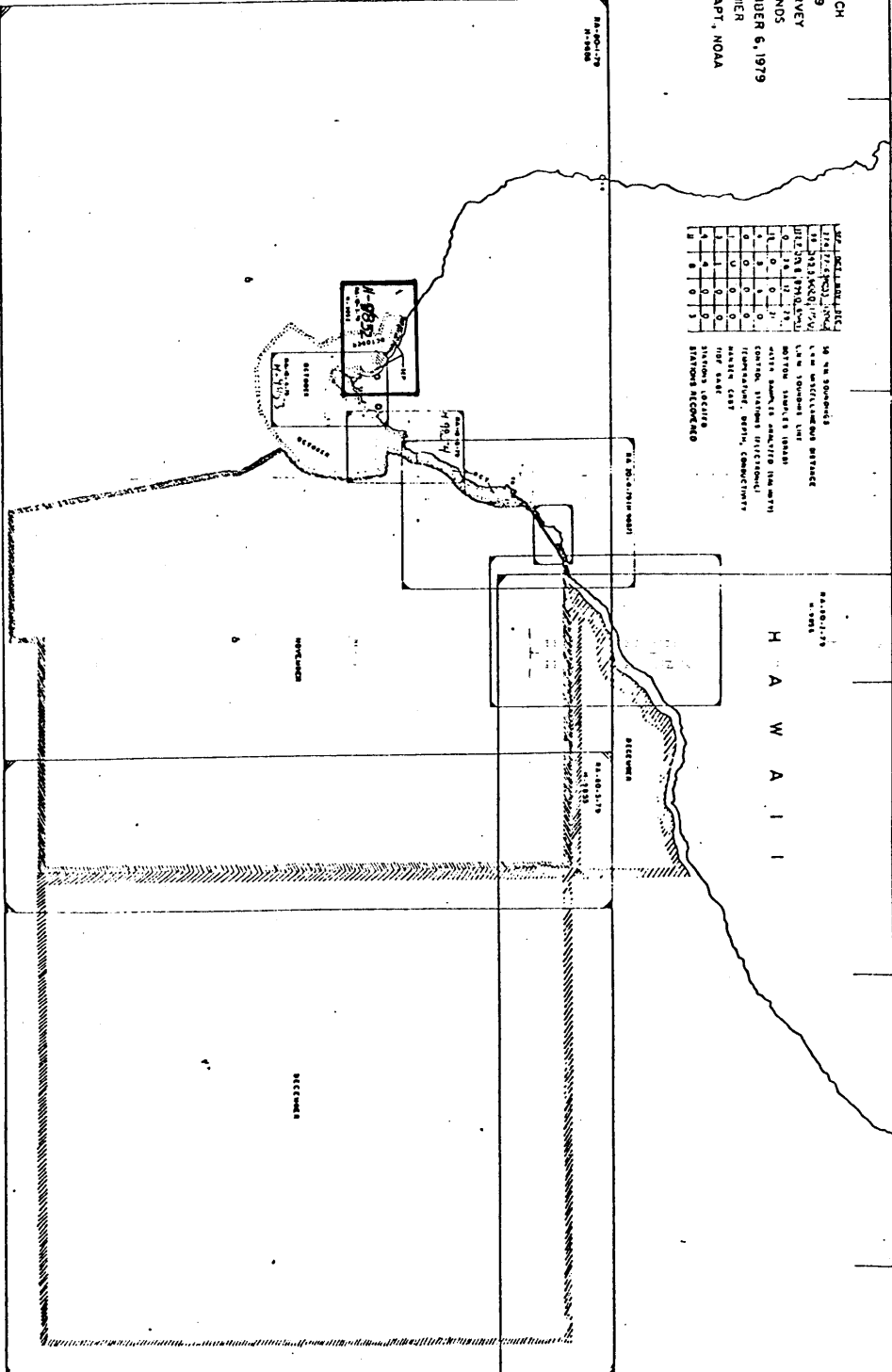


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PROGRESS SKETCH
 OPN-T26-RA-79
 HYDROGRAPHIC SURVEY
 HAWAII, HAWAIIAN ISLANDS
 SEPTEMBER 20 - DECEMBER 6, 1979
 NOAA SHIP RAINIER
 WAYNE L. MOBLEY, CAPT, NOAA
 COMD'G.

FORM CHART NO. 1310

DATE	TIME	POSITION	DEPTH	TEMPERATURE	WIND	WAVE	SEA	REMARKS
09/20	0600	19° 15' N	155° 00' W	22.0	0	0	0	START SURVEY
09/20	0800	19° 15' N	155° 00' W	22.0	0	0	0	
09/20	1000	19° 15' N	155° 00' W	22.0	0	0	0	
09/20	1200	19° 15' N	155° 00' W	22.0	0	0	0	
09/20	1400	19° 15' N	155° 00' W	22.0	0	0	0	
09/20	1600	19° 15' N	155° 00' W	22.0	0	0	0	
09/20	1800	19° 15' N	155° 00' W	22.0	0	0	0	
09/20	2000	19° 15' N	155° 00' W	22.0	0	0	0	
09/20	2200	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	0000	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	0200	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	0400	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	0600	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	0800	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	1000	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	1200	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	1400	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	1600	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	1800	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	2000	19° 15' N	155° 00' W	22.0	0	0	0	
09/21	2200	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	0000	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	0200	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	0400	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	0600	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	0800	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	1000	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	1200	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	1400	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	1600	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	1800	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	2000	19° 15' N	155° 00' W	22.0	0	0	0	
09/22	2200	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	0000	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	0200	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	0400	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	0600	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	0800	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	1000	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	1200	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	1400	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	1600	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	1800	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	2000	19° 15' N	155° 00' W	22.0	0	0	0	
09/23	2200	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	0000	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	0200	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	0400	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	0600	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	0800	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	1000	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	1200	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	1400	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	1600	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	1800	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	2000	19° 15' N	155° 00' W	22.0	0	0	0	
09/24	2200	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	0000	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	0200	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	0400	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	0600	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	0800	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	1000	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	1200	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	1400	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	1600	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	1800	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	2000	19° 15' N	155° 00' W	22.0	0	0	0	
09/25	2200	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	0000	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	0200	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	0400	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	0600	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	0800	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	1000	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	1200	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	1400	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	1600	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	1800	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	2000	19° 15' N	155° 00' W	22.0	0	0	0	
09/26	2200	19° 15' N	155° 00' W	22.0	0	0	0	



155° 00' 153° 00' 151° 00'

19° 00' 19° 30'

A. PROJECT

This project was accomplished in accordance with Project Instructions OPR-T126-RA-79, Hawaii, Hawaiian Islands, dated July 20, 1979; Change No. 1, Amendment to Instructions, dated August 2, 1979; Change No. 2, Amendment to Instructions, dated August 16, 1979; Change No. 3, Amendment to Instructions dated August 28, 1979; and Change No. 4, Amendment to Instructions, dated Oct. 3, 1979

B. AREA SURVEYED

Survey H-9852 was conducted in the vicinity of ^{Kalae} ~~South Point~~, Hawaii, from September 20, 1979 to October 19, 1979. The survey covers the southwest coast of Hawaii from 18°54'55"N to 18°58'33"N. The area surveyed is a band approximately 2.3 square miles in area, following this section of the coast, and extending from the coast out an average of 600 meters to depths from 130 to 200 fathoms. The inshore limit was generally the rocky coast or foul area. The steepness of the coast and/or surf conditions prevented development of the zero fathom curve.

C. SOUNDING VESSELS

<u>Vessel</u>	<u>Hull No.</u>	<u>Usage</u>
RA-3 (21 ²³ 22)	1007	Range Azimuth Hydrography
RA-5 (2125)	1003	Bottom Samples
RA-6 (2126)	1013	Range Azimuth Hydrography

No unusual sounding vessel configurations or problems were encountered.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Sounding Equipment

Echo soundings collected for H-9852 were obtained by the RAINIER's three hydrographic launches (RA-3, RA-5, and RA-6). The launches are equipped with Ross Fineline fathometer systems which include the following components: Ross Model 4000 Transceiver, Ross Model 6000 Digitizer, Ross Model 5000 Analog Recorder and a 100-KHz Transducer.

Table I
Echo Sounder Component Serial Numbers

<u>Component</u>	<u>RA-3 (2123)</u>	<u>RA-5 (2125)</u>	<u>RA-6 (2126)</u>
Transceiver	1041	1047	1042
Analog Recorder	1042, 1070	1040	1042
Digitizer	1080	1040	1044

CORRECTIONS TO ECHO SOUNDINGS

The following corrections to echo soundings are discussed: sound velocity corrections, launch draft corrections, settlement and squat corrections, and

instrument corrections for blanking, phase and initial-drift errors. Consideration of sea-swell errors is not included as it is felt that the irregular nature of the bottom, in addition to the extreme depths found relatively close to shore, makes a consideration of the state of the sea and swell an unrealistic exercise.

Sound Velocity Corrections

Sound velocity corrections for echo soundings were derived from data obtained from two Nansen casts performed during OPR-T126-RA-79. (See H.O. 607 Instruction Manual for Obtaining Oceanographic Data, Third Edition, U.S. Naval Oceanographic Office, 1968). The details relating to these casts are presented in Table II.

Table II
Nansen Cast Data, OPR-T126-RA-79

<u>Nansen Cast #</u>	<u>Date Time (local)</u>	<u>Location</u>	<u>Applicable Survey</u>	<u>Velocity Table Number</u>
1	Sep 27, 1979 1045	18°48'12" 155°47'48"	H-9852 H-9858 (inclusive)	1, 2 ✓
2	Dec 1, 1979 1000	18°46'00" 155°25'00"	H-9852 H-9858 (inclusive)	1, 2

The samples collected in these casts were analyzed for salinity using standard laboratory procedures (See H.O. 607). The salinometer used for these analyses was a Bissett/Berman Model 6210, S/N 1043, which was last calibrated in March, 1979, by the Northwest Regional Calibration Center, Bellevue, Washington.

In order to compute the appropriate velocity correctors, the results of the two Nansen casts and associated salinity data were input into computer program RK-530 - Velocity Correction Computations, and run on RAINIER's PDP 8/e digital computer, S/N 1015.

Listings of computed velocity corrector values are provided in the separates to the text portion of this report. These correctors were derived graphically by co-plotting data from both Nansen casts on the same graph and these graphs are also presented in the separates to the text section of this report (Figs. II-VIII). At the shallower depths, extremely close agreement is noted in the values from the two different casts. In depths approaching and greater than 2000 fathoms, variation between data points between the two casts starts to become evident, and in these cases, the resultant velocity correctors were picked from a curve drawn to reflect mean values between the two sets of data.

Deepest depth on this survey is about 150 Fms.

From a consideration of the corrector values obtained in the two casts, it is seen that a relatively stable water column was maintained throughout the course of OPR-T126-RA-79.

Launch Draft Corrections

In order to determine corrections for the draft of the launches, standard bar checks (see Hydrographic Manual) were performed each day - weather and sea conditions permitting - prior to and at the completion of sounding operations.

The graduations on bar hand lines were compared to those on a steel measuring tape prior to/beginning work on OPR-T126-RA-79 and were found to be accurate. ✓

The mean values were subtracted from the corresponding mean true bar depths in order to obtain a series of "bar check correctors." These values were then plotted alongside sound-velocity corrector data and the magnitude of the difference between the two curves was determined for one through seven fathoms (range of the bar checks). See PMC Operational Order Manual, page 3-35, for a complete description of this graphical method of TRA determination. ✓

TRA determination via this method resulted in an average value of 0.3 fathoms for the launches, which is consistent with values obtained for these vessels during previous surveys. ✓

Launch Settlement and Squat Corrections

Settlement and squat characteristics of RA-3, RA-5 and RA-6 were measured prior to OPR-T126-RA-79 in Lake Washington, Seattle, Washington, on March 20, 1979 (JD 079), by the following method: a level rod, graduated in feet, was held above the transducer on each launch. A self-leveling Zeiss Ni 2 (S/N 103453) level was set up on stable ground and readings were taken at various engine speeds on the launches headed directly toward the level operator. These readings were made relative to a zero heading as the launch was dead in the water. Since the tests were run on an inland lake, no tidal effects need be considered, and the speeds that were used were the same that RAINIER personnel commonly utilize in the field. ✓

The corrections obtained from these tests are included in the Corrections to Echo Sounding Report, OPR-T126-RA-79, for reference, but they were not placed on TC/TI tapes or applied to field plotting sheets. This is so, because the generally deep water, irregular bottom and heavy sea conditions encountered daily in the working areas rendered the settlement and squat corrections insignificant. ✓

Sounding Instrument Corrections

During survey operations, the "blanking" depth was set to a value slightly shoaler than the shoalest bottom depth expected, and was adjusted as the depths changed. Corresponding analog depths were substituted for missed digital soundings during end of day field scanning operations. ✓?

The initial trace on the analog records was continuously monitored and adjusted as necessary in order to prevent the introduction of errors due to a drifting initial. ✓

Manual Sounding Corrections

Where manual soundings needed to be taken, hand-held lead-lines were compared with those on a steel measuring tape prior to OPR-T126-RA-79 and were found to be accurate. Special care was taken to prevent the application of sound velocity corrections to lead-line depths since lead-line soundings were interspersed with fathometer soundings. ✓

For further information concerning echo sounding corrections, please refer to Corrections to Echo Sounding Report, OPR-T126-RA-79. ✓

E. HYDROGRAPHIC SHEETS

All field sheets, including the smooth field sheet were prepared by RAINIER personnel utilizing a PDP 8/e Complot system and were constructed on a modified transverse mercator projection. The list of parameters used to define the hydrographic sheets is included in the separates following the text. All field records will be forwarded to Pacific Marine Center, Seattle, Washington, for verification.

F. CONTROL STATIONS

Horizontal control for this survey was provided by the recovery of fourteen existing stations and the establishment of five new stations. Additionally, two new reference marks were positioned near the stations Kamilo 1989-1979 and Kaena Pt USGS 1977 in order to locate Raydist shore stations. The recovered stations are as follows: Umis Ahu 1887-1938, Wind 1964, Ka Lae 2 1948, Palahemo 1898, Mahana HGS 1898-1967, Kamilo 1898-1979, Kipaepae 1898, Peak 2 1949, Honuapo 1914, Luu 1929, Kamehame New HTS 1949, Kaena Pt USGS 1977, Laeapuki 1914, and Panau 1914. The five new stations established were: Meshera 1979, Haole 1979, Desolation 1979, 8739A, and Pelini 1979. These stations served as positions for Mini-Rangers and visual hydro signals. The stations Kamilo 1938-1979, Kamehame New HTS 1949, and Kaena Pt USGS 1977 were also used as sites for Raydist shore stations. All stations were positioned utilizing Third Order Class I geodetic methods and all were described and monumented.

For further information regarding horizontal control methods and data, refer to Horizontal Control Report, OPR-T126-RA-79.

G. HYDROGRAPHIC POSITION CONTROL

Sounding line positioning during this survey was accomplished entirely by using the range-azimuth technique and Motorola Mini-Ranger III equipment. Wild T-2 theodolites were utilized to determine azimuths during this operation. Positioning equipment aboard the various hydrographic vessels was as follows:

<u>Vessel</u>	<u>Mini-Ranger Console S/N</u>	<u>Mini-Ranger R/T S/N</u>
RA-3 (2123)	715	727
RA-5 (2125)	720	720
RA-6 (2126)	711	718

One Mini-Ranger shore station was recovered and two established for use in the range-azimuth operations of this survey. Shore station numbers, transponder code numbers and other data were as follows:

<u>Station No.</u>	<u>Station Name</u>	<u>M/R Code</u>	<u>M/R Transponder S/N</u>	<u>Dates</u>
101	Ka Lae 2, 1948, 1949	1	001	264-267 269-270 277-279
112	Meshera, 1979	1	001	276
113	Haole, 1979	1	001	275-278 291-292
		4	777	270-271

Two Mini-Ranger baseline calibrations were performed in conjunction with this survey. The first took place on JD 262 on the grounds of the Air Force tracking station, ~~South Cape~~, Hawaii. The second occurred on JD 327 in the vicinity of Hilo Bay, Hawaii. ~~Kalae~~ ✓

The range for the first calibration was 841.8 meters as determined by using the Hewlett Packard Model 3808-A. Using the same distance measuring device, the range for the second calibration was determined to be 1525.8 meters. These baseline calibrations were conducted in accordance with PMC OORDER, Appendix M. All Mini-Ranger baseline calibration field sheets and graphs are contained in attachment #5 of the Electronic Control Report, OPR-T126-RA-79, which accompanies this Descriptive Report. A listing of the final baseline correctors, in addition to the electronic corrector abstracts, are included in the separates to the text portion of this report. ✓

The initial baseline calibration determined low signal strength cut-off values for each Mini-Ranger console, R/T unit, and transponder combination. On the rare occasions when marginal signal strengths occurred during survey operations, data collection was discontinued until the transponder orientation was changed or a different station could be occupied. ✓

The correctors obtained from the initial baseline calibration were applied to all Mini-Ranger data during field operations and a mean value, derived from the two calibrations, was determined for final smooth plotting. ✓

Daily calibration procedures involved taking three-point sextant fixes to visual calibration signals located over Third Order Class I (or better) triangulation stations. Occasionally, bad weather prevented obtaining an end-of-day calibration, but this occurred very infrequently. In all cases, a successful visual calibration of Mini-Ranger equipment consisted of at least five visual fixes, all agreeing, to within five meters, with the distance from a shore station on which the transponder was positioned. ✓

Throughout the course of this survey, the performance of all Mini-Ranger equipment was good. No station failures occurred, and except for an occasional transponder shut-down due to low battery voltage levels, Mini-Ranger problems were minimal. Finally, no unusual atmospheric conditions that may have affected data quality presented themselves. ✓

H. SHORELINE

Shore^{line} was transferred to the field sheet from Class III photo manuscripts T-12557, T-12558, and T-12561. Shoreline details have been field edited along the entire length of the field sheet and all changes noted during field editing have been transferred to the field sheet. ✓
See Verifier report section 2

I. CROSSLINES

A total of 20.8 miles of crosslines were run, including 11.4 miles of shorelines run parallel to the shore. These comprise 48% of the ~~main scheme~~ ^{total} mileage. Crossings totaled about 345. Of these, roughly 50% were within one fathom agreement, and about 25% disagreed by more than two fathoms. ✓
See Verifier report section 3

The large disagreement between soundings is due largely to the extremely irregular nature of the bottom topography, particularly along the shoreline and in the shoaler depths. Soundings from crossing lines which fall practically on top of each other may disagree by several fathoms when one line caught a steep rock peak or coral head which was not sounded on the crossing line. The more significant discrepancies due to rocks, ledges and coral heads have been circled and noted in pencil by the hydrographer on the smooth sheet. Those peaks which stood out significantly from surrounding features were developed for least depth and are indicated on the smooth sheet.

See Verifier report section 4.

In the deeper waters on this sheet (generally over 75 fathoms), crossing discrepancies appear to be due largely to the fathometer side echo from steeply sloped terrain. Since the swath of the fathometer is wider to the sides than fore and aft, covering about 7-1/2° to the sides, the erroneous reading caused by side echo will change with the boat's orientation to the slope of the bottom. When they appear reasonable, the digitized depths were taken, because of the digitizer's tendency to pick the strongest portion of the return signal. Nevertheless, this problem certainly exists, and is compounded by weak fathometer return signals in depths over 100 fathoms. Some rolling and pitching of the launch in the nearly everpresent swell also contributed to sounding error in deeper depths. These problems are not considered to compromise the overall accuracy of the survey, however, as the sounding crossings nearly always agree within acceptable limits. Areas of significant disagreement are noted in pencil on the smooth sheet.

J. JUNCTIONS

This survey junctions with contemporary surveys H-9812 (FA-10-3-79) along its northwest edge, H-9858 (RA-80-1A-79) along its southwest (offshore) edge, and H-9853 (RA-10-4A-79) along its southeast edge.

In junctions with the H-9812 and H-9853, junctioning soundings agree within 1 fathom in depths below 70 fathoms. In greater depths, only two of the junctioning soundings disagree by more than 2 fathoms. Discrepancies in junctions can be attributed to the same sources of error that influenced crossings (See Section I). These junctions are considered good as the depth contours are consistent across them.

Eight ~~Seven~~ soundings from H-9858 junction with this survey. Of these, ~~three~~ ^{two} are not true junctions, being about 200 meters further offshore than soundings on this survey, but they seem to be in good agreement with the trend of the bottom as established in this survey. Of the remaining four junctions, one agrees within one fathom and the other three agree within 10%.

The junction with H-9858 shows the soundings on the 1:80,000 scale sheet to be consistently shoaler than their neighboring soundings on this survey. This can be attributed to the fact that the junction soundings on the small scale sheet were taken with a fathometer system having a swath of 35° in a zone where the bottom is steeply sloped, allowing a considerable side-echo error in soundings on the 1:80,000 scale sheet. The soundings from H-9852 more accurately represent the true bottom in this area.

K. COMPARISON WITH PRIOR SURVEYS

Only one prior survey, H-4655a, dated 1927, falls in the vicinity of this survey. ✓
Except for one, soundings from H-4655a do not overlay the surveyed area, but four
of the seven soundings available for comparison are obviously unreasonably shoal.
The accuracy of this prior survey is considered poor.

Eight rocks (5 submerged and 3 ^{from T-3442 (1914)} awash) shown on H-4655a fall within the area of
this survey. Two of the rocks awash plot on the shore line and were investigated
by the field editor. (One plots in a foul area and the other does not exist.) ✓
Of the other six rocks shown on H-4655a, the one shown as awash and three of the
five shown as submerged were investigated by diving on the charted positions in
clear water (visibility greater than 60 feet vertically, greater than 100 feet
horizontally). No trace of these rocks was found. Charted positions and details
of the search for these rocks are listed in sheets, "Description of Search,"
attached to this report. *See Verification report Section 7*

The other two rocks shown on H-4655a plot in water deeper than seventy fathoms
on this survey, and no indication of any shoaling was seen on the mainscheme
hydrography in these areas. It is justifiable to assume without further search ✓
that these rocks do not exist in their indicated positions. It is believed that
these rocks were placed in their recorded position for cartographic clarity of
the shoreline detail.

L. COMPARISON WITH THE CHART

This survey was compared with Chart 19320, 12th Edition dated June 17, 1978. ✓
The chart shows the same soundings and rocks as the prior survey discussed in
the last section. These soundings are considered inaccurate and no trace of
the rocks was found. It is strongly recommended these rocks be removed from
the chart. See Section "K" for details. *See Verification report Section 7*

There were no presurvey review items for this survey.

M. ADEQUACY OF SURVEY

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

N. AIDS TO NAVIGATION

No floating aids to navigation exist within the area of this survey. One fixed
aid, Ka Lae Light, exists and is accurately located on the chart. It is further
discussed in the Descriptive Report for H-9853. *See Verification report Section 7*

O. STATISTICS

This survey contains 1340 positions and 65.9 nautical miles of hydrography, ✓
covering 2.3 square nautical miles. The following is a table of statistics
for each launch:

<u>Vessel</u>	<u>Positions</u>	<u>NM of Hydrography</u>
RA-3 (2123)	317	33 NM 3 DP's ✓
RA-5 (2125)	62	36 bottom samples 5 DP's
RA-6 (2126)	401	32, 9 NM

Three tide stations were maintained during this survey.

P. MISCELLANEOUS

Shoreline sounding lines were run parallel to the shoreline on this sheet, to aid in developing near-shore depths. Because the lines were run using range-azimuth position control, there is some error in location of soundings in between fixes on these lines. These soundings were plotted using RK 216 (Range-Azimuth Position and Sounding Plot, February 5, 1976) which interpolates azimuths for plotting in-between soundings assuming that the launch is running an arc around the azimuth station. In the case of these shorelines, the program is generating erroneous azimuths to plot the in-between soundings. The magnitude of the error varies with the range from the azimuth station and the angle between the azimuth line-of-position and the true path of the sounding vessel. Long ranges and angles of intersection near 90° produce the least plotting errors. Any change in sounding vessel direction between fixes of course also produces plotting errors. An effort was made while running the shore lines on this survey to acquire fixes frequently enough to minimize plotting errors. Nevertheless, some errors do exist but were determined to be minor. ✓
See verification report section 4.

This area could have been surveyed more efficiently and safely using photobathymetric or laser hydrographic data collection methods.

Q. RECOMMENDATIONS

↳ not available operationally at time of survey. *Deo*

There are no special recommendations for additional field work or unusual processing. This survey is complete and adequate for charting. ✓

R. AUTOMATED DATA PROCESSING

Data acquisition and processing were accomplished as outlined in the Hydrographic Manual (4th Edition), Manual Automated Hydrographic Surveys, PMC OORDER and any standard operating procedures the Pacific Marine Center issued this Command from time to time. ✓

Soundings and positions were taken during the whole survey by a Hydroplot system using Range-Azimuth Logger program FA-181. Daily master and corresponding corrector tapes were generated to include the TRA for the launches, electronic control calibration correctors for the M/R consoles and R/T units and all depth corrections. Velocity tapes were generated from Nansen Cast Data. The following is a list of all computer programs and version dates used for data acquisition or processing. ✓

<u>PDP 8/e Programs</u>	<u>Version Date</u>
FA 181 Range Azimuth Logger	2/23/78
RK 201 Grid, Signal and Lattice Plot	4/18/75
RK 212 Visual Station Table Load	4/01/74
RK 216 Range Azimuth Non-Real Time Plot	2/05/76
RK 300 Utility Computations	2/05/76
RK 330 Reformat and Data Check	5/04/76
PM 360 Electronic Corrector Abstract	2/2/76
AM 500 Predicted Tide Generator	11/10/72
RK 530 Layer Corrections for Velocity	5/10/76
RK 561 Geodetic H/R Calibration	2/19/75
AM 602 Elinore-Line Oriented Editor	5/20/75
AM 603 Tape Consolidator	10/10/72
RK 606 Tape Duplicator	8/22/74


The WANG Series 700 and HP 97 calculators were used to compute geographic positions of electronic control stations and visual signals for calibrations.

S. REFERENCES TO REPORTS

The following reports contain information related to this survey:

Horizontal Control Report, OPR-T126-RA-79
Electronic Control Report, OPR-T126-RA-79
Field Edit Report, OPR-T126-RA-79
Corrections to Echo Soundings Report, OPR-T126-RA-79

Respectfully submitted,


Roger A. Morris
Lieutenant, NOAA

DESCRIPTION OF SEARCH

TYPE: SWEEP/Drag CHAIN/WIRE ONE/TWO BOAT OTTERBOARD DIVERS ALONE

OTHER SEARCH FOR ROCK SHOWN ON H-4655a CHART 19320

WIDTH _____ FT/METERS DEPTH 5² FATHOMS ~~FT/METERS~~ ON BOTTOM

OVERLAP _____ FT/METERS STARTING - ENDING LINES/ARCS _____

SIMULTANEOUS VISUAL SEARCH Y/N WATER VISIBILITY > 60 ~~FT/METERS~~

SIMULTANEOUS GREASE POLE VERIFICATION Y/N OR DIVER VERIFICATION Y/N

OR _____

SWEPT IN BOTH DIRECTIONS Y/N SEAS: DIRECTION & HEIGHT _____

WIND: DIRECTION & KNOTS _____ CURRENT: DIRECTION & KNOTS _____

ANY OTHER PERTINENT DATA CHARTED ROCK POSITION IS 18° 56' 51" N

155° 42' 28" W. NO ROCK WAS FOUND BY DIVING ON THIS

POSITION, OCTOBER 4, 1979. Raja A Pharis, Lt NOAA
J.O. 277

~~INFORMATION FROM LOCALS: _____~~

POSITION CONTROL: RANGE AZIMUTH

MINIRANGER AND T2 AT KA LAE 2 INITIAL 000° 00' 25"

TO UMIS AHU (SEE MASTER STN LIST)

RANGE : 4275 METERS - 3 = 4272

AZIMUTH : 330° 15' 00"

Position 3

Position 5512/3

Delete from chart, see position 2.

DESCRIPTION OF SEARCH

TYPE: SWEEP/Drag CHAIN/WIRE ONE/TWO BOAT OTTERBOARD DIVERS ALONE

OTHER SEARCH FOR ROCK SHOWN ON H-4655a & CHART 19320

WIDTH _____ FT/METERS DEPTH 48 FATHOMS ~~FT/METERS~~ ON BOTTOM

OVERLAP _____ FT/METERS STARTING - ENDING LINES/ARCS _____

SIMULTANEOUS VISUAL SEARCH Y/N WATER VISIBILITY > 60 FT/METERS

SIMULTANEOUS GREASE POLE VERIFICATION Y/N OR DIVER VERIFICATION Y/N

OR _____

SWEPT IN BOTH DIRECTIONS Y/N SEAS: DIRECTION & HEIGHT _____

WIND: DIRECTION & KNOTS _____ CURRENT: DIRECTION & KNOTS _____

ANY OTHER PERTINENT DATA CHARTED ROCK POSITION IS 18° 57' 01" N

155° 42' 34" W. NO ROCK WAS FOUND BY DIVING ON THIS

POSITION, OCTOBER 4, 1979. Reg - Phoenix Is, NOAA
S.D. 277

INFORMATION FROM LOCALS: _____

POSITION CONTROL: RANGE AZIMUTH

MIN RANGE AND T2 AT KA LAE 2, INITIAL 000° 00' 25"

TO UMIS AHU (SEE MASTER STATION LIST)

RANGE : 4640 METERS - 3 = 4637

AZ : 330° 42' 00"

Position 2
Position 5512/2

This submerged rock and two other charted submerged rocks appeared on the first chart standard of 1911. It is considered that these rocks are representative of a generally foul area close to shore and of Kailiki Shoal, and not of actual rocks. These rocks are considered doubtful and should be deleted from the chart. A 3 1/2 RK was located approx. 200 meters NE of this position; (Pos 5512).

DESCRIPTION OF SEARCH

TYPE: SWEEP/DRAG CHAIN/WIRE ONE/TWO BOAT OTTERBOARD DIVERS ALONE

OTHER SEARCH FOR ROCK SHOWN ON H-4655a } CHART 19320

WIDTH _____ FT/METERS DEPTH 5² FATHOMS ~~FT/METERS~~ ON BOTTOM

OVERLAP _____ FT/METERS STARTING - ENDING LINES/ARCS _____

SIMULTANEOUS VISUAL SEARCH Y/N WATER VISIBILITY > 60 FT/METERS

SIMULTANEOUS GREASE POLE VERIFICATION Y/N OR DIVER VERIFICATION Y/N

OR _____

SWEEP IN BOTH DIRECTIONS Y/N SEAS: DIRECTION & HEIGHT _____

WIND: DIRECTION & KNOTS _____ CURRENT: DIRECTION & KNOTS _____

ANY OTHER PERTINENT DATA CHARTED ROCK POSITION IS 18° 56' 51" N
155° 42' 28" W. NO ROCK WAS FOUND BY DIVING ON THIS
POSITION, OCTOBER 4, 1979. Roger A. Pharis, Lt NOAA
J.D. 277

~~INFORMATION FROM LOCALS:~~ _____

POSITION CONTROL: RANGE AZIMUTH

MINIRANGER AND T2 AT KA LAE 2 INITIAL 000° 00' 25"
TO UMIS AHU (SEE MASTER STN LIST)

RANGE : 4275 METERS - 3 = 4272

AZIMUTH : 330° 18' 00"

Position 3
Position 5512/3

Delete from chart, see position 2.

DESCRIPTION OF SEARCH

TYPE: SWEEP/DRAG CHAIN/WIRE ONE/TWO BOAT OTTERBOARD DIVERS ALONE

T-3442 (1914) 1:20,000

OTHER SEARCH FOR ROCK SHOWN ON H-4655a } CHART 19320

WIDTH _____ FT/METERS DEPTH 22 FATHOMS ~~FT/METERS~~ ON BOTTOM

OVERLAP _____ FT/METERS STARTING - ENDING LINES/ARCS _____

SIMULTANEOUS VISUAL SEARCH Y/N WATER VISIBILITY > 60 FT/METERS

SIMULTANEOUS GREASE POLE VERIFICATION Y/N OR DIVER VERIFICATION Y/N

OR _____

SWEEP IN BOTH DIRECTIONS Y/N SEAS: DIRECTION & HEIGHT _____

WIND: DIRECTION & KNOTS _____ CURRENT: DIRECTION & KNOTS _____

ANY OTHER PERTINENT DATA CHARTED ROCK POSITION IS 18° 57' 55" N

155° 43' 30" W. NO ROCK WAS FOUND BY DIVING ON

THIS POSITION. DATE OF DIVE OCT. 4, 1979. R. Marin

SD 277

LT, NOAA

~~INFORMATION FROM LOCALS:~~ _____

DATE OF SEARCH: 4 OCTOBER 1979

POSITION CONTROL: RANGE AZIMUTH

MINIRANGER AND T2 AT KALAE2, INITIAL 000° 00' 25" TO UMIS AHU (SEE MASTER STATION LIST)

RANGE: 6940 METERS - 3 = 6937

AZ : 327° ~~00~~ 00" 12'

Position 1

Position 5512/1

Origin T-3442 (1914)
Same as rock located at lat. 18° 57' 59" N
long. 155° 43' 29" W. Chart present survey
information.

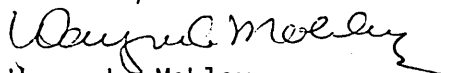
APPROVAL SHEET
DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY

H-9852

RA-10-3-79

In producing this sheet, standard procedures were observed in accordance with the Hydrographic Manual, PMC OORDER, and the Instruction Manual for Automated Hydrographic Surveys. The data was examined daily during the execution of the survey.

The boatsheet and accompanying records have been examined and are complete and adequate for charting purposes and are approved.


Wayne L. Mobley
Captain NOAA

MASTER STATION LIST
OPR-T126-RA-79

FINAL VERSION

101	4	18	54	56570	155	41	04290	250	0008	000000	
/KA LAE 2, 1948-1949 M/R PG.27 G-9279											
102	4	18	55	54401	155	39	40233	250	0050	000000	SE
/PALEHEMO, 1398-1948 M/R PG.27 G-9279											
103	4	18	56	46169	155	39	02560	250	0078	000000	SE
/MAHANA, 1898-1949 M/R PG.19 G-9279											
104	3	18	58	20955	155	36	18901	250	0005	329647	SE
/KAMILO, 1898-1979 RM3 (LEFT SLAVE) PG.19 G-9279											
105	1	19	05	16647	155	32	59609	250	0003	000000	SE
/HONJAPU, 1914-1949 M/R PG.28 G-9279											
106	3	19	07	36455	155	30	48106	250	0015	000000	SE
/LUI, 1930 M/R PG.67 G-446											
107	1	19	08	26595	155	29	21880	250	0006	000000	SE
/PUN, 1930 M/R PG.67 G-446											
108	1	19	16	55404	155	07	27806	250	0010	329647	SE
/KAENA PT, 1977-1979 RM3 (RIGHT SLAVE)											
109	1	19	08	52334	155	28	07488	250	0015	329647	SE
/KAKEHAME NEW, 1977 RM1 (MASTER STATION) PG.1 G-16025											
110	1	18	58	23300	155	36	15919	250	0003	000000	SE
/KAMILO, 1898-1949 M/R											
111	3	19	08	52345	155	28	07628	250	0015	000000	SE
/KAKEHAME NEW, 1977 M/R											
112	4	18	55	15983	155	41	12404	250	0012	000000	
/YESHERA, 1979 M/R											
113	2	18	55	25485	155	41	13019	250	0013	000000	
/HADLE, 1979 M/R											
114	4	18	57	44421	155	37	52340	250	0045	000000	SE
/PELINI, 1979 M/R											
115	3	19	05	16886	155	32	59853	250	0000	000000	SE
/HONUAPU RM1 M/R											
200	4	18	58	18378	155	41	22642	250	0235	000000	SE
/UMIS AHU, 1887-1949 M/R PG.19 G-9279											
201	6	18	56	43150	155	41	13888	250	0000	000000	
/WIND, 1964 M/R PG.122 G-13429											

202 1 18 54 57671 155 41 04143 250 0010 000000
/KA LAE, 1887-1948 M/R PG.40 G-9279

203 6 18 54 54432 155 41 04553 139 0010 000000
/KA LAE LIGHT, 1948 G-16108

204 1 18 56 43366 155 41 13810 139 0000 000000 *body off*
/NORTH TELEMETRY BORESIGHT POLE, 1964 PG.122 G-13429

205 1 18 56 46146 155 39 02311 139 0000 000000 *E*
/MAHANA, 1898-1949 RM2 PG.19 G-9279

206 4 19 02 16794 155 34 20973 250 0142 000000 *N*
/KIPAEPAE, 1898-1938 M/R PG.19

207 4 19 05 01720 155 34 30659 250 0399 000000 *N*
/PEAK 2, 1949 M/R PG.27

208 1 18 55 24119 155 40 24017 250 0029 000000
/DESOLATION, 1979 M/R

209 3 18 55 09977 155 40 16307 139 0005 000000 *S*
/LEVEL MARK 8739A

210 2 18 56 16588 155 38 44564 139 0000 000000 *S*
/HS 1

ASCII SIGNAL TAPE LISTING
OPR-T126-RA-79
HAWAIIAN ISLANDS, HAWAII

FINAL VERSION

101	4	18	54	56570	155	41	04290	250	0008	000000
102	4	18	55	54401	155	39	40233	250	0050	000000
103	4	18	56	46169	155	39	02560	250	0078	000000
104	3	18	58	20955	155	36	18901	250	0003	329647
105	1	19	05	16647	155	32	59609	250	0003	000000
106	3	19	07	36455	155	30	48106	250	0015	000000
107	1	19	08	26595	155	29	21880	250	0006	000000
108	1	19	16	55404	155	07	27806	250	0010	329647
109	1	19	08	52334	155	28	07488	250	0015	329647
110	1	18	58	23300	155	36	15919	250	0003	000000
111	3	19	08	52345	155	28	07628	250	0015	000000
112	4	18	55	15983	155	41	12404	250	0012	000000
113	2	18	55	25485	155	41	13019	250	0013	000000
114	4	18	57	44421	155	37	52340	250	0045	000000
115	3	19	05	16836	155	32	59853	250	0000	000000
200	4	18	58	18378	155	41	22642	250	0235	000000
201	6	18	56	43150	155	41	13888	250	0000	000000
202	1	18	54	57671	155	41	04143	139	0010	000000
203	6	18	54	54432	155	41	04553	139	0010	000000
204	1	18	56	43366	155	41	13810	139	0000	000000
205	1	18	56	46146	155	39	02311	139	0000	000000
206	4	19	02	16794	155	34	20973	250	0142	000000
207	4	19	05	01720	155	34	30659	250	0399	000000
208	1	18	55	24119	155	40	24017	250	0029	000000
209	3	18	55	09977	155	40	16307	139	0005	000000
210	2	18	56	16588	155	38	44564	139	0000	000000

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY

Replaces USGS Form 567.

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT
(If field Party, Ship or Office)
 AMC Norfolk, VA

STATE
 Hawaii

LOCALITY
 Hawaii
 Southwest Coast

DATE
 June, 1980

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

The following objects HAVE HAVE NOT been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO. T-126 JOB NUMBER PH-6402 SURVEY NUMBER T-12559

DATUM Old Hawaiian

METHOD AND DATE OF LOCATION
(See instructions on reverse side)

CHARTING NAME	DESCRIPTION <i>(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)</i>	LATITUDE		LONGITUDE		OFFICE	FIELD	CHARTS AFFECTED
		$^{\circ}$ /	//	$^{\circ}$ /	//			
TELEM. ANT.	(North Telemetry Boresight Pole, 1964)	18-56	43.37	155-41	13.81	63S(P) 7969 Aug 31, 1963	F-V-VIS Oct 11, 1979	19320.
			D.M. Meters 1333.4		D.P. Meters 404.1		Position from master station list OPR-T-126 RA-79	

REF. 2-853 (80)

5/1/80

OBJECTS INSPECTED FROM SEAWARD	T. CLARK	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	T. CLARK L. WILLIAMS	FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'	<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
(Consult Photogrammetric Instructions No. 64.)		
<p>OFFICE I. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75</p> <p>FIELD I. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection</p> <p style="margin-left: 40px;">P - Photogrammetric Vis - Visually 5 - Field identified 6 - Theodolite 7 - Planetable 8 - Sextant</p> <p>A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75</p> <p>*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.</p>	<p>FIELD (Cont'd) B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982</p> <p>III. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75</p> <p>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75</p> <p>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</p>	

NONFLOATING AIDS

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

ORIGINATING ACTIVITY

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)
Coastal Mapping Div.
AMC Norfolk, VA

STATE
Hawaii

LOCALITY
West Coast
Kailua to South Cape

DATE
June 1980

The following objects HAVE HAVE NOT been inspected from seaward to determine their value as landmarks.

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

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	LATITUDE		LONGITUDE		METHOD AND DATE OF LOCATION (See instructions on reverse side)	CHARTS AFFECTED
				° / ' "	D.M. Meters	° / ' "	D.P. Meters		
T-126	PH-6402	T-12561	Ka Lae Light	18	54	1673.6	155 41	63S(C) 8010 Aug 31, 1963	F-2-6-L 19320 19004 19010
			REF. L-853 (80)						

Givern

OBJECTS INSPECTED FROM SEAWARD	J. C. Talbot	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	J. C. Talbot D. P. Butler	FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	D. P. Butler	<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION' (Consult Photogrammetric Instructions No. 64.)		
<p>OFFICE 1. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75</p> <p>FIELD 1. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection P - Photogrammetric Vis - Visually 5 - Field Identified 6 - Theodolite 7 - Planetable 8 - Sextant</p> <p>A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75</p> <p>*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.</p>	<p>FIELD (Cont'd) B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982</p> <p>11. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75</p> <p>111. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75</p> <p>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</p>	

TRAVERSE

DESCRIPTION OF ~~TRIANGULATION INTERSECTION~~ STATION

NAME OF STATION: South Telemetry Boresight Tower

CHIEF OF PARTY: D.J. Florwick YEAR: 1964 STATE: Hawaii COUNTY: Hawaii

Description, including sketch of object:

The station is a plain brass disk, stamped SOUTH TELEMETRY BORESIGHT TOWER 1964, cemented in a drill hole in the center of the concrete base of a 100-foot, portable, 4-legged steel tower located at an old Coast Guard station about 1.7 miles south of the South Point Tracking Facility of the Pacific Missile Range. It is 102 feet southwest of a rock wall, 100 feet east of an old and narrow asphalt road and 72 feet north of the north corner of an old concrete foundation. A traverse connection was made from triangulation station KA LAE 2 1948, distance being 126.789 meters (415.974 feet) north of station KA LAE 2 1948.

Described by Keith Riley

Coast-DC 34313

Form 525b
(11-8-55)

TRAVERSE

DESCRIPTION OF ~~TRIANGULATION INTERSECTION~~ STATION

NAME OF STATION: ^{North} Telemetry Boresight Pole

CHIEF OF PARTY: D.J. Florwick YEAR: 1964 STATE: Hawaii COUNTY: Hawaii

Description, including sketch of object: The station is the center of an 80-foot wooden pole located about 0.25 mile north of the South Point Tracking Facility of the Pacific Missile Range. It is inside a fenced enclosure, 130 feet west-northwest of the gate into the enclosure and 39 feet east of a fence. A traverse connection was made to triangulation station WIND, distance being 7.022 meters (23.038 feet) north of station WIND.

Described by Keith Riley

Coast-DC 34313

GEOGRAPHIC POSITIONS

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

Accession No. of Computation: 0-13429

Locality Vicinity of Hawaii Island

Old Hawaiian
North American 1929 Datum Second and Third-order Triangulation. State Hawaii
and Traverse

STATION	LATITUDE AND LONGITUDE			Seconds in Meters	AZIMUTH			BACK AZIMUTH			TO STATION	DISTANCE		
												Meters	Meters	Feet
Wind, 1964 d.m.	18	56	43.150		298	40	23.10	118	40	53.50	Palahemo (HGS)(HTS) Kolono Ka Lae 2	3,123.376		
	155	41	13.888		326	42	12.78	146	42	15.38		425.869		
					355	06	04.53	175	06	07.64		3,288.934		
AN/GKR-5 Antenna (USE), 1964 d.m.	18	56	32.222		313	53	48	133	53	48	Kolono	28.830*		
155	41	06.608												
South Telemetry Bore-sight Tower, 1964 d.m.	18	55	00.666		353	19	36.4	173	19	36.6	Ka Lae 2	126.789*		
155	41	04.793												
THIRD-ORDER														
AN/GKR-6 Antenna, 1964 d.	18	56	34.256		324	25	37.4	144	25	38.0	Kolono	101.442*		
155	41	07.915												
AN/GKR-6A Antenna, 1964 d.	18	56	30.189		233	56	17.1	53	56	17.8	Kolono	72.232*		
155	41	07.894												
North Telemetry Bore-sight Pole, 1964 d.	18	56	43.366		19	01	08	199	01	08	Wind	7.022*		
155	41	13.810												

* Taped Distance

No check on this position. Abbreviations used: d. = described; m. = marked; n. = not; r. = recovered; l. = lost; p. = probably. (Examples: n. d. = not described; p. l. = probably lost.)

NAME OF STATION: KA LAE LIGHT

CHIEF OF PARTY: R. B. MELBY YEAR: 1978 STATE: HAWAII COUNTY: HAWAII

Description, including sketch of object:

THE STATION IS LOCATED ABOUT 12 MILES SOUTHWEST OF THE TOWN OF NAALEHU, ON KA LAE (SOUTH POINT), ON THE SOUTHERNMOST TIP OF THE ISLAND OF HAWAII AND AT THE SOUTH END OF THE SOUTH POINT ROAD, IN AN OPEN FLAT AREA ABOUT 60 FEET ABOVE SEA LEVEL.

THE STATION IS THE WHITE LIGHT ATOP A 1.4 FOOT IN DIAMETER, OCTAGONAL, CONCRETE POST THAT RISES ABOUT 30 FEET ABOVE A 14 FOOT SQUARE, CONCRETE BASE.

DESIGNATED AS NO. 3693 IN THE PUBLICATION 'LIGHT LIST, VOLUME III, PACIFIC COAST AND PACIFIC ISLANDS, 1977'. THE LIGHT IS 217 FEET SOUTH OF STATION KA LAE 2, 1948.

NOAA FORM 76-81
(10-71)

Described by _____

U. S. DEPARTMENT OF COMMERCE
NOAA

*U.S.G.P.O. 1975-667-041

RECOVERY NOTE, TRIANGULATION STATION

18155

NAME OF STATION: KA LAE LIGHT

ESTABLISHED BY: L.C.W.

RECOVERED BY: R.B.M.

YEAR: 1948

YEAR: 1978

STATE: HAWAII

COUNTY: HAWAII

BENCH MARK(S) ALSO

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 12 MILES SOUTHWEST OF NAAHELU

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:

THE STATION IS LOST. THE LIGHT HAS BEEN REBUILT IN A SLIGHTLY DIFFERENT POSITION.
SEE KA LAE LIGHT, 1978.

R

NOAA FORM 76-165
(12-72)

(OLD C&GS 526) *U. S. GOVERNMENT PRINTING OFFICE: 1976--665661/1138 REGION NO. 6

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

16108

UNADJUSTED

FIELD GEOM/ TIC POSITIONS

1/78

LOCALITY ISLAND OF HAWAII

OLD HAWAIIAN

~~NORTH AMERICAN~~ DATUM THIRD

ORDER TRIANGULATION.

STATE HAWAII

18 155

STATION	LATITUDE AND LONGITUDE		AZIMUTH	BACK AZIMUTH		TO STATION	DISTANCE METERS
	°	'		°	'		
KA LAE LIGHT, 1978	D. 18	54 54.432	186 40 36	0 6 40 36	KA LAE 2	66.187	
PEPEEKO, RADIO STATION KIPA, MAST, 1978	D. 19	51 02.813	D. 155 05 09.349				
WAIAKEA CREEK CHANNEL DAYBEACON 1, 1978	D. 19	43 38.020	D. 155 04 26.262				

No check on this position.

Abbreviations used:

d.-described; m.-marked; n.-not; r.-recovered; l.-lost; p.-probably.
(Examples: m.d.-not described; D. l.-probably lost.)

FIELD TIDE NOTE

OPR-T126-RA-79

Field tide reduction of soundings for OPR-T126-RA-79 was based on predicted tides from Honolulu, Hawaii, corrected to Honuapo, Hawaii. These predicted tides were interpolated by PDP 8/E computer utilizing AM 500. Due to the small range of tide at Honuapo (mean range 1.7 feet, diurnal range 2.5 feet), tide correctors were applied to soundings only on the smooth copies of field sheets. All times of predicted tides are GMT.

Four Metercraft bubbler tide gages were installed at four locations in the project area. Location and period of operation for each gage are as follows:

<u>SITE</u>	<u>LOCATION</u>	<u>PERIOD</u>
Milolii (161-8431)	19°11.3'N 155°54.5'W	18 Sep - 7 Oct 17 Oct - 28 Nov
Ka Lae East (161-8739)	18°56.4'N 155°38.7'W	19 Sep - 23 Nov 30 Nov - 4 Dec
Honuapo (161-8578)	19°05.3'N 155°33.2'W	21 Sep - 6 Dec
Pohoiki (161-8062)	19°27.6'N 154°50.6'W	20 Oct - 6 Dec 20 Oct - 2 Nov usable

Milolii

A 0-10 ft. scale Metercraft gage (S/N 7601-7536-34) was installed 17 September and began operation 18 September. The staff was installed 17 September and leveled 18 September. The gage operated satisfactorily from 18 September to 7 October with two one-day gaps in the marigram on 23 September and 2 October due to ink flow problems. On 7 October, waves from a storm damaged the gage. The gage was replaced with 0-10 ft. scale Metercraft (S/N 7601-7536-31) on 17 October, which operated satisfactorily until removal on 28 October. The staff and orifice were unaffected by the 7 October storm. The last staff observation was on 27 October, and the last 13 hours of tides were inferred from a marginal trace (ink flow problems). Removal levels were run 16 November. The marigram zero line is at 5.7 ft. on the staff. Gage times on the marigram are Zulu. Watch times are local (Zulu - 10 hours) except where noted.

Ka Lae East

A 0-10 ft. scale Metercraft gage (S/N 7601-7536-29) was installed 18 September and began operation 19 September. The staff was installed 18 September and leveled 19 September. The gage operated satisfactorily from 19 September to 23 November with the following exceptions: On 4 and 5 October, the clock wound down and the gage was out of service for about half a day. This happened again on 28 and 29 October, resulting in a one-day gap. On 17 through 21 October, overinking caused bleed through of the tide curve on the marigram paper. On 3 and 4 November, a low nitrogen flow rate caused a one-day gap. On 24 November,

the clock stopped. The gage was restarted again on 30 November and ran satisfactorily until removal on 4 December. However, a stopped clock on 4 December prevented an ending observation for this time period. Removal levels were run 5 December. The marigram zero line equals 0.2 ft. on the staff. All times on the marigram are Zulu unless otherwise noted. The gage was kept on Zulu time.

Honuapo

A 0-10 ft. scale Metercraft gage (S/N 7601-7536-32) was installed and began operation 21 September. The staff was installed 21 September and leveled 22 September. The gage ran satisfactorily until removal on 6 December with one 5-hour gap in data on 28 and 29 October caused by a stopped clock. Removal levels were run 5 December. The gage was kept on Zulu time. All times on the marigram are Zulu unless otherwise noted. The marigram zero line equals 1.1 ft. on the staff.

Pohoiki

A 0-10 ft. scale Metercraft gage (S/N 7601-7536-30) was installed 19 October and began operation 20 October. The staff was installed 19 October and leveled 20 October. The gage ran satisfactorily until removal on 6 December. However, the contract observer's observations are inadequate. He apparently estimated the time without using a watch. Thus, the only usable data from this gage is that from the period covered by shipboard personnel observations, from 20 October to 2 November. Hourly heights are tabulated for this period only. This should be sufficient data to determine sufficiently accurate correctors for Pohoiki. Removal levels were run 6 December. All times on the marigram are local unless noted Zulu. The gage was kept on Zulu time. The marigram zero line equals 3.7 ft. on the staff.

Levels

All levels between marks were within acceptable limits. The levels for all four tide stations indicate no significant staff movements. The following tables show bench mark elevations above staff zero for installation and removal at each tide station.

Milolii (161-8431) BM Elevations (Ft)

<u>BM#</u>	<u>9-18-79</u>	<u>11-16-79</u>	<u>Difference</u>
1	21.293	21.286	-.007
2	15.352	15.312	-.013
3	14.603	14.590	-.013
A	19.744	19.738	-.006
B	19.324	19.321	-.003

Ka Lae East (161-8739) BM Elevations (Ft)

<u>BM#</u>	<u>9-19-79</u>	<u>12-5-79</u>	<u>Difference</u>
A	18.409	18.412	+.003
B	25.732	-	-
C	9.551	9.554	+.003
D	9.951	9.947	-.004
E	9.869	9.869	0

Honuapo (161-8578) BM Elevations (Ft)

<u>BM#</u>	<u>9-22-79</u>	<u>12-5-79</u>	<u>Difference</u>
3	11.381	11.375	-.006
D	9.085	9.081	-.004
E	8.494	8.487	-.007
F	12.188	12.175	-.013
G	9.252	9.239	-.013
H	9.357	-	-

Pohoiki (161-8062) BM Elevations (Ft)

<u>BM#</u>	<u>10-20-79</u>	<u>12-6-79</u>	<u>Difference</u>
A	10.521	10.512	-.009
B	13.034	13.025	-.009
C	12.126	12.126	0
D	14.257	14.252	-.005
E	13.557	13.556	-.001

Recommended Zoning

As differences in times and heights of tides for the various tide stations were small, correctors obtained from Honuapo predicted tides were judged adequate for all smooth field sheets on OPR-T126-RA-79. However, for maximum accuracy, tide correctors could be applied as follows:

<u>Sheet</u>	<u>Tide Station</u>
W	Milolii and Ka Lae East
CC	Ka Lae East
BB	Ka Lae East
DD	Ka Lae East and Honuapo
EE	Ka Lae East and Honuapo
FF	Honuapo
GG	Honuapo

Tide correctors are not considered necessary for the 1:80,000 offshore sheets as the depths on these sheets are all sufficient to make the tide corrector insignificant.

July 3, 1980

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for Form 362

Tide Station Used (NOAA Form 77-12): 161-8739 Ka Lae East, Hawaii

Period: September 21 - October 20, 1979

HYDROGRAPHIC SHEET: H-9852

OPR: T126

Locality: Off the south coast of Hawaii, HI

Plane of reference (mean lower low water): 5.1 ft.

Height of Mean High Water above Plane of Reference is 2.0ft.

REMARKS: Recommended zoning:
Apply + 15 minute time correction.


Chief, Datums and Information Branch

GEOGRAPHIC NAMES

H-9852

Name on Survey	Source of Information											
	A	B	C	D	E	F	G	H	K			
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
HAWAII												1
HAWEA												2
KAALO												3
KAHUKUPOKO												4
KAILIKII												5
KAILIKII SHOAL												6
KAIMUWALA												7
KAIO												8
KA LAE												9
KALIIPAA												10
KALIPOA												11
KANANAKA												12
KEALAKIO												13
KEPUHI O KAHIO POINT												14
LUAKEANANOLO												15
MOKUHONU												16
PALI HAUKEUKE												17
POHAKEA												18
POHAKUWAAKAUHI												19
WAIAHUKINI												20
												21
												22
												23
												24
												25

Approved:

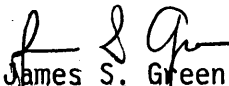
Chas P. Harrington
Chief Geographer - 0343

19 Feb. 1981

APPROVAL SHEET
FOR
SURVEY H- 9852

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position print-out has been made. A new final sounding print-out has been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the verifier's report.

Date: 21 October 1980

Signed:  James S. Green

Title: Chief, Verification Branch

HYDROGRAPHIC SURVEY STATISTICS

H-9852

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	1 & 5
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS ¹ & ARC, EX ³ CESS	4

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES		--				
CAHIERS	1 - with P/D & misc. data	--				
VOLUMES	1					
BOXES			Smooth 1 - & all accompanying data			

T-SHEET PRINTS (List) Class I Manuscripts T-12557, T-12558 and paper copy T-12561

SPECIAL REPORTS (List) 1 - ea contour plot & tide, 1 - Sndg. Analysis plot.

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			
POSITIONS CHECKED		678	678
POSITIONS REVISED		5	
SOUNDINGS REVISED		20	
SOUNDINGS ERRONEOUSLY SPACED		10	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	7		
VERIFICATION OF CONTROL		12	
VERIFICATION OF POSITIONS		10	
VERIFICATION OF SOUNDINGS		104	
COMPILATION OF SMOOTH SHEET		40	
APPLICATION OF TOPOGRAPHY		2	
APPLICATION OF PHOTOBATHYMETRY		---	
JUNCTIONS		3	
COMPARISON WITH PRIOR SURVEYS & CHARTS		3	
VERIFIER'S REPORT		43	
OTHER	7	217	224
TOTALS			

Pre-Verification by James S. Green	Beginning Date 5/12/80	Ending Date 5/12/80
Verification by Charles R. Davies	Beginning Date 6/16/80	Ending Date 10/16/80
Verification Check by James S. Green and James L. Stringham	Time (Hours) 49	Date 10/21/80
Marine Center Inspection by HIT	Time (Hours) 12	Date 11/13/80
Quality Control Inspection by R.W. Derkazanian	Time (Hours) 114	Date 1/30/81
Requirements Evaluation by D.J. Hill	Time (Hours) 1	Date 9/10/81

R. Myers 8 hrs 2/13/81

Reg. No. 9852

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:

Reg. No. _____

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS:

PACIFIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO. H-9852

FIELD NO. RA-10-3-79

Hawaii, Island of Hawaii, Ka Lae to ~~Pani~~ Kaimuuwala

SURVEYED: September 21 - October 20, 1979

SCALE: 10,000

PROJECT NO. OPR-T126-RA-79

SOUNDINGS: Ross Fineline Fathometer
Leadline

CONTROL: Mini-Ranger
Range/Azimuth Mode

Chief of Party.....CAPT Wayne L. Mobley
Surveyed by.....LT R. Morris, LTJG M.
McCluskey, LTJG J. Greene

Automated plot by.....PMC Xynetics Plotter
Verified by.....Russ Davies
17 October 1980

1. INTRODUCTION

H-9852 is a basic hydrographic survey conducted in accordance with the Project Instructions OPR-T126-RA-79, Hawaii, Hawaiian Islands dated July 20, 1979. This area was surveyed by the survey launches of the NOAA Ship RAINIER.

Projection parameters used to prepare the boatsheet have been revised to center the hydrography on the smooth sheet. Parameters used by the Pacific Marine Center are appended in the smooth printout.

Predicted tides from Honolulu, Hawaii and interpolated by PDP/8e computer using Program AM500 were used to reduce soundings on the field sheet. Approved tides from Ka Lae East, Hawaii are used for final reduction of soundings. All correctors used to plot and reduce soundings are located in the smooth printout.

2. CONTROL AND SHORELINE

Section F of the ships descriptive report describes the horizontal control adequately. Calibration procedures and electronic control systems are explained in Section G of the ships report.

Signals used during this project are listed in the descriptive report. Signals not used have been deleted from the field signal list in the smooth control listing.

The following Class I unreviewed manuscripts with their respective dates of photography and field edit were used to transfer shoreline for

H-9852, 1979:

<u>Manuscripts</u>	<u>Date of Photography</u>	<u>Date of Field Edit</u>
T-12557	August 1963	April and Oct 1979
T-12558	August 1963	April 1979
T-12561	August 1963	Sept and Oct 1979

See Section H in the ships report for additional information.

The Class I Manuscripts T-12557, T-12558, and T-12561 display the terms awash and AW near rock awash symbols. During the transfer of shoreline detail from the manuscript to the smooth sheet awash and AW were shown as an underscored zero (0).

The islet shown on the unreviewed Class I manuscript T-12558 at the location; 18°58'21"N and 155°44'05"W has a height of three (3) feet above mean high water and a written statement of Awash MHW. The Class II manuscript which was compiled before the field edit shows the same islet as a rock awash at mean high water. Therefore, the verifier feels the removal of Awash MHW note from the photo manuscript should be made. Concur, has been brought to the attention of Photogrammetry

3. HYDROGRAPHY

Crosslines are not in good agreement in depths of 20 fathoms or less, in some instances. The crossline soundings agreement is from 2 tenths of a fathom up to 2 fathoms north of Latitude 18°57'00"N. This is attributed to the distance from the azimuth station as well as the extreme irregular nature of the coastline. The two parallel soundings lines run along the shoreline caused difficulty in sounding agreement and drawing of depth curves.

Crosslines that fall in deeper than 20 fathoms are acceptable for exposed waters generally 1 to 3 fathoms, on an acute sloping bottom.

The bottom configuration, determination of least depths and ^{delineation} ~~development~~ of all standard depth curves are adequate ~~with the exception of~~ in the vicinities of:

- Latitude 18°55'17"N and Longitude 154°41'15"W
- Latitude 18°57'35"N and Longitude 155°42'53"W
- * Latitude 18°57'53"N and Longitude 155°43'20"W
- * Latitude 18°58'17"N and Longitude 155°43'57"W
- * Latitude 18°58'00"N and Longitude 155°43'27"W

Chart and survey have like depths, no problem exists.
 Subm charted rock: 4 RK on present survey in vicinity of Pass 5508.
 Area foul with rocks.
 Rocky point.
 This is due to the rocky coastline and irregular bottom. The zero, one, and two fathom curves were not developed because of heavy surf conditions and foul areas.* Line adjusted during Q.C., no problems exists.
 See Q.C. paragraph 1.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements as stated in the Hydrographic Manual with the exception of:

- a. The sounding interval on 50% of the survey was too close together causing soundings to overlap each other and making it difficult not to have overprints on the smooth sheet, (See section

4.4.5 of the Hydrographic Manual).

b) At least one more range-azimuth control station should have been located on the northern half of the sheet. Some ranges up to 5 miles were observed on the northern half of the sheet. More care should be taken while observing the azimuth angle over long distances. Also the launch was lost from view because ^A topographical features along the coastline.

c) The shoreline sounding lines displayed some interpolated soundings that did not meet the position accuracy of 1.5mm. The position soundings at the shoreline end of the sounding lines were held as accurate. Approximately 30 interpolated shoreline soundings were deleted during the verification process. See QC Report, para 1.

d) The final field sheet submitted to CPM32 was not accurately plotted. (See Part B, Specific Standards, section 17, ^{para 3} page 1.4 of the Hydrographic Manual). The final field sheet displayed penciled notes pertaining to shoal soundings, disagreements in crossline soundings and guidance for adjustment of plotting the inshore position soundings. The field sheet should be plotted as accurately as possible before mailing to the Marine Center for processing. (See sections 4.5.16 and 4.6.7 of the Hydrographic Manual).

^{In some cases}
e) The sounding lines on H-9852 should have continued offshore to depths of 150 fathoms south of Latitude 18°55'30"; this would have developed the 100 fathoms curve for accurate display on H-9852. Because of the scale difference between H-9852 and H-9858 the 100 fathom curve could not be drawn accurately south of Latitude 18°55'30"N.

5. JUNCTIONS

The survey junctions with three contemporary surveys. To the northwest it joins H-9812 (1:10,000) 1979, to the southeast H-9853 (1:10,000) 1979 and offshore H-9858 (1:80,000) 1979. H-9852 could be junctioned with H-9812; this was in good agreement and inked accordingly. Junction soundings from H-9858 were transferred to H-9852 during preliminary sounding stage and were considered during inking of depth curves. Junction agreement between H-9852 and H-9858 were considered fair. This can be contributed to facts stated in Section J of the ships report. H-9853 is in preliminary processing stages and junction note and curves were left in pencil. Surveys H-9853 and H-9858 were not available at the time of quality evaluation. Their junctional adequacy will be considered at the time of their respective evaluations.

6. COMPARISON WITH PRIOR SURVEYS

H-4655a (1927) scale 1:250,000, is the only existing prior survey from this area. H-4655a is a reconnaissance survey consisting of a track-line along the coast with ^{no} ~~only~~ soundings common to this survey area. Due to the prior survey scale of 1:250,000 a tabulated sheet comparison is listed below:

Latitude	Longitude	(H-4655a)	(H-9852)
18°55'10"N	155°41'25"W	* 14	81
18°57'25"N	155°43'55"W	* 30	plots off sheet limits (deleted from chart)
18°57'46"N	155°43'58"W	* 20	plots off sheet limits

H-9852 is adequate to supersede the prior survey soundings within the area of common hydrography.

These depths are from an ^{and unascertainable} ~~uncertainable~~ source prior to H-4655a (1927), probably from the Hawaiian Exploration of 1902, Sp. 9672. There were no presurvey review items pertaining to this survey.

7. COMPARISON WITH CHART

a. Hydrography

Chart comparison was made with Chart 19320, 12th Edition, June 17, 1978. The charted soundings originate with the previously discussed prior survey. The source of the three charted rocks awash and five charted submerged rocks was not determined during verification. See tabulated comparison below: ^{information.} ~~Sunken rocks originate very possibly with the Hawaiian Exploration of 1902. Rocks awash from T-3442 (1914). Chart present survey~~

Latitude	Longitude	Chart 19320	(H-9852)
18°58'20"N	155°44'36"W	+	6
18°58'00"N 57'59"	155°43'28"W 29"	* -T-3442 (1914)	8 Rock awash, see Des. of Search #1
18°57'35"N	155°43'03"W	+	64 55 Chart 4 RK in vicinity
18°57'20"N 12"	155°42'30"W	T-3442 (1914) *	plots above high water line plots on ledge
18°57'08"N 01"	155°42'35"W	+	48 28 Dived on - See Description of Search #2
18°56'38"N 51"	155°42'29"W	+	52 32 " " " " " " #3
18°56'28"N 51"	155°42'14"W	+	51 11 " " " " " " #4
18°56'59"N 57"	155°41'58"W	T-3442 (1914) *	plots above high water line on ledge

The four detached dive investigations are plotted on the smooth sheet from the Description of Search forms attached to the ships descriptive report. The four detached positions were entered on day 277 under Launch 2125 information and numbered 1 through 4. Because of the scale difference between the chart and the present survey a series of development lines should have been run to disprove the charted rocks.

Sources of the unidentified rocks tabulated above should be researched and if valid, retained. However, from the charted information compared to during verification it is recommended that the present survey supersede the chart over the areas of common coverage.

^{Chart the present survey information.}

b. Controlling Depths

There are no controlling depths charted in the location of this survey.

c. Aids to Navigation

Ka Lae Light LLNR 3683 is located in the survey area. A field ^{Form} 76-80 was submitted in the ships report for Ka Lae Light and North Telemetry Boresight Pole.

The position of Ka Lae Light was entered in the verified survey data file at FMC using the 1978 position.

See description of stations and geographic positions for Ka Lae Light 1978 and North Telemetry Boresight Pole, 1964 attached to the verifier's report.

Ka Lae Light adequately marks the features intended.

8. ~~COMPARISON~~^{COMPLIANCE} WITH PROJECT INSTRUCTIONS

This survey complies with Project Instructions OPR-T126-RA-79 Hawaii, Hawaiian Islands, dated July 20, 1979 and Change No. 1, Amendment to Instructions, dated August 2, 1979; and Change No. 2, Supplement to Instructions, dated August 6, 1979; Change No. 3, Amendment to Instruction, dated August 21, 1979; and Change No. 4, Amendment to Instruction dated October 3, 1979.

9. ADDITIONAL FIELD WORK

No additional field work is required for the area covered by the survey.

Respectfully submitted,

Russ Davies

Russ Davies
Cartographic Technician
17 October 1980

Examined and approved,

James S. Green

James S. Green
Chief, Verification Branch



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102

November 14, 1980

OA/CPM3/JWC

TO: OA/CPM - Charles K. Townsend *[Signature]*

FROM: OA/CPM3 - John W. Carpenter *[Signature]*

SUBJECT: PMC Hydrographic Inspection Team Report for Survey H-9852

This survey is a basic hydrographic survey of Ka Lae to ~~Por~~ Kaimuuwala, Island of Hawaii, Hawaii. This survey was conducted by NOAA Ship RAINIER in 1979 in accordance with Project Instructions OPR-T126-RA-79 dated July 20, 1979.

The following items were noted:

1. The distance between bottom samples did not fully comply with the Hydrographic Manual (Section 1.6.3) requirement for 6 cm maximum spacing for inshore surveys. Also, only one sample was taken outside of the 50 fathom curve which placed too much emphasis on samples next to the beach. If conditions or the situation in the survey area makes compliance unwise or impractical, the reasons should be addressed in the Descriptive Report.

2. Controlling the entire survey utilizing range azimuth control from stations only at the southern end of the survey sheet probably was the expeditious and practical way of accomplishing the survey but it did stretch the survey control to the limit, especially on the inshore end of some of the sounding lines. Further guidelines on the use of range azimuth control need to be promulgated.

3. The sounding interval on a good portion of the survey was generally too close; the 4mm to 6mm interval (Section 1.4.6 of the Hydrographic Manual) needs to be observed to enhance reproduction and visual analysis of the survey sheet.

4. The use of divers to investigate some of the charted symbols enhanced the survey; however, there is a general need for better documentation of the dives especially as to the specific boundaries of the search area.

The inspection team finds H-9852 to be a basic survey adequate to

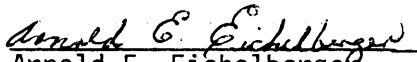


supersede common areas of prior surveys and charted hydrography. Administrative approval is recommended.


John W. Carpenter


James M. Wintermyre

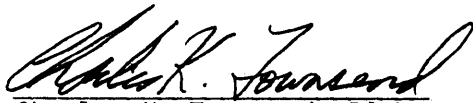

James W. Steensland


Arnold E. Eichelberger

ADMINISTRATIVE APPROVAL

H-9852

The smooth sheet and reports of this survey have been examined and the survey is adequate for charting and to supersede common areas of prior surveys.


Charles K. Townsend, RADM

17 Nov 1980
Date



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

OA/C352:RWD

January 30, 1981

TO: Glen R. Schaefer
Chief, Hydrographic Surveys Division

THRU: Chief, Quality Control Branch *gm*

FROM: R. W. DerKazarian *R.W. DerKazarian*
Quality Evaluator

SUBJECT: Quality Control Report for H-9852 (1979), Hawaii, Island of
Hawaii, Ka Lae to Kaimuuwala

A quality control inspection of H-9852 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, shoreline transfer, decisions and actions taken by the verifier, and the cartographic presentation of data. Revisions and additions to the smooth sheet, plus helpful comments made to the verifier, are identified on a one-half scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to the National Ocean Survey's standards and requirements except as stated in the Verifier's Report, the HIT Report, and as follows:

1. The following supersedes paragraph 4.c of the Verifier's Report:

Several soundings were plotted using time and course between known field positions. These soundings were positioned using range-azimuth control in the field and in some instances were not ideally controlled as described in section 4.b of the Verifier's Report.

The soundings deleted during verification were reentered into the records and smooth plotted during quality evaluation. These soundings are in general agreement with well-controlled soundings nearby.

2. The Descriptive Report is clearly written and fully describes the conditions under which the field work was done.

3. The following supplements paragraph 6 of the Verifier's Report:

The present survey falls within the common area of this prior survey. The three rocks awash (charted) from this prior survey have been verified by



the present survey. See Description of Search Position 1; and the Verifier's Report, paragraph 7.a.

The 273-foot elevation charted in approximate latitude $18^{\circ}57'55''\text{N}$, longitude $155^{\circ}43'15''\text{W}$ was revised on this prior topographic survey to 260 feet. The present chart should be revised accordingly.

cc:
OA/C351



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

SEP 16 1981

OA/C351:DJH

TO: OA/CPM - Charles K. Townsend

FROM:  OA/C3 - Roger F. Lanier

SUBJECT: H-9852 (1979), OPR-T126, Hawaii, Island of Hawaii, Ka Lae to
Kaimuwala, Report of Compliance with Project Instructions

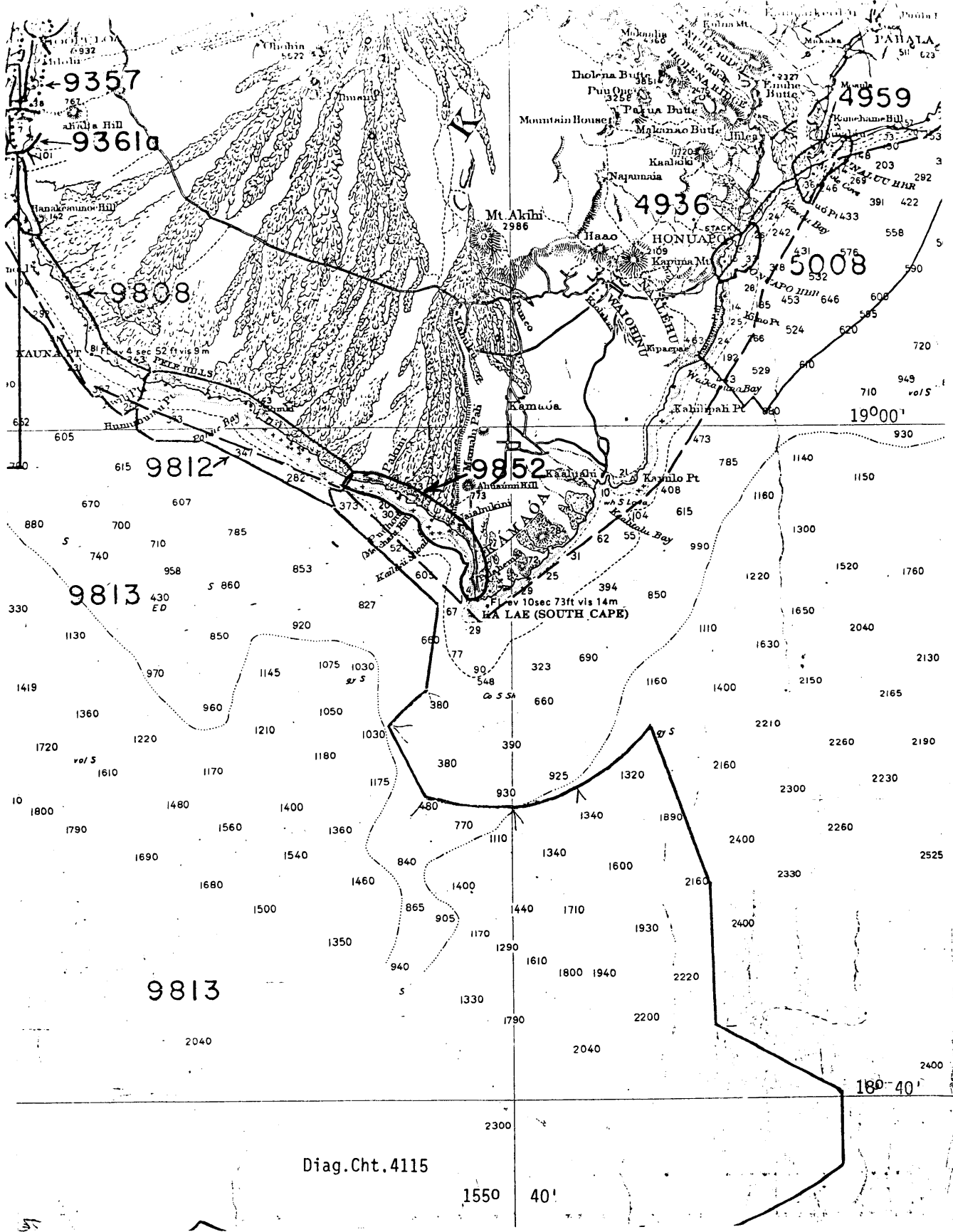
The smooth sheet and Descriptive Report for the subject survey have been examined. This survey, except as noted in the Quality Control Report, dated January 30, 1981 (copy attached), and the Hydrographic Survey Inspection Team Report, dated November 14, 1980, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-T126-RA-79, dated July 20, 1979.

Attachment

cc:
OA/C352 w/o att.



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