

9909

Diagram No. 4115-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. FA-20-5-80
Office No. H-9909

LOCALITY

State Hawaii
General Locality Island of Hawaii
Locality Hilo Bay to Haena

1980

CHIEF OF PARTY
CAPT. A.J. Patrick

LIBRARY & ARCHIVES

DATE Febraury 22, 1984

☆U.S. GOV. PRINTING OFFICE: 1980-766-230

9909

AREA 6
CHTS
19320
19004
19007
19010
540

to sign off see
Record of Application

HYDROGRAPHIC TITLE SHEET

H-9909

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.

FA-20-5-80

State Hawaii

General locality Island of Hawaii

Locality Hilo Bay to Haena

Scale 1:20,000

Date of survey Oct. 2 - Nov. 17, 1980

Aug. 4, 1980; Chg. 1 Aug. 8, 1980; Chg. 2

Instructions dated Aug. 15, 1980; Chg. 3 Sept. 9, 1980; Chg. 4 Nov. 28, 1980

Project No. OPR-T126-RA/FA-80

Vessel NOAA Ship FAIRWEATHER (2020) Launches 2023, 2024 and 2025

Chief of party CAPT A. J. Patrick

LCDR D. Boutle, Royal Navy; LT D. Hennick; LT T. Baxter;

Surveyed by LTJG C. Hancock; CST E. Krick

Ross Fineline Model 5000

Soundings taken by echo sounder, hand lead, pole Raytheon DSF-600 Raytheon-EDO-UGR

Graphic record scaled by Ship's Personnel

Graphic record checked by Ship's Personnel

Verified by

~~Checked~~ by M. G. Sanders

Automated plot by PMC Xynetics Plotter

Evaluation by

~~Checked~~ by K. M. Scott

Soundings in fathoms ~~XXXX~~ at ~~XXXX~~ MLLW

REMARKS: Revisions and marginal notes in black were made by the Evaluator.

NOAIS checked 3/19/92 JSJ

Appl to STDS 2-27-84 RST

KWW 2/14/92

PROGRESS SKETCH
 OPR-T126-FA-80
 NOAA SHIP FAIRWEATHER S-220
 HAWAII ISLAND, HAWAII
 CAPT. A. J. PATRICK, CMDG
 SCALE OF NOS CHART 19320
 -1980-

	SEPT	OCT	
LNM SOUNDING LINE	36	1031	
SQNM SOUNDING LINE	3	1237	
BOTTOM SAMPLE	0	92	
NANSEN CTD CAST	0	4	
LNM FIELD EDIT	20	20	



- △ STA. ESTABLISHED
- ⊙ STA. RECOVERED
- ⊖ TIDE GAGE
- ▣ NANSEN CTD CAST

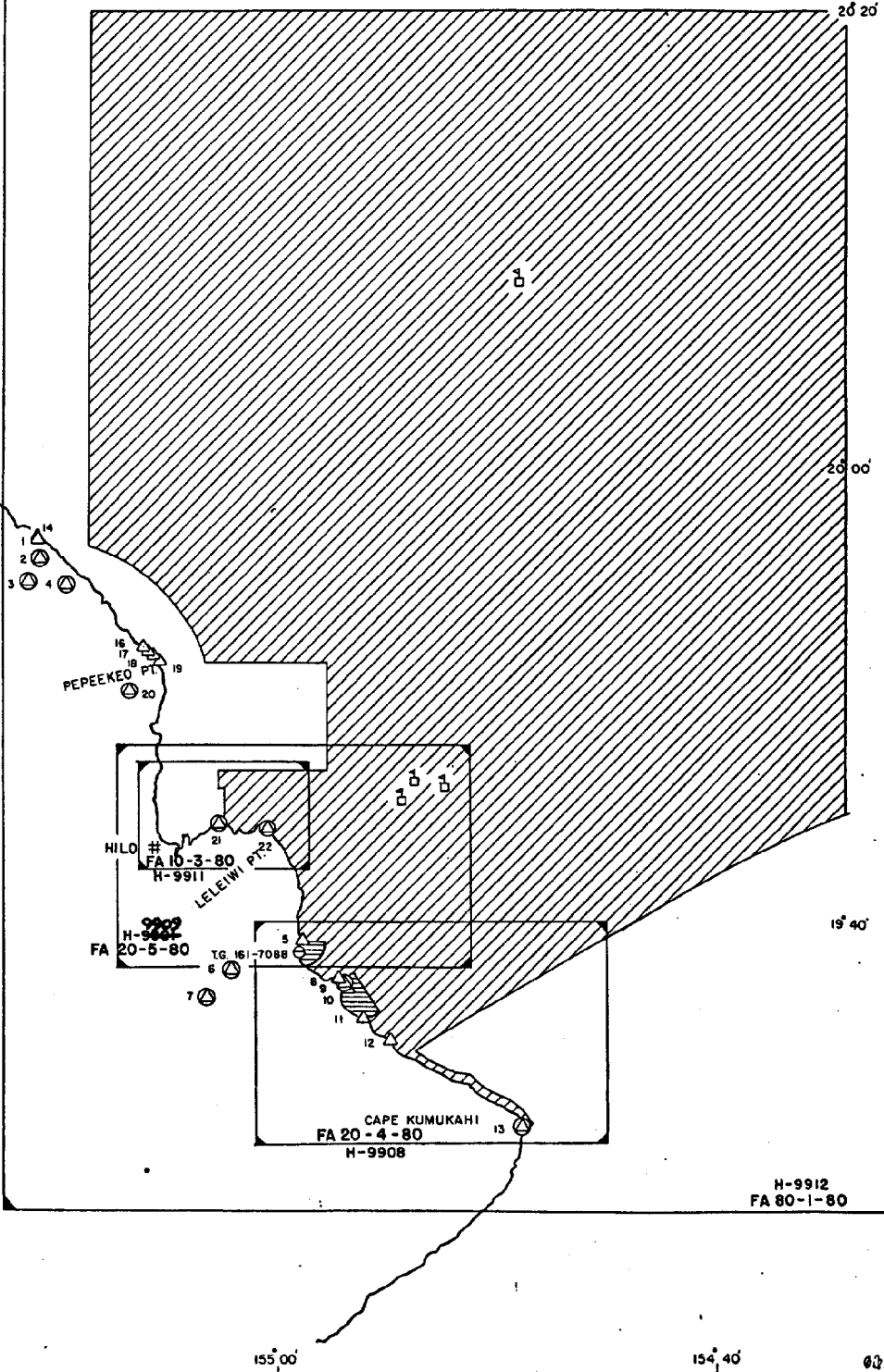
STATIONS
 RECOVERED & ESTABLISHED

SEPTEMBER

- 1 KAYDIST, 1980
- 2 HAIKU, 1877
- 3 COOK HGS, 1949
- 4 HONOHINA, 1877
- 5 WAHINII, 1980 M_R
- 6 OLAA STACK
- 7 KEAAU, 1949
- 8 KALOLI 2, 1949 - RM 3, 1980 M_R
- 9 KALOLI 2, 1949 M_R
- 10 KALOLI 2, 1949 - RM 4, 1980 M_R
- 11 POOL, 1980 M_R
- 12 OPIHI RK, 1980 M_R
- 13 CAPE KUMUKAHI LT.
- 14 KAYDIST RM 1, 1980 RAYDIST
- 15 KALOLI 2, 1949 - RM 5, 1980 RAYDIST

OCTOBER

- 16 KAHOLA, 1980
- 17 WAIEHU, 1980
- 18 HAIPO, 1980
- 19 LOEA, 1980
- 20 ALALA HGS, 1877 M_R
- 21 KEOKEA 2, 1951 M_R
- 22 LELEIWI USGS, 1912 M_R



DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY H-9909 (Field Number FA 20-5-80)

Scale 1:20,000
Year: 1980

NOAA Ship FAIRWEATHER
Commanding Officer: Commander Walter F. Forster

A. PROJECT

OPR-T126-RA,FA-80. Original project instructions were dated August 4, 1980. ✓
Dates of changes were:

Change No. 1, August 8, 1980 ✓
Change No. 2, August 15, 1980 ✓
Change No. 3, September 9, 1980 ✓
Change No. 4, November 28, 1980 ✓

There were no other supplemental instructions or amendments. The PMC OORDER, Hydrographic Manual and the Data Requirements Letter, dated April 11, 1979, ✓ are applicable.

B. AREA SURVEYED

This survey is along the coast of the "Big Island," generally east and south-east of the city of Hilo. Near its southern boundary at 19°39'N, the survey extends from the coastline out to the 180 fathom curve where it junctions with H-9912 (FA 80-1-80). ✓ To the north of 19°42.6'N, this survey extends ✓ from the 30 fathom curve where it junctions with H-9911 (FA 10-3-80), ✓ east to 154°57.6'W where it junctions with H-9912. The northern limit is 19°47'N where the survey junctions with H-9921 (FA 20-6-80). ✓

The area is characterized by rugged and undeveloped lava coastline and heavy surf on the rubble at the base of 30 foot cliffs. The coastline and bottom ✓ contours are more gentle in the northern areas.

Soundings were taken from J.D. 276 (October 2, 1980) to J.D. 322 (November 17, 1980). ✓ Support work in the project area extended from J.D. 259 (September 15, 1980) through J.D. 331 (November 26, 1980).

C. SOUNDING VESSELS

Soundings were taken by:

FAIRWEATHER 2020 ✓
FA-3 2023
FA-4 2024
FA-5 2025

See paragraph D below for a discussion of unusual fathometer configurations. ✓

No other unusual vessel configurations were used, nor were there any unusual problems. ✓

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Starting at J.D. 296, FA-4 (2024) was equipped with both a Ross fathometer and a Raytheon DSF-600 fathometer, as a test of the latter. After several days of trials, the Raytheon digitizer was input to the hydroplot/hydrolog system because it had a deeper range and digitized more reliably than the Ross at all depths.

See
Ver/Eval
Rpt
Sec. 1

The ship (2020) utilized the Raytheon-EDO-UGR fathometer for deep soundings, and a Ross system for shallow work (less than 200 fathoms) because the Ross has a narrower beam.

See
Ver/Eval
Rpt
Sec. 1

No depths were measured by means other than echo sounders. ✓

There were no faults in the equipment which affected the accuracy of sounding. ✓

TABLE I. SOUNDING EQUIPMENT BY VESSEL AND DATE

Vessel	Days	ROSS					RAYTHEON	
		Analog	Digitizer	Transceiver	Inverter	Model	DSF-600	UGR
2020	321/322	1054/172*	1036/203*	1048/317*	1103	FineLine 5000	-	Yes
2023	302	1054	1054	1047	1046	FineLine 5000	-	-
2024	276-282	1097	1047	1046	1054	FineLine 5000	No	-
2024	296-306	1097	1047	1046	1054	FineLine 5000	Yes	-
2025	321/322	1036	1046	1054	1053	FineLine 5000	-	-

*Ross System/UGR System

Velocity of sound was measured by Nansen casts, MarTek data, and bar checks. See the Corrections to Echo Soundings Report for details. TRA corrections were determined by comparing bar check data to velocity data.

Variations in instrument initial were watched for by launch personnel, and corrected immediately.

Phase checks were conducted at the beginning and end of each day by launch personnel, and sometimes at night by the ET Department.

Settlement and squat figures measured in January, 1980, were used for this project. They were determined by using a Zeiss level ashore and shooting to a leveling rod over the transducer on the launch. These correctors were less than 0.1 fathom for all vessel speeds used on this survey and were not applied.

The MarTek unit used was SN 395, calibrated by the Northwest Regional Calibration Center in September, 1979, and March, 1980.

The salinometer used for the Nansen casts was an Industrial Instruments RS-7B 28298, calibrated by Northwest Regional Calibration Center in April, 1980.

TABLE II. VELOCITY OF SOUND STATIONS

Date	Position	Nansen	MarTek
7 Oct 80	19°46'24"N 154°53'36"W	X	
16 Oct 80	20°08'00"N 154°49'00"W	X	
19 Nov 80	19°45'30"N 155°02'48"W (Outside Hilo Harbor)		X
19 Nov 80	19°44'28"N 155°05'45"W (Inside Hilo Harbor)		X
20 Nov 80	19°46'00"N 154°55'00"W	X	

E. HYDROGRAPHIC SHEETS

Field sheets were prepared aboard the FAIRWEATHER using Houston Instrument plotter SN 6166-22, a PDP 8/e computer, and program RK 201. There are no irregularities.

Field records will be sent to PMC for verification and smooth plotting.

In addition to one 1:20,000 scale survey sheet covering the entire survey area, one 1:5,000 scale development sheet was prepared to show the area of dense soundings around the offshore rocks at 19°39'55"N, 154°58'45"W.

F. CONTROL STATIONS

Control stations on this survey are:

Wahini# 1980	S/N 206	3rd Order Class I
Wahini# 1980 RM1	S/N 207	3rd Order Class I
Lelewi 1912	S/N 211	Established Station

No unconventional survey methods were used.

There are no anomalies in adjustment or in closures and ties.

There are no known photogrammetric problems.

See item G following this report for control stations that were used for this survey, but are not within the limits of this survey.

G. HYDROGRAPHIC POSITION CONTROL

Sounding lines were controlled by R/R and R/Az Motorola Mini-Ranger, and R/Az Teledyne-Hastings Raydist.

There were no known difficulties which degraded accuracy.

Mini-Rangers were calibrated on base lines in the Hilo Harbor. System checks were made before and after each day's surveying when weather conditions allowed. Methods used were visual fixes, theodolite cuts, or dynamic checks performed by running on range and using preset sextant angles. Raydist systems were calibrated at the beginning and end of each day by three Mini-Ranger rates, sextant fixes, or theodolite cuts. See the Electronic Control Report, OPR-T126-FA-80, for details.

Calibration data is adequate throughout the survey area.

There were no unusual methods of calibration.

The correctors for Mini-Ranger console 701 changed abruptly during a bench check on October 23, 1980 (J.D. 297). Because the system checks confirmed the BLC data until this date, the sounding data were retained. The correctors remained stable after this date. The cause of the change is unknown. See the Electronic Control Report for details.

There were no unusual atmospheric conditions.

There were no problems with weak signal strength or geometric configurations.

There were no systematic errors in the data.

TABLE III. RAYDIST EQUIPMENT USED ON VESSELS

Vessel	Mobile Transmitter	Navigator	Navigation Interface	Strip Chart Recorder
2023	28	18	20	11692 ✓
2024	90	16	09	03171

The Raydist shore station was Kaloli 2 1949, RM 5 1980, SN 100, frequency 3300.40 KHz, Pattern I, Red. ✓

TABLE IV. MOTOROLA MINI-RANGER III EQUIPMENT USED

Vessel	Console RT Unit	Shore Station	Transponder	Julian Days
2020 (Ship)	703	L 207 R 211	704 702	321/322
2024 (FA-4)	701	L 211 R 212	702 701	296/297
2024 (FA-4)	703	L 211 R 212	702 701	298
2024 (FA-4)	703	L 211 R 212	701 704	303 ✓
2024 (FA-4)	703	L 210 R 212	702 704	304/305
2024 (FA-4)	703	L 210 R 212	702 704	306/307
2024 (FA-4)	703	211	701	306/307
2025 (FA-5)	702	L 110 R 207	702 701	278/279
2025 (FA-5)	701	211	702	321/322

H. SHORELINE

Shoreline was drawn from TP-00070. The shoreline details were field edited on the entire sheet; corrections have been transferred to the field sheet. Revisions to the map are plotted in red on the field sheet. They consist entirely of rocks, ledges, and foul areas in the surf zone near the coast. ✓

See Ver/Eval Report Sec. 2

There were no discrepancies between photogrammetric and hydrographic positions. ✓

There are no control stations seaward of the shoreline. ✓

The zero fathom curve could not be developed by the hydrographer due to heavy surf conditions. All sounding lines were broken just outside the surf line. ✓

I. CROSSLINES

Crosslines consisted on 14.7 percent of the soundings. The same vessels and sounding equipment were used for crosslines and mainscheme hydro. ✓

Crosslines agreed well with mainscheme soundings except in four cases, where rough or steep bottom and large swells made disagreement likely. Therefore, they are not considered discrepancies. They are shown in the following table. ✓

TABLE V. CROSSLINE/MAINScheme DISAGREEMENTS

<u>XL Depth</u>	<u>MS Depth</u>	<u>Position</u>	<u>Reason for Disagreement</u>
9.5 ✓	5.6 ✓ and 7.6 ✓	19°39.6'N ✓ 154°58.5'W ✓	Rough bottom
49 ✓	54 ✓	19°40.8'N ✓ 154°58.1'W ✓	Steep bottom
42 ✓	36 ✓ to 39 ✓	19°42.7'N ✓ 154°58.9'W ✓	Rough bottom ✓
48 ✓	41 ✓	19°43.3'N ✓ 154°59.4'W ✓	Steep bottom
109 & 126 ✓	93 ✓ & 120 ✓	19°42.7'N ✓ 154°58.5'W ✓	Steep bottom

J. JUNCTIONS

This survey junctions with four contemporary surveys, all of them done during this project. Inshore to the west is H-9911 (FA 10-3-80) ✓ which agrees well with this survey. Overlapping soundings on the two agree within one fathom without exception on the smooth bottom in the northwest, and fit the pattern of contours on the steep rugged bottom near the coast in the southern portion, where small differences in position cause large depth changes. ✓

This survey junctions to the north with H-9921 (FA 20-6-80) ✓. Only one crossline has soundings which are common to both sheets, and they agree within one fathom. Contours at the junction match perfectly. Three hundred sixty meter line spacing is maintained at the junction of these sheets. ✓

To the east, this survey junctions with H-9912 (FA 80-1-80) ✓. There are no discrepancies at this junction, although the bottom is steep. All soundings either agree with those adjacent to them or fit into the pattern of the contours. Coverage is complete. ✓

To the south, this survey junctions with H-9908 (FA 20-4-80) ✓. There are no discrepancies, although the area has complex contours. Coverage is complete. ✓

K. COMPARISON WITH PRIOR SURVEYS

Prior survey H-2461, 1:40,000 scale, dated 1900, covers a portion of the northern part of this survey. All of the soundings on H-2461 are shoaler than the current depths. The range of error is from 5 fathoms in the area of 30 fathom depths near 19°46.1'N, 155°02.0'W, to 70 fathom errors in the region of 170 fathom depths near 19°46.0'N, 154°58.7'W. It is as if all the prior survey soundings should be shifted to the west.

There were no presurvey review items in this survey.

There are no non-NOS surveys in this area.

L. COMPARISON WITH CHART

This entire survey is located on NOS chart 19320, 12th edition, dated June 17, 1978, the only current chart of the area. It was blown up to 1:20,000 scale for comparisons.

All of the charted information is accurate with the following exceptions.

The depth contours and shoreline should be redrawn over the entire area and the stippled area at 19°39'N, 154°58.8'W, should be removed. The contours in the northern part of the stippled area extend further offshore and are quite irregular compared to the rest of the coastline, but the few hazards can be more accurately depicted as individual features or soundings.

The two coral bottom descriptions on the chart at 19°46.6'N, 155°02.0'W, and 19°46.0'N, 155°01.0'W, should be removed. No indication of a hard bottom was found there.

The area of the bare rock symbol near 19°39.9'N, 154°58.8'W, was developed and plotted at 1:5000. The rock is in fact awash, and should be recharted as a small reef centered at 19°39'55"N, 154°58'43"W. If a larger scale chart is printed, the following features in the area should also be added:

<u>Feature</u>	<u>Depth</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Position No.</u>
Coral head	1.7 fm	19°39'53"N	154°58'48"W	4071
Submerged rock		19°39'55"N	154°58.45"W	4078
Submerged rock	1.9 fm	19°39'57"N	154°58'35"W	4412

The submerged rock charted 0.3 miles offshore at 19°39.3'N, 154°58.6'W is in an area of irregular bottom, but the least depths found in the vicinity were 4 to 6 fathoms and 300 to 400 meters from the charted position.

TABLE VI. COMPARISON OF ERRONEOUS CHARTED SOUNDINGS WITH THIS SURVEY

<u>Position</u>	<u>Charted Sounding</u>	<u>Correct Sounding</u>
19°46.2'N, 155°00.4'W ✓	60 ✓	125 ✓
19°46.4'N, 154°57.7'W ✓	180 ✓	209 ✓
19°46.8'N, 154°58.9'W ✓	169 ✓	178 ✓
19°46.8'N, 155°00.3'W ✓	102 ✓	162 ✓
19°46.1'N, 154°58.7'W ✓	102 ✓	173 ✓
19°45.9'N, 154°58.0'W ✓	187 ✓	201 ✓
19°45.6'N, 155°00.6'W ✓	47 ✓	59 ✓
19°45.4'N, 154°59.9'W ✓	47 ✓	56 ✓
19°44.3'N, 154°59.4'W ✓	53 ✓	59 ✓
19°45.3'N, 154°59.2'W ✓	58 ✓	61 ✓
19°43.5'N, 154°58.8'W ✓	53 ✓	59 ✓
19°42.3'N, 154°58.2'W ✓	58 ✓	180 ✓
19°41.3'N, 154°57.7'W ✓	65 ✓	196 ✓

There are no PA, ED, or PD notes in the area of this survey. ✓

No uncharted hazards were found. ✓

The proposed new chart coverage of the area will be adequate. Soundings lines in the area of the new Hilo Bay chart were 400 meters maximum spacing as directed by the project instructions. ✓

M. ADEQUACY OF SURVEY

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

N. AIDS TO NAVIGATION

There are no aids to navigation in the area of the survey. There is no need for shipping to go near the rock at 19°39.9'N, 154°58.6'W, so no aids are recommended. ✓

There are no bridges, cables, pipelines, or ferry routes in the area. ✓

O. STATISTICS

TABLE VII

<u>Vessel</u>	<u>Positions</u>	<u>Nautical Miles of Hydro</u>	<u>Square Miles of Hydro</u>	<u>Bottom Samples</u>
2020	76 ✓	21 ✓	2 ✓	-
2023	6 ✓	0.3 ✓	0 ✓	-
2024	584 ✓	126.5 ✓	17 ✓	- ✓
2025	<u>47</u> ✓	<u>2</u> ✓	<u>0</u> ✓	<u>30</u> ✓
TOTAL	713 ✓	149.8 ✓	19 ✓	30 ✓

The oceanographic stations for sound velocity determinations for this project were not conducted within the boundaries of this survey. Three Nansen and two MarTek casts were made for sound velocity determinations in the project area.

One tide gage at Shipman Ranch (See Tide Note attached) was installed for this survey. The gage in Hilo Harbor also applies to this survey.

P. MISCELLANEOUS

This survey was routine; all features detected are evident on the final field sheet or the enlargement of development A.

Q. RECOMMENDATIONS

See section L.

R. AUTOMATED DATA PROCESSING

All data acquisition and processing methods conform to NOS standards. The computer programs used during this survey are presented in Table VIII.

TABLE VIII. COMPUTER PROGRAMS UTILIZED

<u>Number</u>	<u>Description</u>	<u>Version</u>
RK 111	R/R Real Time Plot	01/30/76
FA 181	On Line R/Az Logger	02/23/80
RK 201	Grid, Signal, and Lattice Plot	04/18/75
RK 211	R/R Non-Real Time Plot	01/30/76 ✓
RK 212	Visual Station Load and Plot	04/01/74
RK 214	R/V Non-Real Time Plot	10/07/80
RK 216	R/Az Non-Real Time Plot	02/05/78
RK 300	Utility Package	02/01/76

Number	Description	Version
RK 330	Data Reformat and Check	05/04/76
PM 360	Electronic Corrector Abstract	02/02/76
AM 500	Predicted Tide Generator	11/10/72
RK 530	Layer Corrections for Velocity	05/10/76
RK 561	Geodetic Calibration	02/19/75
AM 602	Elinore	05/21/75

S. REFERRAL TO REPORTS

The following reports pertain to this survey:

- OPR-T126-FA-80 Horizontal Control Report
- OPR-T126-FA-80 Electronic Control Report
- OPR-T126-FA-80 Field Edit Reports
- OPR-T126-FA-80 Corrections to Echo Soundings Report
- OPR-T126-FA-80 Geographic Names Report
- OPR-T126-FA-80 Coast Pilot Report
- OPR-T126-FA-80 Tide Station Reports for Shipman Ranch and Hilo

Special Report on Performance of Raytheon DSF-600 Fathometer, dated November 24, 1980

FIELD TIDE NOTE

OPR-T126-FA-80

Field tide reduction of soundings was based on predicted tides from Honolulu, Hawaii, corrected to Hilo, Hawaii, and were interpolated by PDP 8/E computer utilizing AM500. All times of both predicted and recorded tides are GMT.

Two tide gages were utilized for this project.

<u>SITE</u>	<u>LOCATION</u>	<u>PERIOD</u>
Hilo, #161-7760 (ETG)	19°44'00"N 155°03'31"W	Permanent Secondary Gage
Shipman Ranch, #161-7088 (ADR)	19°38'50"N 154°59'06"W	63 day 16 Sep-17 Nov 1980

HILO

This gage was leveled by RAINIER personnel on September 5 and November 25, 1980 (see Field Tide Note OPR-T126-RA-80). FAIRWEATHER personnel met with the tide observer on September 19 to insure that he contact the ship immediately if the gage should malfunction. Personnel from the Pacific Tide Party visited the Hilo Gage on November 2-5. Leveling and routine maintenance was performed.

SHIPMAN RANCH

Five bench marks were set on 15 September 1980. On 16 September, the tide staff, floatwell and gage were installed. Levels were run to the staff and the gage was started at 234800 GMT. One hour later, it was discovered that the gage had double punched. It was then restarted at 004800 GMT, 17 September. Sometime between the next observation at 223603 GMT, 17 September, and 191815 GMT, 19 September, the gage lost 2 hours 5 minutes 45 seconds. The gage was still punching on the correct six-minute intervals and there is no place on the tape that indicates that the punch had jammed or stopped. The gage was restarted at 192405 GMT, 19 September. The following day at 184810 GMT, 20 September, the gage was again found to be slow by 4 hours 42 minutes 10 seconds. Again, there are no double punches or indications of a jammed punch and it was still punching nearly exactly on the proper six-minute increments. (No hydrography or field edit was conducted during these periods.) The tape was cut at this point. A new motor and punch block were installed; the advance pawl was adjusted and various moving parts were lubricated. The gage was restarted at 201800 GMT, 20 September. The gage ran well throughout the remainder of the installation. The gage was stopped at 190630 GMT, 26 September, at which time the intake on the floatwell was changed from 3/8" diameter to 3/16" diameter in order to improve damping of the swell. The gage was restarted at 200000 GMT, 26 September. The height of the floatwell changed slightly; so two separate average gage-staff differences should be used for the observation prior to the orifice change and for those

following this change. Field edit, but no hydrography, was conducted during this down time. Correctors will have to be interpolated for this period.

The mean gage-staff differences were:

7.08 feet 234800, JD 260 - 190630, JD 270

6.92 feet 200000, JD 270 - 184338, JD 322

Leveling to the staff was performed on 16 September and 17 November 1980. The elevations determined compared very closely between the two runs with a maximum discrepancy of .004 m.

ZONING

Data collected by the Hilo tide gage (#161-7760) will be used in determining correctors for all of the surveys and field edit T-sheets: H-9908, H-9909, H-9911, H-9912, H-9920, H-9921, TP-00822, TP-00070, T-13261, and TP-00069.

Data collected by the Shipman Ranch tide gage (#161-7088) will be used in determining correctors for the following surveys and field edit T-sheets: H-9908, H-9909, H-9912, H-9911 (as far west as 155°01.0'W), H-9921 (as far west as 155°01.0'W), TP-00822, TP-00070 (as far west as 155°01.0'W).

GEOGRAPHIC NAMES

H-9909

Name on Survey	<div style="display: flex; justify-content: space-between;"> A ON CHART NO. 19320 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 RANDOMLY ATLAS H U.S. LIGHT LIST </div>										
	ANAPUKA			X	X	X					X
HAENA	X		X	X						X	2
HAWAII (island)	X		X	X						X	3
HILO BAY	X		X	X						X	4
KAHULUI			X	X	X					X	5
HAWAII (title)	X		X	X						X	6
LELEIWI POINT	X		X	X	X					X	7
PAPAI	X		X	X	X					X	8
PAPUAA (bay)			X	X	X					X	9
PAUKUPAHU			X	X						X	10
WAHINE MAKA NUI			X	X	X					X	11
											12
											13
											14
											15
											16
											17
											18
									Approved:		19
											20
									<i>Charles E. Harrington</i>		21
									Chief Geographer - N/CG 2x5		22
									18 May 1983		23
											24
											25

D. Corrections to Echo Soundings

001 TC/TI TAPE PRINTOUT FOR VESSEL 2020, HAWAII 1980 SURVEYS
002 031501 0 0022 0001 290 202000 000000
003 235959 0 0022 0001 322 202000 000000

001 TC/TI TAPE PRINTOUT FOR VESSEL 2023, HAWAII 1980 SURVEYS
002 213231 0 0003 0002 275 202300 000000
003 235959 0 0003 0002 320 202300 000000 ✓

001 TC/TI TAPE PRINTOUT FOR VESSEL 2024, HAWAII 1980 SURVEYS
002 215015 0 0003 0003 273 202400 000000
003 235959 0 0003 0003 320 202400 000000 ✓

001 TC/TI TAPE PRINTOUT FOR VESSEL 2025, HAWAII 1980 SURVEYS
002 190600 0 0003 0004 277 202500 000000
003 235959 0 0003 0004 322 202500 000000 ✓

001 VELOCITY CORRECTOR TAPE LISTING FOR VESSEL 2020
002 HAWAII 1980 SURVEYS
003 000178 0 0010 0001 001 202000 000000 ✓
004 000197 0 0011
005 000243 0 0015
006 000326 0 0020
007 000419 0 0025
008 000515 0 0030
009 000610 0 0035
010 000710 0 0040
011 000821 0 0045
012 000930 0 0050
013 001027 0 0055
014 001133 0 0060
015 001255 0 0065
016 001396 0 0070
017 001635 0 0075
018 001925 0 0080
019 002200 0 0085
020 002500 0 0090
021 002825 0 0095
022 003200 0 0100
023 003550 0 0105
024 003900 0 0110
025 004265 0 0115
026 004625 0 0120
027 004975 0 0125
028 005325 0 0130
029 005625 0 0135
030 005850 0 0140
031 006575 0 0150
032 007150 0 0160
033 007525 0 0170
034 007825 0 0180
035 008075 0 0190
036 008400 0 0200
037 008825 0 0210
038 009325 0 0220
039 009850 0 0230
040 011550 0 0280
041 014000 0 0330
042 015800 0 0380
043 017300 0 0430
044 018750 0 0480
045 020100 0 0530
046 021400 0 0580
047 022550 0 0630
048 023650 0 0680
049 024700 0 0730
050 025700 0 0780
051 026600 0 0830
052 027400 0 0880
053 028250 0 0930
054 029000 0 0980
055 029850 0 1030
056 030700 0 1080

001 VELOCITY CORRECTOR TAPE LISTING FOR VESSEL 2023
002 HAWAII 1980 SURVEYS
003 000012 1 0002 0002 001 202300 000000
004 000015 1 0001
005 000018 0 0000
006 000035 0 0001
007 000065 0 0002
008 000075 0 0003
009 000080 0 0004
010 000085 0 0005
011 000101 0 0006
012 000120 0 0007
013 000140 0 0008
014 000158 0 0009
015 000178 0 0010
016 000197 0 0011
017 000243 0 0015
018 000326 0 0020
019 000419 0 0025
020 000515 0 0030
021 000610 0 0035
022 000710 0 0040
023 000821 0 0045
024 000930 0 0050
025 001027 0 0055
026 001133 0 0060
027 001255 0 0065
028 001396 0 0070
029 001635 0 0075
030 001925 0 0080
031 002200 0 0085
032 002500 0 0090
033 002825 0 0095
034 003200 0 0100
035 003550 0 0105
036 003900 0 0110
037 004265 0 0115
038 004625 0 0120
039 004975 0 0125
040 005325 0 0130
041 005625 0 0135

042 005850 0 0140
043 006575 0 0150
044 007150 0 0160
045 007525 0 0170
046 007825 0 0180
047 008075 0 0190
048 008400 0 0200
049 008825 0 0210
050 009325 0 0220
051 009850 0 0230
052 011550 0 0280
053 014000 0 0330
054 015800 0 0380
055 017300 0 0430
056 018750 0 0480
057 020100 0 0530
058 021400 0 0580
059 022550 0 0630
060 023650 0 0680
061 024700 0 0730
062 025700 0 0780
063 026600 0 0830
064 027400 0 0880
065 028250 0 0930
066 029000 0 0980
067 029850 0 1030
068 030700 0 1080

001 VELOCITY CORRECTOR TAPE LISTING FOR VESSEL 2024
002 HAWAII SURVEYS 1980
003 000015 0 0000 0003 001 202400 000000 ✓
004 000035 0 0001
005 000045 0 0002
006 000065 0 0003
007 000075 0 0004
008 000085 0 0005
009 000101 0 0006
010 000120 0 0007
011 000140 0 0008
012 000158 0 0009
013 000178 0 0010
014 000197 0 0011
015 000243 0 0015
016 000326 0 0020
017 000419 0 0025
018 000515 0 0030
019 000610 0 0035
020 000710 0 0040
021 000821 0 0045
022 000930 0 0050
023 001027 0 0055
024 001133 0 0060
025 001255 0 0065
026 001396 0 0070
027 001635 0 0075
028 001925 0 0080
029 002200 0 0085
030 002500 0 0090
031 002825 0 0095
032 003200 0 0100
033 003550 0 0105
034 003900 0 0110
035 004265 0 0115
036 004625 0 0120
037 004975 0 0125
038 005325 0 0130
039 005625 0 0135
040 005850 0 0140

041 006575 0 0150
042 007150 0 0160
043 007525 0 0170
044 007825 0 0180
045 008075 0 0190
046 008400 0 0200
047 008825 0 0210
048 009325 0 0220
049 009850 0 0230
050 011550 0 0280
051 014000 0 0330
052 015800 0 0380
053 017300 0 0430
054 018750 0 0480
055 020100 0 0530
056 021400 0 0580
057 022550 0 0630
058 023650 0 0680
059 024700 0 0730
060 025700 0 0780
061 026600 0 0830
062 027400 0 0880
063 028250 0 0930
064 029000 0 0980
065 029850 0 1030
066 030700 0 1080

001 VELOCITY CORRECTOR TAPE LISTING FOR VESSEL 2025

002 HAWAII 1980 SURVEYS

003 000015 0 0000 0004 001 202500 000000

004 000035 0 0001

005 000045 0 0002

006 000075 0 0003

007 000080 0 0004

008 000085 0 0005

009 000101 0 0006

010 000120 0 0007

011 000140 0 0008

012 000158 0 0009

013 000178 0 0010

014 000197 0 0011

015 000243 0 0015

016 000326 0 0020

017 000419 0 0025

018 000515 0 0030

019 000610 0 0035

020 000710 0 0040

021 000821 0 0045

022 000930 0 0050

023 001027 0 0055

024 001133 0 0060

025 001255 0 0065

026 001396 0 0070

027 001635 0 0075

028 001925 0 0080

029 002200 0 0085

030 002500 0 0090

031 002825 0 0095

032 003200 0 0100

033 003550 0 0105

034 003900 0 0110

035 004265 0 0115

036 004625 0 0120

037 004975 0 0125

038 005325 0 0130

039 005625 0 0135

040 005850 0 0140

041 006575 0 0150

042	007150	0	0160
043	007525	0	0170
044	007825	0	0180
045	008075	0	0190
046	008400	0	0200
047	008825	0	0210
048	009325	0	0220
049	009850	0	0230
050	011550	0	0280
051	014000	0	0330
052	015800	0	0380
053	017300	0	0430
054	018750	0	0480
055	020100	0	0530
056	021400	0	0580
057	022550	0	0630
058	023650	0	0680
059	024700	0	0730
060	025700	0	0780
061	026600	0	0830
062	027400	0	0880
063	028250	0	0930
064	029000	0	0980
065	029850	0	1030
066	030700	0	1080

E. Abstracts of corrections to Electronic Position Control.

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2020

SHEET : H-9909

R/R

FA-20-5-80

TIME	DAY	PATTERN 1	PATTERN 2
203646	321	-00003	+00002
000011	322	-00003	+00002 ✓

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2023

SHEET : H-9909

R/Az

FA-20-5-80

TIME	DAY	PATTERN 1	PATTERN 2
212302	302	+00011	
212302	999	+00000	✓

ELECTRONIC COPPECTOR ABSTRACT

VESSEL : 2024

R/R

SHEET : H-9909

FA-20-5-80

TIME	DAY	PATTERN 1	PATTERN 2
200206	296	-00024	+00003
000448	297	-00024	+00003
184258	298	+00003	-00001
203745	300	-00022	-00003
220009	304	+00002	-00003
000001	305	+00002	-00003
223210	326	+00002	-00003

R/A₂

224215	276	-00013	
225930		-00013	
000300	277	-00013	
201115		-00009	
000320	278	-00009	
185930	279	-00015	
000000	280	-00015	
220528	282	-00104	
231622		-00104	
000015	283	-00104	
000819		-00104	
225728	301	-00001	
000042	302	-00001	
015033		-00001	
235614	303	-00002	
000406	304	-00002	
235050	305	+00012	
000005	306	+00012	
000701	307	-00002	
005920		-00002	
012302	999	+00002	

ELECTRONIC CORRECTOR ABSTRACT

Bottom Samples

VESSEL : 2025

SHEET : H-9909

R/R

FA-20-5-80

TIME	DAY	PATTERN 1	PATTERN 2
225200	278	-00004	-00001
001000	279	-00004	-00001
002100		+00000	+00000

R/A₂

202700	321	-00019	
235959	999	+00000	
214400	321	-00019	
001829	322	-00019	
235959	999	+00000	

ELECTRONIC CORRECTOR ABSTRACT

R/VIS

VESSEL : 2025

SHEET : H-9909

TIME	DAY	PATTERN 1	PATTERN 2
190600	277	-00000	
230500	278	-00002	
191700	280	+00016	
232500	999	000000	

HAWAII ISLAND SIGNAL LISTING

001
 002
 003 KALOLI 2 1949, RM 5 1980 FAIRWEATHER 1980
 004 100 3 19 37 29359 154 56 57468 250 0007 330040
 005
~~006 KAYDIST RM 1 1980 FAIRWEATHER 1980~~
~~007 101 5 19 56 58839 155 10 50157 250 0072 330040~~
 008
~~009 FIX 1966 RAINIER 1980~~
~~010 102 0 19 31 09221 154 48 47412 250 0008 330040~~
 011
 012 KALOLI 2 1949, RM 5 1980 FAIRWEATHER 1980
 013 110 4 19 37 29359 154 56 57468 250 0007 000000
 014
~~015 OPIHI ROCK 1980 FAIRWEATHER 1980~~
~~016 201 5 19 34 54763 154 54 52388 250 0007 000000~~
 017
~~018 POOL 1980 FAIRWEATHER 1980~~
~~019 202 5 19 35 53298 154 56 02403 250 0005 000000~~
 020
~~021 KALOLI 2 1949, RM 4 1980 FAIRWEATHER 1980~~
~~022 203 7 19 37 21659 154 56 53003 250 0010 000000~~
 023
 024 KALOLI 2 1949 QUAD 191544 QSN 1005
 025 204 5 19 37 29474 154 56 56479 250 0007 000000
 026
 027 KALOLI 2 1949, RM 3 1980 FAIRWEATHER 1980
 028 205 3 19 37 34361 154 57 02028 250 0007 000000
 029
 030 WAHINII 1980 FAIRWEATHER 1980
 031 206 0 19 39 2163¹ 154 58 5486² 250 0004 000000
 032
 033 WAHINII RM 1 1980 FAIRWEATHER 1980
 034 207 5 19 39 2141⁵ 154 58 552²⁸ 250 0004 000000
 035
 036 OLA'A SUGAR CO. STACK 1949 QUAD 191551 QSN 1125
 037 208 6 19 38 02656 155 02 01518 139 0000 000000
 038
~~039 CAPE KUMUKAHI LT 1949-1980 QUAD 191544 QSN 1002 RAINIER 1980~~
~~040 209 3 19 31 09628 154 48 49069 139 0000 000000~~
 041
 042 KEOKEA 2 1951 QUAD 191551 QSN 1092
 043 210 0 19 44 25398 155 02 42676 250 0003 000000
 044
 045 LELEIWI USGS, 1912 QUAD 191551 QSN 1104
 046 211 0 19 44 21840 155 00 22968 250 0006 000000
 047
 048 ALALA 1877 QUAD 191551 QSN 1007
 049 212 0 19 50 18781 155 06 42654 250 0231 000000

~~051 PEPEEKED PT LT 1949 QUAD 191551 QSN 1136~~
~~052 213 0 19 51 01041 155 05 07509 139 0045 000000~~
053
054 PAUKAA PT LT 1975 QUAD 191551
055 214 0 19 45 54912 155 05 33023 139 0000 000000
056
~~057 HILO HARBOR COMMISSIONERS WATER TANK 1951 QUAD 191551 QSN 1049~~
058 215 6 19 43 54526 155 03 26463 139 0060 000000
059
060 KAIWIKI NEW USGS, 1949 QUAD 191551 QSN 1077
061 216 0 19 45 32480 155 08 04161 250 0369 000000
062
063 HILO SUGAR CO STACK 1949 QUAD 191551 QSN 1066
064 217 3 19 44 27677 155 05 33837 139 0060 000000
065
066 COCOANUT PT LT 1976 QUAD 191551 QSN 1022
067 218 3 19 43 47770 155 05 20208 250 0010 000000
068 HILO HARBOR
069 BREAKWATER LT 1980 FAIRWEATHER 1980
~~070 219 6 19 44 45132 155 04 39926 243 0004 000000~~
071
072 PEPEEKED STACK 1980 FAIRWEATHER 1980
073 220 6 19 50 47192 155 05 19362 243 0010 000000
074
~~075 KOHOLA 1980 FAIRWEATHER 1980~~
076 221 4 19 52 16957 155 06 00462 250 0006 000000
077
078 WAIHEHU 1980 FAIRWEATHER 1980
079 222 4 19 52 03837 155 05 42689 250 0005 000000
080
081 HAIPO 1980 FAIRWEATHER 1980
082 223 4 19 51 55538 155 05 35558 250 0015 000000
083
084 LOEA 1980 FAIRWEATHER 1980
085 224 4 19 51 45245 155 05 27270 250 0008 000000
086
087 HONOHIINA 1877 QUAD 191551 QSN 1069
088 225 0 19 54 58197 155 09 34978 250 0215 000000
089
090 HAKALAU 1980 FAIRWEATHER 1980
091 226 0 19 54 12727 155 07 40960 250 0007 000000
092
093 KOHOLA RM2 1980 FAIRWEATHER 1980
094 227 0 19 52 17744 155 06 02220 250 0008 000000
095
096 NUDE (PHOTO) TP-00822
097 300 5 19 33 54366 154 53 31013 243 0006 000000
098
099 N SAND HILL (PHOTO) TP-00822
~~100 301 5 19 33 29235 154 52 43259 243 0014 000000~~

~~102 S SAND HILL (PHOTO) TP-00822
103 302 5 19 33 23545 154 52 31340 243 0014 000000
104
105 GUAVA (PHOTO) TP-00822
106 303 5 19 33 03677 154 51 51762 243 0006 000000
107
108 N MAK (PHOTO) TP-00822
109 304 5 19 32 56236 154 51 11321 243 0006 000000
110
111 ARCH (PHOTO) TP-00822
112 305 5 19 32 41646 154 50 50360 243 0003 000000
113
114 DUNE (PHOTO) TP-00822
115 306 5 19 32 30519 154 50 31184 243 0004 000000
116
117 KIPU (PHOTO) TP-00822
118 307 5 19 32 14715 154 49 40629 243 0010 000000
119
120 YELLOW N (PHOTO) TP-00822
121 308 5 19 32 00651 154 49 12906 243 0010 000000
122
123 YELLOW S (PHOTO) TP-00822
124 309 5 19 31 44553 154 48 50586 243 0010 000000
125
126 LAST (PHOTO) TP-00822
127 310 5 19 30 23007 154 48 53310 243 0004 000000~~

G. ABSTRACT OF POSITIONS

Julian Date	Position Numbers	Control	Stations		Remarks M/S, X/L, Devel, Bot Samp
			L	R	
<u>Vessel: 2020</u>					
321/322 ✓	1-76 ✓	R/R	207 ✓	211 ✓	MS & XL ✓
<u>Vessel: 2023</u>					
302 ✓	2000-2005 ✓	R/Az ✓	100 ✓		MS ✓
<u>Vessel: 2024</u>					
276/277 ✓	4000-4030 ✓	R/Az ✓	100 ✓		MS ✓
277/278 ✓	4031-4100 ✓	R/Az ✓	100 ✓		MS & Dev A ✓ (Dev 4071-4082)**
279/280 ✓	4101-4197 ✓	R/Az ✓	100 ✓		MS ✓
282/283 ✓	4198-4261 ✓	R/Az ✓	100 ✓		MS & XL ✓
296/297 ✓	4262-4341 ✓	R/R ✓	211 ✓	212 ✓	MS ✓
298 ✓	4342-4368 ✓	R/R ✓	211 ✓	212 ✓	MS ✓
301/302 ✓	4387-4456 ✓	R/Az ✓	100 ✓		MS ✓
303/304 ✓	4457-4496 ✓	R/R ✓	211 ✓	212 ✓	MS & XL ✓
303/304 ✓	4497-4521 ✓	R/Az ✓	211 ✓		MS ✓
304/305 ✓	4522-4570 ✓	R/R ✓	210 ✓	212 ✓	MS ✓
305/306 ✓	4571-4574 ✓	R/Az ✓	100 ✓		MS ✓
306/307 ✓	4575-4585 ✓	R/R ✓	210 ✓	212 ✓	MS ✓
306/307 ✓	4586-4609 ✓	R/Az ✓	211 ✓		MS & XL ✓
<u>Vessel: 2025</u>					
277 ✓	6000-6002 ✓	R/Vis ✓	100 ✓		Bot Samp ✓
278/279 ✓	6003-6007 ✓	R/R ✓	110 ✓	207 ✓	Bot Samp ✓
280 ✓	6008-6020 ✓	R/Vis ✓	100 ✓		Bot Samp ✓
321/322 ✓	6021-6046 ✓	R/Az ✓	211 ✓		XL & Bot Samp ✓

Rejected positions: 4224-4226, 4273, 4295, 4315, 4358, 4359, 4369-4386,
4405, 4542

** Do not plot on main sheet due to congestion

FA-20-5-80 H-9909

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

VESSEL	PROJ. NO.	YEAR	SAMPLE POSITION		DEPTH (Fathoms)	WEIGHT OF SAMPLER	APPROX. PERCENTAGE OF SAND	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS	OBS. INSTR.
			LATITUDE	LONGITUDE								
FA-5	OPR-T126-FA-80	1980										
6000	3 OCT 80 277	19/39/36	154/57/45	47.0	About 45 lb					Fne S ⁻	all samples were taken with a modified Shipek sampler	1980
6001	277	19/39/32	154/58/26	9.9						Co ⁻		"
6002	277	19/39/24	154/58/50	4.2						Crs S ⁻ Hrd ⁻		"
6003	4 OCT 80 278	19/40/22	154/58/24	16.0						Co ⁻		"
6004	"	19/40/18	154/57/38	62.0						Hrd ⁻		"
6005	"	19/41/11	154/57/52	75.0						Hrd ⁻		"
6006	5 OCT 279	19/40/52	154/58/47	17.0						Co ⁻		"
6007	"	19/40/06	154/58/55	5.5						Co ⁻		"
6008	6 OCT 80 280	19/41/41	154/58/14	73.4					brn	Fne brn S ⁻		Deck
6009	"	19/41/29	154/58/45	33.2					"	Crs S, P ⁻		"
6010	"	19/42/07	154/58/47	31.0					"	Hrd, brk Sh ⁻		"
6011	"	19/42/14	154/58/27	69.5					"	Fne S, brk Co ⁻		"
6012	"	19/42/44	154/58/33	75.0					"	Hrd ⁻		"
6013	"	19/42/40	154/58/53	32.0					"	Crs S, brk Sh ⁻		"
6014	"	19/43/19	154/58/36	71.0					"	Hrd ⁻		"
6015	"	19/43/55	154/58/39	70.0					"	Crs S, P, brk Co ⁻		"
6016	"	19/44/30	154/58/41	69.0					"	Crs S, P, brk Sh ⁻		"

CHECKED BY *D. J. Nemick* DATE CHECKED *4/21/81*

Use more than one line per sample if necessary.

NOAA FORM 75-41
(11-72)

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

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

VESSEL	SERIAL NO.	DATE	PROJ. NO.		YEAR	DEPTH (Fathoms)	WEIGHT OF SAM- PLER	AP- PROX. FATH- TION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, observations, depth curves, strat. no., type of bottom, relief low, slope, plain, diposition, etc.)	OBS. INIT.
			LATITUDE	LONGITUDE									
2025			OPR-T146-EA-80		80								
			FA 20-5-80										
			H-9909										
			D. G. Kennick										
			4 Feb 81										
6038	321	16 NOV 80	19/43/11	154/59/03	43.8				lc	fine S			
6039	"	"	19/46/27	155/02/28	32.5				lc	crs S, brk sh			
6040	322	17 NOV 80	19/46/21	155/01/15	55.9				lc	fine S			
6041	"	"	19/45/50	155/01/17	46.7				gy	crs S, brk sh			
6042	"	"	19/45/06	155/01/07	35.8				lc	fine S			
6043	"	"	19/45/33	155/09/24	57.0				gy	fine S			
6044	"	"	19/45/14	154/59/58	51.5				br	fine S, brk sh			
6045	"	"	19/44/43	154/59/48	55.3				lc	brk sh, crs S	Sampler nearly full of broken sh.		
6046	"	"	19/49/23	154/59/44	48.2				lc	fine S, brk sh			

Use more than one line per sample if necessary.

J. APPROVAL SHEET

The Commanding Officer supervised the field work and examined the field sheet and records on a daily basis. Captain A. J. Patrick was the commanding officer at the time of the field work on this survey, but was relieved by Commander Walter F. Forster prior to submission of this report. The survey is complete and adequate to supersede all charted data.

Submitted by:

Douglas G. Hennick

Douglas G. Hennick
LT, NOAA

Approved by:

Walter F. Forster

Walter F. Forster
CDR, NOAA

HYDROGRAPHIC SURVEY STATISTICS

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS		1	
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS 1/2 ARC, EXCESS		4	
DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES						
CAHIERS			1			
VOLUMES						
BOXES			1			

T-SHEET PRINTS (List) TP-00070

SPECIAL REPORTS (List)

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			707
POSITIONS CHECKED		707	
POSITIONS REVISED		128	
SOUNDINGS REVISED		13	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	4	* (VER)/(EVAL)	4
VERIFICATION OF CONTROL		04/01	5
VERIFICATION OF POSITIONS		24/00	24
VERIFICATION OF SOUNDINGS		122/08	130
COMPILATION OF SMOOTH SHEET		60/11	71
APPLICATION OF TOPOGRAPHY		24/02	26
APPLICATION OF PHOTOBATHYMETRY		00/00	0
JUNCTIONS		29/06	35
COMPARISON WITH PRIOR SURVEYS & CHARTS		00/00	0
VERIFIER'S REPORT		05/18	23
OTHER		00/22	22
TOTALS	4	268/68	340

Pre-Verification by J. S. Green	Beginning Date 5/13/81	Ending Date 5/13/81
Verification by M. G. Sanders	Beginning Date 7/21/81	Ending Date 11/18/82
Verification Check by S. H. Otsubo, J. S. Green	Time (Hours) 36	Date 11/19/82
Marine Center Inspection by HIT	Time (Hours) 7	Date 12/3/82
Quality Control Inspection by	Time (Hours)	Date
Requirements Evaluation by	Time (Hours)	Date

* Time in this column is for Verification (VER) and Evaluation (EVAL)

PACIFIC MARINE CENTER
VERIFICATION/EVALUATION REPORT

REGISTRY NO: H-9909

FIELD NO: FA-20-5-80

Hawaii, Island of Hawaii, Hilo Bay to Haena

SURVEYED: October 2 - November 17, 1980

SCALE: 1:20,000

PROJECT NO: OPR-T126-RA/FA-80

SOUNDINGS: Raytheon-EDO-UGR
Ross Finline 5000
Raytheon DSF-600

CONTROL:
Raydist - Range/Azimuth
Mini-Ranger - Range/Range
Range/Azimuth

Chief of Party.....CAPT A. J. Patrick

Surveyed by.....LCDR D. Boutle, Royal Navy
LT D. Hennick
LT T. Baxter
LTJG C. Hancock
CST E. Krick

Automated Plot by.....PMC Xynetics Plotter

Verified by.....M. G. Sanders

Evaluated by.....K. M. Scott

1. INTRODUCTION

NOTE: This survey has been processed utilizing a procedure developed to work in conjunction with the Verification Branch realignment, which established an evaluation process. The survey data was first verified and a smooth sheet compiled by a verifier. Then an evaluator reviewed the work of the verifier, made the necessary comparisons with prior surveys and charts and wrote the Verification/Evaluation Report.

H-9909 is a basic hydrographic survey conducted by NOAA Ship FAIR-WEATHER in accordance with project instructions dated August 4, 1980, Change No. 1 dated August 8, 1980; Change No. 2 dated August 15, 1980; Change No. 3 dated September 9, 1980; and Change No. 4 dated November 20, 1980.

This survey covers the area east and south of Hilo Bay on the northeast coast of the island of Hawaii. This coast is characterized by a series of low bluffs and foreshore lava boulders. Breakers are prevalent approximately 60 to 150 meters offshore and are represented on the smooth sheet.

Two unconventional sounding acquisition methods were utilized when gathering survey data. One method employed during ship hydro, JD 321-322, involved running two systems simultaneously, the Ross 5000 and the Raytheon-EDO-UGR, and switching systems within a line of hydro. The other occurs on JD 296 through 307, launch 2024, when two systems were run simultaneously, the Ross 5000 and the Raytheon DSF 600, during which time the digitized soundings were on time from the Raytheon DSF 600 and the echogram readings from the Ross. Both of these methods resulted in a mix of wide and narrow beam data.

Predicted tides based on the Honolulu gage with time and range adjustments for Hilo, Hawaii, were used during shipboard processing. Tides used for the reduction of final soundings are zoned directly from the Hilo ADR gage and the Shipman Ranch ADR gage and computed from the approved hourly heights supplied by Tides Division, Rockville, Maryland.

The projection parameters and signal list have been revised during the verification process. All corrected information is listed in the smooth printouts accompanying the smooth sheet and noted in the appropriate listing included in the descriptive report.

2. CONTROL AND SHORELINE

The position control and calibration stations governing H-9909 are newly established or recovered triangulation points. Preliminary adjusted field positions were used for position computation. These are computed on the Old Hawaiian Datum. (See Section F, Descriptive Report.)

Position control systems and modes are noted in Section G.

Shoreline was transferred from the Class I unreviewed manuscript TP-00070, December 1976 and January 1977-October 1980. The highwater line and alongshore features agree with hydrography. Rocks and reefs not applied or modified during field edit application to the manuscripts have been transferred to the smooth sheet from the final field sheet without supporting positioning data. A listing of the feature with latitude and longitude follows:

rock awash	19°43'51.7"N	154°59'58"W
rock awash	19°43'15.6"N	154°59'37"W
ledge	19°41'46.5"N	154°59'02.5"W
rock awash	19°40'57.6"N	154°58'56"W
ledge	19°40'03.7"N	154°59'05"W
ledge	19°39'50.5"N	154°59'07.5"W

3. HYDROGRAPHY

Crossline soundings incorporated within this survey are in good agreement. Differences range between .2 and .5 fathom. Few crossings reflect the magnitude of difference noted in Section I. These are attributed to the irregular bottom and rough seas.

The bottom configuration, determination of least depths and development of the standard depth curves outside the breaker limits are adequate. The zero curve was not developed due to the breakers.

4. CONDITION OF SURVEY

The hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual of July 4, 1976, with the following exceptions:

a. On Julian Days 296 through 307, positions 4262-4609, the Ross 5000 and Raytheon DSF 600 were used simultaneously as mentioned in the Introduction. Since the Raytheon digitized soundings seemed more reliable, the Raytheon system was used as the input to the on-time computer system. However, the echograms produced by that system were of poor quality. When the digitizer failed, the soundings were provided by scaled echogram readings from the Ross. The Raytheon DSF 600 has a beam width of 20° compared to the Ross's 7°. The traces reflect that difference. Soundings in this survey are a combination of both.

b. The memo from C3, Captain Lanier, to the Director, PMC, concerning the provisional use of the Raytheon DSF 600 directed the FAIR-WEATHER to annotate the analog sounding record in detail at the beginning of that record. (See appended memo). The launch did not annotate any of the records during survey operations. These settings could affect the digitized soundings; however, the data was accepted and processed normally.

5. JUNCTIONS

H-9909 joins H-9908 (1:20,000) 1980 along the southern limit of hydrography. All soundings are in good agreement. Curves have been inked and soundings transferred to support the junction. The junction note has been inked accordingly.

H-9911 (1:10,000) 1980 joins to the west at the entrance to Hilo Bay and in the vicinity of Paukupahu. Soundings agree within a fathom. This junction has been adequately completed, soundings transferred, and curves and the junction note inked.

The eastern boundary joins H-9912 (1:80,000) 1980 with soundings agreeing very well. The curves and junction note have been inked in agreement.

The survey joining to the north is H-9921 (1:20,000) 1980. Soundings are in good agreement and junction was accomplished without difficulty. This junction note was inked as well.

6. COMPARISON WITH PRIOR SURVEYS

H-2461 (1900) 1:40,000
H-4566a (1927) 1:250,000

H-2461 includes the area north of latitude 19°45'00"N. The prior soundings are all shoalier than present survey soundings; the least difference being less than one fathom at approximately latitude 19°45'06"N, longitude 155°00'08"W. The greatest difference is 84 fathoms occurring at latitude 19°46'45"N, longitude 154°58'42"W. This area has stable bottom characteristics. The change in depths should be attributed to the updated surveying methods.

H-4566a is a reconnaissance survey which consists of only a few lines of soundings around the Island of Hawaii. Soundings within the area of current hydro north of latitude 19°43'00"N are comparable. South of there, present survey soundings are considerably deeper and reflect a possible positioning error on the prior survey magnified by the scale at which it was plotted.

There are no presurvey review items within the limits of this survey.

H-9909 is adequate to supersede hydrography within the common area.

7. COMPARISON WITH CHART 19320 (12th Ed., June 17, 1978)

a. Hydrography - The charted soundings originate from H-2461 and H-4655a and have been discussed in Section 6. The shoreline and three rock or islet symbols are included within the limits of hydrography. The source of these features has not been determined.

1. The rock awash charted at latitude 19°43'50"N, longitude 154°59'50"W falls approximately 100 meters east of an islet portrayed on the present survey at latitude 19°43'50.5"N, longitude 154°59'54.5"W. No elevation is available. An islet marked Rk at latitude 19°39'56"N, longitude 154°58'40"W lies approximately 100 meters east of its survey location and carries the name of Wahine Maka Nui and an elevation bearing three feet at MLLW. The offset reflected by these features is attributed to their representation at the scale of the chart. Further charting should be from this present survey.

2. The charted submerged rock at latitude 19°39'20"N, longitude 154°58'35"W falls in an area where 10 fathom soundings represent the bottom. However, the area three to four hundred meters north has pinnacles rising from the bottom to approximately four fathoms. The source of this rock should be investigated, disposition determined, and the area plotted accordingly, incorporating present survey data.

H-9909 is adequate to supersede all charted hydrography within the common area.

b. Controlling Depths - There are no controlling depths within the limits of the survey.

c. Aids to Navigation - There are no aids to navigation in the survey area.


8. COMPLIANCE WITH PROJECT INSTRUCTIONS

H-9909 (FA-20-5-80) adequately complies with Project Instructions OPR-T126-RA/FA-80, Hawaii, Hawaiian Islands.

9. ADDITIONAL FIELD WORK

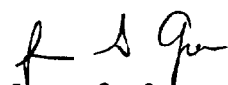
This is a good basic survey. No additional field work is required.

Respectfully submitted:



Karol M. Scott
Cartographer
November 18, 1982

Examined and Approved:



James S. Green
Chief, Verification Branch

October 8, 1981 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

Tide Station Used (NOAA Form 77-12): 161-7760 Hilo, HI
161-7088 Shipman Ranch, HI

Period: September 30 - November 16, 1980

HYDROGRAPHIC SHEET: H-9909

OPR: T-126

Locality: East Coast of Hawaii

Plane of reference (mean lower low water): 161-7760 = 3.54 ft.
161-7088 = 0.82 ft.

Height of Mean High Water above Plane of Reference is 161-7760 = 1.99 ft.
161-7088 = 1.80 ft.

REMARKS: Recommended Zoning:

1. North of latitude $19^{\circ}43.0'$ zone direct on 161-7760 Hilo, Hawaii.
2. South of latitude $19^{\circ}43.0'$ zone direct on 161-7088 Shipman Ranch, Hawaii.

Donald Carrier
for Chief, Datums and Information Branch

CPM3

Copy for Your Information CPM13

CPM 5x1
CPM ✓



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

SEP 2 1980

OA/C35x1:D

TO: OA/CPM - Charles K. Townsend
FROM: OA/C3 - Roger F. Lanier *Roger F. Lanier*
SUBJECT: Raytheon DSF-600 Depth Recorder

A Raytheon DSF-600 Digital Survey Fathometer is being provided to PMC for use by a FAIRWEATHER survey launch on Project OPR-T126-FA,RA-80.

PROVISIONAL USE

The Office of Marine Surveys and Maps is approving the use of the Raytheon DSF-600 Digital Survey Fathometer for echo sounding on NOS hydrographic surveys on a provisional basis. To give due recognition to the test results (discussed later in this memorandum), and the fact that numerous selectable functions are available to the operator, certain restrictions must be adhered to when using this unit in an operational survey mode. These restrictions are:

- o Operation is authorized on the 40 kHz frequency only. At 40 kHz, the Model 7510 transducer produces a 20° beam width.
- o Depth correctors shall not be entered through the depth recorder. Therefore, both the TIDE and DRAFT thumbwheel switches must be set to zero.
- o The SOUND SPEED thumbwheel switches must be set at 4800 ft/sec (800 fm/sec). Velocity corrections shall be determined and applied off line in the standard manner.
- o The DIGITIZER DETECT-MODE switch must be set to digitize the FIRST echo. The THRESHOLD control may be set as necessary.
- o The setting of the above-mentioned switches shall be recorded on each analog sounding record, at the beginning of that record.

All other operation and calibration of the DSF-600 shall be accomplished in accordance with the requirements set forth in the Hydrographic Manual as standard procedure for NOS survey depth recording.



10TH ANNIVERSARY 1970-1980
National Oceanic and Atmospheric Administration
A young agency with a historic tradition of service to the Nation

Before using the DSF-600 operationally, information should be acquired concerning its present reliability. Direct depth comparisons shall be made between this instrument and the Ross depth recorder, either by simultaneous sounding by the same launch, or by running two launches over identical lines. Comparisons shall be made at various depths over flat or gently sloping bottoms. On very steep slopes, a direct comparison may not be valid due to transducer beam width differences.

When the unit is put into use operationally, junctions between ship acquired data and DSF-600 data shall be examined carefully for adequacy.

If, for any reason, the accuracy or quality of the digital or analog data output from the DSF-600 is not adjudged as meeting NOS standards, do not hesitate to discontinue its use and report this fact to OA/C35.

Because existing experience with this unit is extremely limited, a special report shall be written at the end of the project. The report should be devoted to an evaluation of the DSF-600, its capabilities, reliability, and additional knowledge gained during its use. A copy of this report shall be forwarded directly to OA/C35.

TEST RESULTS

The Raytheon DSF-600 Digital Survey Fathometer was acquired and tested by the NOS Test & Evaluation Laboratory (T&EL) in 1978. The report indicates that very limited and inconclusive data were obtained from the tests, and it is obvious that the results were far from positive in several instances. Among the problems encountered were:

- o Hardware failures necessitating field and factory repair.
- o Modification of the receiver gain by Raytheon to enable 100 fathom-, depth operation at 200 kHz. When depths of only 75 fathoms were reached during the tests, Raytheon subsequently attributed the problem to the transducer design.
- o The traces obtained were marred by smearing of lines and numbers in certain phases.
- o It was necessary to turn the gain to maximum during 200-kHz operation to maintain digital tracking.

In a positive vein, the report stated that the 40-kHz operation was more consistent, with good digital and analog data over the range past 130 fathoms, and that operation past the 130-fathom limit of testing was probable. The unit was not tested to the 300-fathom depth capability as stated in the manufacturer's specifications.

In conclusion, the test report states:

The DSF-600 unit in T&EL's possession has undergone several changes since its initial delivery over 2 years ago. These have ranged from wiring changes to component replacements to respecification of the 200-kHz transducer. The result of these changes, as experienced in the field tests, has been fairly consistent operation at 40 kHz, with analog and digital data within the NOS accuracy specification, but ambiguous operation at 200 kHz.

cc:
OA/C73
OA/CAM

SOUNDINGS IN FATHOMS

Nautical Chart Catalog

155°

50'

40'



UNITED STATES

HAWAII

H-9909

ISLAND OF HAWAII

Mercator Projection
Scale 1:250,000 at Lat. 20°30'
Old Hawaiian Datum

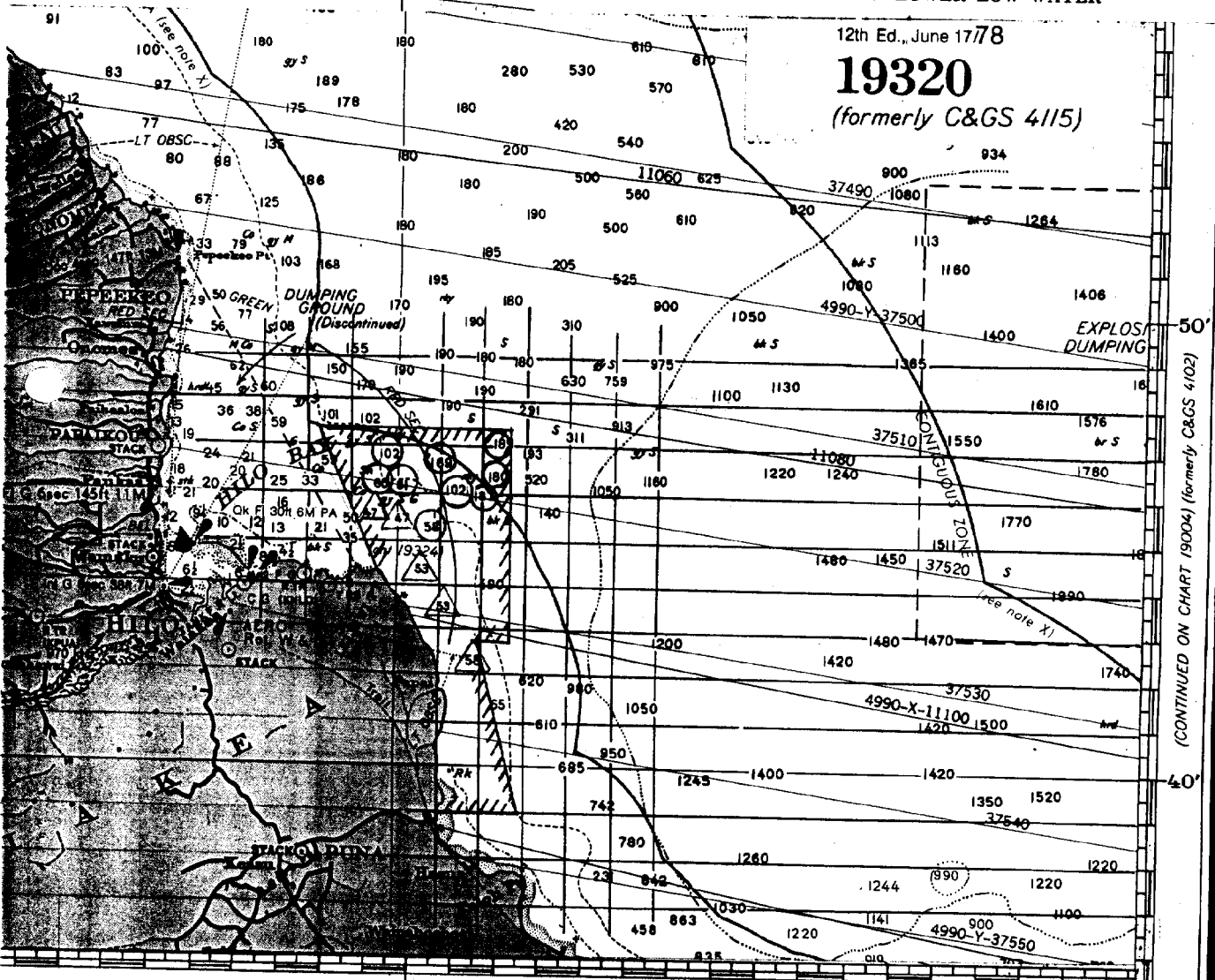
SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER

○ H-2461 (1:40,000) 1900
△ H-4655a (1:250,000) 1927

12th Ed., June 1778

19320

(formerly C&GS 4115)



(CONTINUED ON CHART 19004) (formerly C&GS 4102)

155°

50'

40'

APPROVAL SHEET
FOR
SURVEY H- 9909

- A. This hydrographic survey has been verified, evaluated and inspected. It meets the requirements of the Hydrographic Manual except as noted in the Verification/Evaluation Report. The automated data file has been updated to reflect the data presented on the smoothsheet.

Date: 11/30/82

Signed: 

Title: Chief, Verification Branch

- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the Verification/Evaluation Report.

Date: 12/6/82

Signed: 

Title: Chief, Marine Surveys Division



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

December 8, 1982

TO: N/CG2 - C. William Hayes

FROM: N/MOP -  Charles K. Townsend

SUBJECT: Administrative Approval of H-9909, ^{Hilo Bay to Haena} ~~Kaleli Point to Hilo Bay,~~
Island of Hawaii, Hawaii

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.

cc: N/MO




ADDENDUM TO EVALUATION REPORT FOR H-9909


The Evaluation Report for this survey is supplemented by the following statement:

The digital records for this survey have been updated to include categories of information required to comply with N/CG2 Hydrographic Survey Guideline No. 23, Completion of Digital Hydrographic Surveys, September 7, 1983. Certain descriptive information, however, may not be included in the digital record due to the restrictions of the presently available cartographic codes. The user should refer to the smooth sheet for complete information.

Respectfully submitted,


James S. Green
Supervisory Cartographer
~~October 14, 1983~~
November 22, 1983

APPROVED:



Ned C. Austin
Chief, Nautical Chart Branch

