

5429

Diag. Cnt. No. 5101-3.

Form 504	
U. S. COAST AND GEODETIC SURVEY	
DEPARTMENT OF COMMERCE	
DESCRIPTIVE REPORT	
Type of Survey <u>Hydrographic</u>	
Field No. <u>52</u>	Office No. <u>H-5429</u>
See also <u>T-4832</u>	
LOCALITY	
State <u>California</u>	
General locality <u>San Pedro Bay</u>	
Locality <u>Long Beach Inner Harbor</u>	
<u>1943</u>	
CHIEF OF PARTY	
<u>Robert W. Knox</u>	
LIBRARY & ARCHIVES	
DATE <u>April 20, 1934</u>	

B-1870-1 (11)

5429

Form 537

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

APR 20 1934

Acc. No. _____

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REG. NO.
5429

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. 52

REGISTER NO. 5429

State California

General locality San Pedro Bay, California

Locality Long Beach Inner Harbor

Scale 1:5,000 Date of survey March 21 to 23, 1934

Vessel Long Beach Harbor Department skiff

Chief of Party Robert W. Knox

Surveyed by John C. Mathisson

Protracted by A. J. Vollmar

Soundings penciled by A. J. Vollmar

Soundings in fathoms feet

Plane of reference M. L. L. W.

Subdivision of wire dragged areas by

Inked by EWSmith

Verified by EWS

Instructions dated The Directors letter dated Mar. 13, 1934

Remarks:

Descriptive Report
to accompany

Topographic Sheet T 1934

and

Hydrographic Sheet 52 1934

Long Beach Inner Harbor, Calif.

Robert W. Knox, H. & G. E.
Chief of Party.

INSTRUCTIONS: The authority for this survey was contained in the Directors letter dated March 13, 1934.

INTRODUCTION: There being a deficiency of smooth sheets, the one sheet was used for the topography and the smooth hydrographic sheet. Hence this report covers Topographic Sheet Field No. T (T. 4833) and Hydrographic Sheet Field No. 52. (H-5429).
(The sheet as received from the field was cut in two, permitting the separate filing of both sheets)

TOPOGRAPHY

The topography was executed entirely on three-point fixes on the plotted triangulation stations. Only five set-ups were required to cover the entire area. The topographic features located in addition to the required signals, are those which were requested in the revision of the photo-compiled Sheet Registry No. 5033. These features include the three towers on either side of Cerritos Channel, the location of the tank at the Edison Co. plant and the elevation of the top of the stacks

on the west end of the Edison Co. plant. The clearance under the wires across Cerritos Channel was also determined. The line connecting signals BAL, ALA, LAG and GIG is the bulkhead around this point.

The sheet was inked by civilian personnel under the direct supervision of the undersigned.

HYDROGRAPHY

The hydrography was done in a Long Beach Harbor Department pulling skiff with a five man party. Sextant angles on topographic located objects were used. In some localities fixes were not available and occasionally a very close distance was estimated to an object. No attempt was made to run a uniform system of sounding lines. The lines were spaced to cover the area.

Several pile cluster dolphins have been located by taking sextant fixes close to them. These dolphins have also been located recently on a revision of photo-compiled sheet Registry No. 5033.

The soundings were taken to fathoms and feet and the tenths were estimated. They were reduced to M. L. L. W. on the Long Beach Inner Harbor gauge the datum line on the marigram being taken as the plane. A change of 2.1 feet at 8 fathoms was noted

in the lead line on the first day of sounding. This error was proportioned over the period of sounding, as follows; from the start of hydrography to 10:00 o'clock no correction was applied, from 10:00 o'clock to noon one half the error was applied and from noon to the end of day the whole correction was applied to reduce the soundings. On the sheet the soundings were plotted to feet, calling eight tenths of a foot the next higher foot.

The sheet was protracted and the soundings were penciled by a civilian draftsman under the supervision of the undersigned. After completion the sheet was reviewed.

Respectfully submitted,

John C. Mathisson
John C. Mathisson,

Jr. H. & G. E.

April 7, 1934

Forwarded, approved.

Robert W. Knox
Robert W. Knox,

H. & G. E. , Chief of Party.

*Applied to new chart 5143
5147
before inked or reviewed
H.R. Sept. 1934*

STATISTICS

Hydrographic Sheet Field # 52.

Day	Date	Stat. mi. sdg. line.	No. sdgs.	No. Pos.	Vol.
a	March 21	8.0	634	173	1
b	" 22	7.6	533	161	1
c	" 23	1.4	110	49	1
Total		17.0	1277	383	

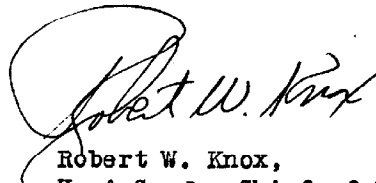
Area of hydrography - 0.2 square stat. mi.

Verification Report

After completion the sheet was reviewed and found to be complete. The water area as it appears on the smooth sheet is not completely covered but this is due to barges and ships being alongside of piers. It was also impossible to sound in Baxters slip on the west side of Channel Two as this slip was filled with logs. These areas are noted on the boat sheet.

No further work is considered necessary on the sheet.

April 7, 1934.



Robert W. Knox,
H. & G. E., Chief of Party.

LAC

July 17, 1934

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
1 volume/s of sounding records for

HYDROGRAPHIC SHEET 5429

Locality Long Beach Inner Harbor, Calif.

Chief of Party: R. W. Knox in 1934

Plane of reference is mean lower low water, reading

3.6 ft. on tide staff at Los Angeles Harbor (Allowance made for time
14.0 ft. below B. M. 8 of tide at place of sounding)

Height of mean higher high water above plane of reference
is 5.4 ft.

Condition of records satisfactory except as noted below:

H. H. Hanner

Acting Chief, Division of Tides and Currents

October 15, 1934.

SECTION OF FIELD RECORDS
Report on Hydrographic Sheet No. 5429

Report on : H-5429

Surveyed in: March 1934.

Chief of Party: R.W. Knox

Surveyed by: J.C. Mathison.

Protracted by: A.J. Vollmar

Soundings plotted by: A.J. Vollmar.

Verified and inked by: E.W. Smith.

1. The records conform to the requirements of the General Instructions with one exception, i.e., the datum for the projection was not included. The following reports and records were included with the sheet: Boat Sheet; Smooth Sheet; 1-vol. of sounding record; Descriptive Report; Title Sheet; Tidal Sheet; Statistics; Approval of Chief of Party; and a list of signals was included with subsequent report from the Field Chief. No "~~Recoverable Stations~~" (form 524) nor "~~Special chart for Lighthouse Service~~" was forwarded to this office. While "Landmarks for Charts" (form 567) was not included with this sheet, Landmarks for Charts Letter No. 29, 1934 include this area.

2. The 30-ft. curve can be completely drawn throughout most of the sheet, the exceptions being where the least depth along the docks is greater than 30-ft. The shoaler depth curves cannot be completely drawn.

3/ The plotting of positions and soundings was exceptionally well done, as was all other records in regard to this sheet.

4. It the preliminary ^{verification - Aug 8, 1934} ~~review~~, it was discovered that a number of signals appeared in the water without any record as to what kind of a structure they were on. Enclosed with the Descriptive Report is the Director's instructions asking for a further investigation and verification and the reply from the Field Chief. This report will be referred to in this review as the "subsequent report".

By checking the plotting of the four stations reported on in the subsequent report, it was found that their plotting was correct on the smooth sheet and that the discrepancies are due to the transferring of the shore line from T-5033a. It will be noted in the preliminary report that this shore line from T-5033a is a field adjustment from the original Air Photo Compilation, and by order of the Assistant chief of the Section, the shore line on the smooth sheet was finally changed to fit the double checked stations. Therefore, the dock at Sta. Gab (33-46.5 & 118-12.7) was changed so that Sta. Gab fell at the N.W. corner of the dock. Also, the dock at Sta. Ham (33-46.3 & 118-12.7) was changed so that Sta. Ham fell at the corner of the dock. The east shore line of Baxter's slip was moved very slightly eastward. These changes should be transferred to T-5033a. Where discrepancies as to location of piles occurred, it was ordered to take a mean of the positions as located by hydrography and T-5033a.

5. There are no junctions with other surveys in this sheet, as all other surveys of this area are done by other bureaus than the C. & G.S.

Report on H. 5429 (continued)

6. The delay in completing the sheet while the subsequent investigation was being conducted cannot be attributed to the hydrographic work but to the improper location of shoreline on the air photocompilation.

8. The time spent on the preliminary review, verification and inking, is as follows: Preliminary Review--6 hours; checking the plotting of soundings-- $2\frac{1}{2}$ hours (this was done so that the hydrography could be applied to the chart before completion of the sheet); checking the field report on discrepancies and making the necessary changes on the topography-- $8\frac{1}{2}$ hours; inking soundings--10 hours; and inking curves, investigation of accompanying reports and writing final report--11 hours.

Respectfully submitted,

Elbert W. Smith

Elbert W. Smith.

FIELD RECORDS SECTION

Report on Hydrographic Sheet No. 5429
(Preliminary Report)

A visual inspection of the protracting was made between the boat and smooth sheets. 10 positions appearing doubtful were checked by protractor and only 1 found in error. The protracting, inking of day letters and position numbers is rated as excellent. ✓

No shoreline detail appears on T-4833 nor the smooth sheet of H. 5429 but does appear on the boat sheet. Investigation indicates that the boat sheet shoreline was evidently taken from air photo compilation sheet No. 5033. Therefore the shoreline on T. 5033a (which includes corrections) was enlarged and transferred to H. 5429. ✓

1. The following stations appear in the water and no indication as to what they are located on; Man, Pun, Oil, Hi, Gab, Fen, Sig, Lad, Ham, Fin, Clo, On, Sli, Pil, Fla, and West.
2. Signal Fin is located about half way between a corner of a pier and a dolphin as transferred from T. 5033a.
3. Signal Pil is plotted near a dolphin as transferred from T. 5033a.
4. Dolphins from the hydrography (located by sextant fixes) do not check locations as transferred from T. 5033a. These dolphins are; 122b, 123b, 84b, 113b, 114b, 14c, and 17c.
5. Fixes 80b and 44b, with 9 ft. and 28 ft. soundings, respectively, plot up on the pier.

From the above it seems some of the signals are plotted incorrectly. ~~The descriptive report states all topography was located on three point fixes, but no records for such fixes were transmitted to this office.~~ Accordingly No changes of the plotting of fixes or location of dolphins have been made until a further check on signals can be executed and the field party consulted. - No changes made - H.W.S.

*By message to West records see
Chief of Party's Letter dated Sept. 20, 1934
which is attached to this report.*

Submitted by - Elbert W. Smith,
August 3, 1934.

KTA
S
apf

80 BMK

August 30, 1934.

To: Lieut. Robert W. Knox,
U. S. Coast and Geodetic Survey,
P. O. Box 463,
Long Beach, Calif.

From: Director,
U. S. Coast and Geodetic Survey.

Subject: Questionable signals on H 5429, Channel Two and
Channel Three, Long Beach Harbor.

Please find enclosed a copy of the report of the preliminary inspection of H 5429. Under separate cover a photostat of this sheet and one of the air-photo-compilation sheet of the same area have been mailed to you.

The report calls attention to a number of signals which fall in the water, without any indication on either sheet as to the character of structures on which the signals are located. Those should be described. In several cases the air-photo-compilation shows wharves or dolphins close to, but not exactly in the same positions of the signals. In such cases, please furnish descriptions of the signals, and state which you consider the more accurate, your topographic location or the air-photo-compilation.

Form 524 should have been accomplished for such stations as are recoverable. The others should have been described in the description report or on the sheet.

(Signed) E. S. PATTON

Director

Enc.

U. S. COAST & GEODETIC SURVEY
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rwj
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POST-OFFICE ADDRESS: Box 463, Long Beach, California.
TELEGRAPH ADDRESS:
EXPRESS ADDRESS:

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

September 22, 1934.

To: The Director,
Coast and Geodetic Survey.
From: Lieut. Robert W. Knox,
Coast and Geodetic Survey.
Subject: Questionable signals on H 5429, channel two and three,
Long Beach Harbor.
Reference: Director's letter of August 30th; Report on above hydrographic
sheet (preliminary); field letter of September 13th.

There is enclosed herewith 1) positions of four hydrographic signals of the above sheet and 2) copy of Lieut. (jg) Mathisson's letter regarding location of the signals.

The four signals mentioned above were located by theodolite three-point fix, and were selected so as to check all sections of the sheet. Due to distortion of the bromides furnished this party, it was not possible to satisfactorily plot them.

The last paragraph of the Director's letter mentioned in the reference, regarding the description of recoverable stations is noted.

Robert W. Knox
Robert W. Knox,
Chief of Party.

This work
should be closed
as 4th order triangulation
signals should be
shown as hydrographic
or topographic signals.
NOT TO BE REGISTERED
AS TRIANGULATION

JUN 26 1934

extract of report of Lieut. (jg) Mathisson on hydrographic sheet
No. H5429.

----- to the best of my knowledge the signals mentioned under
paragraph 1 of the Preliminary Report are as follows:

MAN✓ on the beach on the west side of Baxter's slip. Banner ✓
PUN✓ on the beach at the head of channel two. Banner
OIL* center of a "Purr-Pull" oil sign on the small pier near by. It
is shown to the west of the signal
HI✓ a banner nailed on the overhead works of the small pier shown
just inshore of a float off the pier
GAB✓ east gable of the small pier house near the NE corner of the
oil company pier
FEN* signal cloth nailed to the corner of the bulkhead as shown about
about 5 m to the west
SIG* one of the ends or center of the cable King sign. Do not remember
which
LAD✓ Banner on beach
HAM✓ on the corner of the pier where it makes the diagonal turn. Not so
sure of this
FIN✓ see below
CLO✓ signal cloth nailed to the pier at or near the corner
ON✓ signal cloth nailed to a single pierpile at the end of one
of the floats.
SLI* signal cloth on ~~the~~ the pier about 10 or 12 m west of the corner
PIL✓ a pile or dolphin to the east of the Gypsum pier
FLA✓ Flag pole on the Standard Oil Float
WEST✓ end dolphin on the apron around the bridge protection

signals:

In addition I question the high water line of the following

OUT✓ should be near the corner of Baxter's pier
GRA✓ should not be exactly on the corner of the pier
Sar✓ is the sardine conveyor on the pier
MAST✓ this signal is the loading mast ~~in~~ from the corner and face
of the pier. North and slightly east of where it is shown

Question (2)

Fin ✓ should be on the cluster pile dolphin on the east side of the
Richfield pier

Question (3)

PIL✓ should be on the pile or dolphin near the east end of the
Gypsum pier

* Discrepancies in these signals are due to the enlargement of the topography
from the air-photo compilation - ~~...~~

Question (4)

It is believed that the dolphins as located by sextant fixes are correct ✓

Question (5)

It is believed that these positions are correct and that the piers in question should be moved to fit. * *Peris moved in H.W. - H.L.W.*

The reviewer evidently did not understand my descriptive report. The signals were located from plane table three-point fixes and not sextant three-point fixes. ✓

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 5429

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

Number of positions on sheet	383
Number of positions checked	7
Number of positions revised	0
Number of soundings recorded	1277
Number of soundings revised	X
Number of signals erroneously plotted or transferred	X

Date: Oct. 15, 1934

Cartographer: E. W. Smith

Verification of pretracing
Verification & inking of reefs & shoals) by E. W. Smith

Time: 6-hours }
8 1/2 " } 38

Verification of inking by See Report for time distribution

Time: 23 1/2 Hours

Review by H. W. Murray

Time: 9 1/4 "

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5429 (1934)

Long Beach Inner Harbor, San Pedro Bay, California.

Instructions dated March 13, 1934 (R.W. Knox).

Surveyed March 21 - 23, 1934.

Hand Lead Soundings

3-Point Control on Shore Signals

Chief of Party: R. W. Knox
Surveyed by: J. C. Mathisson
Protracted by: A. J. Vollmar
Soundings penciled by: A. J. Vollmar
Verified and inked by: E. W. Smith

1. Condition of Records.

The records are neat, legible and conform to the requirements of the Hydrographic Manual with the exception that no bottom characteristics were obtained.

2. Compliance with Instructions for the Project.

The plan, character and extent of the survey satisfy the instructions for the project.

3. Sounding Line Crossings.

The few cross lines which were run are satisfactory.

4. Depth Curves.

The usual depth curves may be satisfactorily drawn.

5. Junctions with Contemporary Surveys.

There are no contemporary surveys which make a junction with the present survey.

6. Comparison with Prior Surveys.

a. H-4163 (1920-21).

A portion of this survey comprises the Turning Basin and Channel Three shown on the present survey. In later years numerous dredging operations have been made from time to time which have so completely altered the area that H-4163 (1920-21) is of no value for comparison purposes.

7. Comparison with Chart No. 5146.

Soundings shown on this chart originate from various blueprints which have been submitted to this office from time to time and since the entire area has been dredged, no comparisons are necessary. The new survey should supersede these soundings.

7.

Attention is directed to the fact that information has been received in the office subsequent to the date of this survey stating that the bridge opening at the southern limits of this sheet has been widened. This change has already been incorporated in the new chart No. 5147.

8. Field Plotting.

Field protracting and plotting were very accurate and conform to the requirements of the Hydrographic Manual.

9. Additional Field Work Recommended.

For Future Consideration.

If field work is resumed in this locality, it would be advisable to examine the 15 foot sounding (Pos. 46c, detached) in lat. $33^{\circ}46'+497m.$, long. $118^{\circ}12'+865m.$, which falls between a 23 and 38 foot sounding. The sounding appears erroneous but could not be disproved in the office. Its importance is minimized by the fact that it is shown just outside the channel limits on Chart No. 5147.

10. Superseding Previous Surveys.

The present survey supersedes the following survey for charting purposes:

H-4163 (1920-21) ... In part.

11. Miscellaneous Matters.

A number of topographic signals shown on this sheet fall outside the high water line. Some are described as banners on the beach and others are banners attached to overhead structures extending out over the water (See letter dated September 22nd, from Chief of Party attached to this report). The discrepancy in a few others which fall a few meters outside the dock limits may be accounted for by the enlargement of the topographic detail from the air-photo compilation.

12. Reviewed by: Harold W. Murray - October 19, 1934.

Inspected by A. L. Shalowitz.

Examined and approved:

K.T. Adams
K. T. Adams,
Chief, Section of Field Records.

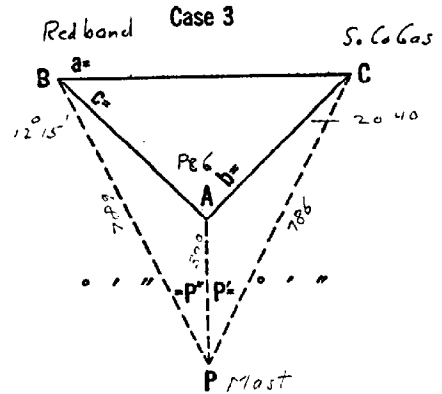
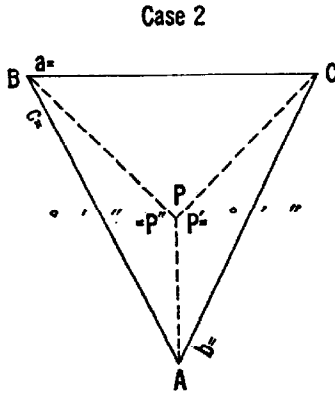
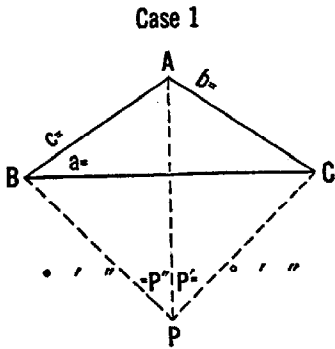
H.S. Borden
Chief, Section of Field Work.

L.D. Polbur
Chief, Division of Charts.

G. Hude
Chief, Division of H. & T.

Han, ecc

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P'
P''
A

Sum
1/2 Sum

$S = 180^\circ - \frac{1}{2} \text{sum} =$

Case 3

P'	90	31	00	-	✓
P''	27	29	45	-	✓
Sum	118	00	45	-	
A	150	20	20	-	✓

A - sum

$S = \frac{1}{2} (A - \text{sum}) =$

32	19	35	-	✓
16	09	48	-	✓

Log c =	2.805 751	✓
Log sin P' =	9.999 982	✓
Colog b =	7.074 901	✓
Colog sin P'' =	0.335 655	✓
Sum = log tan Z =	0.216 289	✓
Z =	58 42 42	✓
Z + 45° =	103 42 42	✓
Log cot (Z + 45°) =	9.387 371	n ✓
Log tan S =	9.462 142	✓
Sum = log tan ε =	8.849 519	✓ (sign n)
ε	4 02 42	✓
S	16 09 48	✓

(Tan ε +)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε -)
S - ε = angle ABP
S + ε = angle ACP

BPA		APC		PCB	32 58 06	✓
ABP	12 07 06	PCA	20 12 30	CBP	29 01 11	✓
PAB		CAP		BPC	118 00 45	✓
					179 59 62	✓

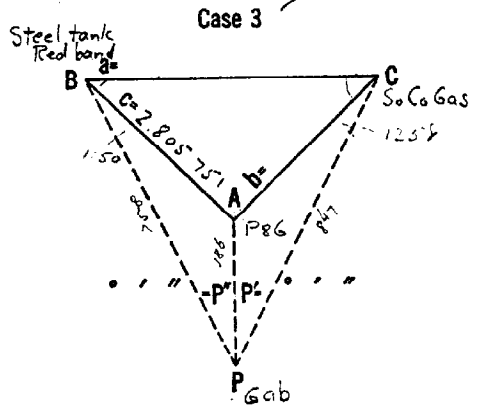
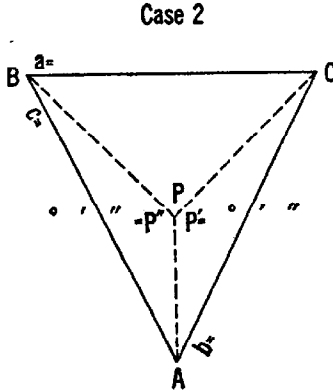
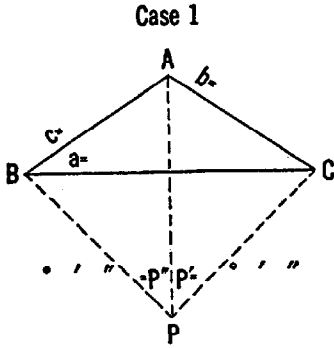
(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

Mike

GAB, ecc

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P'
P''
A

Sum
1/2 Sum

$S = 180^\circ - \frac{1}{2} \text{sum} =$

Case 3

P'	81	23	30	✓
P''	45	00	00	✓
Sum	126	23	30	✓
A	150	20	20	✓

A-sum

$S = \frac{1}{2} (A - \text{sum}) =$

A-sum	23	56	50	✓
S	11	58	25	✓

Log c =	2.805	751	✓
Log sin P' =	9.995	080	✓
Colog b =	7.074	901	✓
Colog sin P'' =	0.150	515	✓

Sum = log tan Z = 0.026 247 ✓

Z =	46	43	49	✓
Z + 45° =	91	43	49	✓

Log cot (Z + 45°) =	8.480	125	n ✓
Log tan S =	9.326	490	p ✓

Sum = log tan ε = 7.806 615 (sign n)

ε	0	22	01	✓
S	11	58	25	✓

(Tan ε+)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε-)
S - ε = angle ABP
S + ε = angle ACP

BPA	45	00	00
ABP	11	36	24
PAB			

APC	81	23	30
PCA	12	20	26
CAP			

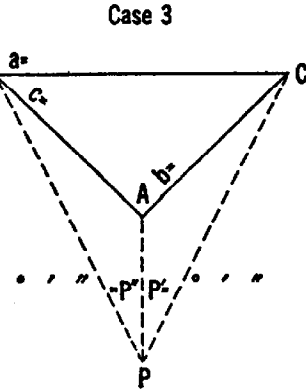
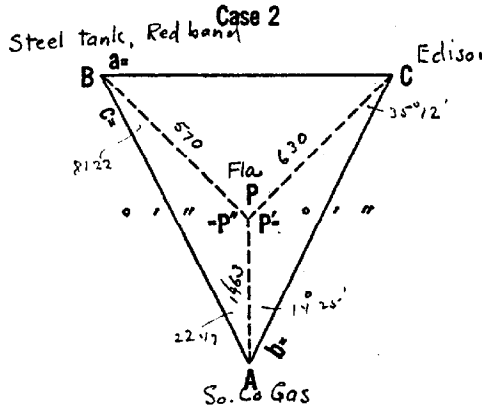
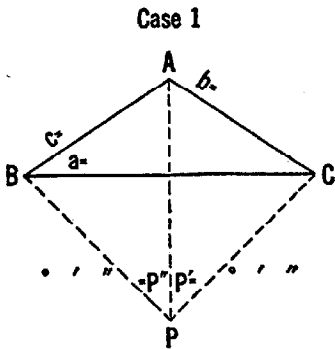
PCB	25	06	02
CBP	28	30	29
BPC	126	23	30
	179	59	61

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

comp Paul ✓ C.P.

FLA ecc

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P'	130	16	30	✓
P''	75	57	30	✓
A	37	20	58	✓
Sum	243	34	58	✓
1/2 Sum	121	47	29	✓

Case 3

P'	
P''	
Sum	
A	

$S = 180^\circ - \frac{1}{2} \text{sum} = 58 \ 12 \ 31$ ✓

$S = \frac{1}{2} (A - \text{sum}) =$

Log c =	3.156 111	✓
Log sin P' =	9.882 496	✓
Colog b =	6.715 305	✓
Colog sin P'' =	0.013 175	✓

Sum = log tan Z = 9.767 087 ✓

Z = 30 19 25 ✓
Z + 45° = 75 19 25 ✓

Log cot (Z + 45°) = 9.418 143 p ✓
Log tan S = 10.207 736 ✓

Sum = log tan ε = 9.625 879 ✓ (sign p.)

ε = 22 54 24 ✓
S = 58 12 31 ✓

(Tan ε+)

S + ε = angle ABP 81 06 55 ✓
S - ε = angle ACP 35 18 07 ✓

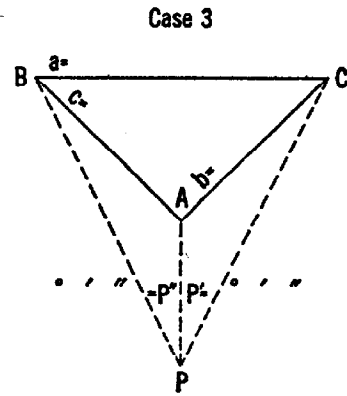
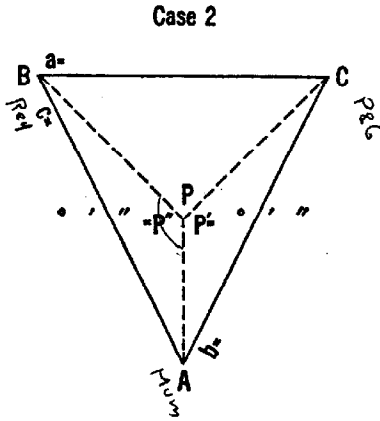
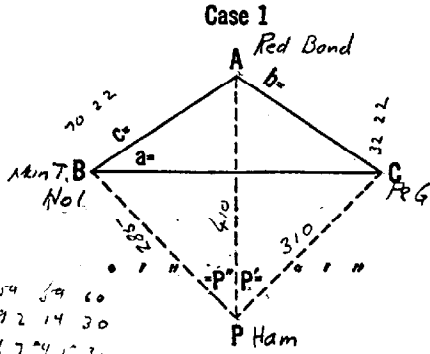
(Tan ε-)

S - ε = angle ABP
S + ε = angle ACP

BPA	75 57 30	✓	APC	130 16 30	✓	PCB
ABP	81 06 55	✓	PCA	35 18 07	✓	CBP
PAB	22 55 35	✓	CAP	14 25 23	✓	BPC

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2		Case 3			
68 16 30	P'	123 58 00 ✓			
123 58 00	P''	178 16 30 ✓			
	A	64 32 03 ✓			
	Sum	256 46 33 ✓			
	1/2 Sum	128 23 16 ✓			
S=180° - 1/2 sum =	51 36 44 ✓	S=1/2 (A - sum) =			
	Log c =	2.604 956 ✓			
	Log sin P' =	9.918 744 ✓			
	Colog b =	7.194 249 ✓			
	Colog sin P'' =	9.031 998 ✓			
	Sum = log tan Z =	9.749 947 ✓			
	Z =	29 20 52 ✓			
	Z + 45° =	74 20 52 ✓			
	Log cot (Z + 45°) =	9.447 449 ✓			
	Log tan S =	10.101 142 ✓			
	Sum = log tan ε =	9.548 591 (sign p.) 9.548 591 ✓			
	ε	19 28 37 ✓			
	S	51 36 44 ✓			
(Tan ε+)	S + ε = angle ABP	74 05 21 ✓			
	S - ε = angle ACP	32 08 07 ✓			
	(Tan ε-)				
	S - ε = angle ABP	71 05 21 ✓			
	S + ε = angle ACP	32 08 07 ✓			
BPA	68 16 30	APC	123 58 00	PCB	123 58 00
ABP	74 05 21	PCA	32 08 07	CBP	32 08 07
PAB	40 38 09	CAP	23 53 53	BPC	23 53 53

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

comp Rank CR

COMPUTATION OF TRIANGLES

11-9121

State: _____

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3							3.156 111 ✓
1	Han, acc	118 00 45				45	0.054 116 ✓
2	Red Band	29 01 11	-01			10 ✓	9.685 837 ✓
3	So Co Gas	32 58 06	-01			05 ✓	9.735 736 ✓
1-3							2.896 064 ✓
1-2							2.945 963 ✓
2-3							2.805 751 ✓
1	Han acc	27 29 45					0.335 655 ✓
2	Red band	12 07 06					9.322 077 ✓
3	P&G	140 23 09					9.804 558 ✓
1-3							2.463 483 ✓
1-2							2.945 964 ✓
2-3							2.925 099 ✓
1	Han acc	90 31 00					0.000 018 ✓
2	P&G	69 16 30					9.970 946 ✓
3	So Co Gas	20 12 30					9.538 366 ✓
1-3							2.896 063 ✓
1-2							2.463 483 ✓
							Comp Recd.
2-3							
1							
2							
3							
1-3							
1-2							

Do not write in this margin

Comp Recd.

COMPUTATION OF TRIANGLES

State: _____

11-9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						3.156 111 ✓
1	Gab ecc	126 23 30 ✓		-01		29	0.094 213 ✓
2	Red band	28 30 29 ✓					9.678 775 ✓
3	So Co Gas	25 06 02 ✓					9.627 579 ✓
	1-3					849.4	2.929 099 ✓
	1-2					754.9	2.877 903 ✓
	2-3						2.805 751 ✓
1	Gab ecc	45 00 00 ✓					0.150 515 ✓
2	Red band	11 36 24 ✓				?	9.303 610 ✓
3	P&G	(123 23 36) ✓					9.921 641 ✓
	1-3					181.9	2.259 876 ✓
	1-2						2.877 907 ✓
	2-3						2.925 099 ✓
1	Gab ecc	81 23 30 ✓					0.004 920 ✓
2	P&G	(86 16 04) ✓				?	9.999 078 ✓
3	So Co Gas	12 20 26 ✓					9.329 849 ✓
	1-3	179 57 60					2.929 097 ✓
	1-2						2.259 868 ✓
	2-3						✓ CAR
	1						
	2						
	3						
	1-3						
	1-2						

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COMPUTATION OF TRIANGLES

State: _____

11-9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						2.604 956 ✓
1	Ham ecc	68 16 30 ✓					0.031 998 ✓
2	Mun Tank No 1	70 05 21 ✓					9.975 902 ✓
3	Red band	(40 38 09) ✓					9.813 747 ✓
1-3		179 59 50				410	2.612 856 ✓
1-2						282	2.450 701 ✓
	2-3						2.805 751 ✓
1	Ham ecc	123 58 00 ✓					0.081 256 ✓
2	Red band	(23 53 53) ✓					9.607 574 ✓
3	P 8 G	352 08 07 ✓					9.725 846 ✓
1-3		78 19 60				300	2.494 581 ✓
1-2		comp Red.				410.1	2.612 853 ✓ comp Red. ✓ C/S
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						

Do not write in this margin

COMPUTATION OF TRIANGLES

11-9121

State: _____

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						3.284 695 ✓
1	Fla acc	130 16 30 ✓					0.117 504 ✓
2	Edison	35 18 07 ✓					9.761 842 ✓
3	So Co Gas	(14 25 23) ✓					9.396 338 ✓
	1-3						3.164 041 ✓
	1-2						2.798 537 ✓
	2-3						3.156 111 ✓
1	Fla acc	75 57 30 ✓					0.013 175 ✓
2	So Co Gas	(22 55 35) ✓					9.590 561 ✓
3	Red band	81 06 55 ✓					9.994 757 ✓
	1-3						2.759 847 ✓
	1-2						3.164 043 ✓
							comp Book ✓
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						

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POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

α	2	to 3	161	08	18	α	3	to 2	341	08	08
β	29	to 1	190	09	28	β	32	to 1	308	10	03
$\Delta\alpha$			180	00	00.0	$\Delta\alpha$			180	00	00.0
α'	1	to 2	10	09	31	α'	1	to 3	128	10	16

FIRST ANGLE OF TRIANGLE

118° 00' 45"
128° 10' 16"

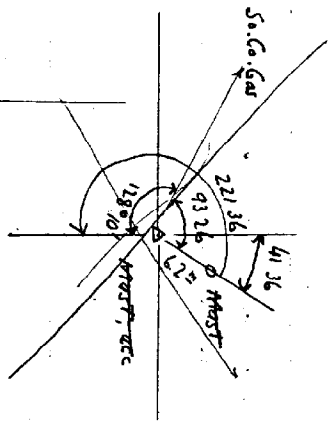
ϕ	33	46	05.20	Steel Tank, Reel/B	λ	118	12	47.66	ϕ	33	46	49.20	So Co Gas	λ	118	13	05.66
$\Delta\phi$			+28.21		$\Delta\lambda$			-6.05	$\Delta\phi$			+15.79		$\Delta\lambda$			-24.05
ϕ'	33	46	33.41	Han, ecc	ϕ'	33	46	41.61	ϕ'	33	46	33.41	Han, ecc	ϕ'	33	46	41.61

s	Logarithms	Values in seconds		s	Logarithms	Values in seconds		s	Logarithms	Values in seconds	
		$\frac{1}{2}(\phi+\phi')$	33 46 193			$\frac{1}{2}(\phi+\phi')$	33 46 41			$\frac{1}{2}(\phi+\phi')$	33 46 41
$\cos\alpha$	9.993 139			$\cos\alpha$	9.790 962			$\cos\alpha$	2.896 064		
B	8.511 312			B	8.511 312			B	8.511 312		
h	1.450 414	1st term	-28.21	h	1.198 338	1st term	+15.79	h	1.198 338	1st term	+15.79
s^2	5.891 93	A'	8.509 272	s^2		A'	8.509 272	s^2		A'	8.509 272
$\sin^2\alpha$	8.492 79	Sec ϕ'	0.080 285	$\sin^2\alpha$		Sec ϕ'	0.080 285	$\sin^2\alpha$		Sec ϕ'	0.080 285
C	1.230 31	$\Delta\lambda$	0.781 919	C	1.230 53	$\Delta\lambda$	1.381 158	C	1.230 53	$\Delta\lambda$	1.381 158
h^2	5.615 03	$\sin\frac{1}{2}(\phi+\phi')$	9.744 988	h^2		$\sin\frac{1}{2}(\phi+\phi')$	9.745 057	h^2		$\sin\frac{1}{2}(\phi+\phi')$	9.745 057
D		- $\Delta\alpha$	0.526 907	D		- $\Delta\alpha$	1.126 215	D		- $\Delta\alpha$	1.126 215
		3d term				3d term				3d term	
		- $\Delta\phi$				- $\Delta\phi$				- $\Delta\phi$	

1070.6
4.3
1074.9

CR

S.O.C.G.S



128°10'
62°33'
65°37'

H.M.S.T.
H.M.S.T.

H.M.S.T. ecc

602.
log 6.72 = 0.779 60
log cos 4/36 = 9.873 78
~~log Δd = 0.653 38~~ log 0.60172
Δd = +4.5 m Δd = -3.99 m. or -4.

	H.M.S.T. ecc.	H.M.S.T.
33	(819.2)	(821.1)
46	1029.8	1027.5
118	(473.2)	(468.9)
12	1070.6	1074.9
	+4.3	

Log 4.7 = 0.672 10
log cos 65°37' = 9.615 78
Log φ = 0.287 88
1.94
1.9
4.28
+4.3

0.672 10
9.959 42
0.631 52

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

α	2	to 3	161	08	18.4	α	3	to 2	341	08	08.4
β	2	&	+ 28	30	29	β	2	&	- 25	06	02
γ	2	to 1	189	38	47.4	γ	3	to 1	316	02	6.4
$\Delta\alpha$					+	$\Delta\alpha$					12.7
			180	00	00.0				180	00	00.0
α'	1	to 2	.9	38	50.1	α'	1	to 3	136	02	19.1
			12.6	23	20.1				136	02	19.1
			13.6	24	20.1						

FIRST ANGLE OF TRIANGLE

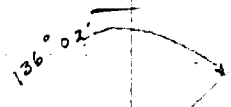
ϕ	33	46	00.20	2	Red Brand	ϕ	33	46	49.20	8	So. Co. Gas
$\Delta\phi$		+	24.16			$\Delta\phi$		-	19.84		
ϕ'	33	46	29.36	1	Gas	ϕ'	33	46	29.36	1	Gas
					acc						acc
						λ			118	13	05.66
						$\Delta\lambda$					22.92
						λ'			118	12	42.74

	Logarithms		Values in seconds		$\frac{1}{2}(\phi+\phi')$	Logarithms	Values in seconds		$\frac{1}{2}(\phi+\phi')$	Logarithms	Values in seconds	
	s	Cos α	s	Sin α			s	Cos α			s	Sin α
A	2.877903	9.993815	(9440)	(904.5)	33	46	173	2.929097	4.857191	33	46	34.3
B	8.511312							8.511312				
h	1.383030		1st term	- 24.16				1.297600		1st term	19.84	
α'			Sin α	9.224193				Sin α	9.841096			
β'			A'	8.509272				A'	8.509272			
C			Sec ϕ'	0.080280				Sec ϕ'	0.080298			
$\Delta\alpha$			$\Delta\alpha$	0.691648	- 4.92			$\Delta\alpha$	1.360163	- 2.292		
h'			Sin $\frac{1}{2}(\phi+\phi')$	9.744982				Sin $\frac{1}{2}(\phi+\phi')$	9.745052			
D			- $\Delta\alpha$	0.436630	- 2.73			- $\Delta\alpha$	1.105215	- 12.74		
			3d term					3d term				
			- $\Delta\phi$					- $\Delta\phi$				

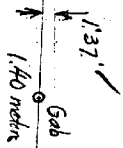
$\phi = 904.5$

1099.7
- 1.4
1098.3

S. C. 646



Gab. ecc



Gab

135.35

Log	1.40 m	0.14613	Log	0.14613
Log cos	1.37'	= 9.99983	Log sin	8.45044
Log	λ	0.14596	Log φ	8.59657
λ		= 1.399		= .0395

136.02
 135.35
 271.37
 370
 1 39'

33 46
 118 12

Gab. ecc. (444.0)
 904.5 - 0
 (444.2) 1099.7 - 1.4
 Gab. (445.1)
 904.8
 (445.1) 1098.3

200

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

α	2	to 3	341	08	08	08	161	08	18
β	2	to 1	+ 22	55	35	- 81	06	06	55
α	2	to 1	04	03	43	80	01	23	✓
$\Delta\alpha$					- 2				12
α'	1	to 2	180	00	00.0	180	00	00	00.0
α''	1	to 2	184	03	41	260	01	11	✓

FIRST ANGLE OF TRIANGLE $260^{\circ} 01' 11''$

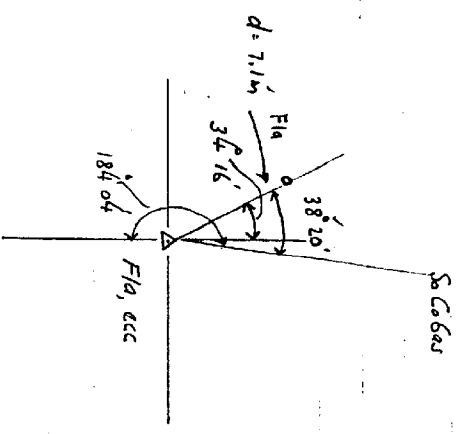
ϕ	33	46	49.20	2 S. Co Gas	λ	118	13	05.66
$\Delta\phi$			- 47.23		$\Delta\lambda$			+ 4.02
ϕ'	33	46	01.97	1 Fla, ecc	λ'	118	13	09.68

s	Logarithms	Values in seconds		$\frac{1}{2}(\phi+\phi')$	Logarithms	Values in seconds	s	Logarithms	Values in seconds	
		(1787.9)	60.7						33	46
Cos α	9.998 908							2.759 847		
B	8.511 312							8.511 312		
h	1.674 263	1st term	+ 47.23					0.509 837	1st term	+ 3.23
s^2										
Sin α										
C		2d term	+						2d term	+
h^2										
D		3d term	+						3d term	+
		- $\Delta\phi$							- $\Delta\phi$	

60.7
5.9
249.1
54.0
293.1

$\lambda = 253.1$

130 16 ✓
 91 52 ✓
 38 20 ✓
 4 04 ✓
 34° 16' ✓



$\log 7.1 = 0.851258$
 $\log \cos 34.16 = 9.917204$
 $\log \Delta d = 0.768462$
 $\Delta d = 4.59$

0.851258
 $\log \sin = 9.750543$
 $\log \Delta d = 0.601801$
 $\Delta d = 4.399 = 4m$

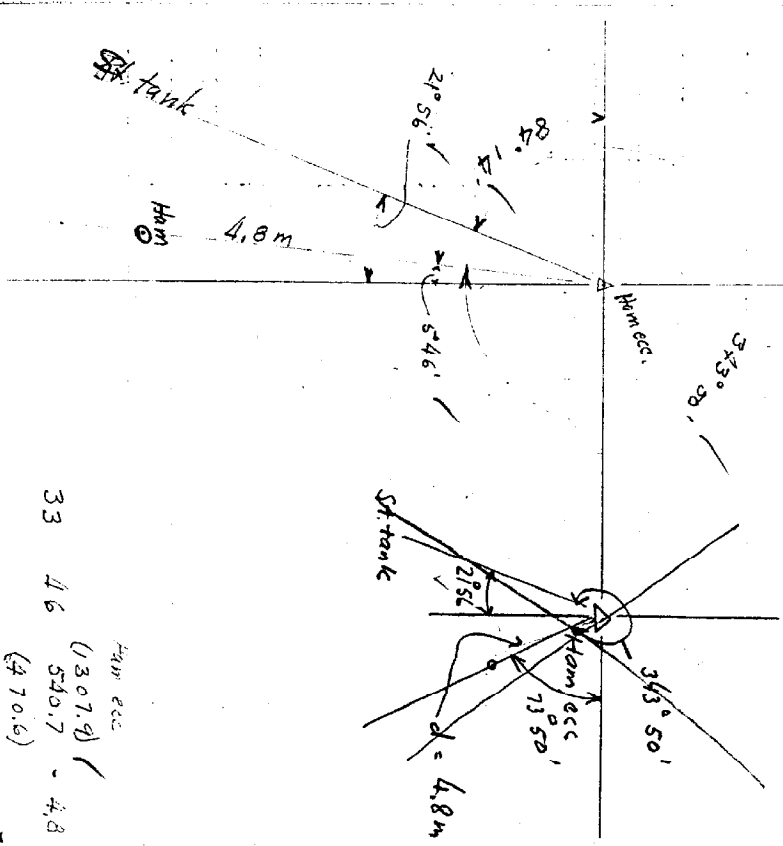
33 46
 118 13
 (1782.9)
 (1290.7)
 (249.1)
 (787.9)
 (253.1)
 60.7
 60.6
 60.6
 $+59$
 $+4$

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		FIRST ANGLE OF TRIANGLE				SECOND ANGLE OF TRIANGLE				THIRD ANGLE OF TRIANGLE			
		0	1	2	3	0	1	2	3	0	1	2	3
α	2	to 3	62	34	34	α	3	to 2	242	34	26		
β	2	to 1	71	05	21	β	2	to 1	40	38	09		
γ	2	to 1	133	39	55	γ	3	to 1	201	56	17		
$\Delta\alpha$					4	$\Delta\alpha$					3		
α'	1	to 2	180	00	00.0	α'	1	to 3	180	00	00.0		
			313	39	51				21	56	20		
ϕ	33	46	11.22	2	Mon. Tok No. 1	ϕ	33	46	05.20	8	Steel-Redland		
$\Delta\phi$			+6.33			$\Delta\phi$			+12.35				
ϕ'	33	46	17.55	1	Ham. ecc	ϕ'	33	46	17.55	1	Ham. ecc		
s	2.450 701	Values in seconds		$\frac{1}{2}(\phi+\phi')$	33	46	14.3	Logarithms	33	46	11.3		
$\text{Cos } \alpha$	9.839 129			Logarithms	2.450 701			Values in seconds	2.612 856				
B	8.511 312			$\text{Sin } \alpha$	9.859 370				2.612 856				
h	0.801 142	1st term	-6.33	A'	8.509 272				2.612 856				
s'				$\text{Sec } \phi'$	0.080 263				0.080 263				
$\text{Sin } \alpha$				$\Delta\lambda$	0.899 606				0.774 803				
C		2d term	+	$\text{Sin } \frac{1}{2}(\phi+\phi')$	9.744 973				9.744 963				
h'				$-\Delta\alpha$	0.644 579				0.519 766				
D		3d term	+										
		$-\Delta\phi$											

$d = \frac{5407}{535.9}$

$d = \frac{1073.3}{1073.8}$



33	46	(1307.9)	- 4.8
118	12	(470.6)	+ 3.5
		1073.3	

		(1312.7)
		535.9
		(470.6)
		1073.8

$$\begin{aligned} \log 4.8 &= 0.68124 \\ \log \cos 73.5 &= 9.44472 \\ \log \Delta d &= 0.12596 \\ \Delta d &= -1.3 \end{aligned}$$

$$\begin{aligned} \log 4.8 &= 0.68124 \\ \log \cos 84.14 &= 9.00207 \\ \log \Delta d &= 9.68331 \\ \Delta d &= +0.4723 \\ &+ 0.5 \end{aligned}$$

$$\begin{aligned} \log \Delta d &= 0.67905 \\ \Delta d &= 4.735 \\ &- 4.8 \end{aligned}$$

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		FIRST ANGLE OF TRIANGLE				SECOND ANGLE OF TRIANGLE	
α	β	α	β	α	β	α	β
2	3	3	2	3	2	3	2
347	242	34	26	34	26	34	26
2	1	2	1	2	1	2	1
180	00	180	00	180	00	180	00
1	2	1	2	1	2	1	2
62	34	62	34	62	34	62	34

		STEEL TANK, RED.				PEG TANK	
ϕ	λ	ϕ	λ	ϕ	λ	ϕ	λ
33	46	33	46	33	46	33	46
05.20	06.02	05.20	06.02	05.20	06.02	05.20	06.02
11.22	11.22	11.22	11.22	25.94	25.94	11.81	11.81
118	118	118	118	118	118	118	118
12	12	12	12	12	12	12	12
47.66	47.66	47.66	47.66	47.66	47.66	47.66	47.66
33.77	33.77	33.77	33.77	48.51	48.51	48.51	48.51

s	Logarithms		Values in seconds		s	Logarithms		Values in seconds	
	$\log(\phi+\phi')$	33 46	08.2	✓		$\log(\phi+\phi')$	33 46	15.6	✓
Cos α	2.268 284	✓	1st term	-06.02	Cos α	2.805 497	✓	1st term	-20.74
B	8.511 312	✓	h	1.316 809	B	8.511 312	✓	h	1.316 809
h	0.779 596	✓	h	1.316 809	h	1.316 809	✓	h	1.316 809
ϕ	33 46	✓	ϕ	33 46	ϕ	33 46	✓	ϕ	33 46
Logarithms	11.22	✓	Logarithms	11.22	Logarithms	11.22	✓	Logarithms	11.22
Values in seconds	06.02	✓	Values in seconds	06.02	Values in seconds	06.02	✓	Values in seconds	06.02
1st term	-06.02	✓	1st term	-06.02	1st term	-06.02	✓	1st term	-06.02
2d term	+	✓	2d term	+	2d term	+	✓	2d term	+
3d term	+	✓	3d term	+	3d term	+	✓	3d term	+
- $\Delta\phi$	-06.02	✓	- $\Delta\phi$	-06.02	- $\Delta\phi$	-06.02	✓	- $\Delta\phi$	-06.02

$S \sin \alpha = 2.553 176$
 $S \cos \alpha = 2.268 284$
 $T \tan \alpha = 10.284 892$
 $a = 242 34 26$
 402.67 meters
 $S \sin \alpha = 1.339 872$
 $S \cos \alpha = 2.805 497$
 $T \tan \alpha = 8.534 375$
 $a = 178 02 22$
 639.3 meters
 $S \sin \alpha = 2.553 176$
 $S \cos \alpha = 2.268 284$
 $T \tan \alpha = 10.284 892$
 $a = 242 34 26$
 402.67 meters
 $S \sin \alpha = 1.339 872$
 $S \cos \alpha = 2.805 497$
 $T \tan \alpha = 8.534 375$
 $a = 178 02 22$
 639.3 meters

U. S. COAST & GEODETIC SURVEY
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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

September 13, 1934.

20

1934 SEP 17 - PM 3:22
17 PM 3:22

To: The Director,
Coast and Geodetic Survey.

From: Lieut. Robert W. Knox,
Coast and Geodetic Survey.

Subject: Questionable signals on H 5429, Channel Two and
Channel Three, Long Beach Harbor.

Reference: Director's letter of August 30th; Report on above
Hydrographic sheet (Preliminary)

Receipt of the Director's letter of August 30th regarding the
above subject is respectfully acknowledged.

The photostatic copies of the sheets in question were forwarded
to Lieut. (jg) John C. Mathisson for study and comment. The position of
several questionable signals were satisfactorily decided upon. Theodolite
three point fixes were taken on or near nine of the more questionable
signals. These have not as yet been computed as all books of logarithms
are in use on other parties, and none as available about town. However,
it is expected a set will become available with the arrival of the Str.
Pioneer when the position of the signals will be computed and the results
forwarded to the Office.

The reviewer evidently misunderstood the descriptive report of
this sheet in that he apparently assumed that all three point fixes were
located by sextant, whereas they were actually located by plane table.

Robert W. Knox
Robert W. Knox
Chief of Party.

20 Jan 24, 1936
ENG

applied to Chart 5101 - May 1936 - R.M.F.

Form 250
Ed. July, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

RS Patton Director.

State: *Calif*

OBSERVATIONS
OF
HORIZONTAL ANGLES

LOCALITY

Long Beach Inner Harbor

INSTRUMENT

4" Berger 229

.....
.....
1934

CHIEF OF PARTY

Robert W. [Signature]

..... Vols.

..... Vol. *1*

HORIZONTAL

STATION: *Hyd No 333* STATE: *Calif*

OBSERVER: *Amel B*

OBJECTS OBSERVED	TIME h. m.	TEL. D OR R	REP'S	ANGLE	
				°	'
<i>Brkers tower</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>190</i>	<i>00</i>
<i>Hyd No</i>		<i>D</i>		<i>190</i>	<i>55</i>
		<i>R</i>		<i>10</i>	<i>55</i>
<i>Edison Stk</i>		<i>D</i>		<i>227</i>	<i>40</i>
		<i>R</i>		<i>48</i>	<i>24</i>
				<i>47</i>	<i>41</i>
<i>Craig tank</i>		<i>D</i>		<i>270</i>	<i>04</i>
		<i>R</i>		<i>90</i>	<i>04</i>
<i>Brkers tower</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>180</i>	<i>00</i>

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HORIZONTAL

STATION: *Ball*

STATE: *Calif*

OBSERVER: *Ames B*

OBJECTS OBSERVED	TIME	TEL. D OR K	REP'S	ANGLE	
	h. m.			°	'
<i>Edison Stk</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>180</i>	<i>00</i>
<i>Brkys hotel</i>		<i>D</i>		<i>646</i>	<i>42</i>
		<i>R</i>		<i>346</i>	<i>42</i>
<i>LB Lite</i>		<i>D</i>		<i>282</i>	<i>37</i>
		<i>R</i>		<i>102</i>	<i>37</i>
<i>Edison Stk</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>180</i>	<i>00</i>

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HORIZONTAL

STATION: *hyd Tel ecc* STATE: *Cebip*

OBSERVER: *KmclB*

OBJECTS OBSERVED	TIME h. m.	TEL. D OR R	REP'S	ANGLE ° ' "
<i>Baker's Craig Tank</i>		<i>D</i>		<i>00 00</i>
		<i>R</i>		<i>180 00</i>
<i>L.B. Lite</i>		<i>D</i>		<i>166 44</i>
		<i>R</i>		<i>346 65</i>
<i>E. d. Stk.</i>		<i>D</i>		<i>254 56</i>
		<i>R</i>		<i>74 56</i>
<i>hyd Tel</i>		<i>D</i>		<i>331 30</i>
		<i>R</i>		<i>151 30</i>
<i>Craig Tank</i>		<i>D</i>		<i>00 00</i>
		<i>R</i>		<i>180 00</i>

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HORIZONTAL

STATION: ⁵¹⁰ Ecc Sta. SW. Cor. Pier. B STATE: Calif.

OBSERVER: C.L.R.

OBJECTS OBSERVED	TIME h. m.	TEL. D OR R	REP'S	ANGLE ° ' "	
Craig Tank			D	00 00	
			R	180 00	
Breakers Hotel.			D	98° 38'	
			R	278 38	
L.B. Light House. B.W.			D	224° 48'	
			R	44° 48'	
B.W. Cor. Pier. B			D	274° 48'	
			R	94 47	
Craig Tank			D	00 00	
			R	180° 00	

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ANGLES

ISLAND OR COUNTY: *Long Beach*

DATE: *July 27/34*

INSTRUMENT: *Berger 4" #229*

	A "	B "	MEAN OF VERNIERS	ANGLE MEAN D AND R			REMARKS
				o	'	"	
				00		00	
				98		38	
				224		46	<i>780 meters 225-6"</i>
				274		30	
				00		00	

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DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 250

HORIZONTAL

STATION: ^{Spd} E.C. Sta. S.E. Cor. Pier "B" STATE: ^{California} Long Beach

OBSERVER: C.L.R.

OBJECTS OBSERVED	TIME h. m.	TEL. D OR R	REP'S	ANGLE	
				O	I
Craig Tank			D	00	00
			R	180	00
Breakers Hotel			D	103	45
			R	283	45
S.E. Cor. Pier "B" (Spd)			D	131	24
			R	311	25
L.B. Light House B.W.			D	234	47
				54	48
Craig Tank			D	00	00
			R	180	00

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ANGLES

ISLAND OR COUNTY: *Long Beach*

DATE: *July 27/34*

INSTRUMENT: *Berger 4" # 229*

	A	B	MEAN OF VERNIERS	ANGLE MEAN D AND R			REMARKS
	"	"		°	'	"	
				22	40		
				180	00		
				103	45	15	
		30					
				131	24	30	<i>795 meters - 32-6 1/2"</i>
	30			234	17	15	

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HORIZONTAL

STATION: *Cover of dock*

STATE: *Calif*

OBSERVER: *Wm B*

OBJECTS OBSERVED	TIME h. m.	TEL. D OR R	REP'S	ANGLE	
				°	'
<i>So. Counties gas</i>			<i>D</i>	<i>90</i>	<i>00</i>
			<i>R</i>	<i>180</i>	<i>00</i>
<i>O Mast Han</i>			<i>D</i>	<i>93</i>	<i>26</i>
			<i>R</i>	<i>273</i>	<i>26</i>
<i>Steel tank, ice road</i>			<i>D</i>	<i>241</i>	<i>59</i>
			<i>R</i>	<i>61</i>	<i>59</i>
<i>Tank Pt G</i>			<i>D</i>	<i>269</i>	<i>29</i>
			<i>R</i>	<i>89</i>	<i>29</i>
<i>O Han, dist = 4.7m</i>				<i>297</i>	<i>27</i>
<i>So counties gas</i>			<i>D</i>	<i>00</i>	<i>00</i>
			<i>R</i>	<i>180</i>	<i>00</i>

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20 50
 13 71
 76 21

HORIZONTAL

STATION: *Hyd @ Gab, ecc setup*

STATE: *Calif*

OBSERVER: *K. M. C. D.*

OBJECTS OBSERVED	TIME	TEL. D OR R	REF'S	ANGLE	
	h. m.			°	'
<i>So counties Gas</i>			D	00	00
			R	180	00
<i>@ Gab *</i>			D	315	30
			R	135	40
<i>Steel tank red band</i>			D	233	35
			R	53	37
<i>Tank P. CT</i>			D	278	36
				98	37
<i>So counties gas</i>			D	00	08
			R	180	00

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HORIZONTAL

STATION: *East Bkw* STATE: *Calif*

OBSERVER: *Am B*

OBJECTS OBSERVED	TIME	TEL. D	REP'S	ANGLE	
	H. M.	OR R		°	'
<i>San Pedro Bkw Lite*</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>190-00</i>	<i>00</i>
<i>RM 1</i>		<i>D</i>		<i>181-13</i>	
		<i>R</i>		<i>01-13</i>	
<i>Buoy</i>		<i>D</i>		<i>191-20</i>	
		<i>R</i>		<i>11-25</i>	
<i>U.S. Station "147+24"</i> <i>San Pedro Bkw Lite</i>		<i>D</i>		<i>190-49</i>	
		<i>R</i>		<i>00-49</i> <i>01-13</i>	
<i>S. P. Bkw Light</i>		<i>D</i>		<i>00-00</i>	
		<i>R</i>		<i>190-01</i>	

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ANGLES

ISLAND OR COUNTY: Long Beach DATE: Sept 10, 1944
 INSTRUMENT: Berger 4" No 229

A	B	MEAN OF VERNIERS	ANGLE MEAN D AND R. ° ' "	REMARKS
				* very indistinct
6	00	00		
				dist - East Bkw to Pm 1 = 18.84 m 61.85 ft.
	48	30	180 48	dist = East Bkw to - East end of bkw - h/w line = 9.37 m
00	00			dist East Bkw to USE sta = 42.24 m 138.35 ft
	60	30		Sextant Fix on buoy at east end of Bkw = Seal 5200 = V1 = Ed 4747 Ed to Long 42.24 dist 15 m NE mag from buoy

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HORIZONTAL

STATION: *Hyd 9 4 m. sec. 10 4 m. sec. 10 4 m. sec. 10 4 m. sec.* STATE: *Calif*

OBSERVER: *K. M. B.*

OBJECTS OBSERVED	TIME	TEL. D OR R	REF'S	ANGLE	
	h. m.			o	'
<i>Tank, P & G</i>		<i>D</i>		<i>80</i>	<i>00</i>
		<i>R</i>		<i>180</i>	<i>00</i>
<i>O Ham</i>		<i>D</i>		<i>219</i>	<i>52</i>
		<i>R</i>		<i>39</i>	<i>52</i>
<i>L.B. Mun. tank #1</i>		<i>D</i>		<i>167</i>	<i>46</i>
		<i>R</i>		<i>347</i>	<i>45</i>
<i>Steel tank, Red sand</i>		<i>D</i>		<i>236</i>	<i>62</i>
		<i>R</i>		<i>56</i>	<i>00</i>
<i>Tank P & G</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>180</i>	<i>00</i>

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HORIZONTAL

STATION: *Hyd @ Fla. ecc. set up* STATE: *Calif*

OBSERVER: *K. M. B.*

OBJECTS OBSERVED	TIME	TEL. D OR R	Rep's	ANGLE	
	b. m.			o	'
<i>Edison</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>180</i>	<i>00</i>
<i>@ Fla</i>		<i>D</i>		<i>92</i>	<i>06</i>
		<i>R</i>		<i>271</i>	<i>46</i>
<i>Southern Counties Gas</i>		<i>D</i>		<i>130</i>	<i>17</i>
		<i>R</i>		<i>310</i>	<i>16</i>
<i>Steel tank red band</i>		<i>D</i>		<i>206</i>	<i>14</i>
		<i>R</i>		<i>76</i>	<i>14</i>
<i>Edison</i>		<i>D</i>		<i>00</i>	<i>00</i>
		<i>R</i>		<i>180</i>	<i>00</i>

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