

9916

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. RA-20-5-80
Office No. H-9916

LOCALITY

State Hawaii
General Locality Southeast Coast of Hawaii
Locality Ka Lae Apuki to Kaaha

1980

CHIEF OF PARTY
CAPT. N.L. Mobley

LIBRARY & ARCHIVES

DATE June 28, 1982

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

AREA 5
1904
19010
19007
540
530

TO SIGN OFF SEE
"Record of Application to Charts"

HYDROGRAPHIC TITLE SHEET

H-9916

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-20-5-80

State Hawaii

General locality Island of Hawaii - Southeast Coast of Hawaii

Locality Apua Point and Vicinity Ka Lae Apuki to Kaaha

Scale 1:20,000 Date of survey Oct. 17 - Nov. 7, 1980
Aug. 4, 1980; Chg No. 1, Aug. 8, 1980; Chg No. 2,

Instructions dated Aug. 15, 1980; Chg No. 3, Sep. 9, Project No. OPR-T126-RA-80
1980; Chg No. 4, Nov. 28, 1980

Vessel NOAA Ship RAINIER, Launches RA-3 (2123), RA-6 (2126)

Chief of party CAPT W. L. Mobley

Surveyed by LCDR A. Anderson, LTJG D. Kruth, ENS R. Fleischman (USN)

Soundings taken by echo sounder, hand lead, pole Ross Fine/line, EDO

Graphic record scaled by NOAA Ship RAINIER Personnel

Graphic record checked by NOAA Ship RAINIER Personnel

Verified

~~Reviewed~~ by R. D. Mueller

Automated plot by PMC Xynetics Plotter

Evaluated

~~Reviewed~~ by B. A. Olmstead

Soundings in fathoms ^{and tenths} ^ feet at MLW MLLW

REMARKS: See also the following reports:

HORIZONTAL CONTROL REPORT OPR-T126-RA-80

FIELD EDIT REPORTS OPR-T126-RA-80

FIELD EDIT REPORTS OPR-T126-RA-80

ELECTRONIC CONTROL REPORT OPR-T126-RA-80

CORRECTIONS TO ECHO SOUNDING REPORT OPR-T126-RA-80

TIDE STATIONS REPORTS OPR-T126-RA-80

COAST PILOT REPORT OPR-T126-RA-80

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

Time Meridian 0° GMT

STANDARDS CK'D 4-2-86

ANOLS/SURE ✓ 2/28/86 ARH

C. Lay

A. PROJECT

Hydrographic survey RA-20-5-80 (H-9916) was conducted in accordance with project instructions OPR-T126-RA-80, FA-80, Hawaii, Hawaiian Islands dated August 8, 1980 and with the following amendments; Change No. 1: Supplement to Instructions, dated August 8, 1980; Change No. 2: Supplement to Instructions, dated August 15, 1980; Change No. 3: Amendment to Instructions, dated September 9, 1980; and ~~Change No. 4: Amendment to Instructions, dated November 28, 1980.~~

B. AREA SURVEYED

The area covered by RA-20-5-80 is on the southeast coast of the Island of Hawaii. The western and eastern limits of the survey were approximately 155° 19' west and 155° 05' west respectfully. The northern limit of the survey area was the shoreline and southern limit was with the junction of 80-2-80 (H-9856), which was approximately the 150 fathom curve.

This survey was conducted from October 17, 1980 to November 7, 1980 (JD 291-312).

C. SOUNDING VESSELS

Data was collected on this survey by the ship RAINIER (2120) and by the RAINIER's aluminum launches, RA-3 (2123, hull 1007) and RA-6 (2126, hull 1013). No unusual sounding vessel configurations were employed nor were any problems encountered with the sounding vessels.

D. SOUNDING EQUIPMENT & CORRECTIONS TO ECHO SOUNDINGS

SOUNDING EQUIPMENT

Echo soundings obtained during RA-20-5-80 were taken with the ship RAINIER equipped with an EDO model 248 transceiver, Raytheon - UGR (Universal Graphic Recorder), and a Digitrak, model 261-C digitizer. The skeg transducer was used during all ship hydrography (ANDIST = 33.5 m). RAINIER survey launches (RA-3 and RA-6) equipped with the Ross fineline fathometer system were used to gather the majority of the sounding data. The Ross systems include the following components: Ross model 400 transceiver; Ross model 5000 analog recorder; Ross model 6000 digitizer; and a 100 kHz transducer. Table I summarizes the serial numbers of the components used in each vessel.

Table I

Echo Sounder Component Serial Numbers

<u>Component</u>	<u>RAINIER</u> <u>(S2120)</u>	<u>RA-3</u> <u>(2123)</u>	<u>RA-6</u> <u>(2126)</u>
Transceiver	202	1041	1042
Analog Recorder	75	1070	1042, 1071
Digitizer	204	1080	----

CORRECTION TO ECHO SOUNDING

The following corrections to echo soundings are discussed: sound velocity corrections, draft corrections, settlement and squat corrections, and instrument corrections. Sea and swell corrections were not applied due to the insignificance of the seas versus the depth of water encountered in this project. ✓

Sound Velocity Corrections

Sound velocity corrections for echo soundings were derived from data obtained from one Martek TDC and one Nansen cast performed in the survey area during this project. The details of these casts are presented in Table II. ✓

Table II
Nansen & Martek Cast Data

<u>Cast Type</u>	<u>Date</u>	<u>Location</u>	<u>Velocity Table No.</u>
Nansen	9/20/80	Lat 19 ⁰ 14' 48" Long 154 ⁰ 43' 36"	1 & 2
Martek	11/4/80	Lat 19 ⁰ 09' 42" Long 155 ⁰ 22' 42"	Not Used

The samples collected from the Nansen casts were analyzed for salinity using standard laboratory procedures (see H.O. 607). The salinometer used for these analyses was an Industrial Instruments model RS-7B, S/N 28298, which was last calibrated in April 1980 by Northwest Regional Calibration Center, Bellevue, Washington. The Martek S/N 758 was also calibrated there in February 1980. The Nansen cast was used to compute the sound velocity correction for all surveys in this project. It was compared to the Martek cast to check its accuracy and the stability of the water column. Two separate tables were made: A Deep Water Table for the ship and a Shallow Water Table for the launches. A copy of both velocity corrector tape listings are provided in the separates following the text. For more detailed information and raw data records concerning the determination of sound velocity corrections refer to the Correction To Echo Sounding Report for this project (OPR-T126-RA-80). ✓

A comparison of the data collected from NOAA Ship FAIRWEATHER (2020) on November 20, 1980 at latitude 19⁰ 46' 00" North, Longitude 154⁰ - 55' 00" West was made. The FAIRWEATHER was working on the Island of Hawaii north of Cape Kumakahi. This comparison indicates a stable water column throughout the area at the time of hydrography. ✓

Launch Draft Corrections

Due to rough water conditions encountered during OPR-T126-RA-80 bar checks were not feasible. Historically 0.3 fathoms has been ✓

used as the launch TRA correction. There has been no changes in the launches that would cause a change in draft. ✓

All field sheets were plotted using a launch TRA correction of 0.3 fathoms. ✓

DRAFT CORRECTION FOR RAINIER (2120)

TRA corrections for ship RAINIER (2120) were calculated by leadline comparison. These were done on November 16 and 17, 1980 (JD 321 and 322). They were performed in calm water, while the ship was anchored in Kealakakua Bay. The TRA corrected for velocity of sound was found to be 2.7 fathoms. This verifies the historic data for TRA of the RAINIER which was 2.6. The 2.6 figure was used to smooth plot the data. Calculations of the leadline comparison are included in the separates following the text with the section of fathogram used during the comparison. ✓

LAUNCH SETTLEMENT AND SQUAT CORRECTIONS

Settlement and squat characteristics of survey launches RA-3, RA-5, and RA-6 were measured prior to OPR-T126-RA-80 in Lake Washington, Seattle, Washington on April 11, 1980 (JD 102). ✓

The corrections obtained from these measurements are included in this report for reference only. The largest potential error from settlement and squat during this project is 0.06 fathom. The launches collected most of the data while traveling slowly because of the weather. The settlement and squat corrections were not put on TC/TI tapes or applied to soundings on the field plotting sheets. These corrections are not considered necessary for this project in accordance with PMC OPORDER 3-03.07x1, page 3-31. "Settlement and squat errors are commonly ignored when operating in areas of irregular bottom at various speeds, as this error is visually insignificant if the sounding unit is fathoms." ✓

The settlement and squat correction for the ship was also considered insignificant in accordance with paragraph 4.9.1, page 4-67 of the Hydro Manual. ✓

SOUNDING INSTRUMENT CORRECTIONS

Ross Systems

During survey operations the "blanking" was normally set at the minimum of the scale that the fathometer is set, i.e. if the fathometer is on 50-100 fathoms, the blanking was set at 50 fathoms. Analog depths were substituted for missed digital soundings during on-line or end of day field record scanning. ✓

The initial trace on the analog recorders was continuously monitored and adjusted to prevent errors due to a drifting initial.

To prevent belt length error or stylus/paper misalignment on the analog recorders, RAINIER personnel performed "phase calibrations" of the fathometers each day in accordance with the calibration procedures contained in the PMC OORDER.

An alteration to the Ross system was implemented during this project that increased significantly the sounding limits of the system. By essentially halving the pulse repetition rate and increasing the pulse length, the effective depth was extended to 200 fathoms in reasonable weather. This included both the analog and digital performance. ✓

E. HYDROGRAPHIC SHEETS

All hydrographic field sheets including the smooth field sheet were prepared using the PDP 8/e Complot system on the RAINIER (2120).

A modified transverse ^{Mercator} projection was used for plotting of hydrographic data. A list of parameters used to define the projection is attached in the separates following the text.

Soundings on the smooth field sheet have been corrected for predicted tide, launch draft and sound velocity errors. No noticeable distortion of mylar sheets was observed during smooth field plotting of hydrographic data. One field sheet was used to cover the entire area. ✓

All field records will be sent to the Pacific Marine Center, Seattle, Washington for verification.

F. CONTROL STATIONS

Horizontal control during this project was provided by the recovery of twenty-one existing stations and establishment of twenty-three new stations. This survey was controlled using ten of those stations. A copy of the Master Station List is included in the attachments, the stations used each day are listed in the raw records, and check marked on the Master Station List.

The new stations were established using Third Order Class I methods, and were monumented and described. All work was performed on the Old Hawaiian Datum. The new stations located in the area of this survey were in arid, isolated areas and were located by intersection methods. Helicopters were used extensively during this work. ✓

The details concerning the location and recovery of each station, including the field records and processing computations are located in the Horizontal Control Report for this project.

G. HYDROGRAPHIC POSITION CONTROL

Range-azimuth methods were used exclusively for hydrographic position control on this survey. A Motorola Miniranger III system was employed. ✓

Description of Miniranger Shore Stations

There were four shore stations established and two stations were re-covered for use as electronic control stations. Data on the use of the stations is as follows:

RA-20-5-80 (H-9916)

<u>Station Number</u>	<u>Name</u>	<u>M/R Code</u>	<u>Transponder S/N</u>	<u>Dates</u>
-107 ✓	Lae Apuki	B	775	297, 308
-119 ✓	Echo	B	775	294
-124 ✓	Puu Kapu Kapu	B A	775 001	291-293 310
-126 ✓	Golf	B	775	295
-127 ✓	Foxtrot Eccentric	C	776	295
-128 ✓	Kaena Aid	B	775	296

The Miniranger transponders were positioned over Third Order Class I geodetic control stations. They were two to four feet above the stations. One transponder station, No. 127 Foxtrot Eccentric, was a temporary station, eccentric of station Foxtrot, that was established because of the strong wave action washing over station Foxtrot. Power for the shore stations was provided by two 12 volt auto batteries in series to provide 24 volts DC.

Miniranger Shore Station Performance

There were no transponder failures during this survey.

Miniranger Mobile Station Performance

There were three vessels involved in the hydrographic operations:

<u>Vessel</u>	<u>Console</u>	<u>R/T Unit</u>
2120	715	713302
2123	720	720
2126	711	727

Signal strengths were generally well above the cutoff values. In the areas where signal strengths did drop and rates became erratic work was halted until readjustment of the Miniranger or its transfer to another station eliminated the problem.

Description of the Baseline Calibrations

Two Miniranger baseline calibrations were performed during OPR-T126-RA-80. Both took place at Hilo Municipal Airport. The first was on JD 248 and the second on JD 329.

The initial calibration determined initial correctors and the low signal strength cut off values for each Miniranger console, R/T unit and transponder combination. The ending correctors to determine the final correctors were meaned with the initial correctors to determine the final correctors used to plot the smooth field sheet. This smooth field sheet was mistakenly plotted with the Miniranger correctors having the wrong signs. The sheet was not replotted because the resulting error is insignificant at the scale of the survey. All field data contains accurate correctors.

The details of these calibrations and the raw data and graphs are included in the Electronic Control Report for this project.

Description of Daily Calibrations

Visual sextant fixes were used to system check Miniranger accuracy. Signals for these fixes were positioned over Third Order Class I stations. These checks were accomplished twice a day, mornings and evenings weather permitting, and were performed in accordance with the PMC OPORDER, Appendix M.

H. SHORELINE

Shoreline for H-9916 was transferred from Class III shoreline manuscripts TP-00376, TP-00377 and TP-00378. The shoreline details have been field edited along the entire sheet, and all corrections have been transferred to the field edit manuscripts and the smooth field sheet.

I. CROSSLINES

Crosslines for H-9916 totaled 25.6 linear nautical miles or 15.5% of the principle system of sounding lines. All crossline soundings were plotted in red ink on the smooth field sheet. Crossline agreement was excellent considering the extreme steepness of the bottom contour in this area. Discrepancies in agreement can be attributed to the steep bottom contours, rough weather, and noncoincidence of comparison sounding pairs. A total of 119 sounding pairs were compared. Noncoincident sounding pairs were interpreted. The results are as follows:

<u>Depth (fathoms)</u>	<u>Percent</u>	<u>No. of Comparisons</u>
0	46	55
1	17	20
2	19	23
3	5	6
4	5	6
5	3	4
7	1	1
8	1	1
10	2	2
12	1	1

J. JUNCTIONS

H-9916 (RA-20-5-80) junctions with H-9914 (RA-20-4-80) on the western boundary of RA-20-5-80. There were no sounding pairs close enough to provide an accurate comparison except near the shoreline. Junction agreement was checked by comparing contour lines. This agreement was very good. ✓

H-9916 (RA-20-5-80) junctions with H-9917 (RA-20-6-80) on the eastern boundary of RA-20-5-80. Junctioning was compared by directly overlaying the RA-20-5-80 smooth field sheet with RA-20-6-80 semi-smooth field sheet. Junctioning between the two sheets was excellent. ✓

H-9916 (RA-20-5-80) junctions to the south with H-9856 (RA-80-2-80). Soundings from H-9856 were plotted on the boat sheet of H-9916 and overlaid on the smooth field sheet. A discrepancy from four to fifteen fathoms was found between H-9916 and H-9856. This difference was noticed on all survey sheets in Hawaii where the ship's work junctioned with the launch work. The difference is due to the fact that the fathometer beam width on the launches is only $7\frac{1}{2}^{\circ}$ whereas on the ship it is 35° . Since the ocean bottom contour is so steep in Hawaii, the ship's 35° beam width will pick up a shoaler sounding to the side than will the launches fathometer. It is recommended that soundings from the launches be given priority in areas common to both surveys. ✓ *Concur*

K. COMPARISON WITH PRIOR SURVEYS

H-9916 was compared with the most recent prior survey, H-4655a (a reconnaissance survey) which was performed in 1927 at a scale of 1:250,000. A comparison was made by plotting soundings from the prior survey on the boat sheet for RA-20-5-80. The boat sheet was then overlaid on the smooth field sheet and a comparison was made. Of the thirteen soundings that were compared, disagreement ranged from 0-65 fathoms. The majority of soundings disagreed by approximately 40-50 fathoms. *See Verification Report p. 6*

The most likely reason for this disagreement is that soundings from the prior survey were transferred from a 1:250,000 scale to a 1:20,000 scale. A positioning error is always induced when transferring soundings from a small scale sheet to a large scale sheet. A small positioning error over such a steep bottom contour would produce a large disagreement between comparison soundings. This is the most likely reason. ✓

Another possible explanation would be that the position control during the 1927 reconnaissance was poor. It is recommended that this survey, H-9916, supersede all prior surveys for charting. ✓ *Concur*

L. COMPARISON WITH THE CHART

Survey H-9916 was compared with the most recent chart, No. 19320, 12th Edition, 6/17/80 at a scale of 1:250,000. A comparison was made by plotting soundings from the chart on to the boat sheet. The boat sheet was then overlaid with the smooth field sheet and a comparison was made. ✓

It became readily apparent that the soundings on the chart in this area are the ~~exact~~ same soundings that were compared in the prior survey, H-4655a previously discussed in section K. The chart comparison yielded the ~~exact~~ same results and conclusions that were discussed in section K.

✓

Three charted rocks awash located approximately at 19° 16' 20" north, 155° 16' 23" west; 19° 16' 17" north, 155° 16' 32" west; 19° 16' 05" north, 155° 16' 32" west were searched for. Several lines were run over each charted in an effort to disprove them. Data can be seen by looking at JD 294 fix No. 6346-6364. No evidence of these rocks were seen by anyone including a bow lookout. In each case the depth of the water over each charted rock position was very deep. It is highly recommended these charted rock positions be deleted from the chart.

✓ See
Verification
Report
Sec. 6

A thorough visual search was conducted on JD 295 by the launch OIC for the charted rock at 19° 16' 35" north, 155° 07' 55" west. No rock was sighted nor were there any indications of it's existence on the fathometer. It is recommended that it be deleted from the chart.

✓ See
Verification
Report
Sec 6

The rock charted at 19° 15' 23" north, 155° 11' 45" west was searched for on JD 295 fix No. 6580. The launch was positioned over the charted rock position and a detached position was taken as a snorkler jumped in the water. The snorkler swam in all directions. The water was deep here, but the bottom was still clearly visible. No rock was seen in the area. A "Description of Search" form is included with the raw data. It is recommended that this charted rock be removed from the chart.

✓ Evaluator
Concurs
See Verification
Report
Sec 7

A search was conducted for the charted rock located at 19° 15' 30" north, 155° 11' 28" west on JD 295 fix No. 6602. Again, the launch was positioned over the area and a detached position was taken as the snorkler jumped in the water. Water visibility was 100+ feet, but the bottom could not be seen. The depth of the water here was approximately 50 fathoms. No rock was seen in the area. A "Description of Search" form is also included for this investigation. It is recommended that this rock be deleted from the chart.

✓ Evaluator
Concurs
See Verification
Report
Sec 6

The charted rock located along the junction of RA-20-5-80 and RA-20-6-80 and located at 19° 18' 03" north, 155° 05' 13" west was visually searched for on JD 302 fix No. 3152. The field records for the search can be found with RA-20-6-80 (H-9917). There was no indication of rocks, either visually or with the fathometer in the area. The water depth varied between 28-34 fathoms. It is recommended that this rock be deleted from the chart.

✓ See
Verification
Report
Sec 6

M. ADEQUACY OF SURVEY

This survey H-9916 is complete and adequate to supersede all prior surveys for charting

✓

✓

N. AIDS TO NAVIGATION

There were no aids to navigation on H-9916.

✓

✓

O. STATISTICS

This survey contains 1561 positions in 164.6 linear nautical miles covering 16.31 square nautical miles. ✓

Linear Nautical Miles

<u>Vessel</u>	<u>Main Scheme</u>	<u>X-lines</u>	<u>Development</u>	<u>Total</u>
2123	62.5	14.7	0	76.2
2126	65.4	6.9	0	74.4
2120	10.0	4.0	0	14.0
Total	137.9	25.6	0	164.6

<u>Vessel</u>	<u>Positions</u>	<u>Bottom Samples</u>
2123	855	0
2126	637	0
2120	69	12

Two tide gages were installed: one at Pohoiki Breakwater and one at Honuapo. ✓

P. MISCELLANEOUS

H-9916 was a very difficult hydrographic survey to conduct at times because of tradewinds, surf and the extremely rugged coastline. The bottom profile of Hawaii along this coast is very steep. Delineating the zero fathom curve under these conditions was impossible. ✓

The rough weather and steep bottom contours in this area combined to produce fathogram traces that were very difficult to interpret. Every effort was made to produce soundings for plotting that are as accurate as possible. However, crossline comparisons for this survey are still less accurate than could be expected in an area with a smooth bottom. ✓

The Keauhou landing area was investigated on JD 295 as a harbor of refuge for small craft. The investigation was performed by a snorkler from a rubber boat. All depths and positions noted were estimated. The results were rough~~y~~ plotted in the field on a 1:5,000 scale sheet and submitted with the raw data. The approximate shoreline was transferred from the 1:20,000 scale class three manuscripts of the area. The area is much too small to be represented effectively at 1:20,000 scale. A detailed write-up on the results was submitted for publication in the Coast Pilot No. 7. (See Recommendations section). ✓

Q. RECOMMENDATIONS

It is recommended that the following note be included on the new chart of this area: ✓

"Keauhou Landing offers protection from rough weather for boats with up to five foot draft and up to thirty feet in length. The entrance is guarded by a dangerous submerged

ledge and the safest entrance can be made along the northwest shore where the minimum depth is approximately six feet. The best protection and anchorage is immediately north of the exposed, isolated rock outcrop that guards the southeast side of the entrance. The depth there is approximately nine feet. The area offshore is also a possible anchorage for large vessels as the twenty fathom curve extends .3 miles offshore. The bottom here is hard and has a relatively gradual slope. The trade winds blow slightly offshore. For more information on this area, refer to the Coast Pilot No. 7." ✓

This area appears to be too small to warrant a chart inset. The Coast Pilot and a chart notation should be adequate to disseminate the information. There are no special recommendations for additional field work or unusual processing. ✓

This survey is complete and adequate to supersede prior surveys within the common area. ✓

R. AUTOMATED DATA PROCESSING:

Data acquisition and processing were accomplished per instructions in the Hydrographic Manual (4th Edition), Manual Automated Hydrographic Surveys and the PMC OORDER.

Soundings and positions were taken by a Hydroplot system using range Azimuth program FA 181. There are daily master tapes and corresponding corrector tapes which include the TRA for the vessel, baseline 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 & Latic 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	2/02/76
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 HP 97 and HP 9815 calculators were used to compute geographic positions of electronic control stations and visual signals for calibration.

S. REFERRAL TO REPORTS

The following reports contain information related to this survey:

Horizontal Control Report, OPR-T126-RA-80
Electronic Control Report, OPR-T126-RA-80
Field Edit Reports, OPR-T126-RA-80
Corrections to Echo Soundings Report, OPR-T126-RA-80
Coast Pilot Report, OPR-T126-RA-80 ✓

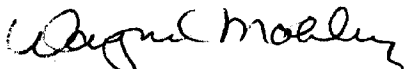
Respectfully submitted,

Alan J. Anderson
For David J. Kruth
LTJG, NOAA

APPROVAL SHEET
DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
H-9916
RA-20-5-80

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-80
 HAWAIIAN ISLANDS, HAWAII

FINAL VERSION

~~101 1 19 16 55404 155 07 27806 250 0000 329649~~
 /KAENA PT. ¹⁹⁷⁷ RM 3 RED RAYDIST STATION RA-79

~~102 1 19 31 09221 154 48 47412 250 0000 329649~~
 /FIX 1966-1980 GREEN RAYDIST STATION RA-80

~~103 1 19 27 12889 154 51 03305 250 0000 000000~~
 /LAKA 1980 RA-80

~~104 1 19 24 06000 154 55 18553 250 0000 000000~~
 /KEE 1980 RA-80

~~105 1 19 20 56109 154 58 54856 250 0000 000000~~
 /HAKUMA 1914 G-16241

~~106 1 19 19 54935 155 01 10910 250 0000 000000~~
 /KUPAPAU 1914 G-16241

107 1 19 18 09600 155 05 22586 250 0000 000000 *
 /LAEAPUKI 1914 G-16241

108 3 19 16 55404 155 07 27806 250 0000 000000 * CALIBRATION
 /KAENA PT 1977 RM 3 M/R RA-79

~~109 1 18 54 56570 155 41 04290 250 0000 329649~~
 /KA LAE 2 1948-1949 GREEN RAYDIST PG.27 G-09279

~~110 1 19 07 36455 155 30 48106 250 0000 000000~~
 /LUU 1930 PG.67 G-446

~~111 1 19 09 10376 155 30 49687 250 0000 000000~~
 /PUNALUU 1949 G-09279

~~112 1 19 08 52349 155 28 07649 250 0000 000000~~
 /KAMEHAME NEW HTS 1949 G-09279

~~113 1 19 12 24452 155 26 00452 250 0000 000000~~
 /PUU ULAULA HTS 1914 G-09279

~~114 1 19 08 26595 155 29 21880 250 0000 000000~~
 /PUN 1930 PG.67 G-446

~~115 1 19 08 53389 155 27 44321 250 0000 000000~~
 /ALFA 1980 RA-80

~~116 1 19 09 19447 155 26 56863 250 0000 000000~~
 /BRAVO 1980 RA-80

* STATIONS USED FOR THIS SURVEY

~~117 1 19 10 14477 155 25 57639 250 0000 000000~~
~~/CHARLIE 198 RA-80~~

~~118 1 19 12 28051 155 21 55840 250 0000 000000~~
~~/DELTA 1980 RA-80~~

~~119 1 19 14 4765⁴⁷ 155 19 067⁸⁹ 250 0000 000000~~ *
~~/ECHO 1980 RA-80~~

~~120 1 19 15 3296⁸ 155 11 4109⁸ 250 0000 000000~~ *
~~/FOXTROT 1980 RA-80~~

~~121 1 19 17 40026 155 18 57509 250 0000 000000~~
~~/HALIMA AZI 1980 RA-80~~

~~122 1 19 17 51107 155 18 36324 250 0000 000000~~
~~/HILINA RESET 1975-1980 RA-80~~

~~123 1 19 19 05904 155 09 5102⁶ 250 0000 000000~~ *
~~/FINNEGAN 1980 RA-80~~

~~124 1 19 16 43355 155 15 44461 250 0000 000000~~ *
~~/PUU KAPUKAPU 1914 G-16241~~

~~125 1 19 10 14231 155 25 57295 254 0000 000000~~
~~/CHARLIE 1980 ECC. RA-80~~

~~126 1 19 16 3412¹ 155 08 0150⁶ 250 0000 000000~~ *
~~/GOLF 1980 RA-80~~

~~127 1 19 15 35165 155 11 40018 254 0000 000000~~ *
~~/FOXTROT ECC. 1980 RA-80~~

~~128 1 19 17 0604¹ 155 07 10580 254 0000 000000~~ *
~~/KAENA AID 1980 RA-80~~

~~129 1 19 19 00739 155 03 42583 250 0000 000000~~
~~/KAMOA 1980 RA-80~~

~~130 1 19 19 37783 155 01 52960 250 0000 000000~~
~~/WAHAULA 1980 RA-80~~

~~131 1 19 21 01936 154 58 45999 250 0000 000000~~
~~/PANA 1980 RA-80~~

~~132 1 19 22 31420 154 57 12839 250 0000 000000~~
~~/MOANA HAUAE USGS 1978 G-16241~~

~~133 1 19 25 06205 154 53 32829 250 0000 000000~~
~~/KAULUPO 1980 RA-80~~

~~134 1 19 26 21328 154 52 02887 250 0000 000000~~
~~/MAC 1980 RA-80~~

* STATIONS USED FOR THIS SURVEY

~~135 1 19 27 49995 154 50 20735 250 0000 000000~~
/HULA 1980 RA-80

~~136 1 19 28 29295 154 49 45134 250 0000 000000~~
/HAL 1980 RA-80

~~137 1 19 22 49224 154 56 43746 250 0000 000000~~
/KIKA 1980 RA-80

~~138 1 19 23 21490 154 56 09086 250 0000 000000~~
/WAIPUKU 1980 RA-80

~~139 1 19 25 43275 154 52 53989 250 0000 000000~~
/OPIHI 1980 RA-80

~~140 1 19 30 01441 154 50 31048 250 0000 000000~~
/KAPOHO HGS 1896 G-16241

~~141 1 19 27 37580 154 50 43442 250 0000 000000~~
/POHOIKI BAY BREAKWATER LIGHT 2 1980 RA-80

~~200 1 19 31 09621 154 48 49076 139 0000 000000~~
/CAPE KUMAKAHI LIGHTHOUSE 1949 RA-80

~~201 1 18 55 24119 155 40 24017 139 0000 000000~~
/DESOLATION 1979 RA-79

~~202 1 18 54 54432 155 41 04553 139 0000 000000~~
/KA LAE LIGHT 1948 G-16108

~~203 1 19 27 37932 154 50 42526 139 0000 000000~~
/NOS BENCHMARK 161-8062-E 1979 RA-80

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	LTJG DAVID KRUTH
POSITIONS DETERMINED AND/OR VERIFIED	LTJG DAVID KRUTH
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64.)

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

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
- 5 - Field identified
- 6 - Theodolite
- 7 - Planetable
- 8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

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

II. 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

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	L TJG DAVID KRUTH
POSITIONS DETERMINED AND/OR VERIFIED	L TJG DAVID KRUTH
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	

ORIGINATOR

PHOTO FIELD PARTY

HYDROGRAPHIC PARTY

GEODETIC PARTY

OTHER (Specify)

FIELD ACTIVITY REPRESENTATIVE

OFFICE ACTIVITY REPRESENTATIVE

REVIEWER

QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'
(Consult Photogrammetric Instructions No. 64.)

OFFICE	FIELD (Cont'd)
<p>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>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>FIELD</p> <p>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>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>II. 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>

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	LTJG DAVID KRUTH
POSITIONS DETERMINED AND/OR VERIFIED	LTJG DAVID KRUTH
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	

INSTRUCTIONS FOR ENTRIES UNDER "METHOD AND DATE OF LOCATION"
 (Consult Photogrammetric Instructions No. 64,

OFFICE	FIELD (Cont'd)
<p>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</p> <p>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>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>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>II. 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>

VELOCITY CORRECTOR LISTING

OPR-T126-RA-80

S-T114-RA-80

S-T101-RA-81

TABLE NO. 1 (SCALE-FATHOMS)

CC0790 C 004C CCC1 C01 212000 CC0000
CC0910 C 0045
CC1030 C 0050
CC1400 C 0060
CC1830 C 0070
CC2050 C 0080
CC2760 C 0090
CC3750 C 0100
CC4400 C 0110
CC5000 C 0120
CC5600 C 0130
CC6250 C 0140
CC6850 C 0150
CC7750 C 0160
CC8050 C 0170
CC8700 C 0180
CC9360 C 0190
CC9850 C 0200
C10450 C 0210
C10950 C 0220
C11500 C 0230
C11950 C 0240
C12400 C 0250
C12850 C 0260
C13250 C 0270
C13650 C 0280
C14050 C 0290
C14400 C 0300
C14750 C 0310
C15100 C 0320
C15450 C 0330
C15700 C 0340
C16300 C 0350
C16420 C 0360
C16740 C 0370
C17050 C 0380
C17350 C 0390
C17620 C 0400
C17800 C 0410
C18130 C 0420
C18480 C 0430
C18650 C 0440
C19000 C 0450
C19170 C 0460
C19500 C 0470
C19750 C 0480
C20000 C 0490

TABLE NO. 1 (CONTINUED)

020250	0	0500
020750	0	0520
021000	0	0530
021250	0	0540
021500	0	0550
021700	0	0560
022000	0	0570
022250	0	0580
022500	0	0590
022700	0	0600
022820	0	0610
023150	0	0620
023380	0	0630
023550	0	0640
023800	0	0650
024000	0	0660
024250	0	0670
024450	0	0680
024650	0	0690
024850	0	0700
025000	0	0710
025200	0	0720
025500	0	0730
025650	0	0740
025800	0	0750
025950	0	0760
026200	0	0770
026550	0	0780
026650	0	0790
026750	0	0800
026900	0	0810
027100	0	0820
027220	0	0830
027450	0	0840
027650	0	0850
027800	0	0860
028000	0	0870
028150	0	0880
028350	0	0890
028450	0	0900
028650	0	0910
028850	0	0920
029000	0	0930
029150	0	0940
029350	0	0950
029500	0	0960
029650	0	0970
029850	0	0980
030000	0	0990
030150	0	1000
030300	0	1010
030450	0	1020
030600	0	1030
030750	0	1040
030900	0	1050
031050	0	1060
999999	0	1070

VELOCITY CORRECTOR LISTING
OPR-T126-RA-80

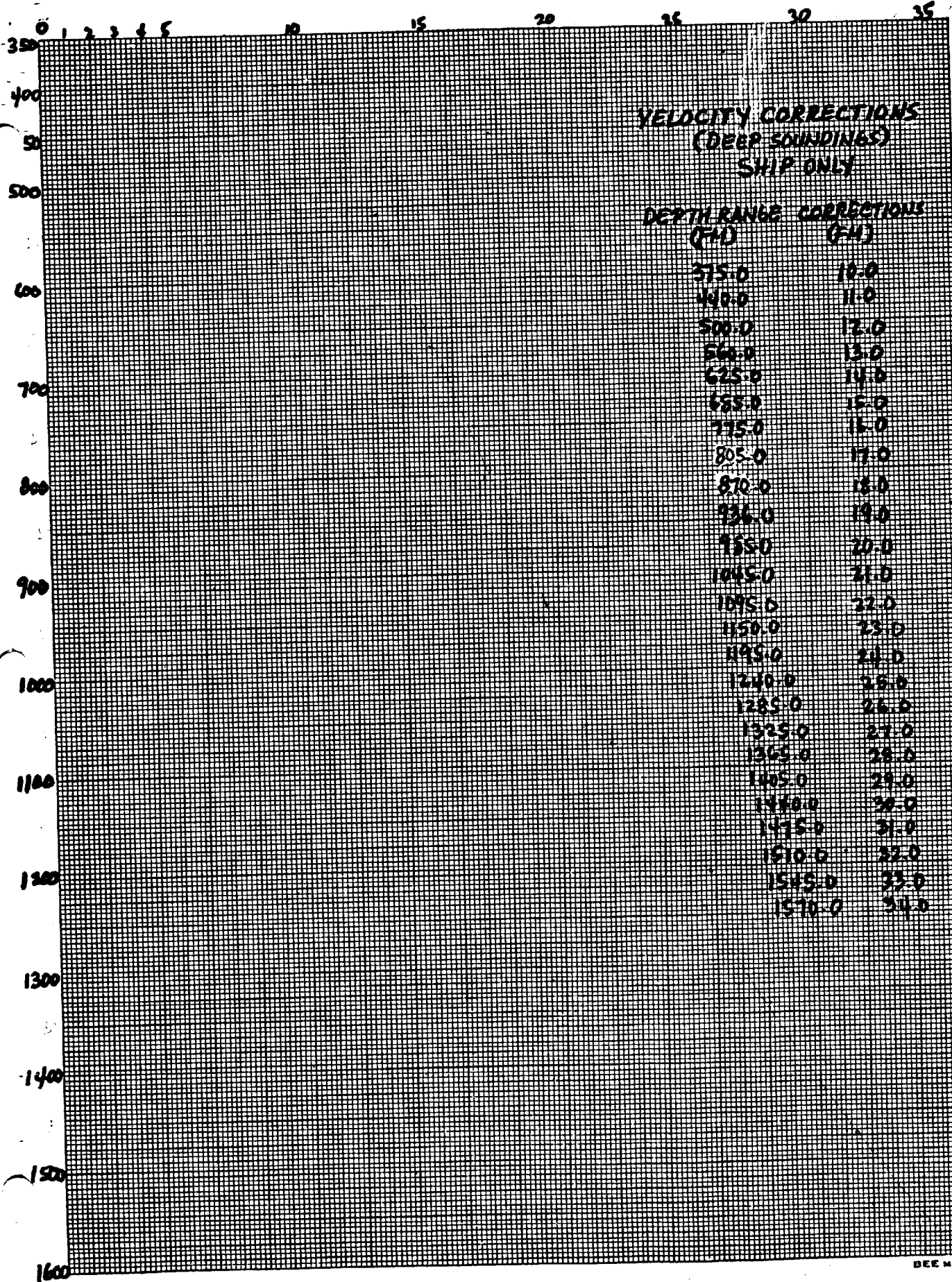
LAUNCHES ONLY
TABLE NO. 2

000010	0	0000	0002	001	000000	000000
000030	0	0001				
000050	0	0002				
000060	0	0003				
000080	0	0004				
000100	0	0005				
000115	0	0006				
000130	0	0007				
000150	0	0008				
000170	0	0009				
000180	0	0010				
000300	0	0015				
000390	0	0020				
000480	0	0025				
000570	0	0030				
000680	0	0035				
000790	0	0040				
000900	0	0045				
001030	0	0050				
001400	0	0060				
001760	0	0070				
002260	0	0080				
999999	0	0085				

VELOCITY CORRECTIONS
(DEEP SOUNDINGS)
SHIP ONLY

DEPTH RANGE CORRECTIONS
(FM)

DEPTH RANGE (FM)	CORRECTIONS (FM)
79.0	1.0
91.0	4.5
103.0	5.0
110.0	6.0
163.0	7.0
225.0	8.0
276.0	9.0



160 35 40 45 50 55 60 65 70 75 80 85 90 95

VELOCITY CORRECTIONS
(DEEP SOUNDINGS)
SHIP ONLY

DEPTH RANGE CORRECTIONS
(FM) (FM)

1630	35.0
1642	36.0
1674	37.0
1705	38.0
1735	39.0
1762	40.0
1780	41.0
1813	42.0
1842	42.0
1865	43.0
1900	45.0
1917	46.0
1950	47.0
1970	48.0
2000	49.0
2025	50.0
2045	51.0
2075	52.0
2100	53.0
2125	54.0
2150	55.0
2170	56.0
2200	57.0
2225	58.0
2250	59.0
2270	60.0
2287	61.0
2315	62.0
2338	63.0
2355	64.0
2380	65.0
2400	66.0
2425	67.0
2445	68.0

2465	69.0
2485	70
2500	71
2520	72
2550	73
2565	74
2580	75
2605	76
2620	77
2645	78
2655	79
2685-2715	80
2740	81
2760	82
2772	83
2795	84
2815	85
2835	86
2860	87
2880	88
2905	89
2935	90

1800

1900

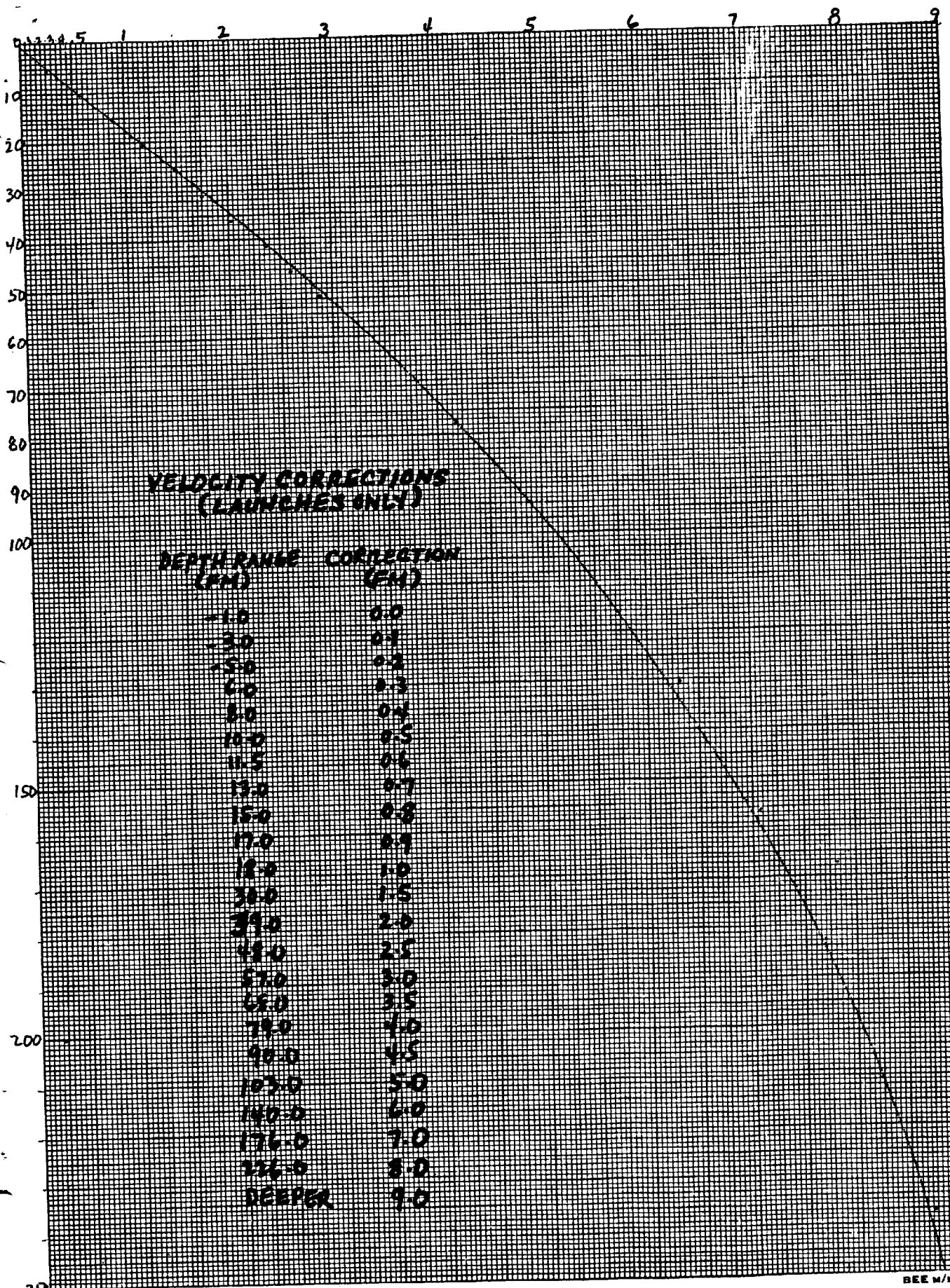
2000

2500

2980 85
2985 86
2990 87
2995 88
3000 89
3005 90
3010 91
3015 92
3020 93
3025 94
3030 95
3035 96
3040 97
3045 98
3050 99
3055 100
3060 101
3065 102
3070 103
3075 104
3080 105
3085 106
3090 107
3095 108
3100 109
3105 110
3110 111

100 105 110

2965 91
2970 92
2975 93
2980 94
2985 95
2990 96
2995 97
3000 98
3005 99
3010 100
3015 101
3020 102
3025 103
3030 104
3035 105
3040 106
3045 107
3050 108
3055 109
3060 110
3065 111
3070 112
3075 113
3080 114
3085 115
3090 116
3095 117
3100 118
3105 119
3110 120
3115 121
3120 122
3125 123
3130 124
3135 125
3140 126
3145 127
3150 128
3155 129
3160 130
3165 131
3170 132
3175 133
3180 134
3185 135
3190 136
3195 137
3200 138
3205 139
3210 140
3215 141
3220 142
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3235 145
3240 146
3245 147
3250 148
3255 149
3260 150
3265 151
3270 152
3275 153
3280 154
3285 155
3290 156
3295 157
3300 158
3305 159
3310 160
3315 161
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3325 163
3330 164
3335 165
3340 166
3345 167
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3355 169
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3365 171
3370 172
3375 173
3380 174
3385 175
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3395 177
3400 178
3405 179
3410 180
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3440 186
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3465 191
3470 192
3475 193
3480 194
3485 195
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3500 198
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3555 209
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3565 211
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3575 213
3580 214
3585 215
3590 216
3595 217
3600 218
3605 219
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3620 222
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3645 227
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3675 233
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3685 235
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3710 240
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3795 257
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3845 267
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3870 272
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4000 298
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4095 317
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4115 321
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4125 323
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4140 326
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4155 329
4160 330
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4170 332
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4180 334
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4215 341
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4235 345
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4255 349
4260 350
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4280 354
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6535 805
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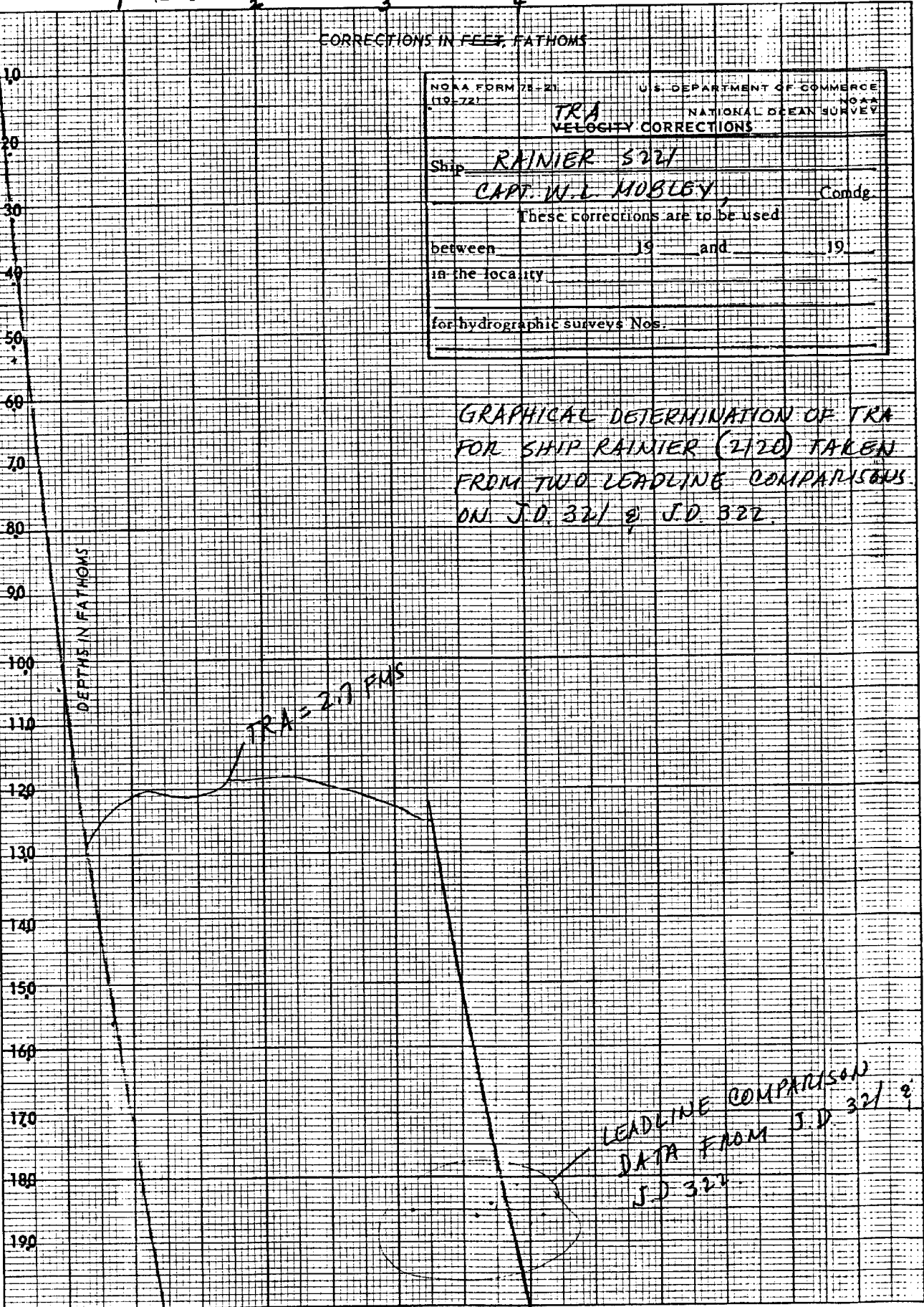
(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 78-21 (10-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEAN SURVEY	
TRA VELOCITY CORRECTIONS		
Ship	RAINIER 5221	
	CAPT. W. L. MOBLEY, Comdg.	
These corrections are to be used		
between	19	and 19
in the locality		
for hydrographic surveys Nos.		

GRAPHICAL DETERMINATION OF TRA FOR SHIP RAINIER (2120) TAKEN FROM TWO LEADLINE COMPARISONS ON J.D. 321 & J.D. 322.

(For deep water add a 0 to these figures)



46 1240

KΣ 20 X 20 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

TC/TI TAPE LISTING
RA-20-5-80 (H-9916)

VESSEL: 2120
FATHOMETER: UGR 75

180000 0 0000 0000 297 212000 000000
030743 0 0027 0001 312 212000 000000
061400 0 0000 0000 312 000000 000000

VESSEL: 2123
FATHOMETER: 1070

193437 0 0003 0002 291 212300 000000
224300 0 0000 0000 310 000000 000000

VESSEL: 2126
FATHOMETER: 1071

194418 0 0003 0002 291 212600 000000
235000 0 0000 0000 295 000000 000000

DESCRIPTION OF SEARCH

RA-20-5-80 (H-9916)

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

OTHER _____

WIDTH _____ FT/METERS DEPTH _____ FT/METERS/ON BOTTOM

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

SIMULTANEOUS VISUAL SEARCH Y/N WATER VISIBILITY 100+ FT/METERS

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

OR _____

SWEPT IN BOTH DIRECTIONS Y/N SEAS: DIRECTION & HEIGHT 3' FROM OBS

WIND: DIRECTION & KNOTS S OBS CURRENT: DIRECTION & KNOTS 0

ANY OTHER PERTINENT DATA SWELL 6'-10'

^{OVERBOARD}
SNORKELOR ON BOARD AT D.P., VISIBILITY EXCELLENT
WITH BOTTOM FLAT AND IN VIEW AT 100+ FT.

INFORMATION FROM LOCALS: NO ROCK SEEN AFTER 360° SWIM.

J.D 295

2126

Fix# 6580

TIME 210227

19° 15' 23" N
155° 11' 45" W

DESCRIPTION OF SEARCH

RA-20-5-80 (H-9916)

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

OTHER _____

WIDTH _____ FT/METERS DEPTH _____ FT/METERS/ON BOTTOM

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

SIMULTANEOUS VISUAL SEARCH Y/N WATER VISIBILITY 100+ FT ~~METERS~~

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

OR _____

SWEPT IN BOTH DIRECTIONS Y/N SEAS: DIRECTION & HEIGHT 3' FROM OBS

WIND: DIRECTION & KNOTS 5 OBS CURRENT: DIRECTION & KNOTS 0

ANY OTHER PERTINENT DATA SWELL 6'-10'

SNORKELOR OVERBOARD AT D.P. VISIBILITY EXCELLENT AND 100+ AS DETERMINED ON

INFORMATION FROM LOCALS: PREVIOUS DIVE IN 100' WATER FATHOMETER INDICATES 50 FM. ON FLAT BOTTOM. NO ROCK (NO BOTTOM) SEEN AFTER 360° SWIM

J.D. 295

2126

Fix # 6602

TIME 22146Z

19° 15' 30" N

155° 11' 28" W

FIELD TIDE NOTE
OPR-T126-RA-80

Field tide reduction of soundings for OPR-T126-RA-80 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.

Metercraft bubbler tide gages were installed at two locations in the project area. Their location and time of operation are as follows:

<u>SITE</u>	<u>LOCATION</u>	<u>PERIOD</u>
Honuapo (161-8578) <i>Used for reduction of sounding data on the final field and smooth sheets</i>	19°05.3'N 155°33.2'W	6 Sep - 25 Nov
Pohoiki (161-8062)	19°27.6'N 154°50.6'W	6 Sep - 25 Nov

Honuapo

A 0-10 feet scale Metercraft gage (S/N 7601-7536-31) was installed and began operation 7 September. The staff was installed and leveled on 7 September also. The time meridian was 000° for this gage. The gage performed well through the project except that the clock/paper drive stopped at 0300 Z November 21; it was restarted 1927 Z November 21, resulting in a two-thirds of a day loss of data. The gage ran out of nitrogen on November 24 about 0900 Z and was leveled on November 21. The gage was removed November 25. There were no unusual tides during the period of operation of this gage. Zero on the marigram equals 16.31 feet on the tide staff.

Pohoiki

A 0-10 feet scale Metercraft gage (S/N 7601-7536-29) was installed and began operation 6 September. The staff was installed on 6 September and the leveling done on 5-6 September. The time meridian was 000° for this gage. There were several minor problems during September. The pen was marking intermittently between September 8, 1600 Z and September 10, 2307 Z. Some scattered hourly heights were recovered during this period. On September 25, beginning about 0400 Z, there is a strange pressure build-up which released at 0610 Z. Comparison of staff and gage difference before and after this period are consistent, suggesting a one-time problem. The hourly heights 04-06 Z were interpolated. Finally, the paper slipped off its sprockets September 28 at 1100 Z and was not fixed until October 1 0200 Z, a loss of 2½ days of data. The remainder of the time the gage performed well. It was leveled November 19 and removed November 25. There were no unusual tides during the period of operation of this gage. Zero on the marigram equals 3.51 feet on the tide staff.

Levels

In addition to Honuapo and Pohoiki gages, the Hilo control station (161-7760) was leveled September 5 and November 25.

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

Honuapo (161-857B)

<u>BM#</u>	<u>BM Elevations (ft)</u>	
	<u>9/6/80</u>	<u>11/21/80</u>
3	24.160	24.170
D	21.873	21.877
E	21.273	21.286
F	24.957	24.980
G	22.018	22.034

Difference

+ 0.010
+ 0.004
+ 0.013
+ 0.023
+ 0.016

Pohoiki (161-8062)

<u>BM#</u>	<u>BM Elevations (ft)</u>	
	<u>9/6/80</u>	<u>11/19/80</u>
A	10.522	10.525
B	13.038	13.041
C	12.139	12.136
D	14.265	14.268
E	13.570	13.570

Difference

+ 0.003
+ 0.003
+ 0.003
+ 0.003
+ 0.000

Recommended Zoning

The differences in times and heights of tides for the various tide stations were small, and correctors obtained from predicted tides at Honolulu, adjusted for Honuapo, were judged adequate for the 1:5,000 and 1:20,000 smooth field sheets. However, for maximum accuracy tide correctors could be applied as follows:

<u>Sheet</u>	<u>Tide Station</u>	
HH (RA-5-4-80)	Honuapo	H-9913
JJ (RA-20-4-80)	Honuapo	H-9914
KK (RA-20-5-80)	Honuapo	H-9916*
LL (RA-20-6-80)	Pohoiki	H-9917
MM (RA-20-7-80)	Pohoiki	H-9918

The correctors are not considered necessary for the 1:40,000 and 1:80,000 offshore sheets as the depths on these sheets are all sufficient to make the tide corrector insignificant.

Miscellaneous

A comparison of actual and predicted tide heights at Honuapo was performed. There was reasonable agreement between them.

* Used for Final Field and smooth sheet reduction of sounding data.

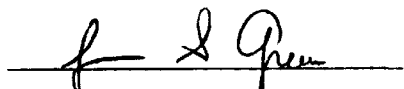
APPROVAL SHEET

FOR

SURVEY 9916

- 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: 5/5/82



Chief, Verification Branch

REGISTRY NO. A-9916

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 REQUIRED _____ INITIALS _____

REMARKS:

U.S. DEPARTMENT OF COMMERCE
October 8, 1981 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): 161-8578 Honuapo, HI

Period: October 6 - November 7, 1980

HYDROGRAPHIC SHEET: H-9916

OPR: T-126

Locality: Southeast Coast of Hawaii

Plane of reference (mean lower low water): 0.6 ft.

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

REMARKS: Zone Direct.

Donald Carrier
for Chief, Datums and Information Branch

GEOGRAPHIC NAMES

H-9916

Name on Survey	Source of Name										U.S. LIGHT LIST SHEETS	
	A	B	C	D	E	F	G	H	I	J		
	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					
APUA POINT ✓	X										X	1
HALAPE ✓											X	2
KAHA ✓											X	3
KAENA POINT ✓	X										X	4
KAHUE POINT ✓	X										X	5
KAKIWAI ✓											X	6
KA LAE APUKI ✓	X										X	7
KALUE ✓											X	8
KEALAKOMO ✓	X										X	9
KAEOI ISLAND ✓	X											10
KEAUHOU LANDING ✓											X	11
KEAUHOU POINT ✓	X										X	12
HAWAII ✓											X	13
PANAUNUI	X											14
PUU KAPUKAPU (control point located on this peak)	X											15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved

Chas. L. Harrington
Chief Geographer - N/CG2x5

12 APRIL 1983

HYDROGRAPHIC SURVEY STATISTICS

H-9916

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	10
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. ARC, EXCESS	7 7

DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES			1-smooth Plo			
CAHIERS	1	Raw Plo, bathograms				
VOLUMES						
BOXES						

T-SHEET PRINTS (List) T-00376, T-00377, T-00378

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			
POSITIONS CHECKED		1431	
POSITIONS REVISED		297	
SOUNDINGS REVISED		719	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	2	*(VER)/(EVAL)	
VERIFICATION OF CONTROL		02/00	
VERIFICATION OF POSITIONS		45/00	
VERIFICATION OF SOUNDINGS		51/00	
COMPILATION OF SMOOTH SHEET		51/00	
APPLICATION OF TOPOGRAPHY		16/00	
APPLICATION OF PHOTOBATHYMETRY		NA	
JUNCTIONS		06/00	
COMPARISON WITH PRIOR SURVEYS & CHARTS		04/12	
VERIFIER'S REPORT		00/24	
OTHER		00/28	
TOTALS	2	175/64	239
Pre-Verification by James S. Green	Beginning Date May 28, 1981	Ending Date May 28, 1981	
Verification by Robert D. Mueller	Beginning Date Oct. 22, 1981	Ending Date Feb. 25, 1982	
Verification Check by James L. Stringham, James S. Green	Time (Hours) 32	Date May 4, 1982	
Marine Center Inspection by HIT	Time (Hours) 4	Date May 13, 1982	
Quality Control Inspection by Lisa Quinlan	Time (Hours) 35	Date Oct 15, 1982	
Requirements Evaluation by	Time (Hours)	Date	

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

D. Morgan 4/11/82 5 hrs.

PACIFIC MARINE CENTER
VERIFICATION/EVALUATION REPORT

REGISTRY NO. H-9916

FIELD NO. RA-20-5-80

Hawaii, ~~Island of Hawaii. Apua Point and Vicinity~~ *Southeast Coast of Hawaii; Kalae Apuki to Kaaha.*

SURVEYED: October 17 - November 7, 1980

SCALE: 1:20,000

PROJECT NO: OPR-T126-RA-80

SOUNDINGS: Ross Model 400 *Echo Sounder*
EDO Model 248 *Echo Sounder*

CONTROL:
Range/Azimuth - Mini-Ranger

Chief of Party.....CAPT W. L. Mobley

Surveyed by.....LCDR A. Anderson
LTJG D. Kruth
ENS R. Fleischman (USN)

Automated plot by.....PMC Xynetics Plotter

Verified by.....R. D. Mueller

Evaluated by.....B. A. Olmstead

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-9916 (RA-20-5-80) is a basic survey conducted under the current National Ocean Survey methods of planning, executing and processing a hydrographic survey as defined in the Hydrographic Manual, 4th Edition. The PMC OORDER and the Data Requirements Letter for 1980 further define field procedures. Project Instructions OPR-T126-RA,FA-80, Hawaii, Hawaiian Islands dated August 4, 1980 were generated to supplement the Hydrographic Manual. Four supplements to instructions were appended for the 1980 field work; Change 1 dated August 8, 1980; Change 2 dated August 15, 1980; Change 3 dated September 9, 1980, and ~~Change 4 dated November 28, 1980.~~

H-9916 (⁽¹⁹⁸⁰⁾~~RA-20-5-80~~) is an inshore survey situated along the south-eastern coast of the Island of Hawaii. The area of hydrography encompasses the five fathom depth curve as an inshore limit and generally reaches depths to 150 fathoms off the coastline. Sounding data extends one-half mile to 2.5 miles offshore and parallels the high water line; specifically, from one mile east of Naliikakani Point to Ka Lae Apuki; latitude 19°14'30"N, longitude 155°19'00"W on the west and latitude 19°17'45"N, longitude 155°05'00"W on the east. There is approximately 17 miles of shoreline. The alongshore characteristics are composed primarily of breakers (heavy surf) and submerged ledges. Navigation inside the five fathom curve is extremely dangerous. There are no all-weather harbors or anchorages. However, two possible areas of harbor refuge for small boats do exist; Keauhou Landing, latitude 19°16'06"N, longitude 155°14'18"W and Keaoi Island, latitude 19°16'15"N, longitude 155°15'24"W.

Two tide gages, Honuapo and Pohoiki were installed and operating during the survey. Honuapo was considered adequate for office reduction of sounding data. Field tide reduction of soundings was based on predicted from Honolulu, Hawaii, corrected to Honuapo, Hawaii. Sounding differences between the final field sheet and the smooth sheet are attributed to the application of approved tidal zoning during processing at the Marine Center.

Depths of water range from 1.3 fathoms to 367 fathoms. Bottom characteristics are composed primarily of black sand and mud.

The Projection Parameters, Signal List and Electronic Corrector Abstract were amended during the verification process. All corrected data is listed in the smooth printouts to accompany the final PMC plot.

2. CONTROL AND SHORELINE

Stations located to Third Order, Class I standards were used to control the hydrographic survey. One station, KAENA AID, 1980, was considered a Third Order, Class I (no check) position. The Motorola Mini-Ranger III was employed exclusively in the range-azimuth mode. A Wild T-2 theodolite was employed for azimuth control. The second ranging option on the R/T unit (receiver/transmitter) was utilized to capture a redundant set of data points.

Except for PUU KAPUKAPU, 1914, station heights were not entered into the control file to automatically reduce Mini-ranger ranges to horizontal distances. Station FINNEGAN, 1980, used for positioning control on this survey, is approximately 350 meters above MSL. This elevation resulted in a maximum error of 5.25 meters or 0.26mm at the scale of the survey for about 30 inshore soundings. Although this discrepancy does not by itself exceed the positional accuracy standards for hydrographic survey data, the accuracy of the survey would be improved by consideration of the station elevation.

The Mean High Water Line and other photogrammetrically determined features were applied from Class I unreviewed manuscripts. ✓

<u>Dates of Photography</u>		<u>Dates of Field Edit</u>
TP-00376	December 1976, March 1977	October 1980
TP-00377	December 1976, March 1977	October 1980
TP-00378	December 1976, March 1977	October 1980

Discrepancies between the Class I shoreline manuscript and the hydrography are as follows: ✓

a. The Mean High Water Line at latitude 19°16'25"N, longitude 155°15'30"W is shown in red on the final field sheet. Photogrammetric information stated that this area was foul with stumps. Additionally, there was no field edit data to support the MHWL change. The hydrographic records provided no source information to effect such a change. The Class I unreviewed manuscript was used to graphically portray this area. However, the dashed foul line was revised to encompass the stumps. ✓

b. The dashed line symbology depicting breakers on the Class I is further defined by the final boatsheet as submerged ledge and/or foul with breakers and rocks. Several notes in the hydrographic records substantiate the existence of additional rock data in the surf zone. However, positions could not be taken to fix these features. The informational notes from the final boatsheet were added to supplement the photogrammetric information. ✓

c. The descriptive report recommends Keauhou Landing as a harbor refuge for small boats. A submerged ledge and an isolated rock outcrop are two prominent features of navigational interest situated here. However, the estimated depths and positions for this area were not submitted with the raw data. And, the shoreline manuscript does not accurately portray the surrounding approaches. An informational note was inked on the smooth sheet to See Coast Pilot No. 7, ~~dated June 1981.~~ ✓

3. HYDROGRAPHY

Soundings at crossings are in good agreement. ✓

The bottom configuration and determination of least depths are adequate. ✓

The 0-fathom, 1-fathom, 2-fathom, 3-fathom and 5-fathom standard depth curves could not be adequately developed. Hazardous surf conditions and the rugged coastline precluded the development of these areas. Additionally, the 200-fathom depth curve was not complete. (See Section 5, Junctions, for further discussion.) Development of the remaining standard curves, 10-fathoms seaward to 100-fathoms was satisfactory. ✓

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, PMC OORDER and the Data Requirements Letter with the exception of:

a. Data supporting the investigation of Keauhou Landing as a harbor refuge for small boats was not submitted with the raw records as specified in the descriptive report. Subsequently, verification/evaluation could not substantiate the recommendations as stated by the hydrographer. See Hydrographic Manual, Section 4.2, Field Sheet.

b. The junction with H-9856 (1979-80) is poor. Generally, very few soundings between this offshore survey and the present inshore work overlap. A much better junction between these two contemporary surveys would have occurred if ship hydrography had been accomplished to 200-fathoms on the inshore sheet. (Ship operations were conducted on the west.) See Hydrographic Manual, Section 4.3.2., Junctions and Overlaps. *Due to lack of overlap not due to depth deficiencies.*

c. Several items that were deficient on the final boatsheet are listed as follows:

(1) The present survey junctions H-9914 (1980) on the west and not H-9857 (1980) as inked.

(2) Bottom samples are not listed in order of size, color and class of bottom material as per the Hydrographic Manual, Section 4.7.2., Classification of Bottom Materials. Additionally, an empty sampler does not automatically indicate a hard bottom. The return of an empty sampler is not sufficient reason to label the bottom as hard. See Hydrographic Manual, Section 4.7.3., Description of Bottom Materials.

5. JUNCTIONS

H-9916 (~~RA-20-5-80~~¹⁹⁸⁰) is bordered on the west, east and south by three contemporary surveys.

- a. H-9914 (~~RA-20-4-80~~) (1980)
H-9917 (~~RA-20-6-80~~) (1980)

These contemporary inshore surveys junction the western and eastern limits of the present survey; latitude 19°14'30"N, longitude 155°19'00"W on the east, latitude 19°17'45"N, longitude 155°05'00"W on the west. Depths of water range from 4-207 fathoms. Good agreement was made in the adjoining areas. The junctional notes are inked accordingly.

- b. H-9856 (~~FA-80-2-79~~) (1979)

This offshore survey joins the entire southern boundary of the present survey; latitude 19°13'50"N to latitude 19°17'45"N, longitude 155°05'00"W to longitude 155°19'00"W. Depths of water range from 200-367 fathoms. Generally, few soundings from this offshore sheet overlap with the present inshore sheet. (See Section 4, Condition of Survey,

Item b.) However, good agreement was made in the adjoining areas where supporting data was available. The junctional note is inked accordingly.

6. COMPARISON WITH PRIOR SURVEYS

H-4655^a (1927) 1:250,000

The comparison with this reconnaissance survey accomplished in 1927 reveals little information about how the area has changed. Basically, no significant changes appear to have occurred in the last 53 years. The displacement of soundings and the lack of sounding line data can create discrepancies of up to 100 fathoms between surveys. There appears to be no pattern of either a **Subsidence** or uplifting.

CONCUR

The sunken rock at latitude 19°15'30"N, longitude 155°11'28"W was searched for and not found. Depths of water in this area precludes the existence of such a feature. The evaluator feels this item is displaced offshore from Apua Pt. and concurs with the ship's recommendation that this feature be superseded by data from this survey.

CONCUR

The rock awash at latitude 19°16'35"N, longitude 155°07'55"W was investigated. Although no rock was found at this location, the evaluator feels this item is displaced offshore from its true charted position. The evaluator recommends charting according to the present survey.

CONCUR

The rock awash at latitude 19°18'03"N, longitude 155°05'13"W was searched for and not found. Although no evidence was found to support the existence of this feature, the evaluator feels this item is displaced offshore from its true charted position. The evaluator recommends charting according to the present survey.

CONCUR

The three rocks awash charted at latitude 19°16'20"N, longitude 155°16'23"W; latitude 19°16'17"N, longitude 155°16'32"W; and latitude 19°16'05"N, longitude 155°16'42"W were searched for during hydrographic operations. Although no evidence was found to support the existence of these features, the evaluator feels these items are displaced offshore from their true charted positions. The evaluator recommends charting according to the present survey.

CONCUR

There were no numbered or dashed pre-survey review items for investigation. However, a 67-fathom sounding at latitude 19°14'55"N, longitude 155°12'30"W should have been warranted for further investigation. The evaluator feels this sounding is probably displaced offshore and recommends charting from the present survey.

CONCUR

H-9916 ⁽¹⁹⁸⁰⁾ ~~(RA-20-5-80)~~ is adequate to supersede the prior survey within the common area.

Shoalest depth in area is 104 fms. about 400 meters north of 67 fm sdg.

7. COMPARISON WITH CHART

a. Hydrography - A chart comparison was made with Chart 19320, 12th Edition, June 17, 1978. The charted information originates with the previously discussed prior survey and ~~unknown~~ sources.

Miscellaneous

A comparison with those soundings charted from the prior reconnaissance survey reveals the same trends as discussed in Section 6, Comparison with Prior Surveys. However, one feature, a sunken rock at latitude 19°15'23"N, longitude 155°11'45"W merits further discussion. A search was conducted by the launch and a diver to verify or disprove the existence of this item. Depths of water in this area preclude the existence of such a feature. The evaluator feels this item is displaced offshore from Apua Pt. and concurs with the ship's recommendation. CORRECT

With consideration of the above item, the present survey is adequate to supersede the charted hydrography within the common area.

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

c. Aids to Navigation - There were no fixed or floating aids within the limits of this survey.

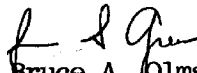
8. COMPLIANCE WITH INSTRUCTIONS

H-9916 ⁽¹⁹⁸⁰⁾ (~~RA-20-5-80~~) adequately complies with the ^P project ^I instructions except as noted in Section 4, Condition of Survey.

9. ADDITIONAL FIELD WORK

H-9916 ⁽¹⁹⁸⁰⁾ (~~RA-20-5-80~~) is a good basic survey. Additional field work is not required.

Submitted by

for 
Bruce A. Olmstead
Evaluator

Examined and Approved


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

May 28, 1982

TO: C35 - C. William Hayes

FROM: CPM - Charles K. Townsend

SUBJECT: Administrative Approval, H-9916, Apua Point and Vicinity,
Island of Hawaii, Hawaii

*Southwest Coast of Hawaii, Kalahe Apukii
to Kaaha.*

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.

The Descriptive Report (Section Q) recommended that Keauhou Landing be described on the next chart by a special note that was provided in the report. This note is important because this is the only harbor of refuge for 20 miles in either direction along the coast and sufficient data was not collected to allow compilation of a larger scale inset for the stated reason that this area is too small to warrant a chart inset.

As recommended in the Verifier/Evaluator's Report (Section 2.c.), the note could reference the current Coast Pilot #7 for necessary information. However, it is noted that Coast Pilot No. 7, 1981 was published using information from the ship's Coast Pilot Report, but the wording was changed and some of the information omitted. These changes have distorted somewhat the original description and reduced the usefulness of this information to the mariner.

Because of the potential importance of this refuge it is recommended that the Coast Pilot No. 7 be changed to include the information exactly as noted in the ship's Coast Pilot Report. *Coast Pilot revised accordingly.*



10TH ANNIVERSARY 1970-1980

National Oceanic and Atmospheric Administration

A young agency with a historic
tradition of service to the Nation



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

N/CG242:LQ

October 30, 1984

TO: Roy K. Matsushige *RM*
Chief, Hydrographic Surveys Branch

THRU: Chief, Standards Section *epd*

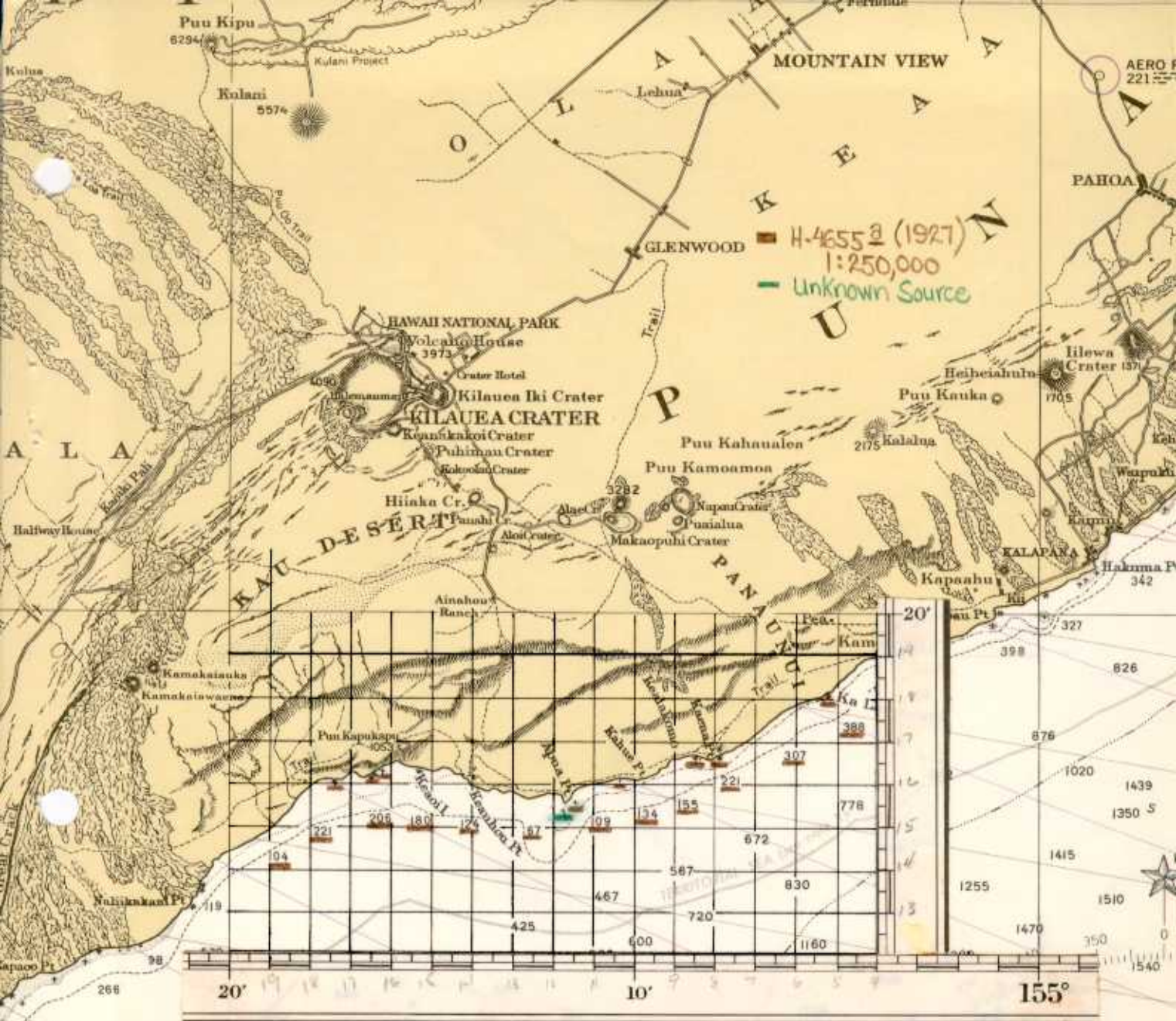
FROM: Lisa Quinlan *Lisa Quinlan*
Quality Evaluator

SUBJECT: Quality Control Report for Survey H-9916 (1980), Hawaii, Southeast
Coast of Hawaii, Ka Lae Apuki to Kaaha

A quality control inspection of survey H-9916 (1980) 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 made 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 $\frac{1}{2}$ -scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to National Ocean Service standards and requirements except as stated in the Verifier's Report and the HIT Report.

cc:
N/CG241





99 16

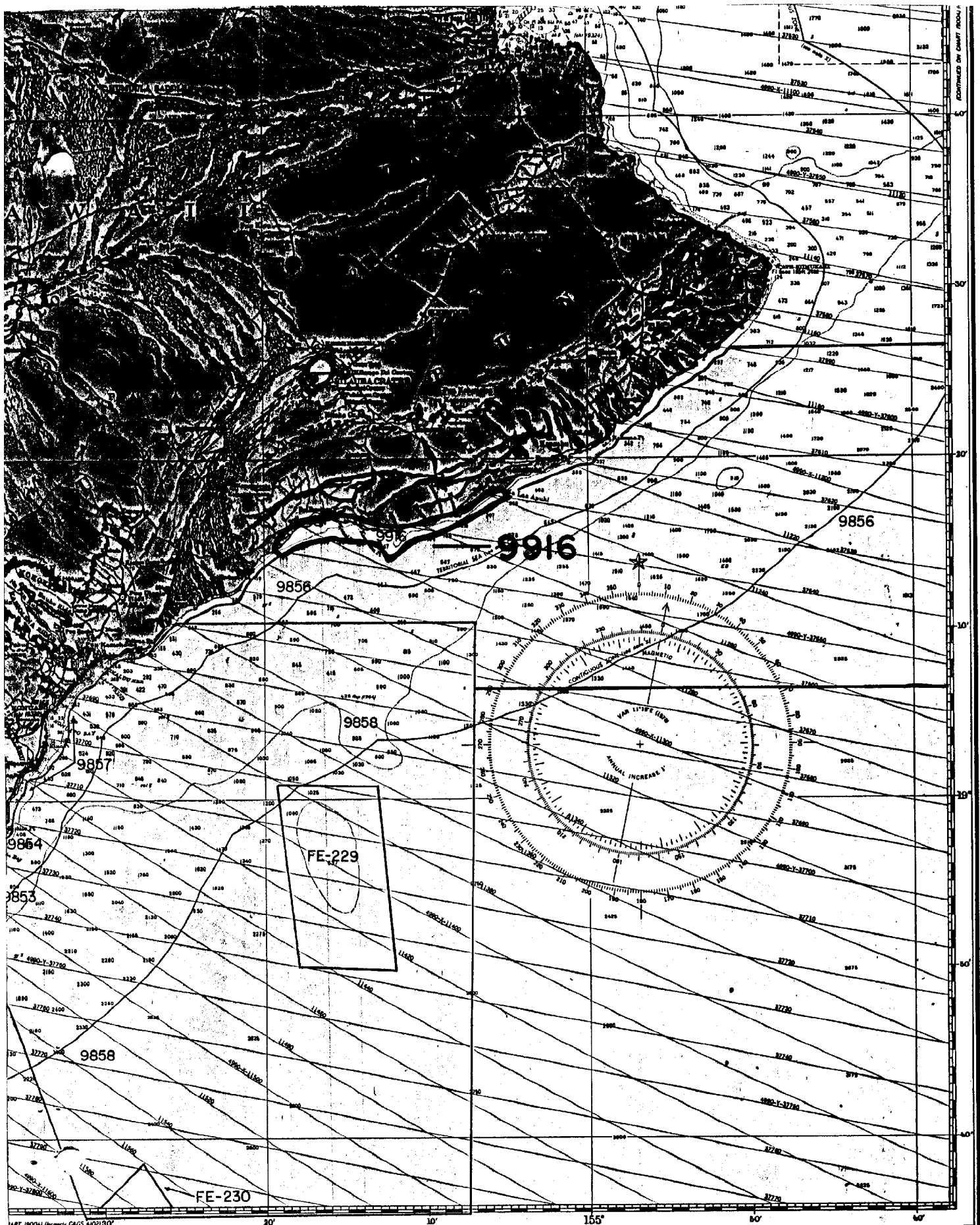
12th Ed., June 1778
19320
 (formerly C&GS 4115)
LORAN-C OVERPRINTED

(Island of Hawaii)

SOUNDINGS IN FATHOMS - SCALE 1:250,000

19320

(formerly C&GS 4115)



CONTINUED ON CHART NO. 4115-2

4115-2 (2-sheets)

CHART 19004 (formerly C&GS 410730)

CE
MINISTRATION

PATHS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
FEET	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
METERS	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48

(Island of Hawaii) 19320
 SOUNDINGS IN FATHOMS - SCALE 1:200,000
 (formerly C&GS 4115)
 LORAN-C OVERPRINTED



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

N/CG24x1:DEW

FEB 20 1986

TO: N/MOA - Wesley V. Hull
N/MOP - Robert L. Sandquist
FROM: N/CG2 - *J. Austin Yeager*
SUBJECT: Reports of Compliance for Hydrographic Surveys

I have decided that a special "Report of Compliance" is no longer required for those remaining hydrographic surveys processed under the Verification/Quality Control system in place prior to October 1982. You will no longer receive these reports. Statements made in the Verifier's Reports, modified as necessary by the Quality Control Reports, will suffice with regard to compliance with project instructions.

After their examination of the Descriptive Reports for Automated Wreck and Obstruction Information System (AWOIS) file revisions, Operations Section (N/CG241) personnel will insert a copy of this memorandum into each Descriptive Report to provide appropriate authority for the missing compliance report. In accordance with past practice, we will forward a copy of the Quality Control Report to you for your information.

CC:
N/CG22 - Nortrup



