

9667

Diag. Cht. No. 5101-4

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC
Field No. RA-20-6-76
Office No. H-9667

LOCALITY

State CALIFORNIA
General Locality SANTA BARBARA CHANNEL
Locality POINT MUGU

1976

CHIEF OF PARTY
James P. Randall

LIBRARY & ARCHIVES

DATE March 6, 1978

9667

*Area 5
CHT*

5202-18720^x 232-
5120-18725^x 50-
* 5020-18022- 868
5002-18020^x 1,444
5101-18740^x 234-

HYDROGRAPHIC TITLE SHEET

H-9667

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-20-6-76

State California

General locality Santa Barbara Channel

Locality Point Mugu

Scale 1:20,000 Date of survey Nov. 20-Dec. 5, 1976

Instructions dated 22 July 76 Change 1: 27 Sept 76=
Change 2: 1 Dec 76 Project No. OPR-411

Vessel RAINIER (2120) ^{and} Launches RA-3 (2123) and RA-5 (2125)

Chief of party CAPT James P. Randall
LTJG G.B. Stanke LT F.L. Kleinschmidt ENS M. Molchan, LTJG S.R. Ramsey

Surveyed by ENS J.C. Osborn LTJG J.W. Peterson ENS M. Lerch

Soundings taken by echo sounder, hand lead, ~~XXX~~ Ross Fathometer Model 5000, Universal Graphic Recorder and Leadline (between fix 5398-5400)

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel
Positions verified

~~XXXXXX~~ by Bruce Alan Olmstead Automated plot by PMC Xynetics Plotter
Soundings

Verification by Bruce Alan Olmstead

Soundings in fathoms ^{and fathms} ~~XXX~~ at ~~XXXX~~ MLLW

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

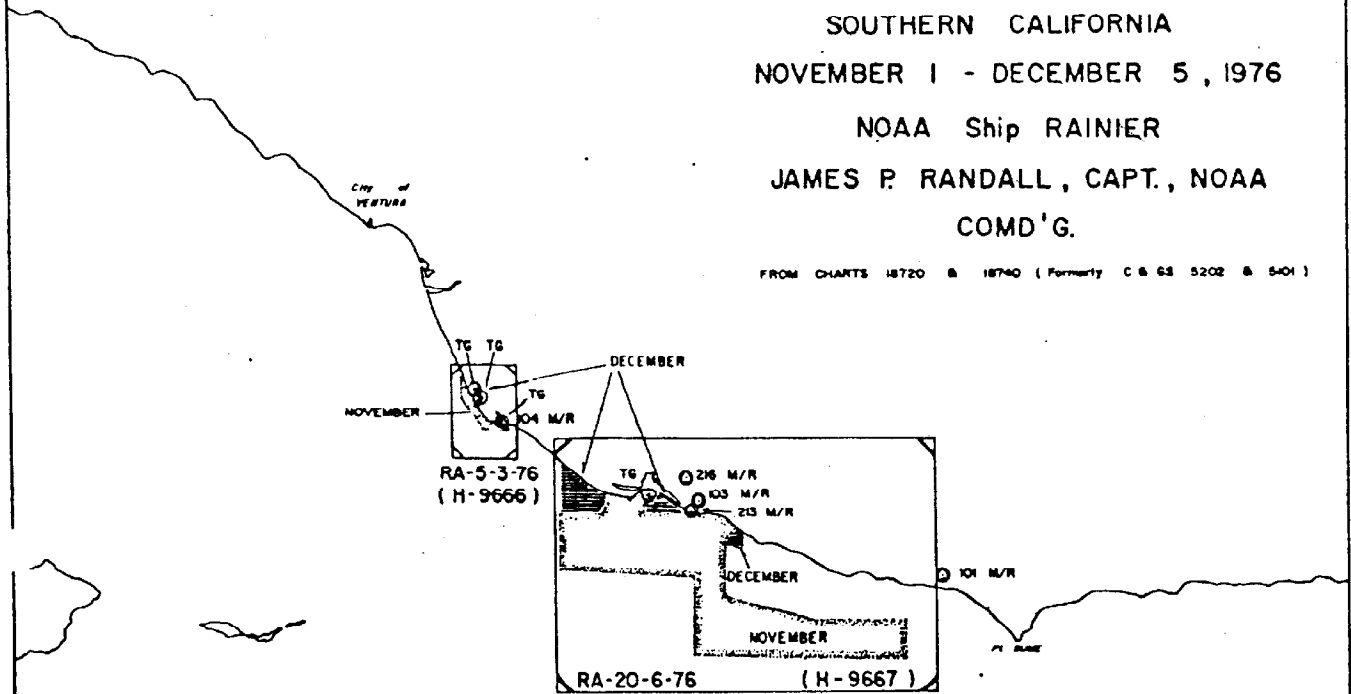
Time meridians 0° (GMT)

This survey meets 1:20,000 accuracy requirements.

Applied to stps 7/10/78
CAF

✓
 PROGRESS SKETCH
 OPR - 411-RA-76
 HYDROGRAPHIC SURVEY
 SOUTHERN CALIFORNIA
 NOVEMBER 1 - DECEMBER 5, 1976
 NOAA Ship RAINIER
 JAMES P. RANDALL, CAPT., NOAA
 COMD'G.

FROM CHARTS 18720 & 18740 (Formerly C & GS 5202 & 5401)



LEGEND

NOV	DEC	
343	52	50 M SOUNDING
98	69	L.N.M. MISCELLANEOUS DISTANCE
132	99	L.N.M. DISTANCE TO & FROM
2888	1312	L.N.M. SOUNDING LINE
27	62	BOTTOM SAMPLES (GRAB)
9	0	WATER SAMPLES ANALYZED (SALINITY)
5	0	CONTROL STATIONS (ELECTRONIC)
0	0	TEMPERATURE, DEPTH, CONDUCTIVITY
1	0	MANSEN CAST
4	0	TIDE GAUGE
7	0	STATIONS LOCATED BY TRAVERSE

✓
DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SURVEY

H-9667

RA-20-6-76

SCALE 1:20,000

1976

NOAA SHIP RAINIER

CAPT. JAMES P. RANDALL

COMMANDING

A. PROJECT

This survey was accomplished in accordance with Project Instructions OPR-411-RA-76, Southern California Coast date July 22, 1976; change NO. 1, supplement to Instructions, dated ~~October 4,~~ ^{SEPTEMBER 27,} 1976; and change NO. 2, Amendment to Instructions, dated December 9, 1976.

✓

B. AREA SURVEY

The area surveyed is in Southern California, approximately five miles southeast of Port Hueneme. The western most boundary of the survey is formed by Long. 119° 09.6'. The northern boundary is formed by the shore line and extends for approximately seven miles. The north-eastern boundary is formed by Fairweather surveys H-9599 and H-9600. The eastern most boundary is Long. 118° 53.3'. The survey's southern limit in the West is Lat. 34° 02.5' while East of Long. 119° 03.6' the southern boundary is formed by Lat. 33° 59.5'. Hydrography on this survey began on November 21, 1976 (JD 325) and ended on December 5, 1976 (JD 340).

✓

C. SOUNDING VESSELS

Sounding vessels used for this survey were NOAA SHIP RAINIER (2120) and aluminum launches RA-3 (2123) and RA-5 (2125). A special mount for the Mini Ranger on RA-5 extended fifteen feet above the cabin of the launch (Figure 1). This allowed the launch to take soundings closer to shore with minimal loss of signal strength. In addition, this fifteen foot mast provided a distinct target during the periods of range-azimuth hydrography.

✓

D. SOUNDING EQUIPMENT

Sounding equipment for RAINIER launches 2123 and 2125 consisted of Ross Model 5000 Fineline Fathometer Systems. The serial number of these systems were 1071 and 1070 for launches 2123 and 2125 respectively. Depths sounded by these systems ranged from less than one fathom to nearly 100 fathoms, with most depths falling in the 10 fathom to 30 fathom range.

✓

During ship hydrography, RAINIER utilized a Raytheon UNIVERSAL Graphic Recorder (s/n 75) coupled with an Edo Model 248 Transceiver and an Edo Model 261 C Digitizer. The transducer was located in Soundroom #1 of RAINIER, 2.4 meters forward of the mast supporting the positioning equipment.

✓

Preliminary draft and velocity corrections were applied to all soundings of this survey during smooth plotting. The preliminary draft corrections were determined by previous experience with both launches and the ship, and are shown on the daily master and

✓

FIGURE 1



Fifteen Foot Mast Attachment on Launch RA-5

corrector tapes. The final TRA values were determined by bar checks and leadline comparisons, and are shown on the TC/TI tapes. For details of determination of initial and final velocity corrections please see Corrections to Echo Soundings, OPR-411-RA-76 which accompanies this survey. ✓

Fathometers were monitored continuously during operations to maintain zero initial and phase corrections. The phase calibration technique specified by PMC Op Order for the Ross system was used for those instruments. ✓

Fathograms were scanned during and after hydrography and missed digital depths were determined from the analog trace by applying a correction for any systematic analog-to-digital error. In areas of heavy swell, depths were taken at the top one third of the analog wave trace. ✓

Settlement and squat for all vessels was determined to be negligible. For methods of this determination see the echo sounding report mentioned above. ✓

Five leadline soundings were taken on this survey by vessel 2125 on J.D. 339. The TRA correction for these soundings was corrected to zero on the daily corrector tape used for smooth plotting. However, during smooth plotting these soundings also had preliminary velocity corrections applied. The final TC/TI tapes submitted to PMC refer these soundings to a special table indicating zero velocity correction at all depths. Therefore there may be a discrepancy of one-tenth fathom between the final Marine Center smooth plot and the ship's smooth plot of these five soundings. ✓

E. HYDROGRAPHIC SHEETS

The modified Transverse Mercator Projection and all soundings were plotted by RAINIER personnel with the use of the on-board PDP8/e Complot systems. The smooth sheet was constructed on plotter S/N 5445-7. Rough plots were made daily and examined for completeness. The final smooth sheet was started December 6, 1976 and completed on December 20, 1976; no discernable distortion was noted. Predicted tides, TRA and preliminary velocity corrections were applied to all data on the smooth field sheet. All data was transferred to PMC for verification. ✓

The survey was run using 1:20,000 scale boatsheets and smooth field sheets as specified in OPR-411-RA-76 Project Instructions. In all cases line spacing met or exceeded the density of spacing required by the project instructions. Position accuracy and calibration tolerances were selected to comply with requirements for 1:20,000 scale surveys. ✓

F. CONTROL STATIONS

All electronic control stations were located by third order class I geodetic procedures. All positions were computed on the 1927 North American Datum. No photo control points were used. ✓

KINKAID 1927 (101), MUGU 1927 ECC. (103), LIGHT RM 1 1976 (104), MUGU PT. 1932 (213), LAGUNA 2 1951 (216) were used for electronic navigation control stations. MUGU 1927 ECC. (103) and LIGHT RM 1 1976 (104) were established during this survey. ✓

Range-azimuth survey operations used Mini-Ranger Code 2 co-located with T-2 (S/N 68648) at MUGU PT. 1932 (213). A tripod supporting the T-2 was plumbed directly over MUGU PT. 1932. A "T" shaped support structure held the Mini-Ranger directly above both the T-2 and station MUGU PT. 1932. ✓

G. HYDROGRAPHIC POSITION CONTROL

Two methods of position control were used for data acquisition on this sheet. The primary method of control was electronic range-range, using Motorola Mini-Ranger III. For control by this method, shore station pairs were selected in such a manner as to provide an arc intersection between 30° and 150° . In a small area around MUGU POINT it was not possible to provide adequate signal coverage from two stations without the establishment of extensive additional geodetic control. Range readings were obtained by Motorola Mini-Ranger III; the transponder was located at station "Mugu Point 1932"; signal #213. Azimuth readings were obtained by a Wild T-2 located at the same signal (213). Whenever possible, range readings were obtained and recorded for every sounding as an aid for more accurate plotting. The launch (2125) was run along arcs of constant distance from the shore station, and both channels of the launch console were used to obtain range data. It was thus possible to eliminate many busted positions since two separate range readings were obtained for each sounding. ✓

The following is a list of Mini-Ranger components used by each vessel:

<u>VESSEL</u>	<u>CONSOLE</u>	<u>R/T</u>	<u>DATES USED</u>
2120 (RAINIER)	715	720	327 - 329
2123	720	727	339 - 340
2125	711	718	325 - 337
2125	715	720	339

Shore station Mini-Ranger components and their location for work on this sheet were as follows:

<u>STATION NAME</u>	<u>SIGNAL</u>	<u>COMPONENT</u>	<u>S/N</u>
KINKAID 1927	101	M/R Code 1	774
MUGU 1927 (ecc.)	103	M/R Code 3	776
LIGHT RM 1 1976	104	M/R Code 4	777
MUGU PT 1932	213	M/R Code 2	775
MUGU PT 1932	213	T-2	S/N 6848
LAGUNA 2 1951	216	M/R Code 1	774

Electronic correctors to Mini-Ranger values were derived from baseline calibration data and verified by daily calibration checks. The initial baseline calibration was conducted on 10 November 1976, and the final baseline calibration was conducted on 6 December 1976. Both calibrations were conducted in accordance with PMC OORDER Appendix M over a distance of 1484.9 meters, from the roof of Port Hueneme Lighthouse to the Port Hueneme Pier. The distance for this calibration range was determined by Tellurometer observations. Baseline calibration data and graphs are provided in the appendix to this report.

Calibrations were performed twice daily whenever possible. The following methods of calibration were used and are all documented on the RAW data printouts:

STATIC: The launch was positioned alongside a station of known geodetic location and the observed rates were compared to the true distance as calculated by PDP8/e computer using Program RK-407. Any eccentricity between the station and the launch antenna was accounted for during calibration.

Originally signal #303 was photo located and this position was used for daily checks. Once the geodetic position had been determined the G.P. showed the signal to be two meters east of the photo location. Static calibrations on the RAW data printouts were reexamined and none of the variances were significant enough so that an addition or subtraction of two meters would cause a rejection of the baseline values.

ON RANGE AND VISUAL: The vessel was run at a slow speed along a known range consisting of two geodetically located signals. Mini-Ranger rates were noted when crossing a set of predetermined angles between the range and a geodetically located third object.

VISUAL: 3-point sextant fix. In some cases the sextant calibration was augmented by an azimuth reading taken by T-2 from shore. ✓

ELECTRONIC: Rates from two Mini-Ranger stations (which were calibrated by one of the above methods) were used to calibrate a third Mini-Ranger rate. This method was used only rarely when the third rate could not be calibrated elsewhere, i.e. in fog or low visibility. ✓

In all cases, signal strengths were observed and recorded to insure accuracy within the limits determined during baseline calibration. A minimum of six readings were obtained for each calibration. Daily calibration data are included with raw data printouts or in sounding volumes. ✓

A summary of baseline and daily calibrations is given in the following table. The final baseline calibration was not performed for console S/N 711 and R/T S/N 718 due to a hardware failure in the R/T unit. Variances were not calculated for the initial baseline calibration. Console S/N 715 and R/T S/N 720 were used both on 2120 (RAINIER) and 2125. Since the daily observed correctors differed significantly for the use on the two vessels, analysis was made both separately and combined. ✓

VESNO	CONSOLE R/T	CODE	FIELD	MEAN CORRECTORS		STANDARD DEVIATION				TOTAL VARIANCES		CORRECTOR USED
				B.L.1	B.L.2	FIELD	B.L.1	B.L.2	FIELD	B.L.1	B.L.2	
2120	715/720	1	+5.0	+3	+4.3	2.9	2.3	2.3	7.8	...	5.1	04
		2	...	0	+1.4	...	2.3	2.3	...	...	5.1	+1
		3	-6.6	0	+0.4	3.5	2.0	1.8	11.5	...	3.1	0
		4	+0.9	+1	+1.3	3.7	2.2	1.9	13.1	...	3.7	41
2123	720/727	1	-3.4	-1	+1.5	1.8	2.6	2.3	3.1	...	5.1	0
		2	...	-1	-1.1	...	1.7	2.0	...	...	3.9	-1
		3	-1.7	+1	+1.2	4.5	2.4	2.4	18.7	...	5.9	+1
		4	-0.1	-1	+1.0	1.8	2.5	2.5	2.9	...	5.9	0
2125	711/718	1	-0.5	-1	...	1.5	2.2	...	2.0	...	...	-1
		2	+0.5	-3	...	2.3	2.1	...	4.8	...	...	-3
		3	-0.6	-1	...	1.7	2.0	...	2.7	...	...	-1
		4	+2.7	0	...	3.1	1.8	...	9.3	...	...	0
2125	715/720	1	-1.2	+3	+4.3	2.0	2.3	2.3	3.8	...	5.1	44
		2	+6.0	0	+1.4	3.9	2.3	2.3	13.3	...	5.1	+1
		3	-1.1	0	+0.4	1.6	2.0	1.8	2.0	...	3.1	9
		4	+2.2	+1	+1.3	2.7	2.2	1.9	7.0	...	3.7	41
2120 & 2125	715/720	1	+1.6	+3	+4.3	3.9	2.3	2.3	15.1	...	5.1	44
		2	+6.0	0	+1.4	3.9	2.3	2.3	13.3	...	5.1	44
		3	-4.9	0	+0.4	3.9	2.0	1.8	15.1	...	3.1	44
		4	+1.5	+1	+1.3	3.3	2.2	1.9	10.5	...	3.7	44

Analysis of the data in this table shows the following:

-The maximum difference between baseline calibrations of any one unit was 2.5 meters, with a mean difference of 0.9 meters. ✓

-The maximum difference between daily correctors and the mean of the two baselines was 6.8 meters, with a mean of 2.7 meters. These values are well within the limits of accuracy specified by the Provisional Hydrographic Manual and the PMC OORDER. ✓

-Field calibrations indicate an accuracy of approximately 4 meters in general for Mini-Ranger values on this survey. ✓

The most notable problem encountered during this project was the interference of the Mini-Ranger reception due to the operation of high-powered C-Band military radar in the project area. This interference existed to the extent that both Mini-Ranger equipped launches and the ship often experienced complete loss of reception, over broad areas of the sheet. At times signal reception was reduced to one interrogation every half hour; signal strengths of those signals that were received were generally very high when this problem occurred. On weekends and during early morning hours, when C-Band installations were shut down, this problem would disappear. ✓

The problem of destructive interference due to multipath signal propagation was also encountered. The signal strength indicator was monitored continuously in order to recognize the onset of this phenomenon. When low signal strengths existed over a large area, data acquisition was postponed for slightly changed weather, sea, or tide conditions. The boatsheets and rough plots were examined for obvious position busts; all suspect positions were plotted by time-and-course interpolation. In several cases, it was necessary to reject portions of hydrography due to poor signals. ✓

The only hardware failure occurred on Julian Day 338 in R/T Unit 718 on launch RA-5. The unit was replaced by R/T 720, and the console was replaced by console S/N 715 in order to use a calibrated console-R/T pair. Refer to FAILLOG #7670 for details of the failure. ✓

A separate electronic control report will not be compiled for OPR-411-RA-76. ✓

H. SHORELINE

The final shoreline was transferred from 1:10,000 scale ^{reductions} ~~enlargements~~ of National Ocean Survey Shoreline Manuscripts TP-00779 and TP-00780. All shoreline and topographic details on the Master Field Edit sheets were verified by field edit and this information was transferred to ✓

the smooth boatsheet by pantograph due to the scale difference between the Master Field Edit sheets and hydrographic survey boatsheets.

Not only was field edit complete for the shoreline covering this survey but additional field edit work was done for the shoreline south-east of the survey inshore of FAIRWEATHER survey H-9600. There were no major changes in the mean high water line or to the inshore detail. Refer to Field Edit Report, OPR-411-RA-76 and Master Field Edit sheets TP-00779, TP-00780 for further information. ✓

I. CROSSLINES

Approximately 36.5 n.m. of crosslines were run on this sheet, equal to 13% of the total mainscheme mileage. In areas shoaler than 11 fathoms, 92% of all crossings agree within 0.3 fathoms and 100% of the crossings are within 0.6 fathom agreement. For areas with depths of 11 fathoms or greater 92% of the crossings agree within one fathom or less. For the remaining 8% the maximum discrepancy is three fathoms except at Lat. $34^{\circ} 05'.4$ N, Lon. $119^{\circ} 05'.3$ W. At this position the crossline sounding of 43 fathoms disagree with a mainscheme sounding of 36 fathoms. These soundings occur on a rapidly changing bottom and the 43 fathom sounding is located down slope of the 36 fathom sounding and is consistent with the general bottom contour. ✓

J. JUNCTIONS

This survey junctions to the North and to the East with FA-10-4-76 (H-9599) and FA-10-5-76 (H-9600). For areas shoaler than 100 fathoms, the soundings of these surveys were in perfect agreement having a maximum discrepancy of one fathom. At the junction with H-9599 where soundings were greater than 100 fathoms, the surveys were not in good agreement. In the quad bordered by Lat. $33^{\circ} 59'.0$ to $34^{\circ} 00'.0$ and Lon. $118^{\circ} 53'.0$ - $118^{\circ} 54'.0$. soundings from H-9599 are 5 to 10 fathoms deeper than those on this survey. It is recommended that this survey's soundings be accepted over that of survey H-9599 due to the following considerations: 1) Ross Fathometer was used for the survey H-9599 for soundings in this area, 2) RAINIER's Universal Graphic Recorder was used in depths greater than 100 fathoms on this survey, 3) the Ross recorder has shown in the past that it is not accurate in depths much greater than 100 fathoms. *Diff. in cones of fathrs may account in part for differences* ✓

K. COMPARISON WITH PRIOR SURVEYS

Prior surveys with soundings in the area covered by this survey are:

H-5392	1:10,000	1933
H-5425	1:10,000	1933
H-5446	1:40,000	1933-34
H-5507	1:40,000	1933 - 34

The 10 fathom curve on H-5392 directly south of Mugu Point is 20 meters inshore of the 10 fathom curve of the present survey south and east of Mugu Point. The 20 fathom curve on H-5392 is also slightly inshore of the 20 fathom curve on this survey, indicating a slight filling in this area. All other soundings from H-5392 are within 1 fathom agreement with this survey. ✓

The Mugu Canyon area is covered by H-5425 and it should be noted that the 200 fathom curve for H-5425 is wider and extends north into an area this survey sounded at less than 200 fathoms. This indicates a slight filling of the canyon within the last 43 years. This filling is especially evident at Lat. $34^{\circ} 04'.5$ N, Lon. $119^{\circ} 06'.3$ W. Other than this particular area, agreement with soundings and depth curves is remarkably good. It appears that this canyon and the surrounding bottom is very stable. ✓

Displacement of curve due to 30° cone of fmr

All soundings 100 fathoms and shoaler on H-5507 are within 1 fathom agreement with this survey. In areas deeper than 100 fathoms agreement fell within two or three fathoms. These 2 to 3 fathom discrepancies are found in areas of rapidly changing bottom and the slope or rise indicated by the prior survey soundings is consistent with the bottom contour on the present survey. ✓

The presurvey Review Item #1 (of sheet 1 of 2) lists a mooring buoy CG1 which is east of the present survey's project limits and is believed to have been investigated during the FAIRWEATHER's survey H-~~2500~~²⁵⁰⁰ 5599. (RA-10-4-76) ✓

Item #2 lists another mooring buoy at Lat. $34^{\circ} 05'.75$ N, Lon. $119^{\circ} 05'.9$ W in accordance to Notice to Mariners No. 41 of 1945. This buoy was searched for, not found, and should be removed from the chart. ✓

In the process of checking transferred soundings from prior surveys onto the smooth sheets a few errors by ship's personnel were observed. The color coding for H-5425 was mixed with that of H-5507, one or two soundings had to be repositioned, and four soundings had incorrect depths. These errors were all corrected on the smooth sheet but the mistakes still show on the rough boatsheets. ✓

L. COMPARISON WITH THE CHART

Comparison of this survey with Chart 18720 (formerly C&GS 5202) 19th edition, August 7, 1976 showed excellent agreement. Since the scale of chart 18720 is 1:232,188 in comparison to RAINIER's 1:20,000 survey, the exact placement of the soundings on the smooth sheet for comparison was difficult. However a comparison of the 20,30,50,100 and 200 fathom depth curves was made by choosing distinctive features and locating these features on both the chart and this survey. The plateau located with an approximate center at Lat. $34^{\circ} 00' 00''$ N, Lon. $119^{\circ} 02' 00''$ W showed the 50 fathom curve to be in exact agreement. The ✓

chart has a least depth on the southern edge of this plateau of 45 fathoms. This survey shows a least depth in this area of 44 fathoms. It is recommended that the chart be changed to include the 44 fathom sounding in place of the 45 fathom sounding. The present survey's depth curves paralleling the shoreline and those in Mugu Canyon were in excellent agreement with those on the chart. The 18 fathom peak charted at the inshore tip of Mugu Canyon, Lat. $34^{\circ} 04'.85$ N, Lon. $119^{\circ} 05'.25$ W, was verified by the present survey. ✓

On chart 18720 a RA REF Buoy R Or Gp F1 (2) 18 sec is shown at Lat. $34^{\circ} 03'.4$ N, Lon. $119^{\circ} 03'.6$ W. This buoy was observed by RAINIER personnel to be in the parking lot of the Pacific Missile Test Center Geophysics Division. It had been removed by the Geophysics Division and should be removed from the chart as the Navy has no plan at this time for its redeployment. ✓

A visible wreck was located by hydrographic survey operations. Two detached positions were taken on the seaward edge of visible wreck ruins. The longitude and latitude were computed using RK-300 and the average position was taken between the two (attached is a zerox copy of the two computed positions). The average geographic position is Lat. $34^{\circ} 05' 50''.79$ N, Lon. $119^{\circ} 05' 24''.96$ W. The physical characteristics include approximately 35 metal ribs embedded vertically in the sand with a height above water of one foot at 222702 GMT on December 4, 1976. According to predicted tides it was MLLW at this time. Master Field Edit Sheet TP-00779 contains a reference to this object and it should be noted it was not located by photogrammetric means nor was it seen by the field edit officer. The wreck ruin has been hand plotted in red on the smooth sheet. ✓ ←

M. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede prior surveys for charting. All fathograms were scanned and checked for peaks and deeps, and appropriate changes were made to the original records where necessary. The curvature of the lines in the survey's South-Eastern portion are due to the helmsman problems and not due to control problems. ✓

N. AIDS TO NAVIGATION

There were no fixed or floating aids to navigation now located within the survey area. For more complete information on presently charted aids that have been removed refer to sections K and L of this report. ✓

O. STATISTICS

This survey contains 338.2 n.m. of soundings, covering 38 square nautical miles. The following data were obtained: ✓

✓
GEOGRAPHIC POSITION OF WRECK

ELECTRONIC STATIONS(S1,M,S2)= 216,000,213

PATTERN 1= 002704 } Pos. 5401
PATTERN 2= 003125 }

X = 68428.392
Y = 20224.926

Pos 5401 LATITUDE = 34/05/50.753
LONGITUDE= 119/05/25.026

PATTERN 1= 002700
PATTERN 2= 003123

X = 68431.691
Y = 20227.258

Pos 5402 LATITUDE = 34/05/50.828
LONGITUDE= 119/05/24.897

PATTERN 1=

→ 34/05/50.79
119/05/24.96

<u>VESSEL</u>	<u>N. Mi.</u>	<u>POSITIONS</u>
2120	218.3	615
2123	61.5	258
2125	58.4	415

For additional information refer to the Abstract of Positions in the separates following this text.

P. MISCELLANEOUS

The Mugu Lagoon, located northwest of Mugu Point was not surveyed as boats cannot cross into the lagoon from seaward. ✓

Just south of Mugu Lagoon is Mugu Canyon, an area which reaches depths of over 80 fathoms one mile off shore and 200 fathoms two miles off shore. Except for the slight filling in the 200 fathom curve area, this canyon is remarkably stable in comparison with prior surveys dated 1933. ✓

Apparent Not actual

The major problem encountered during this project was Mini-Ranger interference due to the operation of high-powered C-Band radar in the survey area. For more complete information regarding this refer to section G. ✓

Q. RECOMMENDATIONS

This survey is considered complete and adequate for charting. Other than those already mentioned, there are no further recommendations. ✓

R. DATA PROCESSING PROCEDURES

Data acquisition and processing were accomplished per instructions in the Provisional Hydrographic Manual and the PMC OPORDER. Soundings and positions were obtained by the hydroplot system using computer program RK-111 for range-range hydrography. The range-azimuth data was manually recorded in sounding volumes and transferred to master tapes using manual loggers and programs AM-602 and RK-330. The range-azimuth programs were plotted by RK-216. ✓

For each vessel, daily master tapes and corresponding corrector tapes were made that include the vessel's TRA, electronic control calibration corrections, and all depth corrections. Bar checks and Nansen casts supplied the information for the velocity tapes. ✓

The following is a list of all computer programs (and version dates) used for this sheet: ✓

<u>PDP-8 PROGRAM</u>	<u>NAME</u>	<u>VERSION</u>
RK 111	Range-Range Real Time Plot	1/30/76
RK 201	Grid, Signal, and Lattice Plot	7/12/75
RK 211	Range-Range Non-Real Time Plot	1/18/76
RK 216	Range-Azimuth Position and Sounding Plot	2/05/76
RK 300	Utility Computations	2/10/76
RK 407	Geodetic Inverse/Direct	10/23/75
AM 500	Predicted Tide Generator	11/10/72
RK 530	Layer Corrections for Velocity	5/10/76
RK 561	H/R Geodetic Calibration	2/19/75
AM 602	Elinore	5/21/75

WANG PROGRAM

Long Line Geodetic Position	700-1
Long Line Inverse	700-2
EDAT 006-011	

S. REFERENCES TO REPORTS

The following is a list of reports which have been submitted to Pacific Marine Center relating to this descriptive report:

Horizontal Control Report, OPR-411-RA-76

Field Edit Report, Job CM-7404, OPR-411-RA-76

Corrections to Echo Sounders Report, OPR-411-RA-76

Descriptive Report, H-9666, RA-5-3-76, OPR-411-RA-76

Respectfully submitted,

Marianne Molchan

Marianne Molchan
Ensign, NOAA

✓
INDEX TO
SEPARATES FOLLOWING THE TEXT

	<u>Page</u>
Hydrographic Sheet Projection and Electronic Control Parameters	16
Field Tide Note	17
Ross Fathometer Calibration	21
Geographic Names List	23
Abstracts of Corrections to Echo Soundings	24
✓ Abstracts of TC/TI Tapes	28
List of Stations	30
✓ Abstract of Positions	36
✓ Bottom Samples	38
Non-Floating Aids for Charts	42
✓ Electronic Correctors	49
✓ Electronic Baseline Calibration Data	53
Approval Sheet	101

✓ = Misc. items removed from the D.R. and filed with the field records

✓
FIELD TIDE NOTE

H-9666, H-9667
OPR-411
SOUTHERN CALIFORNIA

NOAA SHIP RAINIER
CAPTAIN J.P. RANDALL
COMMANDING OFFICER

Field tide reduction of soundings for H-9666 Channel Islands Harbor and Port Hueneme was based on station number 463, Port Hueneme, of the Tide Tables. Reduction of soundings on H-9667 near Point Mugu was based on station number 461, Mugu Lagoon Entrance (Ocean), of the Tide Tables. Both stations used Los Angeles (Outer Harbor) #941-0660 as the reference station. These predicted tides were converted to GMT tide correctors with PDP8/E computer using Program AM 500, PREDICTED TIDE GENERATOR, version 10 November, 1972. Except for 2-10 November for the Port Hueneme gage (941-1065), all tide observations were done on GMT (000⁰W).

Four stations were established to monitor the tide within the OPR-411 project limits:

<u>Station</u>	<u>Location</u>	<u>Operation Dates</u>
T-1, Mugu Lagoon Entrance (Ocean). 941-1015	Lat. 34 ⁰ 06.0' N Lon. 119 ⁰ 06.0' W	16 Nov - 20 Dec 1976 34 days
T-2, Port Hueneme 941-1065	Lat. 34 ⁰ 08.87' N Lon. 119 ⁰ 12.47' W	2 Nov - 6 Dec 1976 34 days
T-3, Channel Islands Harbor 941-1081	Lat. 34 ⁰ 09.68' N Lon. 119 ⁰ 13.28' W	18 Nov - 16 Dec 1976 28 days
T-4, Middle Channel 941-1095	Lat. 34 ⁰ 10.55' N Lon. 119 ⁰ 13.58' W	2 Dec - 6 Dec 1976 5 days

T-1, Mugu Lagoon Entrance (Ocean), 941-1015

T-1 was a F and P ADR tide gage S/N 7403A3402M18. It is recommended that this gage be used to control all offshore hydrography for this project. This gage lost approximately 1 minute per day and may have double-punched on a few occasions; specifically, between: 30 Nov. and 1 Dec., 2 & 3 Dec., and 10 & 13 Dec. On 21 November the float cable was broken and had to be spliced. The staff to gage relationship undoubtedly changed slightly at this time. The gage was set to read 10 feet higher than the staff.

Levels were run to five (5) bench marks. Installation levels were run on 16 November and removal levels were run on 3 December 1976. Comparison between installation and removal levels indicate a difference of 0.020 ft. between the rod stop and BM A. It is believed that the staff did NOT move. The rod stop that was used during removal levels was not the same as that used during installation levels. The installation rod stop had been destroyed.

T-2, Port Hueneme, 941-1065

T-2 was a F and P ADR tide gage S/N 7304A1380M19. It is recommended that this gage be used to control hydrography in Port Hueneme.

On or after 7 November the gage started running slow (up to 35 min. per day), so the timer was replaced. The problem persisted so the entire gage was replaced with S/N 7403A3402M2 on 11 November. There were no other problems with this gage.

Levels were run to five (5) bench marks. Installation levels were run on 17 November and removal levels on 3-4 December, 1976. The gage was set to read the same as the staff.

T-3, Channel Islands Harbor, 941-1081

T-3 was a F and P ADR tide gage S/N 2R6406A5853M7. It is recommended that this gage be used to control hydrography in Channel Islands Harbor. The gage ran without problems until 17 December, 1976 when the float cable was found off the drum. It is believed that the gage was struck hard by a boat or by someone on the seawall.

Levels were run to five (5) bench marks. Installation levels were run on 19 November and removal levels on 4 December, 1976. The gage was set to read 10 feet higher than the staff.

T-4, Middle Channel, 941-1095

T-4 was a Bristol, 0-10 ft. bubbler tide gage S/N 64 A 11027. This gage operated without problems. It is recommended that this gage be used to control hydrography in the northern channels of Channel Islands Harbor (see zoning section of this report).

Levels were run to three (3) recoverable points. Installation levels were run on 1 December and removal levels on 4 December, 1976. Comparison of installation and removal levels indicate a difference in the elevation of 1.05 ft. It is believed that 1.0 ft. of that was due to a duplicated incorrect instrument observation at close range and was not due to movement of the staff. Since the staff was removed immediately upon closure of removal levels without comparison to installation levels, it cannot be determined which levels are incorrect. 0.0 ft. on the gage equalled 0.16 on the staff.

Comparison Among Gages

Since four (4) of the five (5) gages used were ADR gages, no detailed

comparison of gage records was performed. There was, however, a question regarding tidal zoning within the Channel Islands Harbor. As a result, a comparison was done between the Channel Islands Harbor ADR Record (941-1081) and the Middle Channel marigram (941-1095). It was found that, although the tidal heights varied only by 0.1 ft. or less, the times of high and low tides differed by as much as 20 minutes; indicating that zoning is advisable.

Recommended Zoning

Unless Rockville Smooth Tides display significantly different comparison information to the above field interpretation, it is recommended that:

1. T-1, Mugu Lagoon Entrance (Ocean), 941-1015 be used to control all offshore hydrography for OPR-411, 1976.
2. T-2, Port Hueneme, 941-1065 be used to control all hydrography in Port Hueneme.
3. T-3, Channel Islands Harbor, 941-1081 be used to control hydrography in the southern part of Channel Islands Harbor as far north as $34^{\circ} 10.04' N$.
4. T-4, Middle Channel, 941-1095 be used to control hydrography in Channel Islands Harbor north of $34^{\circ} 10.04' N$.

✓
ROSS FATHOMETER CALIBRATION

IMPORTANT: THROUGHOUT CALIBRATION PROCEDURE AND DURING OPERATION OF FATHOMETER IGNORE INITIAL MARK.

FEET:

1. INSTALL FEET PAPER.
2. TURN SYSTEM ON.
3. ON RECORDER SET "RANGE SELECTOR" TO 0-100 FEET.
4. ON DIGITIZER SET "PHASE SET BLANKING" SWITCH TO CALIBRATE.
5. ON DIGITIZER DIAL UP 50 ON "PHASE SET BLANKING THUMBWHEELS.
6. ON DIGITIZER SET "FEET-FATHOMS" TO FEET.
7. ADJUST THUMBWHEEL ON RECORDER UNTIL THE TOP OF THE MARK SPLITS THE 50 FOOT LINE.
8. SWITCH TO 100-200 FOOT SCALE ON RECORDER.
9. DIAL UP 150 ON DIGITIZER.
10. ADJUST LEFT-HAND POTENTIOMETER WITH SMALL SCREWDRIVER UNTIL THE MARK SPLITS THE 50 FOOT LINE. (THIS IS ONE OF THREE POTS LOCATED UNDERNEATH THE FIRST COVER OF THE RECORDER, BOTTOM CENTER).
11. DIAL UP 250 ON DIGITIZER.
12. ADJUST CENTER POTENTIOMETER UNTIL MARK SPLITS 50 FOOT LINE.
13. DIAL UP 350 ON DIGITIZER.
14. ADJUST RIGHT HAND POTENTIOMETER UNTOL MARK SPLITS 50 FOOT-LINE.

ROSS FATHOMETER CALIBRATION

FATHOMS: SEQUENCE IS THE SAME AS FOR FEET. THE ONLY CHANGES BEING PROPER CHART PAPER INSTALLED, FEET-FATHOM SWITCH SET TO FATHOMS AND DIAL UP 30, 80, 130, AND 180 ON DIGITIZER ON 0-50, 50-100, 100-150, AND 150-200 FATHOMS SCALES RESPECTIVELY.

✓
VELOCITY CORRECTOR TAPE LISTING
RA-22-6-76 (K-9567)LAUNCH - 2123 (FA-3)
SCALE - FATHOMS
TABLE NO. 2

000016	0	0000	0002	001	212300	009567
000043	0	0001				
000069	0	0002				
000097	0	0003				
000126	0	0004				
000152	0	0005				
000183	0	0006				
000231	0	0007				
000268	0	0008				
000311	0	0009				
000351	0	0010				
000395	0	0011				
000439	0	0012				
000482	0	0013				
000529	0	0014				
000576	0	0015				
000625	0	0016				
000673	0	0017				
000721	0	0018				
000769	0	0019				
000818	0	0020				
000869	0	0021				
000921	0	0022				
000973	0	0023				
001025	0	0024				
001076	0	0025				
001130	0	0026				
001184	0	0027				
001238	0	0028				
001292	0	0029				
001345	0	0030				
001399	0	0031				
001455	0	0032				
001510	0	0033				
001566	0	0034				
001624	0	0035				
001682	0	0036				
001740	0	0037				
001798	0	0038				
001855	0	0039				
001913	0	0040				
001976	0	0041				
009999	0	0042				

✓
VELOCITY CORRECTOR TAPE LISTING
RA-22-6-76 (H-9667)LAUNCH - 2125 (PA-5)
SCALE - FATHOMS
TAPE NO. 2

000015	0	0000	0002	001	212500	009567
000043	0	0001				
000069	0	0002				
000097	0	0003				
000126	0	0004				
000150	0	0005				
000193	0	0006				
000231	0	0007				
000268	0	0008				
000311	0	0009				
000351	0	0010				
000395	0	0011				
000439	0	0012				
000482	0	0013				
000529	0	0014				
000576	0	0015				
000625	0	0016				
000673	0	0017				
000721	0	0018				
000769	0	0019				
000818	0	0020				
000869	0	0021				
000921	0	0022				
000973	0	0023				
001025	0	0024				
001076	0	0025				
001130	0	0026				
001184	0	0027				
001238	0	0028				
001292	0	0029				
001345	0	0030				
001399	0	0031				
001455	0	0032				
001510	0	0033				
001565	0	0034				
001624	0	0035				
001682	0	0036				
001740	0	0037				
001798	0	0038				
001856	0	0039				
001913	0	0040				
001975	0	0041				
999999	0	0042				

✓
 OPR-411-RA-76
 RA-20-6-76

H-9667

VELOCITY CORRECTIONS TABLE III

VESNO: 2120

IN FATHOMS

<u>VELOCITY CORRECTIONS</u>	<u>FATHOMETER DEPTHS</u>	<u>VELOCITY CORRECTIONS</u>	<u>FATHOMETER DEPTHS</u>
0.0	3.0	3.0	138.3
0.1	6.1	3.1	143.7
0.2	9.0	3.2	149.5
0.3	11.9	3.3	154.9
0.4	15.4	3.4	160.4
0.5	18.4	3.5	166.3
0.6	21.5	3.6	172.0
0.7	25.5	3.7	177.7
0.8	29.5	3.8	183.5
0.9	33.7	3.9	189.6
1.0	37.7	4.0	195.6
1.1	42.2	4.1	201.6
1.2	46.9	4.2	207.5
1.3	51.4	4.3	213.4
1.4	55.8	4.4	219.5
1.5	60.7	4.5	225.6
1.6	65.4	4.6	232.0
1.7	70.3	4.7	238.3
1.8	75.2	4.8	244.8
1.9	80.1	4.9	251.4
2.0	85.0	5.0	257.9
2.1	90.5	5.1	264.5
2.2	95.8	5.2	270.9
2.3	101.0	5.3	277.4
2.4	106.4	5.4	284.2
2.5	111.7	5.5	290.7
2.6	117.1	5.6	297.2
2.7	122.3	5.7	303.7
2.8	127.5	5.8	310.2
2.9	132.9		

✓
VELOCITY CORRECTOR TAPE LISTING
RA-20-6-76 (H-9667)

LAUNCH - 2125 (RA-5)
SCALE - FATHOMS
TABLE NO. 4

000000 0 0000 0004 001 212500 009667
999999 0 0000

✓
ASCII SIGNAL TAPE LISTING

RA-20-6-76

H-9667

SHIP ONLY

101	4	34	02	34563	118	51	49745	250	0243	000000
103	4	34	05	33050	119	03	15249	254	0191	000000
104	4	34	08	42491	119	12	30114	250	0003	000000
200	1	34	08	42574	119	12	32584	139	0000	000000
201	1	34	09	08341	119	11	33712	139	0000	000000
202	1	34	09	54919	119	12	08822	139	0000	000000
203	1	34	09	30260	119	12	28588	139	0000	000000
205	4	34	12	23155	119	15	01278	139	0000	000000
206	4	34	07	46581	119	10	02336	139	0000	000000
207	4	34	07	47422	119	10	03517	139	0000	000000
208	1	34	08	42534	119	12	30153	139	0000	000000
209	4	34	02	57137	118	56	38362	250	0100	000000
210	4	34	05	03560	118	59	15591	139	0448	000000
211	4	34	02	36312	118	56	10585	139	0016	000000
212	4	34	02	50435	118	54	02843	139	0237	000000
213	4	34	05	07590	119	03	34710	139	0003	000000
214	4	34	06	54196	119	02	54802	139	0458	000000
215	4	34	03	23900	118	54	17102	139	0000	000000
300	4	34	08	38236	119	12	55094	243	0000	000000
336	4	34	09	21675	119	13	35275	243	0000	000000

✓
ASCII SIGNAL TAPE LISTING

RA-20-6-76

H-9667

LAUNCHES ONLY

RA-3 (2123) & RA-5 (2125)

101	4	34	02	34563	118	51	49745	250	0257	000000
103	4	34	05	33050	119	03	15249	254	0204	000000
104	4	34	08	42491	119	12	30114	250	0011	000000
200	1	34	08	42574	119	12	32584	139	0000	000000
201	1	34	09	08341	119	11	33712	139	0000	000000
202	1	34	09	54919	119	12	08822	139	0000	000000
203	1	34	09	30260	119	12	28588	139	0000	000000
205	4	34	12	23155	119	15	01278	139	0000	000000
206	4	34	07	46581	119	10	02336	139	0000	000000
207	4	34	07	47422	119	10	03517	139	0000	000000
208	1	34	08	42534	119	12	30153	139	0000	000000
209	4	34	02	57137	118	56	38362	250	0113	000000
210	4	34	05	03560	118	59	15591	139	0461	000000
211	4	34	02	36312	118	56	10585	139	0029	000000
212	4	34	02	50435	118	54	02843	139	0250	000000
213	4	34	05	07590	119	03	34710	250	0016	000000
214	4	34	06	54196	119	02	54802	139	0571	000000
215	4	34	03	23900	118	54	17102	139	0389	000000
216	4	34	06	30760	119	03	51138	139	0000	000000
217	4	34	05	21352	119	03	52708	139	0000	000000
218	4	34	05	46142	119	06	22327	139	0000	000000
219	4	34	05	57330	119	05	58589	139	0000	000000

✓
MASTER STATION LIST

RA-20-6-76 (H-9667)

SHIP ONLY

OPR - 411 SOUTHERN CALIFORNIA COAST

101 4	34 02	34563 118 51	49745 250 0243	000000	
/KINCAID 1927-1976 M/R CODE 1				341183	(1042)
103 4	34 05	33050 119 03	15249 254 0191	000000	
/MUGU ECC M/R CODE 3				341192	
104 4	34 08	42491 119 12	30114 250 0003	000000	
/LIGHT RM1 1976 M/R CODE 4				341192	
200 1	34 08	42574 119 12	32584 139 0000	000000	
/POINT HUENEME LIGHTHOUSE 1948-1965				341192	
201 1	34 09	08341 119 11	33712 139 0000	000000	
/PORT HUENEME MUNICIPAL WATER TANK, 1960				341192	(1039)
202 1	34 09	54919 119 12	08822 139 0000	000000	
/PORT HUENEME NCBC WATER TANK #374, 1960				341192	(1037)
203 1	34 09	30260 119 12	28588 139 0000	000000	
/PORT HUENEME NCBC WATER TANK #431, 1960				341192	(1038)
205 4	34 12	23155 119 15	01278 139 0000	000000	
/SO CAL EDISON CO MANDALAY GENERATING STA STACK				341192	
206 4	34 07	46581 119 10	02336 139 0000	000000	
/ORMOND BEACH SCE EAST STACK, 1976				341192	
207 4	34 07	47422 119 10	03517 139 0000	000000	
/ORMOND BEACH SCE WEST STACK, 1976				341192	
208 4	34 08	42534 119 12	30153 139 0000	000000	
/ABANDONED USCG TWR, 1976				341192	
209 4	34 02	57137 118 56	38362 ¹³⁹ 250 0100	000000	
/LINE 1927				341183	(1045)
210 4	34 05	03560 118 59	15591 139 0448	000000	
/FLAT 1927				341183	(1038)

211	4	34	02	36312	118	56	10585	139	0016	000000	
/SEQUIS 1927										341183	(1062)
212	4	34	02	50435	118	54	02843	139	0237	000000	
/ARROYO SEQUIT A -7 AUX 2, 1965										341183	
213	4	34	05	07590	119	03	34710	250	0003	000000	
/MUGU POINT 1932 M/R CODE 2										341192	(1078)
214	4	34	06	54196	119	02	54802	139	0458	000000	
/VORTAC, 1976										341192	
215	4	34	03	23900	118	54	17102	139	0000	000000	
/ARROYO SEQUIT L-5, 1965										341183	
300	4	34	08	38236	119	12	55094	243	0000	000000	
/POINT HUENEME WEST JETTY LIGHT #3										TP-00778	
336	4	34	09	21675	119	13	35275	243	0000	000000	
/CHANNEL IS HARBOR SOUTH JETTY LIGHT #2										TP-00778	

NOTE: ELEVATIONS OF MINI RANGER STATIONS ARE CORRECTED
FOR HEIGHT OF SHIPS AND LAUNCHES TRANSPONDER ABOVE WATER.

STATIONS 101-104, 213 WERE USED AS MINI-RANGER STATIONS.
STATIONS 200-215, 300, 336 WERE USED FOR VISUAL CALIBRATIONS.

✓
MASTER STATION LIST

RA-20-6-76 (H-9667)

LAUNCHES ONLY

OPR - 411 SOUTHERN CALIFORNIA COAST

101 4	34 02	34563	118 51	49745	250 0257	000000	
/KINCAID 1927-1976 M/R CODE 1						341183	(1042)
103 4	34 05	33050	119 03	15249	254 0204	000000	
/MUGU ECC M/R CODE 3						341192	
104 4	34 08	42491	119 12	30114	250 0011	000000	
/LIGHT RM1 1976 M/R CODE 4						341192	
200 1	34 08	42574	119 12	32584	139 0000	000000	
/POINT HUENEME LIGHTHOUSE 1948-1965						341192	
201 1	34 09	08341	119 11	33712	139 0000	000000	
/PORT HUENEME MUNICIPAL WATER TANK, 1960						341192	(1039)
202 1	34 09	54919	119 12	08822	139 0000	000000	
/PORT HUENEME NCBC WATER TANK #374, 1960						341192	(1037)
203 1	34 09	30260	119 12	28588	139 0000	000000	
/PORT HUENEME NCBC WATER TANK #431, 1960						341192	(1038)
205 4	34 12	23155	119 15	01278	139 0000	000000	
/SO CAL EDISON CO MANDALAY GENERATING STA STACK						341192	
206 4	34 07	46581	119 10	02336	139 0000	000000	
/ORMOND BEACH SCE EAST STACK, 1976						341192	
207 4	34 07	47422	119 10	03517	139 0000	000000	
/ORMOND BEACH SCE WEST STACK, 1976						341192	
208 4	34 08	42534	119 12	30153	139 0000	000000	
/ABANDONED USCG TWR, 1976						341192	
209 4	34 02	57137	118 56	38362	238 ¹³⁹ 0113	000000	
/LINE 1927						341183	(1045)
210 4	34 05	03560	118 59	15591	139 0461	000000	
/FLAT 1927						341183	(1038)

211 4	34 02	36312	118 56	10585	139 0029	000000	
/SEQUIS 1927						341183	(1062)
212 4	34 02	50435	118 54	02843	139 0250	000000	
/ARROYO SEQUIT ^L A-7 AUX 2, 1965						341183	
213 4	34 05	07590	119 03	34710	250 0016	000000	
/MUGU POINT 1932 M/R CODE 2						341192	(1078)
214 4	34 06	54196	119 02	54802	139 0571	000000	
/VORTAC, 1976						341192	
215 4	34 03	23900	118 54	17102	139 0389	000000	
/ARROYO SEQUIT L-5, 1965						341183	
216 4	34 06	30760	119 03	51138	139 0000	000000	
/LAGUNA 2 1951 M/R CODE 1						341192	(1008)
217 4	34 05	21352	119 03	52708	139 0000	000000	
/TOWER BY FIRING RANGE LORAC TOWER, 1964						341192	
218 4	34 05	46142	119 06	22327	139 0000	000000	
/RUSTY, 1967						341192	
219 4	34 05	57330	119 05	58589	139 0000	000000	
/CLUB 1965, BM RESET 1969						341192	

NOTE: ELEVATIONS OF MINI RANGER STATIONS ARE CORRECTED FOR HEIGHT OF SHIPS AND LAUNCHES TRANSPONDER ABOVE WATER.

STATIONS 101-104, 213, 216 WERE USED AS MINI RANGER STATIONS.
STATIONS 200-219 WERE USED FOR VISUAL CALIBRATIONS.

NOAA FORM 76-40 (2-71) PRESCRIBED BY PHOTOGRAMMETRY INSTRUCTION NO. 64.		U.S. DEPARTMENT OF COMMERCE-NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION		NONFLOATING AIDS [REDACTED] FOR CHARTS				ORIGINATING ACTIVITY <input type="checkbox"/> FIELD INSPECTION <input checked="" type="checkbox"/> FIELD EDIT <input checked="" type="checkbox"/> COMPILATION <input type="checkbox"/> FINAL REVIEW <input type="checkbox"/> QUALITY CONTROL AND REVIEW (See reverse for responsible personnel)		
TO BE CHARTED <input checked="" type="checkbox"/> HAVE (have not) TO BE DELETED <input type="checkbox"/>		ORIGINAL LOCATION Coastal Mapping Division, Norfolk, Va. NOAA SHIP RAINDER P.M.C. SEATTLE		DATE		FEB, 1977		APRIL 5, 1978		
The following objects (have not) been inspected from seaward to determine their value as landmarks:		SURVEY NUMBER T-TP-00777		DATUM N.A. 1927		METHOD AND DATE OF LOCATION (See instructions on reverse of this form)				
CHARTING NAME	DESCRIPTION	POSITION		LATITUDE	LONGITUDE	FIELD INSPECTION	COMPILATION	FIELD EDIT	CHARTS AFFECTED	
		D.M. METERS	D.M. METERS							D.M. METERS	D.M. METERS
	sec TP-00778 (1:5,000) for 13 nonfloating aids									
	NONE BEING SUBMITTED FOR CHARTING PURPOSES TP-00777									

NOAA FORM 76-40
(2-71)
PRESCRIBED BY
PHOTOGRAMMETRY INSTRUCTION NO. 64.

TO BE CHARTED

 TO BE DELETED

ORIGINAL LOCATION
 Coastal Mapping Division, Norfolk, Va.
 NOAA SHIP RAINDER P.M.C. SEATTLE

DATE
 FEB, 1977
 APRIL 5, 1978

The following objects ~~(have not)~~ been inspected from seaward to determine their value as landmarks:

SURVEY NUMBER
 T-TP-00777

DATUM
 N.A. 1927

METHOD AND DATE OF LOCATION
 (See instructions on reverse of this form)

CHARTING NAME

DESCRIPTION

POSITION

LATITUDE

LONGITUDE

FIELD INSPECTION

COMPILATION

FIELD EDIT

CHARTS AFFECTED

sec TP-00778 (1:5,000)
 for 13 nonfloating aids

NONE BEING SUBMITTED
 FOR CHARTING PURPOSES
 TP-00777

Replaces C&GS Form 567.

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

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

ORIGINATING AGENCY

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

REPORTING UNIT (Field Party, Ship, or Office) **NOAA SHIP NUMBER**
PMO, SEATTLE

STATE **CALIFORNIA**

LOCALITY **POINT MUGLL**

DATE **FEB, 1977**

The following objects HAVE BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS.

OPR PROJECT NO. **OPR-411-RA-76**

JOB NUMBER **CIM-7404**

SURVEY NUMBER **TP-00779**

DATUM **N.A. 1927**

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses.)	POSITION				METHOD AND DATE OF LOCATION (See instructions on reverse side)		CHARTS AFFECTED
		LATITUDE D.M. Meters	LONGITUDE D.P. Meters	OFFICE	FIELD			
AERD BN.	BEACON, AIRPORT, PT. MUGLL ROT. LIGHT, POSITION UPDATE See L 1716-79 Re apply.	50.842 34 06	119 06 35.661		V-VIS. 11-30-76 POSITION DETERMINED FROM PT. MUGLL, GEOGRAPHICS BRANCH		5120 5202	

NOAA FORM 12 (8-74)
 Replaces C&GS Form 367.

NON-FLOATING AIDS OR LANDMARKS FOR CHARTS

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

REPORTING UNIT (If not Party Ship or Officer)
 NOAA SHIP RA/11/12/13
 P.M.C. SEATTLE

STATE CALIFORNIA

LOCALITY PT. MUGEL

DATE FEB. 1977

OPR PROJECT NO. DAR-411-AA-76

HAVE NOT BEEN INSPECTED FROM SEAWARD TO DETERMINE THEIR VALUE AS LANDMARKS.

JOB NUMBER C.M.-7404

DATUM N.A. 1927

SURVEY NUMBER TP-00179

CHARTING NAME

DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)

STATE

LATITUDE

LONGITUDE

D.P. Meters

OFFICE

FIELD

CHARTS AFFECTED

ORIGINATING ACTIVITY

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

CHARTING NAME	DESCRIPTION	STATE	LATITUDE		LONGITUDE		OFFICE	FIELD	CHARTS AFFECTED
			D.M. Meters	° / ' "	D.P. Meters	° / ' "			
TANK	OIL STORAGE		34 07	119 09	48.63	1246	7420603	V-VIS 11-30-76	5120 5202
TANK	"		34 07	119 09	42.11	1679	"	V-VIS 11-30-76	"
TANK	"		34 07	119 09	52.37	1342	"	"	"
TANK	"		34 07	119 09	43.55	1116	"	"	"
TANK	"		34 07	119 09	43.90	1125	"	"	"
TANK	"		34 07	119 09	44.21	1133	"	"	"
TOWER	BORSIGHT 853		34 07	119 09	23.898	-		V-VIS, 11-30-76 POSITION OBTAINED FROM PT. MUGEL, GEOPHYSICS BRANCH	"
TOWER	BORSIGHT 850		34 07	119 09	24.9891	-		"	"
TOWER	M.E.T., 1965	✓	34 06	119 07	09.8474	-		V-VIS, 11-30-76	"
TOWER	BORSIGHT ANTENNA W OF MET.	✓	34 06	119 07	24.6199	-		V-VIS, 11-30-76	"

NOAA FORM 76-40 (8-74)
 Replaces C&GS Form 567.

NON-FLOATING AIDS OR LANDMARKS FOR CHARTS

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

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT (If field party, ship or office)
 NOAA SHIP RAINIER
 PIRC. SEATTLE

STATE
 CALIFORNIA

LOCALITY
 PT. MUGU

DATE
 FEB. 1977

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

OPR PROJECT NO. OPR-411-RA-76
 JOB NUMBER CM-7404
 SURVEY NUMBER TP-00779
 DATUM N.A. 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses.)	LATITUDE		LONGITUDE		OFFICE	FIELD	CHARTS AFFECTED
		D.M. Meters	° /	D.P. Meters	° /			
TOWER	BUILDING 742 E. OF M.E.T. ✓	34 05	119 07	01.719	-		V-VIS, 11-30-76 POSITION OBTAINED FROM PT. MUGU, GEOPHYSICS BRANCH	5120 5302
TOWER	BUILDING 739 N. OF M.E.T. ✓	34 06	119 07	18.3686	-		"	"

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

NOAA FORM 10
(8-74)

Replaces C&GS Form 567.

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

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

ORIGINATING ACTIVITY

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

REPORTING UNIT
(Field Party, Ship or Office)
NOAA SHIP RAHWER
PMC SEATTLE

STATE
CALIFORNIA

LOCALITY
PT. MUGL

DATE
FEB. 1977

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

JOB NUMBER
CM-7404

DATUM
N.A. 1927

SURVEY NUMBER
TP-00180

OPR PROJECT NO.
OPR-411-AA-76

DESCRIPTION
(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses)
NONE BEING SUBMITTED FOR
CHARTING PURPOSES

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

POSITION

LATITUDE

LONGITUDE

D.M. Meters

D.P. Meters

OFFICE

FIELD

CHARTS AFFECTED

Replaces C&GS Form 567.

~~NONFLOATING AIDS OR~~ LANDMARKS FOR CHARTS
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
- GEODETIC PARTY
- PHOTO FIELD PARTY
- COMPILATION ACTIVITY
- FINAL REVIEWER
- QUALITY CONTROL & REVIEW GRP.
- COAST PILOT BRANCH

REPORTING UNIT
If field Party, Ship or Office
NOAA SHIP REFINER
PAC. SEATTLE

STATE
CALIFORNIA

LOCALITY
PT. MUGLL

DATE
FEB. 1977

(See reverse for responsible personnel)

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

OPR PROJECT NO. OPR-411-RA-76

JOB NUMBER CM-7404

DATUM N.A. 1927

SURVEY NUMBER TP-00780

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses.)	POSITION		LONGITUDE D.P. Meters	OFFICE	METHOD AND DATE OF LOCATION (See instructions on reverse side)	CHARTS AFFECTED
		LATITUDE D.M. Meters	LONGITUDE D.P. Meters				
SLIDE	PROMINENT SLIDE (SAND)	34 04.5	119 01.2	-	742 (CI) 1597 MAR 26, 1974	V-VIS 11-30-76	NOS 18720
TWIN TANKS	WESTERLY OF TWO ✓	34 06	119 04	35.04 898	742 (CI) 2235 APR. 5, 1974	V-VIS 11-30-76	"
ANTENNA	LAGUNA PEAK COMMAND DISTRICT ANTENNA ✓	34 06	119 03	53.0529		V-VIS, 11-30-76 POSITION OBTAINED FROM PT. MULLG., GEOPHYSICS BRANCH	"
TOWER	I.D.T.S. TOWER ON PEAK ✓	34 06	119 03	53.2857		"	"
DISH ANTENNA	60' DISH, LARGEST & HIGHEST ✓	34 06	119 03	49.5589		"	"
ANTENNA	SURVEILLANCE RADAR, SMALLER & SET LOWER ON PEAK THAN COMMAND DIST. ✓	34 06	119 03	56.6630		"	"
TOWER	LOOKOUT TOWER FOR RIFLE RANGE ✓	34 05	119 03	56.29		LP-5 21 MAR. 74; 1600 11-30-76	"

✓
PARAMETER TAPE LISTING
RA-20-6-76(H-9667)

RA-20-6A-76
SKEW:0,22,36
SCALE - 1:20000

FEST=46000
CLAT=3754000
CMER=119/20/0
GRID=60
PLSCL=20000
PLAT=34/01/30
PLON=119/09/54
VESNO=2120
YR=76
ANDIST=-2.4


RA-20-6B-76
SKEW:0,22,42
SCALE - 1:20000

FEST=46000
CLAT=3754000
CMER=119/20/0
GRID=60
PLSCL=20000
PLAT=33/58/12
PLON=119/06/00
VESNO=2120
YR=76
ANDIST=-2.4

✓
APPROVAL SHEET
DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY

H-9667
RA-20-6-76

In producing this sheet, standard procedures were observed in accordance with the Provisional Hydrographic Manual, PMC OPORDER, and the Instruction Manual for Automated Hydrographic Surveys. The data was examined daily during the execution of the survey. The boat sheet and the accompanying records have been examined and are complete and adequate for charting purposes and are approved.


for JAMES P. RANDALL
CAPTAIN, NOAA

26/77

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): Mugu Lagoon Entrance

Period: November 5 - December 5, 1976

HYDROGRAPHIC SHEET: H-9667

OPR: 411

Locality: Southern California

Plane of reference (mean lower low water): 2.77 ft.

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

Remarks: Zone direct.

Don Spillman
Chief, Tides Branch

GEOGRAPHIC NAMES

Name on Survey	Source of Name										
	A	B	C	D	E	F	G	H	K		
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST			
BIG SYCAMORE CANYON	18720	not necessary									1
LAGUNA PEAK ✓	"										2
LAGUNA POINT ✓	"										3
LA JOLLA PEAK ✓	"										4
MIDDLE POINT ✓	18725										5
MUGU CANYON ✓	18720										6
POINT MUGU ✓	"										7
SANTA BARBARA CHANNEL ✓	"	(TITLE)									8
SANTA MONICA MOUNTAINS	"	not necessary									9
											10
											11
											12
											13
											14
											15
											16
											17
											18
											19
											20
											21
											22
											23
											24
											25

APPROVED

Chas E. Harrington

STAFF CHIEF GEOGRAPHER C3x8

27 APRIL 1978

HYDROGRAPHIC SURVEY STATISTICS

H-9667

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS 6-PARTS BOAT SHEETS & 5-PARTS PRELIMINARY OVERLAYS		11
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARC, EXCESS		2

DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES	2					
CAHIERS	1					
VOLUMES	2					
BOXES						

T-SHEET PRINTS (List) Class I Manuscripts TP-00779 and TP-00780
 SPECIAL REPORTS (List) 1 Cahier Special Reports OPR-411-RA-76, 1ea Tide Plot

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

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			1255
POSITIONS CHECKED		1255	
POSITIONS REVISED		33	
SOUNDINGS REVISED		183	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	4		
VERIFICATION OF CONTROL		7	
VERIFICATION OF POSITIONS		101	
VERIFICATION OF SOUNDINGS		73	
COMPILATION OF SMOOTH SHEET		70	
APPLICATION OF TOPOGRAPHY		1	
APPLICATION OF PHOTOBATHYMETRY		0	
JUNCTIONS		2	
COMPARISON WITH PRIOR SURVEYS & CHARTS		20	
VERIFIER'S REPORT		30	
OTHER			
TOTALS	4	304	

Pre-Verification by	Beginning Date	Ending Date
Verification by Bruce Alan Olmstead Bruce Alan Olmstead	14 June 1977	19 January 1978
Verification Check by J.S. Green, R.D. Lynn, M.G. Sanders	Time (Hours) 38	Date 20 January 1978
Marine Center Inspection by HIT	Time (Hours) 19	Date 1 February 1978
Quality Control Inspection by R.W. Wellman	Time (Hours) 29	Date 4-25-78
Requirements Evaluation by J. Baumgardner	Time (Hours) 4	Date 6-5-78

Completed 9 hr 5/14/78

REGISTRY NO. _____

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

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

CARDS CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

REGISTRY NO. H-9667

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:

H-9667

Information for Future Presurvey Reviews

None

<u>Position Index</u>		<u>Bottom Change</u>	<u>Use</u>	<u>Resurvey</u>
<u>Lat.</u>	<u>Long.</u>	<u>Index</u>	<u>Index</u>	<u>Cycle</u>
340	1191	4	2	25 years

PACIFIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO: H-9667

FIELD NO: RA-20-6-76

California, Santa Barbara Channel, Point Mugu

SURVEYED: November 20 - December 5, 1976

SCALE: 1:20,000

PROJECT NO: OPR-411

SOUNDINGS: Ross Fathometer
UGR
LEAD LINE

CONTROL: Mini-Ranger
Range Azimuth

Chief of Party.....CAPT James P. Randall
Surveyed by;.....LTJG G.B. Stanke, ENS J.C. Osborn,
LT F.L. Kleinschmidt,
LTJG J.W. Peterson, ENS M. Molchan,
ENS K. Lerch and LTJG S.R. Ramsey
Automated plot by.....PMC Xynetics Plotter
Verified by.....Bruce Alan Olmstead
A.L. Garzelli
19 January 1978

I. INTRODUCTION

This survey is located in Southern California between Port Hueneme and Point Dume. Specifically, from Lat. 33°59'30"N, Long. 118°53'10"W to Lat. 34°07'00"N, Long. 119°09'30"W. The southwestern limits of this sheet encompass the Santa Barbara Channel. Some of the geographic features common to this area include: Laguna Point, Mugu Canyon, Santa Monica Mountains and Point Mugu. Point Mugu is the seaward termination of the Santa Monica Mountains. The coastline is very rugged and there are no known outlying dangers. One prominent natural landmark, located approximately two miles east of Point Mugu is a 140-foot sand dune. The Navy advises users of this area that continuous guided missile firing operations may take place in the Pacific Missile Range. A small arms range also maintained by the Navy extends about 2 miles offshore at Point Mugu.

The NOAA Ship RAINIER operated under Project Instructions OPR-411-RA-76, dated July 22, 1976. There were two amendments to Instructions, dated September 27, 1976 and December 1, 1976. Submission of field parameters

covered the entire OPR-411-RA-76 project. The central meridian, projection parameters and list of stations were amended to cover the individuality of this sheet. All corrected data is listed in the smooth printouts to accompany the final PMC plot.

H-9667 (RA-20-6-76) is a good basic survey. It is recommended that the information provide a new data base for nautical charts, bathymetric revisions and other tools associated with the prediction and development of the ocean environment of the Continental Shelf and adjacent area.

II. CONTROL AND SHORELINE

All stations used in controlling the positions of hydrography either met or were established using Third Order Class I geodetic procedures. Several stations from the Signal List that were employed during this survey were obtained from the Pt. Mugu Pacific Missile Test Center, Geophysics Branch, Geodesy Group. These geographic positions were obtained to expand the control networks for hydrographic survey operations and for location of fixed aids to navigation and objects of landmark value. No field computations were made to verify this data. However, this data appears to meet or exceed NOS, NGS Third Order Class I standards for accuracy.

During verification, Station 216, Laguna 2, 1951 was found to have an elevation of 441 meters. The Descriptive Report listed no elevation data. The slope corrector using this station was not applied to the smooth field sheet. The correction was applied to the smooth sheet. All other significant information concerning the horizontal control or those problems which may have compromised the quality of this survey are listed in Parts F and G of the Descriptive Report.

Shoreline information originates with Class I manuscripts TP-00779 and TP-00780. Photography is dated March and April of 1974. Field edit was accomplished in December of 1976. Collection of field edit was done on two paper ozalids at a scale of 1:10,000. Once reduced to 1:20,000, certain features were almost impossible to decipher during application of the manuscript data.

Three sunken rocks which were identified by the Photogrammetrist for investigation by the field were not spoken to. See Section IV, Paragraph 9, for identification.

III. HYDROGRAPHY

Soundings at crossings are in good agreement.

All standard depth curves are adequately depicted with the exception of the 0-fathom,^{and} 1-fathom ~~and 2-fathom~~ depth curves. The breakers along the inshore areas probably negated any attempt to define these depths. The delineation and development of the bottom is good. Determination of least depths is adequate.

IV. CONDITION OF SURVEY

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

- (a) No Project Number was entered on the title sheet.
- (b) The fathogram was marked manually (event markers) for Julian Days 335, 336 and 339 (Positions 5036-5350). No mention of this was made in the Descriptive Report.
- (c) During day 335, the fathometer paper slowed down in a number of places. (L-5, Positions 5036-5084)
- (d) Ship submitted no elevation data for Laguna 2, 1951. Slope correction was not applied to the smooth field sheet.
- (e) Digitizer was off by 5-10 fathoms in numerous places.
- (f) Time in the sounding volume did not agree with the *time on the fathogram for Positions 5217 and 5234. ^{Handled this in report.} _{statement is not here}*
- (g) Three sunken rocks were not investigated by the field from seaward. Two of these rocks were searched for from shore and not seen. (See Section H of the Descriptive Report and pages 7 and 8 of the Field Edit Report)
 - (1) Lat. 34°04'02"N Long. 119°00'38"W
 - (2) Lat. 34°03'57"N Long. 119°00'22"W
 - (3) Lat. 34°04'16"N Long. 119°01'00"W

V. JUNCTIONS

(See Q.C. Report - item 1)
Contemporary junctions were adequately effected with H-9599 (FA-10-4-76) on the east from 20 to 100 fathoms and H-9600 (FA-10-5-76) offshore

from 30-fathoms at 118°56'00"W to the 5-fathom curve at 119°01'00"W. H-9725 (RA-20-1-77) junctions on the west but was not available for comparison. No contemporary junctions exist on the southern limits (110 fathom curve) of the entire sheet. It should be noted, however, that several offshore surveys dated 1933-34 show relatively small discrepancies in depth. It is doubtful that any contemporary surveys will be run in these offshore areas. The Project Instructions stress that in order to satisfy the immediate nautical charting needs of the West Coast of the United States, operations for the foreseeable future will be limited to the area between the shoreline and the 110-fathom curve. The verifier recommends that these prior surveys be considered for junctioning purposes.

VI. COMPARISON WITH PRIOR SURVEYS (See Q.C. Report-item 4)

H-4559 *Add'l Work (1928)* 1:120,000
H-5392 (1933) 1:10,000
H-5425 (1933) 1:10,000 < H-5426 (1933) 1:10,000
H-5446 (1933-34) 1:40,000
H-5507 (1933-34) 1:40,000
H-5851 (1934-35) 1:80,000

The bottom has remained very stable in the past forty-three years. The inshore hydrography reveals a 11^m to .3^m shoaling of depths. The most noticeable changes are around the ten-fathom curve where a shift of 20-140 meters to seaward has occurred. Depths over ten fathoms indicate differences of 1-2 fathoms. Generally, depths to fifty fathoms compare quite well. A shoaling of 5-20 fathoms is indicated in depths over fifty fathoms. The shoal located at Lat. 34°04'54"N, Long. 119°05'20"W on the present survey confirmed the least depth found in 1933.

Due in part to displacement resulting from consolidation of fathoms.

H-5446 and H-5507 reveal excellent agreement in depths of 20-200 fathoms. A slight shoaling is indicated with generally 1 fathom differences. The 200-fathom curve at Lat. 34°04'15"N, Long. 119°05'30"W on the present sheet does not provide the extensive coverage as on the prior which extends more north and west. Present depths in this area reveal a slight filling of Mugu Canyon.

Surveying methods, surveying equipment and the natural processes ~~of shoaling~~ in this area account for most of the discrepancies since these prior surveys. Because of the superior positioning and sounding methods, the present survey soundings should be considered correct.

The present survey, H-9667 (RA-20-6-76) is adequate to supersede the above prior surveys within the common area.

VII. COMPARISON WITH CHART

A chart comparison was made with Chart 18720 (5202), 19th Edition, August 7, 1976 and Chart 18725 (5120), 14th Edition, November 1, 1975. The charted hydrography originates primarily with the previously discussed prior surveys.

- (a) Pre-Survey Review Item #2 located at Lat. 34°05'45"N, Long. 119°05'54"W originates with a Local Notice to Mariners #41 of 1945. This feature was searched for but not found. The verifier recommends the mooring buoy be removed. (See Descriptive Report, Section K, page 10)
- (b) The GpF1(2) 18 sec RaRef (Navy Maintained) located at Lat. 34°03'12"N, Long. 119°03'18"W originates from a source unknown to the verifier. This buoy has been removed and further plans for its deployment have not been determined. The verifier recommends this lighted buoy be removed from the chart. (See Descriptive Report, Section L, page 11)
- (c) The sunken wreck charted at Lat. 34°04'00"N, Long. 119°08'30"W originates from source unknown to the verifier. This was not a PSR item for ship investigation and consequently, no mention was made by the ship of its existence. The depth of water in this area (100 fathoms) should testify to its remote potential as a hazard to navigation. However, the verifier recommends that this wreck be left on the chart.
- (d) The Aero R. Bn charted at Lat. 34°06'30"N, Long. 119°08'00"W originates from an unknown source. The USCG Light List has no record of its existence. The verifier recommends retaining this item on the chart until further investigation as to its landmark or aid to navigation value.

The present survey is adequate to supersede the charted hydrography within the survey area.

B. Aids to Navigation

As listed in Section N of the Descriptive Report, no fixed or floating aids to navigation are charted within the survey limits. However, several new landmarks and one fixed aid to navigation were located using Third Order Class I geodetic procedures. This data is reflected on Forms 76-40 as appended in the Descriptive Report.

VIII. COMPLIANCE WITH PROJECT INSTRUCTIONS

This survey complies with Project Instructions OPR-411-RA-76, dated July 22, 1976 and the amendments of September 27 and December 1, 1976

See L1716-77
← K 11/18/76
10-17-78 KOB

except for two possible areas of non-compliance:

- (a) Inadequate development of the 110-fathom curve
- (b) Inadequate development of Mugu Canyon. (See Section 4.7 of PI)

IX. ADDITIONAL FIELD WORK

H-9667 (RA-20-6-76) is a good basic survey. No additional field work is required.

Respectfully submitted,

Bruce Alan Olmstead

Bruce Alan Olmstead
Cartographic Technician
January 19, 1978

Examined and approved,

J. S. Green
James S. Green
Chief, Verification Branch

APPROVAL SHEET
FOR
SURVEY H-9667

- 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: 25 Jan 1978

Signed: _____




Title: Chief, Verification Branch



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Pacific Marine Center, 1801 Fairview Ave, E
Seattle, WA 98102

10 February 1978

TO: Eugene A. Taylor
Director, Pacific Marine Center

FROM: 
Glen R. Schaefer
Chief, Processing Division

SUBJECT: PMC Hydrographic Survey Inspection Team Report--H-9667

This survey is a basic hydrographic survey of the Santa Barbara Channel off Point Mugu, California. This survey was conducted by NOAA Ship RAINIER in 1976 in accordance with Project Instructions OPR-411-RA-76 dated 22 July 1976 and Change Nos. 1 dated 27 September 1976 and 2 dated 1 December 1976.

The 110 fathom curve was not completely developed as required by the Project Instructions. Areas which were not developed are centered at 34° 02.5' N 119° 09' W, 33° 59' N 119° 01' W, and 34° 04.5' N 119° 06' W.

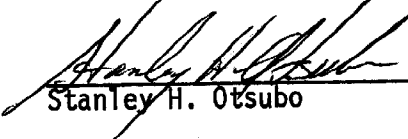
Mugu Canyon was surveyed at 400 meter line spacing. Closer line spacing should have been run to more adequately delineate the depth curves in the canyon area.

The inspection team finds H-9667 to be a very good basic survey adequate to supersede common areas of prior surveys and charted hydrography. Administrative approval is recommended.


Glen R. Schaefer


John C. Albright



James W. Steensland


Stanley H. Otsubo



ADMINISTRATIVE APPROVAL
H-9667

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.



Eugene A. Taylor, RADM
Director
Pacific Marine Center

2/13/78

Date



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

C352/KWW

April 25, 1978

TO: *A. J. Patrick*
A. J. Patrick
Chief, Marine Surveys Division

THRU: Chief, Quality Control Branch

FROM: K. W. Wellman *K. W. Wellman*
Quality Evaluator

SUBJECT: Quality Control Report for H-9667 (1976), California, Santa Barbara Channel, Point Mugu

A quality control inspection of H-9667 has been accomplished to evaluate the accuracy and adequacy of the survey with respect to data acquisition, delineation of the bottom, determination of least depths and navigation hazards, junctions, shoreline transfer, decisions and actions by the verifier, and cartographic presentation of data.

Junctional sheets H-9599 (1976) on the east and H-9725 (1977) on the west are not available for a quality control inspection of the junctions. The adequacy of the two junctions will be considered during the course of their respective quality control inspections.

In general, the present survey was found to conform to National Ocean Survey standards and requirements except as discussed in the Verifier's Report, the HIT Report, and as follows:

1. Reference section V of the Verifier's Report:

The junction with H-9600 was completed during quality evaluation. Some minor revisions of depth curves and the addition of the junctional note on adjoining survey H-9600 were made. When an adjoining survey is not available and the verifier is unable to effect a completed junction, additional comments detailing steps necessary to complete the junctional work on the unavailable adjoining survey should be included in the Verifier's Report. (See the memorandum dated March 21, 1977, from the Office of Marine Surveys and Maps entitled "Verifier's Report Format.")

2. The elevations of three islets and one pile, referenced to MHW, were shown in vertical lettering rather than slanted lettering as is the common



practice. Further, the pile symbol was improperly shown in red ink during verification. (See provisional manual--section 7.2.5.2 and appendix B, Cartographic Code 110.) In addition, a rock awash and its elevation were omitted and one rock awash elevation was shown in error. Appropriate additions and revisions were effected during quality control evaluation.

3. Several elevations of landmarks added to the smooth sheet during verification are not supported by the survey records and do not appear on the T-sheets or the Landmarks for Charts form (NOAA Form 76-40) included in the Descriptive Report. The source(s) of such information should be indicated on the NOAA form 76-40 to validate the elevations shown on the smooth sheet. Further, the elevations, as shown during verification, do not clearly indicate whether they refer to the elevation of the highest point of the feature or to the ground elevation at the base of the structure. Since validating information pertaining to the elevations is not readily available, they are considered to be of questionable value to the survey and were therefore deleted during quality control evaluation.

4. Reference Verifier's Report--section VI:

Three additional prior surveys were not considered during verification thus necessitating comparisons with the present survey during quality control evaluation. The listing of prior surveys included in the referenced section of the Verifier's Report has been annotated so as to include the additional surveys. The discussion pertaining to prior surveys in the Verifier's Report, however, is lacking any mention of shoreline changes. (See provisional manual--section 6.6(11) and the memorandum dated March 21, 1977, from the Office of Marine Surveys and Maps entitled "Verifier's Report Format.")

Section VI of the Verifier's Report is supplemented by the following:

The comparisons revealed random variations of the depth curves within a range of ± 100 meters. The present shoreline west of Laguna Point reflects a net recession of approximately 100 meters since 1933. The noted shoreline recession is accompanied by a corresponding shoreward migration of the 3-fathom depth curve in the area.

The peninsulas restricting access to Mugu Lagoon (vicinity of latitude $34^{\circ}05.90'$, longitude $119^{\circ}05.30'$) have accreted as much as 200 meters since 1933, thereby indicating the eventual natural closure of the entrance to the lagoon.

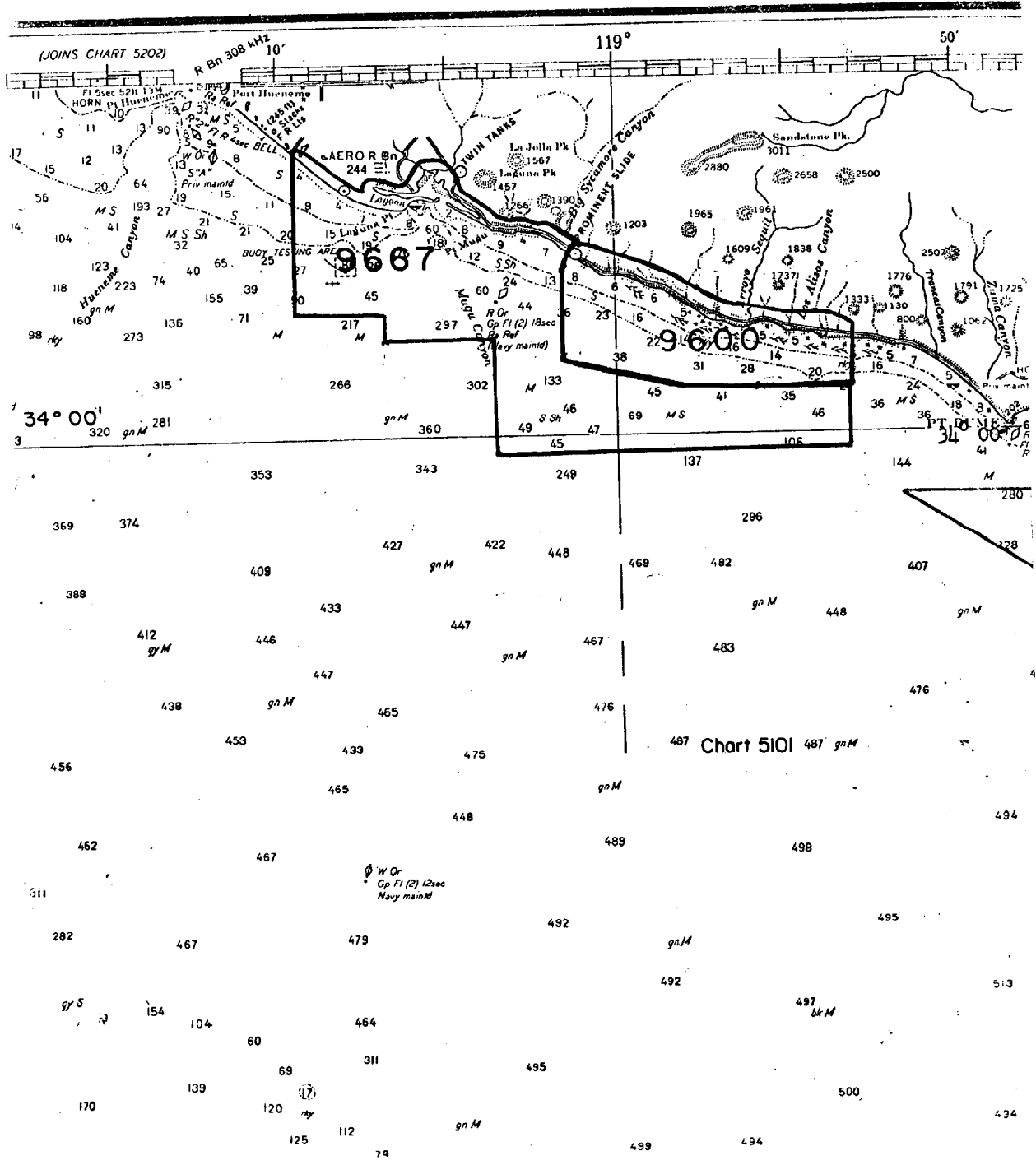
5. Reference section VI of the Verifier's Report:

Attributing the slight difference in present and prior depths in Mugu Canyon to shoaling is questioned. Considering the cone of the UGR depth recorder equipment to be possibly 30° the displacement of the present shoaler depths would be sufficient to indicate actual agreement in depth.

6. Some depth curves in 100-fathom depths did not adequately reflect deep indications and were appropriately revised during quality control inspection.

7. The "Prominent Slide" charted in the vicinity of latitude 34°04.50', longitude 119°01.20' does not have a specific position on the present survey or TP-00780. The "Prominent Slide" landmark, therefore, should be retained as presently charted.

cc:
C35
C351



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. 9667

INSTRUCTIONS

- A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
 2. In "Remarks" column cross out words that do not apply.
 3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
18725	10-13-78	S.M. HOO / RCS	Full Part Before <u>After Verification</u> Review <u>Inspection</u> Signed Via Drawing No. <u>17</u>
18720	10-16-78	S M HOO RCS	Full Part Before <u>After Verification</u> Review <u>Inspection</u> Signed Via Drawing No. <u>33</u>
18740	10-16-78	S M HOO RCS	Full Part Before <u>After Verification</u> Review <u>Inspection</u> Signed Via Drawing No. <u>44</u>
18022	10-16-78	S.M. HOO RCS	Full Part Before <u>After Verification</u> Review <u>Inspection</u> Signed Via Drawing No. <u>40</u>
18020	10-16-78	S.M. HOO RCS	Full Part Before <u>After Verification</u> Review <u>Inspection</u> Signed Via Drawing No. <u>31</u>
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.