5429

5429

Diag.Cht. No. 5101-3. Form 504 U. S. COAST AND GEODETIC SURVEY DEPARTMENT OF COMMERCE **REPORT** DESCRIPTIVE Type of Survey Hydrographic Field No. 52 Office No. H-51,29 See also T-1,33? LOCALITY State California General locality San Pedro Bay Locality Long Beach Inner Harbor 19/4 34 CHIEF OF PARTY Robert W. Knox LIBRARY & ARCHIVES April 20, 1934

B-1870-1 /1

Form	587

U. E. COAST & GEODETIC SURVEY LIBRARY AND ARCHIVES

APR 20 1934

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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	alifornia.
General locality Scan	h Pedric a Baj ornia.
Locality Long Be	ach Inner Harbor.
Scale 1:5,000 I	Date of survey March 21 to 23 , 1934
Vessel Long Beac	h Harbor Department skiff
Chief of Party Ro	bert W. Knox
Surveyed byJo	hn C. Mathisson
Protracted byA.	J. Vollmar
Soundings penciled by	AJ J. Vollmar.
Soundings in Tathons	feet
Plane of reference	. L. L. W.
Subdivision of wire dr	agged areas by
Inked by EWSmit	· la
Verified by EWS	
Instructions dated Th	e Directors letter dated Mar.13, 19 34
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 (7.4833) and Hydrographic Sheet Field No. 52. (H-5429). (H-5429) sheet field No. 52. (H-5429). (H-5429) sheet field was cut in two, permitting the character from the field was cut in two, permitting the character filing of both sheets)

TOPOGRAPHY

The topography was executed entirely on threepoint fixes on the plotted triangulation stations. Only five
set-ups were required to cover the entire area. The topographic
features tocated in addition to the required signals, are those
which were sequested 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 clearence winder 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 ats8 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,

Jr. H. & G. E.

April 7, 1934

Forwarded, approved.

Adbert W. Knox.

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

applied to new chart 5147) before intend or reviewed HTM. Sept. 1934

STATISTICS

Hydrographic Sheet Field # 52.

Day	Date	Stat. m		No. Pos.	Vol.
a	March 2	21 8.0	634	173	1
ъ	" 2	22 7.6	533	161	. 1
_c	n g	23 1.4	110	49	11
	Tot	tal 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 completly 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.

July 17, 1934

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in

1 volumes of sounding records for

HYDROGPAPHIC 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:

Acting Chief, Division of Tides and Currents

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.

L. 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; l-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 Lighhouse 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 perion, 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.S. 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 wiss moved very slightly eastward. These changes should be transferred to T-5033a. Where discrepancies as to location of piles occured, 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--22 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 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-4855 nor the smooth sheet of H. 5429 but does appear on the boat sheet. Investigation indicates that the boat sheet shoreline was évidently taken from air photo compilation sheet No. 5035. Therefore the shoreline on T. 5035a (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, Fil, 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.
- 5. Signal Pil is plotted near a dolphin as transferred from T. 5035a.
- 4. Dolphins from the hydrography (located by sextant fixes) do not check locations as transferred from T. 5035a. 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.

The descriptive report states all topography was located on three point fixes, but no records for such fixes were transmitted to this offices.

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 party constitution.

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

BO BAK

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-photocompilation 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.

(Signes) R.S. PATTON

Director

Enc.

POST-OFFICE ADDRESS:

Box 463, Long Beach, California.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

20 80

U. S. COAST & GEODETIC SURVEY LIBRARY AND ARCHIVES

SEP 26 .334

Acc. Ne. -----

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 feference, regarding the description of recoverable stations is noted.

This work should be closed

as 4th order branquelelis

Silvery as hydrographic

NOT TO BE PEGISTERED MAS TRIANGULATION MI

Robert W. Knox, Chief of Party.

extract of report of Hieut. (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:

on the beach onthe west side os Baxter's slip. Banner

−PUN ~ on the beach at the head of channel two. Banner

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 one of the ends or center of the cable Xing sign. Do not remember SIG×

LAD W 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 x-sithe pier about 10 or 12 m west of the corner

 $PIL_{
u}$ a pile or dolphin to the east of the Gypsum pier

FLAL Flag pade on the Standard Oil Ploat

end dolphin on the apron around the bridge protection

signals:

In addition I question the high water line of the following

should be near the corner of Baxter's pier

should not be exactly on the corner of the pier

is the sardine conveyor on the pier

this signal is the loading mast intfrom the corner and face of the pier. North and slightly east of where it is shown

Question (2)

Fin \vee should be on the cluster pile polphin on the east side of the Richfield pier

Question (3)

should be on the pile or polphin near the east end of the

* Discrepancies in their signals are due to the enlargement of the topography from the air-plots 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. * fun mand in ffw -)this.

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.

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	
Number of soundings recorded	1277
Number of soundings revised	X
Number of signals erroneously	
plotted or transferred	×

Cartographer: 6that W Smith

Verification of protracting
Verification & inking of rooks & should by Ew. Smith Verification of inking by See Report for time distribution H. W. Murray Levies by

71 Hours .

21mm 94

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

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°46'+497m., long. 118°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.I. Adams

K. T. Adams,

Chief, Section of Field Records.

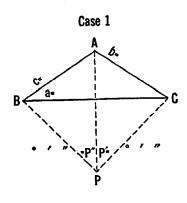
Chief. Division of Charts.

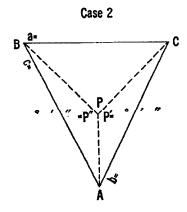
Chief, Division of H. & T.

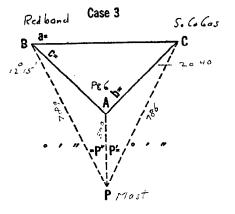
Chief, Section of Field Work.

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

COMPUTATION OF THREE-POINT PROBLEM







Cases 1 and 2 P' **P**" A

Log c =

Log sin P' =

Sum ½ Sum Case 3

P' 31 00 90 P" 29 27 45 118 00 Sum 150 20 20

A - sum

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

A

32

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

2.805 75! 9.999 982 7,074 901

 $\begin{array}{c} \operatorname{Colog} b = \\ \operatorname{Colog} \sin P'' = \end{array}$ 0.335 655

0.216289 Sum = log tan Z =

> 58 42 42 103 42 42 \mathbf{Z} $Z + 45^{\circ} =$

 $Log \cot (Z+45^\circ) =$ 9. 387 371 20 9. 462 148 'Log tan S=

8,849519 (sign n) Sum=log tan €=

02

 $(Tan \epsilon +)$ $S + \epsilon = angle ABP$ $S - \epsilon = \text{angle ACP}$

 $S-\epsilon=$ angle ABP 07 06 $S + \epsilon = angle ACP$ 20 12 30

> PCB 32 58 06 CBP 01 BPC

 $(Tan \epsilon -)$

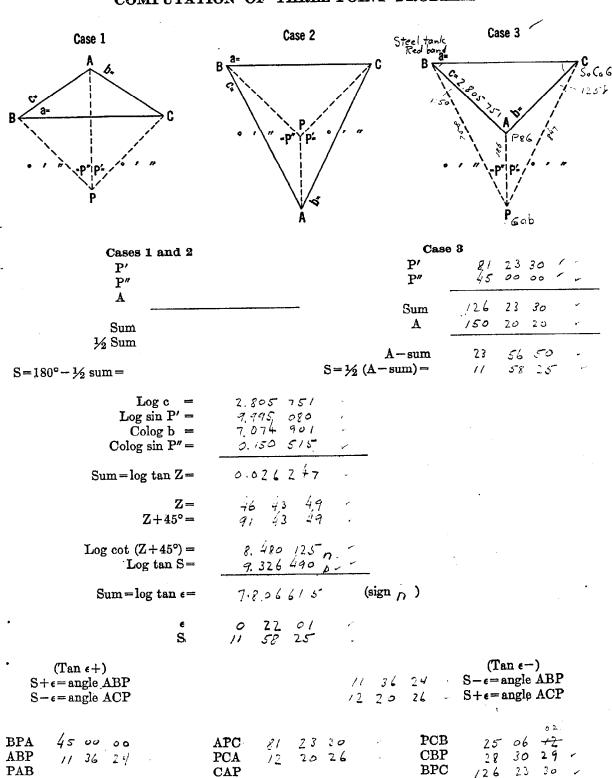
BPA ABP PAB

12

APC **PCA** CAP

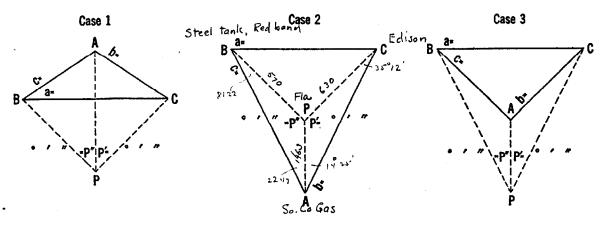
59 179

COMPUTATION OF THREE-POINT PROBLEM



59

COMPUTATION OF THREE-POINT PROBLEM



Case 3 Cases 1 and 2 P' 130 16 P" 75 57 30 37 20 58 Sum243 SumΛ ½ Sum A-sum

 $S=180^{\circ}-\frac{1}{2}$ sum = $\frac{1}{58}$ /2 3 / $S=\frac{1}{2}$ (A-sum) =

Log c = 3.756 /// - Log sin P' = 9.882 496 - Colog b = 6.775 305 - Colog sin P'' = 0.0/3 775 -

Sum = log tan Z = 9.767087

Z= 30 /9 25 × Z+45°= 75 /9 25 ×

Log cot $(Z+45^\circ)$ = 9.4/8 /43 p = 10.207 736

Sum = $\log \tan \epsilon = 9.625879$ (sign β .)

e 22 54 24 ~ S 58 12 31 ~

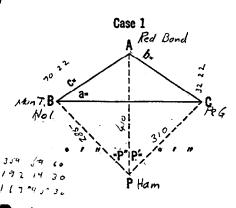
(Tan ϵ +) S+ ϵ =angle ABP 8/06 55 S- ϵ =angle ACP 35/18/07 (Tan ϵ -) S- ϵ -angle ABP S+ ϵ -angle ACP

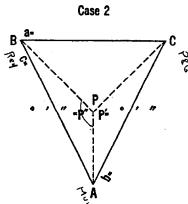
V CK

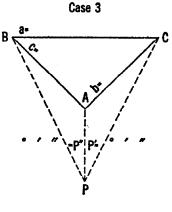
BPA 75 57 30 - APC /30 /6 30 - PCB ABP 8/ 06 55 - PCA 35 /8 07 - CBP PAB 22 55 35 - CAP /4 25 23 - BPC

(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







' .					A S			r
,	Cases 1	l and 2	2		-		C	ase 3
, 16 3 0	P′	/23	58	00			P'	The state of the s
3 1800	P"	128_					P"	
*	A	64	32	<u>03</u>		eran anyar erana yannya ya a a a sa	particular of a section of the section of the	
and the second section and the second section of		2,01	1. 1				Sum	· · · · · · · · · · · · · · · · · · ·
	Sum						A ,	
	1/2 Sum		23	16		or the state of the state of the state of		The state of the s
S=180°-	½ sum=	<i>~</i>	2/	66		S-1/ //	$\begin{array}{l} A - sum \\ - sum \end{pmatrix} = \end{array}$	
	/2 sum	, 5,/					L—Bum)—	The second secon
	Lo	gc =		2.604	956	·		· · · · · · · · · · · · · · · · · · ·
		in P' =		9 919		·	gy egyen i a	The second secon
The statement with the common of		og b 😑		7. 194	249			The second secon
	Colog s	in P"=		0,031	998			mententen i un aparamententa un manima de la companio de la companio de la companio de la posição de posição d
The world is produce about the residence	C	7						
The second secon	Sum = log	tan Z=	٠.,	9.14	947	_ <u></u>		to the second se
* ** *** *** *** *** *** *** *** *** *	er er han der stelleradet begrindeligt in der sind den sind	Z =		70	20 52	140 A. V. W. L.	*. *	was the control of th
	Z	+45°=		74	50 25			
	the sole of a second sole of							Section of the Market Control of the
	Log cot (Z+			9.447	449			9.447449
and the trap for taken others are than a contract.	Log	tan S=		10,101				10./21/42
s to the control of the second								
	Sum = log	$\tan \epsilon =$	· · · · · · · · · · · · · · · · · · ·	9.54	8 591	. (si	gn 🎤)	9.548.591
					20 27			
	THE THE STREET	Š		7.7 51	28 37 36 44		-	190 26 27
	man and an analysis of the same				<u> </u>			51 36 +44
· (Tar	1 (+)	•						(Tan e-)
	igle ABP	740	5 ⁻ Z	12		71 05	2/	S-e=angle ABP
S-c=ar	igle ACP	31 0	· -	7			٥7	S+e=angle ACP

BPA 68 16 30 3 14 30 APC 123 58 00 123 58 00 PCB ABP 70 05 21 7 22 1 PCA 32 08 07 32 08 07 CBP PAB (40 38 09 40 38 64 CAP 23 53 53 53 53 52 BPC

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

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 25 Ed. Jan., 1929

	W. B. SPINE	1—9121	State:		<u> </u>				E
	NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM	=
		2-3 1 Han, acc 2 Red Band 3 So Co Gas 1-3 1-2	118 00 45-, 29 01 11 32 58 06	-01			16	3.156 111 0.054 116 9.685 837 9.735 736 2.896064 2.945963	
		2-3 1 Hanocc 2 Red band 3 P&G 1-3 1-2	12 07 06					2,805 751 - 0,335 655 - 9,322 077 - 9,804 558 - 2,463 483 - 2,945 964 -	
		2-3 1 Hanacc 2 P86 3 So Co Gas 1-3 1-2	169 16 30	ŗ				2. 725 099 - 0.000 018 - 9.970 946 - 9.538 366 - 2.896063 - 2.463483 - comp Rulc.	
·		2-3 1 2 3 1-3 1-2							

DEPARTMENT OF COMMERCE u. s. coast and geodetic survey Form 25 Ed. Jan., 1929

0	1	1—9121	State:					
	NO.	STATION	OBSERVED ANGLE	CORR'N	Spher'l Angle	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
		2-3						3. 156 111 4
and programme in		1 6 a6 ecc	126 23 30		-01		29	0.094 213 ~
		2 Red band	1	<u> </u>				9.678 775
-		3 So Co Gas	25 06 02	<u> </u>			. T The Mark of Colonial Colonial of England Co.	9.627 579 ~
*** *** * **** *****	<u>.</u>	1-3					849.4	2.929099~
· •	· · ·	1-2			************		754.9	2.877903
	•							
	٠,							•
	ļ	2-3						2.805 751
			45 00 00	<u> </u>			<u> </u>	0.150 515 -
		2 Red band	11 36 24			,	,	9,303 610 V
21 T V V V V V V V V V V V V V V V V V V		3 P3 C	(123 23 36)					9,921 641
		1-3					181.9	2.259876
rgin		1-2		<u>.</u>	le vete la seri			2.877907
this ma		****						
. s		2-3						7,925 099 -
t write		1 Gab acc	81 23 30	_				0.004 920
Do no		2 P86	(86 16 04)					9,999 078 -
-		3 So Co Gas	12 20 26	-				9.329 849 ~
		1-3	179 19 60					2.929097
	3	1-2						2.259868 -
	- •							
•								VCER
		2-3					on a constant of the second of	THE RESIDENCE OF THE PARTY OF T
ale de layer gage		1						
		2						and the company property and the second of t
		3						
		1-3						
		1-2						
			and an order of the contract o					CANTON MATERIAL MATERIAL SECTION AND AND ADMINISTRATION OF THE PROPERTY OF THE PROPERTY AND ADMINISTRATION OF THE PROPERTY ADMINISTRATION OF THE PROPERTY AND ADMINISTRATION OF THE PROPERTY AND ADMINISTRATION OF THE PROPERTY ADM

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 25 Ed. Jan., 1929

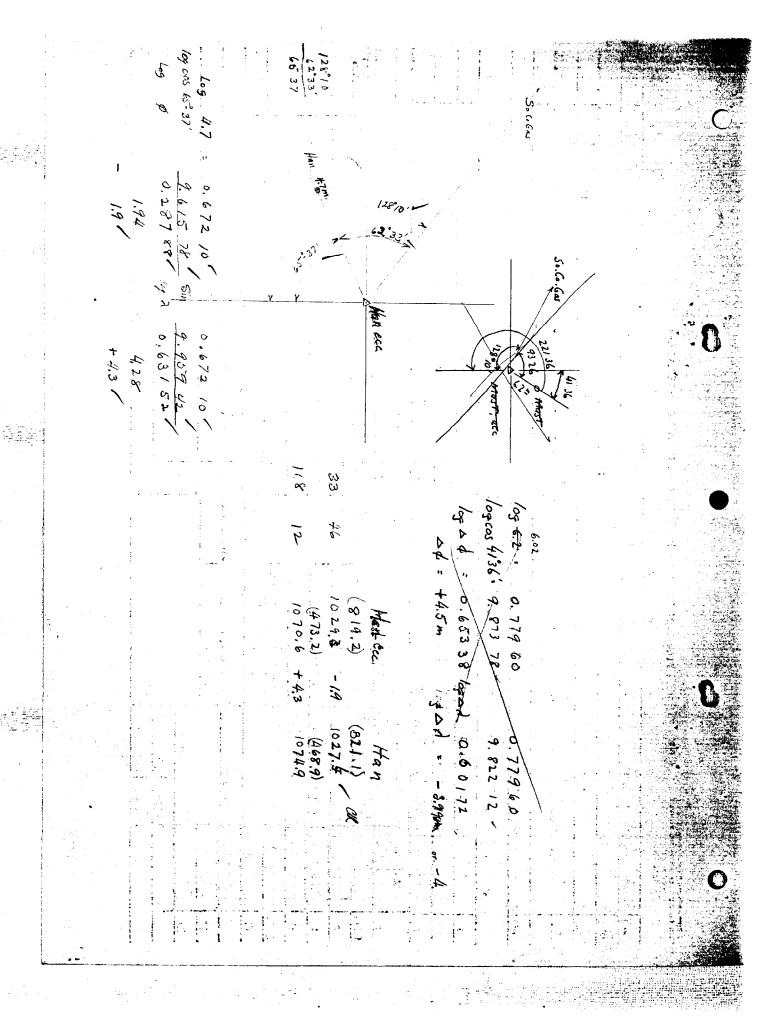
0	1	1—9121	State:					
	NO.	STATION	OBSERVED ANGLE	CORR'N	Spher'l Angle	Spher'l Excess	PLANE ANGLE AND DISTANCE	LOGARITHM
		2-3						
	.	and the second of the second o						2.604 956
3		1 Ham acc	68 16 30 1		-			0.031 998
		2 Mun Tank No1	7\$ 05 21		. ,		,,	9.975 902
ni Pana amanganan		3 Red band	(40 38 09)					9.813 747 -
		1-3	179 59 60		<u> </u>		410	2.612 856 -
•	<u> </u>	1-2	Commence of Americans of the Commence of the C				282	2.450 701/
	•	2-3						2.805 751 r
		1 Hamecc	123 58 00					0081 256=
		2 Red band						9.607 574
r 414		3 P86	332 08 07	<u> </u>				9.725 846 -
		1-3	78 18 60	<u> </u>			300	2.494581.
		1-2					410.1	2.6/2853
margin		THE PROPERTY OF THE PROPERTY O	corp leak				1	comp Ride
					1			LAN.
Do not write in this		2-3		!				
wri		1						• 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10
o no		2						
Д		3	•					The second of th
		1-3			<u> </u>			
1	. .	1-2						•
	1.			<u> </u>	! 			
	-	•			<u> </u>			
•		2 2						
		2-3			ļ 1	<u> </u> 	1	o company and the second of th
· · · · · · · · · · · · · · · · · · ·		1					Experience of the control of the con	
		2						
		3		f 1 2 4				
		1-3					•	
		1-2		•				a y a company and a company
and the second second		and the second s			ļ			

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 25 Ed. Jan. 1929

	Ed.	Jan., 1929	_			`	SOMI STATION	OF TRIANGLES
<u> </u>	11-	-0121	State:					
	NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
		2-3						3.284 695
V 10 10 10 10 10 10 10 10 10 10 10 10 10	-	1 Fla occ	/2	,				0.117 504
		2 Edison	/30 16 30 ×					9.761 842 -
-		3 So Co Gas	(14 25 23)				Control of the second s	9,396 338
		1-3	(77 25 20)					3.164 041
🚶		1-2		e complete				2.798537
8	•		A STATE COMMENSAGE AND A STATE OF THE STATE		M 5 K . 1 . 10			2.77
\top	-							
	ĺ	2-3						7 (5) (1)
		1 Fla acc						3.156 111
		2 So Co Gas	75 57 30	[]				9.590 561
-			(22 55 35).	1				
		3 Red bond	81 06 55					9,994 757 -
lacksquare		Contract and the Contract of t	ATT AND THE STATE OF THE STATE	 			A-1	2.759847
		1-2		,				3.164043
		· · · · · · · · · · · · · · · · · · ·						comp Ruk
		•						
	-	2-3					and the second of	and a same of them and the same of the same of
		1						· · · · · · · · · · · · · · · · · · ·
		1-3						
		1-2		METERS CONTRACTOR AND CO.	a Mariantan			The second section of the second section of the second section of the second section s
	•	2-3						and the second s
-		1				<u>.</u>		
		2						
		3						
	İ	1-3			-			
7	Ì	1-2						
	1	····	of the first of the second of			↓	•	the state of the second second

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

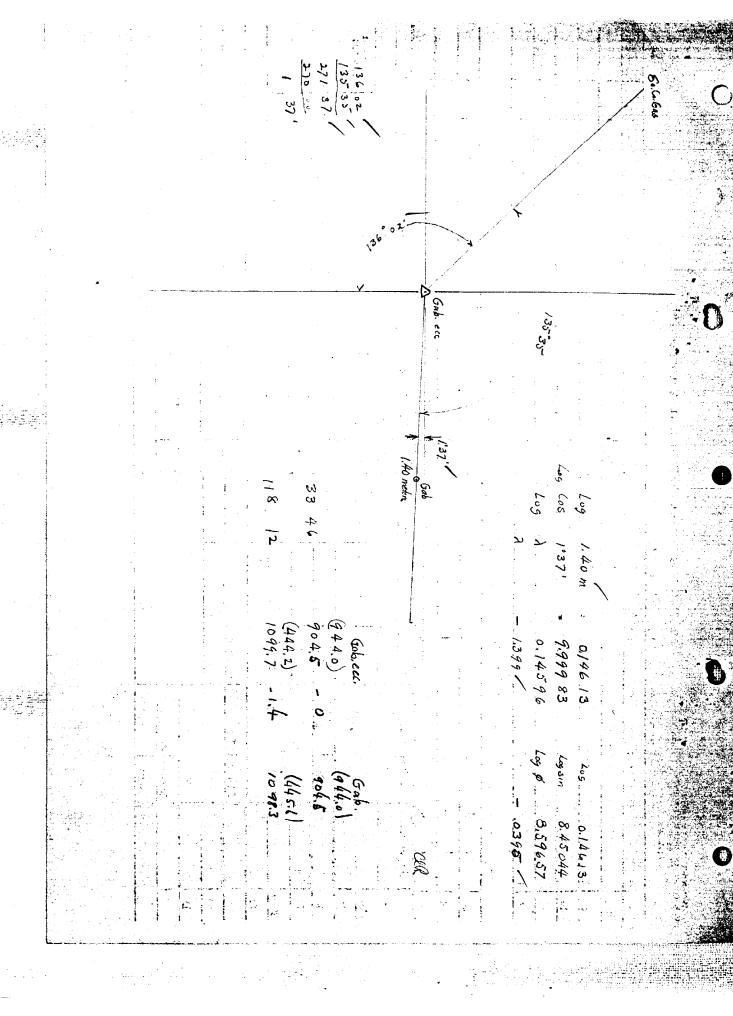
			ש	탕		a	Sin ³ a	6	Þ	В	Cosa	Ca		Φ,	Δφ	a		R.		À	a	247	a
					5.6150	1. 230	8.49	3.5	1.4:	8.51	9.99	2,94	Logs	33		æ	•	1			22		10
	<u>i</u>				1503	031		89193	.450414	8.511 312	9.993 /39	2,945 963	Logarithms	46		46							
	1	3d t		- 	2d	<u>,</u>		_حــــــــــــــــــــــــــــــــــــ	<u> </u>		<u></u>	4		33.41	+28.21	05.20							
	$-\Delta\phi$	3d term +	_		2d term +				1st term -		`	102	alues i	41.1	2/	<u>! · · </u>		ર્જ 29			to 1	82	ර් ස
		ľ			1				-28.21			1029.20	n second	Han		Steel:	т Амег						
2	-	 			Sir	<u> </u>		T	1			<u> </u>	<u>-</u>	M, ecc		2 Steel tank. Real Bd	A OF T						
		. 1	_	$-\Delta \alpha$	$\sin \frac{1}{2}(\phi + \phi')$	₽	Sec ø'	A'	Sin a	Se		\$ (++¢')				100	First Angle of Triangle						
1070.6		1077	1029.3	0. 04		0.7	0.080	مرح	9.2	2.9	 Jog	\vdash		۲,	\$	<u>></u>			1			+	
		<u>~</u>	s) W	0.526907	9.744988	0.781919	80 285	1.509 272	9,246 399 ,	2.945 963	Logarithms	C3	۰	8//	7	1/8	118	10	180		190	29	161
,		j		7-	120	10	OJ.	1	1	<u>l.</u>		16 193	, ,,	/2		/2	,00	Ġ	00	+	99	0/	80
				3.36		6.05-		7	1070, & ∕	6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Values in seconds	£1)		41.61	- 6,05	47.66	75	3/	00.0	w	28	10	18
			ם	h .		a	Sin ³ a	80	þ	В	Сова	Cq.		θ,	Δφ	•		R,		Δα	R	842	Q
						1. 230			1.19	8.51		2.89	Logs	33		33	۰	1			ထ		ဆ
					}	0 53			.198388-	8.511 312	9.790 962	2.896 064	Logarithms	46		7	•						
	$-\Delta\phi$	3d te			2d t				1st term		+	١,		33,4	+ 15.79	49.20	"	,					
	-	d term +	-		d term +								alues in	3,4111		٠.		±0 8		. *	to 1	g.	to 2
								٠,	+ 15.79-				Values in seconds	Han		8 So. Co.	,	-					
		<u> </u>	<u> </u>	<u> </u>	Sin		ro.						<u> </u>	1,000		Gas							
17				$-\Delta_{\alpha}$	Sin 1 (++4')	Δ),	Sec ø'	A'	Sinæ	Ce.		} (φ+φ')									·		
11—9362				1.12	9.74	1.38	0.08	8.50	9.89	2.89	Logs	\vdash			-	<u>۲</u>		128	180		308	1	341
7 A 10				1.1262151	9.745057	1.381158-	0.080 285	8,509272	9.895 537.	2.896 064	Logarithms	33 46	0 ,	2		118 /	•					.	—
v CKR			-		-		7	15	7,-	, ,		6 41	"	12 4	- 2	73 0	L	0	00 ÷	4	0		80
** ***********************************				- 13.4		24.05					Values in seconds	,		17.17	24.05	23.80	1.0.11	16	00.0	۲/ ۲	20	مي	80
e and a second of				1, 7	l .	, T						I	ı II	, 1	7	7				.,	\	√ 1	1



PARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
FORD ST

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

***	i vez	The second secon			ש	뒫		a	Sinac	93	Þ	₩	Cosa	Op.	. !	ė.	Δφ	•		R.		8	R S	7,18	a	i i
45.									ţ		1.383030	8.571/312	9.993 815	2.877 903	Logarithms	33 46	+	33 46	•	H			L 9		20	
American and the major of the second of the		d= 904.5-1	-Δφ	3d term +			2d term +		. *		1st term - 24.16		40.40	(9440)	Values in seconds	29.36 1 Gab	24.16	05.20 2 Rd	" First Angla	to 22			to 1	&	ф 8	
many many that the second of the second		•			<u> </u>	$-\Delta \alpha$	Sin } (φ+φ')	Δλ	Sec ø′	A'	Sin a	Ča .		± (++¢′)		dcc 3	_	Band	First Angle of Triangle							
The second second second	2 - 10			ţ		0,436630	9.744 982	0.691648	0.080280	8.509 272	9.224 193	2877903	Logarithms	7 33 46	0 ,	1/16 /	Δ >	λ 1/8 /2	13.6 2	-	180 00		189 3	+ 28 30	161 08	
Apple provide the second second	1098.3	1099.7		-		- 2.73		- 4.92		, , ,	(17.4th)	(,,,,,	Values in seconds	/73	:	2 42.74	- 4.92	2 47.66	23 20 7	<u> </u>	0 00.0	+ 2.7	38 47.4	0 29	8 18.4	
4				-	Ð	당		a	Sin ³ a	69	 	쁑	Сова	S		Φ,	Δφ	9-		a' 1		Δα	8	8d Z	2	
· · · · · · · · · · · · · · · · · · ·								2			1.297 600	8.511312	9.857/91	2,929,097	Logarithms	33 46	,	33 46	0							
			- Δφ	3d term +			2d term +			•	1st term /		4		Values in seconds	29.36 1	19.84	49.20 8	"	\$0 8			to 1	æ	to 2	
: ::::::::::::::::::::::::::::::::::::											9.84 .					Gab		So. Co.								
						Δα	Sin } (++4')	Δλ	Seo ø'	A'	Sina	Os.		}(+¢¢)		2CC >		Gas					.15	-		
· · · · · · · · · · · · · · · · · · ·		800.1				1.105215	9.745052	1.360 163	0.080 298	8.509 272	9.841 296	2,929 097	Logarith	33 46	0 /	x' 118 1	Δλ .	λ //8	•	1360	180 0			7	341 0	0
Applications and the second						5-12.74	7	3-2292	79	<u>P</u>	1	ــــــــــــــــــــــــــــــــــــــ		6 39.3	=	12 42.74	- 22.92	13 05.66		02 19.1	00.0				08 08.4	,



D'ARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
FORM 27
Ed. Anti. 1920

POSITION COMPUTATION, THIRD-ORDER TRIANCULATION

			ש	판		a	Sin¹α	92	5	В	Cosa	00		θ,	Δφ	Φ.		a'		Δα	Ω	242	ρ	
									1.674	8.51		3.16	Log	ટડ		33	0	1			12		2	Ed. J
									4 263	8.511 312	9,998 908	3.164 043	Logarithms	44		46	,							Ed. April, 1929
		 ယ			182	<u> </u>			<u>. </u>	2	اج	Ļ		01	- 47	40			`					•
	Δφ	3d term			2d term				1st term			(1787.9)	Value	01.97 1	47. 23	49.20	, E	ಕ ಜ			ъ 10 1	₽°	to 3	
	٠	+			+				+		•	7.68	s in sec	1		ξ. 53	гват А	80			۳		အ	
ļ									47.23:			75	onds	Fla		0	OFFIEN							
				,	Sin †(Si Si	_	Zi.					, 000		625	First Angle of Triangle							
				-Δα	Sin] (φ+φ')	\\$	Seo ø'	A'	Sin a	60		} (φ+φ')				<u> </u> 	NGTE							
				0.34	9.74	0.60	0.08	8,50	8.85	3/6	Loga	\vdash		× /	₽	>	260	184	180		0	+ 2	341	
				48813	745009	0.603804	0.080 241	8,509 272	8.850 248	3164 043	Logarithms	33 4	•	8//		118		<u> </u>			04 0	22 3	<u> </u>	
•				3 /+ 2,2	17	+	-	Ι.	ــــــــــــــــــــــــــــــــــــــ	جحك		46 2:	=	/3	*	/3	-00	03	00	<u> </u>	0 3	55	80	,
				2,2		4.02-			249.11	2.	Values in , seconds ,	25.6		04,68	4.02	05.66	= 40	141	00.0	- 2	43	35	80	:
			U	P	<u> </u>	α α	Sin ³ a	83	<u> </u>	В	Cos a	6		ر هر	₽	9		R		Δα	R	√ 3d∠	7 8	
		_) <u>"</u>	R	<u>-</u>	1	1		<u>. </u>		33	1	32		-		<u> </u>	ထ	_	3	
	-								0.509837	8.511 312	9. 238 678-	2.759 847	Logarithms	 -	 -	<u> </u>								
									37	3/2		847	Butte	46 1		46								
	Δφ	3d term			2d term				1st term		+		Valu	01.97	-03,23	05.20"	=							
		+			+				+				Values in seconds	ĭ				င် အ			to 1	જિ	to 2	
									3.23				econds	F19		el tai								
		<u> </u>		1.	Sin		D2	Τ	\ 				[230,6		3 Steel tank, Red Bel								
÷				$-\Delta \alpha$	$Sin \frac{1}{2} (\phi + \phi')$	ΔX	Sec ø'	A'	Sin a	s		1(++¢')												
11-0362				1.0	Ġ.	1.3	0.0	8.5	9.9	2.7	Tog	()		<u>۲</u>	۵	>		2	18			1		_
EA08 19 'D				1.087681	744 939	1.342742	0.080 241	8.509 272	9,993 382	2 759 847	Logarithms	S	0	1/8		118	•	260	180		0	8/	161	•
OLEY EVENTOR				-	39.	42+	414	72	92.4	12		46	7	/3	+	12	•	01	00	<u>, </u>	0 /	90	80	•
SECURE OFFICE				12.2		+22.02					Values in seconds	3,6		89.60	22.02	47.66	=	-	00.0	12	2 3	55	18	*
Ī				23		2-					a P			00	2	10			0		١,	ζ,	\	

1

249.1

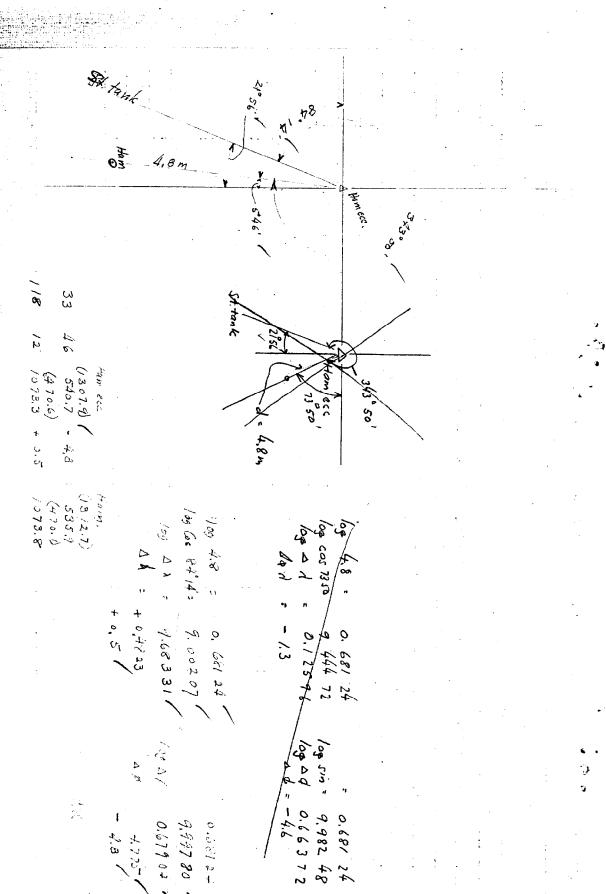
250

Fla, ecc

1073.3 + 5-

-			Ð	본		C	Sinsa	83	ь.	В	Cosa	.		ø,	Δφ	6-		R.		K	a	247	R	
									0.80	8,5	9,839	2.45	Loga	33		33	۰	1			120		ca	
									01142	11 312	39 129	2450 701	Logarithms	46,		46	~			,				
	D¢	3d term			2d term		1	<u> </u>	2 1st term		<u> 1 </u>	<u> </u>	Val	17.55	+ 6.33	11.22								
:	_	+			m +				 		ر د آ	100	Values in seconds	1	\	t	First	रू 2		٠	to 1	Rr-	ঠ 3	
· ·									6.33 -			(307.9)	econds	Ham,		Min Tonk Hol	First Angle of Triangle							
			<u> </u>	Δα	$Sin \frac{1}{2}(\phi + \phi')$	Δλ	Sec φ'	A'	Sin a	30				ac		1/01	TRIAN							
			•	_	+&') 9,	0		ļ	 	7.	—	\$ (p+p')		 ۲	D)	 ~	GTE					+		
				0.644579	744973	8996	0.080 263	8.509 2	9.859 3701	2.450 701	Logarithms	33		//8		//8	010	3 3	180		/33	7/	62	١
				79	73	4 909	63		701+			46	7 =	12		/2	56	39	00		39	05	3 4	
		×.		4.4		7.94-	,	0 733	4+(470,4)	-	Values in seconds	14.3		4,71-	+ 7.94	33.77	12	57	00.0	- 4	55	2/	34	:
			ם	<u>۲</u>	<u> </u>	0	Sin ² a	60.	Þ	В	Сова	60	<u> </u>	<u>.</u>	ΔΦ.	0	1	R,		Δα	8	7 8d Z	R	
						·-			1,09	8.511	T	2.6/	Log	33		33	•	1			8		8	
									1.09,523-	1 3/2	9.967 355	2.612 856	Logarithms	46		46								
	Δφ	3d term		!!	2d term		1		1st term		1,	1 *	_	17.55	12.35	05:20	=							
		+			+				1				Values in seconds	1		<u> </u>		ජ හ			to 1	R	to 22	
									/2.35-				econds	Ham, ecc		telte-								
		.	1	$-\Delta \alpha$	Sin 1 (φ+φ')	Δ),	Sec φ'	A'	Sina	c _o		LS\$-a		, פנכ	-	8 Steel the Red band								
11-0362						0	<u> </u>	99	ļ	2.		* (+++¢')		×	Δ,	λ						ı		
4.1.8				0.519766	9,744963	0,774803	0.080 263	8.509272	9.572 412.	2.612 956.	Logarithms	33	٥	118		118	•	21	180		201	40	242	۰
ORS DESCRIP				-191	63	03/	263	72	1127			46	, ,	/2		/2	-	56	00		25	38	34	,
u. e. 407eryzek? Zhenine artne: 1949				ين د ک		5.95 -					Values in seconds	11.3		417	5.95	47.66	=	20	00.0	+ 3	77	09	26	*
• [,	1	1.						1			Ĩ,	ا``ا	ļ	١,		(ارا	ξ.	ا ر ا	ı

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION



POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

4								ם	P.			a	Sin ³ a	83	-	0	,	Cosa	c.	ŀ	<u>.</u>	\$	Φ.		α,		Ç.	}	2	7 2	Q	F 98
		tona	5 60	SSIN								1.230	5.331		1.643	. / /	5.5	3.73	100	Logo	ی		33	•	1				19		22	AST AND FOR Ed. A)
	۵:	4	COS 9 :	4,							\ 	051	139		0 47 0	٠ / ٢ ٦ ١٠ ٢ ٢ ١	PS11 312	3.132 141		Logarithms	46		46	•								Form 27 Ed. April, 1929
	~ CÁ	9.53	یر	. 2, 6			30	<u> </u>			2. 	<u>`</u>			1			, ,	 _		49.20	+44.00	05	=								G SORVE
	24/ 0	w	13 2		- 1	I > ♣	3d term				2d term				TRI AGETT					Values in seconds	20.1	8	05.20. 2	1	ර 2		Ì		중 1	æ	to 3	1
	08 /3.4	5525	1	693		- 44	+			-	+				14:	- /14"00	•			n secoi	5		Steel	ST ANG								
	0.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1	`				44.00			Ŀ		1		.,		,	0							2 Steel Tank, Red-	T O BET								
			3							$-\Delta \alpha$	Sin (φ+φ')	Δ)	Sec ø'	A'		Z in Z	6) [505		100	First Angle of Triangle					i			
		3.156,11	1,30	2.66							14') 4.		-	04	_	~			} (φ+φ′)		۲,	Δ)	۲	- 1	_	1	-			<u> </u> +	<u> </u>	703111
				2.663 643						.000	745	1. 255 272	0.080	:309)	7 115 693		Logarithms	20	۰	118		811	•	341		180		161			0 2
		•								286.	014	1		8.309 272	3	693		arms	#	-	/3		12	· ·	00		00	,	0 8			-
		,	602 6	•						+ 10.01		+ 18,00		•	٦٠ ــــــــــــــــــــــــــــــــــــ	Σ`		Values in seconds	27.2	=	99.30	+18,00	47.66		100,4	+	00.0	10.0	18.4	<u> </u>		
		3.156		3,13,	2 127 141 -					0		9			-				,		1.99	0	- 99		+	\$	0	<u> </u>	+		_	-
		.156113		976030	141.		_	٦	,	P.		a	Sin ³ a	82		 -	В	Cos a	60	<u>.</u>	φ,	\$	0	_	α 1	4		Δα	Ω 00	3 d Z	Q Q	_
	:	•														7366 610	8.511	2.85		Logarithms	33		33	•								
				1050 1												610	312	2 855 298		thms	46	1	46		ŀ					i		
))	.	_0		_	1	3d term		1		2d term					1st term		,		٧a	49.20	743.26	25.94) =								
	81,	2	780	2,85°	2.644	- A# +		-			trm +	-				1			•	lues in	49.20 150	 	8	-	8				to 1	St.	to 2	
123	}	22	7893876	2,855 298	7.644 6851	+23.46										23.26				Values in seconds	000		100	,								
		420	2 '	``	'	6	<u> </u>			T	Sir		- 1	Τ					1		Sas	-	lank	4								
		1 5120		cos						$-\Delta \alpha$	$\sin \frac{1}{2}(\phi + \phi')$	۵	Sec o	` :	•	Sina	60		\$(++¢')			_	7									
	8415	2 2		۴	7	11 0342				0.9		3 12	0.000	3 0	8	7	12	Lo	- [8)		×		_		-	3	18		1.	1		-
	8 41,58 Meters	719	2644	9.430	2. 855					0.979309	7 745 043	7 5 6 6 6 7 7	2 7	2	09 2	2.153 459	2,644	Logarithms	33 4	-	1/8		//8	•	 -	32 n	180	-	8 4/		\downarrow	
		286.	685	1991	298					4 60	12	1		207	R 509 272 /p	159	5.8.		46 3		3	ı	1	; `	-	77	8		77			
	1	6605:60	` .	1992,925099.	,					9.5		1					į.	seconds	Volum i	- `	03.66		48.31	3 =			00.0	10	4	,	-	:
	,	99		99,	i													-	1		١,		<u>, </u>	<u>, </u>	1		1	ı	ļ	Ĭ	1	1

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

10	42 34 26 a	242 34 26 a 8	242 34 26 \ \alpha \ 84\ \ \ 8 \ \ \ \ \ \ \ \ \ \ \ \ \ \	242 34 26 \alpha 8 to	242 34 26 a 8 to 2 -	242 34 26 a 8 to
42 34 26 a + 8 \ \(\Data \)	42 34 26 - α + 8 - Δα	42 34 26 - α 8 + 8 / Δα	42 34 26 - α 8 + 8 / Δα	42 34 26 - α 8 + 8 / Δα	42 34 26 - α 8 to 1 + 8 / Δα	42 34 26 α 8 to 1 /78 + 8 / Δα
00.0	00 00.0 34 34 a	34 34 34 2 2 1	34 34 34 2 2 1	34 34 34 2 2 1	34 34 7 at 1 to 8	00 00.0 180 34 34 ' a' 1 to8 359
4 34 "" 2 47.66 2 -13.89 2 33.77	4 34 a 1 "" a 1 2 47.66 4 33 46 -13.89 Ab	4 34 ~ a 1 "" ° "" 2 47.66 ~ b 33 46 05.20 -13.89 ~ Ab 420.74	4 34 ° a' 1 to8 "" o ' " 2 47.66	4 34 · a 1 · to8	4 34 de 1 to8 3:	4 34 ° a 1 to8 358 . 2 47.66
20.0 Δα 1 α α 1 1 .66 φ α 1 77. φ 6	8 \ \Delta \alpha \ \delta \delta \ \de	8 Δα 2.0 4 α 1 6 α 1 .66 φ 33 46 05.20 .89 Δα +20.74	8 \ \(\Delta a \) 4 \ \ \(a \) 1 \ \ \(\text{to 8} \) 5 \(\text{to 8} \) 5 \(\text{to 8} \) 6 \(\text{to 8} \) 6 \(\text{to 8} \) 7 \(\tex	8 \ \(\Delta a \) 1 \\ \(\text{to 8} \) \\ \(\text{to 3} \) \(\delta \) \(\del	8 Δα 1 to 8 3: 46 os. 20 8 Steel Tank Ped. λ	8 \ \(\Delta a \) 1 \ \(\text{to 8} \) 358 \\ \(\text{to 8} \) 33 \ 46 \ \(\text{os. 20' 8 Steet Tank, Red.} \) \(\text{N} \) 1/P,
	33 46	33 46 05.20	33 46 05.20 8 Steel	1 to 8 o , , , , , , , , , , , , , , , , , ,	1 to 8 3:	1 to 8 358 3 46 05.20 8 Steel Tank Red. x 118,
		05.20	to 8 " os. 20. 8 Steel +20.74	to 8 " " " " " " " " " " " " " " " " " " "	18 to 8 3:	180 to 8 358 " " os. 20.8 Steel Tank Ped. x 118,

639.36 meters

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
SEP 26 .334
Acc. No.

Box 463, Long Beach, California. POST-OFFICE ADDRESS:

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

September 13, 1934.

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 inquestion 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 yest 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 Chief of Party.

	wateria an angli aniigi agas ayaan amaa aa a		**************************************		,	1
u						•
,		·				e e
,	•			23 /2	-24,1966	
	•			ير ن	-24,1966 EALP	
	up	plus to Chart 51	01- May 19	36 - R.M.Z		:
•						
4						
		•	The second secon		<u> </u>	_
1 e						. ·
0,						
						·.
- Table 1						
		·	,			
	and the second s					
						1,47
		<u></u>	· · · · · · · · · · · · · · · · · · ·			
			A SAME			
					•	1
		programme of the control of the cont	The second secon	and the second of the second o		1
		The second secon		The second secon	The second secon	
	and a second control of the second control o	and the second s			¥	
)						:
J		and the second of the second o	processor and the second of th		Andrew Annual Comment September Section (1997)	
	pre	and the second s	e e	I is the second of the second	The second secon	
		-				
	and a second the control of the cont	AMERICAN STATE OF THE STATE OF				
\			a programment in the control of the	Annual Communication of the Co		
						i

şab.

Form 250 Ed. July, 1928
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
RS Patton, Director.
State: Calif
OBSERVATIONS
HORIZONTAL ANGLES
LOCALITY
Long Beach Inner Harbor
INSTRUMENT
41 Berger 229

19.14
CHARGO OF PARTY
Vols. Vol

٠,

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

STATION: Myd Na OBSERVER: Mym.			TATE:	Co 41		
OBJECTS OBSERVED	Time b. m.	TEL. D	Rep's	Angle		
Brkes-tower		D R		00 00	0	
Hy d No		D. R		190 55 10 55		
Edison Stk		UK		227 40 48 24 47 41	his magin	
Craig tank		D R		270 04	15	
Brkers tower		DR		140 00	å	1
					O	
				7		
						1

DEPARTMENT OF COMMERCE U S, COAST AND GEODETIC SURVEY FORM 250

Station:	13011		5	STATE	Calif	ノ	
Observer:	true	3		**			
OBJECTS OBSERVE	D	TIME h. m.	TEL. D	Rep's	Angle		
Edison S-14	,		D		00 00	(•
nak mai umani u Washini End Elan Washi a'			R		180 00		
Brkyshot	f		j		644 42	·	
			P		346 42		
1B 1; te			0		2823;	18	
			R		102 37	this this	
Edeson 3	MA	-	2		00 00		
			<u> </u>		180 00	- 30 - 20 - 20	
		oranier man amen y					
			***			-	
							.

ANGLES

Island or County:

DATE: Culy 25 34

	Ins	TRUM	ENT: /	Berser 7"	No 287
	. A	B //	Mean Of Verniers	Angle Mean D and R o / //	REMARKS
70	ce			00 00 ·	
				166 42	
ri ujb				282 37	
os write in this margin				00 00	
Do not sorift					
ing salah sasar Tiga					
Ċ.			and the second s		
A CONTRACTOR					
1					Ball

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

HOIM		1 1 1 1 2	4				ı
STATION: hyd Tel	ece		STATE:	Cel	sign of		
Observer: /cmc	13				/_		
OBJECTS OBSERVED	TIME h. m.	TEL. D or R	Rep's	Angli	,	•	- ار _ا م
Boker's Craig Tink		N R			00	<u> </u>	~ ;
1.13 Lite		D			64		
		1		346	15		
Ed. Stk.		1		254 74	•	nigara sic	
hyel Tel		D		33 /	_}} _{&}	arite in th	
Craig Tank		2		00	30	Do not	
Craig iam		R		183	ð ų		
						-	\mathbf{C}
					·.	-	
						-	

5					3
	Isla Cou	NTY:	7.	ANGLES	DATE: (1), 25 /3L
	LNST	RUM	ENT:	verger 1"	16 2
	A //	В //	Mean of Verniers	Angle Mean D and R	REMARKS
7				80 60	
	30			166 44 45	
				./	
margin				254 56 00	dist: 5,73 m
not write in this				331 30 15	18.8 f+
Do not wr	- 30				
	•			00 00	
					,
•					
			-		
					······································
1				<u>-</u>	Te!

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

HORIZONTAL

STATION: Ecc Sta. SW. Cor. Per. B STATE: Colif

OBSERVER: C.L.R.

OBJECTS OBSERVED	Time h. m.	TEL. D or R	Rzp's	Angle	
Craig Tank			†	00 00 180 00	
Breakers Hotel.			DR	98° 38′ 278 38	
L.B. Light House. B.W.			DR	224°48 44°48	this margin
B.w. Cor. Pier. B			DR	274° 48′	Do not serite in
Craig Tank			D R	180°00	
		_			
			·		-

ANGLES

ISLAND OR COUNTY: Long Beach

DATE: July 27/34

Instrument:

	A.)B	Mean of Verniers	Angle Mean D and R	REMARKS
•				00.,	
				98" 38	
argin.		***		224 46	1780 Melers
Do not write in this margin				274 - 47 '30	
Do not ser	•				
		48 (* 154) 1 (* 154)			
		meteral Proces			
	Process and Ministers		s control de la control de		
		<u> </u>		Section that the control of the cont	

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

HORIZONTAL

STATION: E.C. Sta. S.E. Cor Pier B' STATE: Lang Beach

UBSERVER: C.A.				11-721	
OBJECTS OBSERVED	TIME h. m.	TEL. D OR R	Rer's	ANGLE O /	
N. Tork			D	00 00	C
Craig Tank			R	180 00	,
Breakers Hotel.		<u> </u>	D	103. 45 283 45	
S.E. Cor, Pier. 'B' Spci	ļ		D	131 24	argin
			R	311 ZS	this margin
1.B.Light House B.W.			0	234 47	errite in
21917-1911-110-00				54 48.	<u> </u>
	 		 D	00 00	8
Craig Tank	 	+	R	180 00	
	-	-	-		
	+	+	┪		
·		_			
			1		<u> </u>

ANGLES

Island or County: Long Beach DATE: July 27/54

•	Insti	RUM	ENT: 6	erger 4" #	229
	A //	B	Mean of Verniers	Angle Mean D and R	REMARKS
(
				140 00	
				103 45 15	
	ļ	30			
ë		_		131 24 30	7.95 meters - 32-6/2"
margin					
74		_			
mrife in	30	-		234 47 15	
<u>ë</u> _	1	-			
	+	\vdash	 		
		1_			
<u> </u>	-	+-			
	+-	+-			
	+-	+	- 		
-	1				
1					

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

STATION: OBSERVER: OBJECTS OBSERVED TIME THE DO REF'S ANGLE O / C	HORI	ZOI	NTA.	L							
OBJECTS OBSERVED TIME TEL. D OR R REP'S O / C	STATION:	State:									
OBJECTS OBSERVED h. m. OB R REF'S UBBERTS O UBBERTS	Observer:					-					
Do roc corfice the this recognition	OBJECTS OBSERVED	•	TEL. D OR R	Rep's	i						
fills the most scatter in this	<i>Hi</i>		e con proper de la constante d			O.					
fills the most scatter in this											
fills the most scatter in this					and the same of th	er e i e gran er er erier ha assaulasa					
fills the most scatter in this					***************************************	n i - chia afrika basa sanaba sa					
fills the most scatter in this					ware to the stage of the stage						
fills the most scatter in this						woin					
Do rock writer in						an Arman and a second					
						.s					
					-						
					and the second of the second o						
						a sa salah salah mada dalam salah dalam					
	Company of the second of the s										
	Prince of the second section sec			11	(1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	-					
	distincts an elegan calculation between the selections are covered throat state of the calculation of the calculation and the calculations are calculated as the calculation of the calc) 1 - 10 - 10 - 10 - 10 - 10 - 10 -	The state of the s						
					a construction of the cons						

				ANGLES	3
	Isla Cou	ND (OR		DATE:
	Inst	RUM	ENT:		
	A //	B //	Mean OF Verniers	ANGLE MEAN D AND R	REMARKS
. (dist purhear to 5 Hi
					9.750m 32.05 in-
			en a. e		
this margin					
orite in thi					
	•				
a					

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

STATION: Corner of a	ock	S	TATE:	Calif	
OBSERVER: M. C			,		
OBJECTS OBSERVED	TIME h. m.	TEL, D or R	Rep's	Angle	, -
So Counties gas			1	30 00	e (
	THE WAY TAKEN		R	180 00	
O Host Han		ay	i	93 26 173 16	
Steel tank in sand			0	341 59	n le l
and the second s		**************************************	R	61 59	this man
Trnk Prof	***********		2	69 29 89 29 89 29	write in
O Han, dist=4.7m		er gerke i viver kilden der		297 27	9
S com 1155 985			R	185 00	

	Islai	NTD (1 0	ANGLES	3
-	Cour	TTY:	Lor	- Beach	DATE: Sept 172/1
· .	Inst	RUM	ENT:	Garger h.	" No 029 " "
	T _A	В	MEAN	Avara	
	"	",	OF VERNIERS	ANGLE MEAN D AND R	REMARKS
- 1 C					
			_		Circol Mart 1.205m
				93-26	Pist instant 8.035
					10 75/4
Ş				241 59 15	center of mast . 0.2
marg	30			The second of th	
shis s			Broke of commissions	e de la proposición servición de describility de la constantion de	6,0
	1		Control of the Control of the Control	269 29 00	
			and the second second	Control Contro	en e
9	1		· · · · · · · · · · · · · · · · · · ·		A contract of the contract
		*******		يريدن بهمان دينو دين مواهم بداد المستد	A PROPERTY OF THE PROPERTY OF
and the second second	-			a verte communication of the section	The second secon
	1				13 Andrew Commence B. (Made Mathematica Mathematica (Mathematica) 1 km 1 km
0	 				
<u>, 3</u>					
¥.					
<u> </u>					
	-				
· , · · ·	-		1111		
		1			-

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY Form 250 HORIZONTAL STATION: Observer: OBJECTS OBSERVED h. m. 5**3** Tank D R

					8
	Isla Cou	ND (OR.	ANGLES	DATE: Scp 10,1934
) 	Inst	RUM	ENT;	1 Jerger 4	11 No 229
	A //	B //	Mean of Verniers	Angle Mean D and R O / //	REMARKS
				·	dist - inst to Grab =
· <u> </u>					= 1.40 m. = 3.40 FA.
				135 35	* Visibility of fix objects
				-	too close to Glas for
margin			-	233 36 30	Cor of dock = 1193 m
this					docker 262 32
write in				278 36 30	
Do not	•				length of Jock 14, 21 m
			:		
			•		
<u> </u>					
t _e					

.

.

: 4 :<u>₹</u>

	DEPARTMENT OF COMMERCE U.S. COAST AND GEODETIC SURVEY FORM 250	1 1 2 -					
	HORI						
f ; ;	STATION: ZEST	13 k	W 8	STATE	: Calif	1 2	
	OBSERVER:	3_	·	· · · · · · · ·	<u> </u>	- 7	
	OBJECTS OBSERVED	Тіме b. п.	TEL. D	Rep's	Angle		
	D 4 *		1			0)
	San Padrobkwlite		R.	_	180-00-		
			1	-	780-00-0	9	
	RM,		5 1		181-13		
			R	<u></u>	01-13		
			1				
	Buoy		٥,		191-20	at a	
	/		R		11-25	am 🦠	
	LISE Station 147+24".					th this	
	Son Pedro Bkar lite		0 *		180-49	1	
		ļ	R	ļ <u>-</u>	07 73	j	
				ļ		Ā	
	S. P. Bkw Light	 	0		00-08		
		<u> </u>	<u> </u>	<u> </u>	180-01		
		-	ļ				
			 			3	
1919 : #49-121 1. 1. 1914 1914 1915 1914 1915 1914 1915 1914 1915 1914 1915				-		. 1	
		1	<u> </u>		10 m		
			١.,				
			7. 1				
		1	تعليدا	L		[si	

•					
•	Isla	ND	OR.	ANGLES	
1	Cou Inst	NTY:		Bercer 4	DATE: Sep 10,1934
	TNO	LECE	ENI	soryer 4	1/0 2 1 /
100	. A.	B	Mean of Verniers	Angle Mean D and R	REMARKS
}				·	* very indistinct
	6	00	00		
The continuous services of the					dist - East Bku
And the second s	-				to PM 1 = 18.84 m
mo.				tions and the same of the same	C1.85.64.
W W	-			ma promiser i mang sebuah ini ini sahar sebagai ari sebagai sebagai sebagai sebagai sebagai sebagai sebagai se	dist: East Blow to-Eastendof
mortite to	1-	48'30	,	180 48	blica - hwline = \$1.37m
· 4		2			dish East Bhu
	00	60	30		to USEsta = 42,24 m.
) <u> </u>		60	730		138.35 Ft
				<u> </u>	Fix on Away at east end
					= Seal 5200
					Ed to long
					dist 15 m. NE mag from bury

DEPARTMENT OF COMMERCE U s. COAST AND GEODETIC SURVEY FORM 250

HOIL			4		£
STATION: Lyd 6 4m c	 <u>حې م</u> ي	ع ن <i>رزا</i> يد	TATE:	Colif	
OBSERVER:				,	
OBJECTS OBSERVED	Time h. m.	TEL. D	Rep's	Angle o /	.0
Tank, 1 + G		D_ R		80 00	- 2
				219 52	
O Hom		2		39 52	77
L.B. Mun, fank 4,		D 12		167 46 347 45	margin
					is in this
Steel tonk, Red Sand	1	1) R		236 62 56 60	Do not wri
76316 / 4 /7		0		00 00	
		K		180 00	0
	,				
					(1854) (1854)

	•		***		10
	Isla	ND 4	OTR.	ANGLES	
	Cov	NTY:		nglieach	DATE: Seps 11, 1934
	Inst	RUM	ENT;	Berger +	" No 229
rC.C.	A //	B //	Mean Of Verniers	Angle Mean D and R O / //	REMARKS
				0 00 00	
				7.4 67	
				219 52	dist - inst
margin				167 4530	4.82 m.
orits in this				236 02	
Do not w			1	,	
· Cj	. g . S			•	
·					MPN and the machine management of the second

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

STATION:	Hyd C	Fla	ecc.	setur	STATE:	Co	IF	
				$\overline{}$				١

OBJECTS OBSERVED TIME THE D REF'S O, ANGLE O, O O O O O O O O O O O O O O O O O O	OBSERVER: Mul	2					,
6 Fla D 92 06 271 46 Southern Counties 925 D 130 17 310 16 Steel tank red in a R 26 14 Edison D 00 00 150 00	OBJECTS OBSERVED		TEL. D OR R	Rer's		. "	9 O
6 Fla D 92 06 271 46 Southern Counties 925 D 130 17 310 16 Steel tank red in a R 26 14 Edison D 00 00 150 00	Edison		Ŋ		00	00	•
Suthern Counties ges D 130 17 310 16 Steel tank rec 1206 14 32 46 48 Edison D 00 00 180 00					180	00	
Steel tank red in a 2016 14 18 18 18 00 00 00 180 0	6 F/a	<u> </u>	0		92	06	
Steel tank red sand D 206 14 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			19.		271	46	:
Steel tank rad 1206 14 2 206 14 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Southern Countres gos		0		130	17	ngin
Edison D 00 00 150 00		er deke e sakar	.C.		310	16	this me
Edison D 00 00.	Steel tonk red sand						
150 00		e meric mana	R		76_		Do not
	Edison		2		00	00	
			1		180	0	
					_		
		,					- -

•		NTY:	との ENT: '	g Berch Berger	DATE: Seps 11,199
0-	₹ A	B //	Mean OF Verniers	Angle Mean D and R o / //	REMARKS
•					
· · · · · · · · · · · · · · · · · · ·					
	 			91 56	Barge bearing OFTO
-					moving.
<u> </u>	-		P E CANTON AND AND AND MANAGEMENT	130 16 30	dist - inst to
margin		A		730 70 5	0 Flo = 7110 M
3				The Committee and the Committee of the C	23.3 64
w tite in				206 1400	
<u>ğ</u>					
					of the second contract
•	-			***************************************	
	 -				
())			:		
<u>, </u>				. ,	
			7 34		

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

STATION:	STATE:								
Observer:					- 5				
OBJECTS OBSERVED	Time h. m.	TEL. D OR R	Rep's	Angle	o C				
				1 1 1	•				
	-			<u>-</u>					
>									
					margin				
					e in this				
				, ,	Do not wille in this margin				
					8				
		-V							
					•				
					a variation and				
	······································				1				

ANGLES

ISLAND OR COUNTY:

DATE:

Instrument:

(7	A ,,	B //	Mean of Verniers	Angle Mean D and R	REMARKS	
	·						
						•	
			•	• •	. 2	: • :	
		· ·	•				
	ä	1	•			: • ,	
	is marg		· ·			•	
	Do not write in this margin		• •	.			
	not wri	-	:	•		•	
•	Do.		: -	• • •	· •		
	t	•	:		•		
• (4 g		<u>1</u> .	: : :		
			•	• · · · · · · · · · · · · · · · · · · ·			
2				; }			
	-		•	•	<u></u>		
		İ	Ł			<u> </u>	

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

STATION:	State:					
Observer:				f and a con- 1880 Milled salar recording a resonant		
OBJECTS OBSERVED	Time h. m.	TEL. D or R	Rep's	Angle	c C	
					•	
·				5 .		
				·		
					gtn	
					his mar	
		· · · ·	1		Do not write in this margin	
				· ·	o not w	
			1		, A	
					~ • • • • • • • • • • • • • • • • • • •	
					0	
					-	
					-	
			ļ			