4915

4915

Form 504
Rev. Dec. 1933

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, DIRECTOR

DESCRIPTIVE REPORT

Topographic | *Sheet No.* B
~~*Hydrographic*~~ | Graphic Control Sheet

State Virginia

LOCALITY

Wachapreague Inlet & Vicinity
~~Wachapreague Inlet~~

~~Eastern Shoreline of~~ Metomkin Bay to
~~Metomkin~~ Little Machipongo Inlet
~~Cedar and Parramore Islands~~

1934

CHIEF OF PARTY

H. A. Seran

U.S. GOVERNMENT PRINTING OFFICE: 1934

Form 537a
Ed. Nov., 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

TOPOGRAPHIC TITLE SHEET

Graphic Control Sheet

The Topographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. B

REGISTER NO. 4915

State Virginia

General locality ~~Eastern Shore - Accomac County~~ Wachapreague Inlet & Vicinity

Locality ~~Eastern shoreline of Metomkin, Cedar and Parramore Islands~~ Metomkin Bay to Little Machipongo Inlet

Scale 1-20,000 Date of survey June and July, 1934

Vessel Sub-party Ship OCEANOGRAPHER

Chief of party H. A. Seran

Surveyed by R.A.Earle and J. E. Waugh

Inked by R. A. Earle and F.J.Kish

Heights in feet above to ground to tops of trees

Contour, Approximate contour, Form line interval feet

Instructions dated April 27, 1933

Remarks: Exception: Shoreline to be obtained from air photographs. This sheet was executed only for the purpose of locating signals for control of the hydrographic survey.

DESCRIPTIVE REPORT

to accompany

TOPOGRAPHIC SHEET - B, "G.C.S."

Sub-party Ship OCEANOGRAPHER H.A. Seran, Comdg.
Vicinity: Metomkin to Parramore I. Scale 1 - 20,000.

PROJECT - H. T.142

INSTRUCTIONS

Instructions were dated April 27, 1933.

PURPOSE OF SURVEY

The topography on this sheet was executed only to locate signals for the control of the hydrographic survey. The signals located on this sheet lie along the outer coast of Metomkin, Cedar and Parramore Islands.

CONTROL AND SURVEY METHODS

This survey was controlled by triangulation executed during previous seasons. The position of the tall hydrographic signal "Jim" was computed from triangulation cuts, however, as it was built on the beach, it was unmarked and is unrecoverable, therefore the position is submitted with this report and was considered of fourth rather than third order accuracy.

Signals to the southern end of Cedar Island were located by Lieutenant R.A. Earle, all signals to the south and west of this point were located by Ensign J. E. Waugh.

Along the beach of Parramore Island it was necessary to run traverses between definitely located points. These traverses all checked within the allowable limits and were adjusted in accordance with the "Topographic Manual". On all other sections of the sheet, signals were located by three or more topographic cuts and many of the positions were supplemented by short traverses between accurately located points.

"LANDMARKS FOR CHARTS" AND "DESCRIPTION OF RECOVERABLE TOPOGRAPHIC SIGNALS"

"Landmarks for Charts" and "Descriptions of Recoverable Topographic Signals" for objects located in this area, are attached herewith. Along these beaches nearly all objects which could be classed as "Recoverable Topographic Stations" have been previously cut in by triangulation.

Respectfully submitted:

R.A.Earle, Lt.(j.g.) C&GS

Approved and forwarded:

H. A.Seran, Comdr. C&GS
Commanding Ship OCEANOGRAPHER.

Sheet A

Form 567
Ed. Dec., 1929

DIVISION OF CHARTS, FILE NO. _____

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS

Norfolk, Virginia.

_____, 193

DIRECTOR, U. S. COAST AND GEODETIC SURVEY:

The following determined objects are prominent, can be readily distinguished from seaward from the description given below, and should be charted.

H.A.Seran.

H.A.Seran, Chief of Party.

DESCRIPTION	POSITION						METHOD OF DETERMINATION	CHARTS AFFECTED
	LATITUDE			LONGITUDE		DATUM		
	°	'	D. M. METERS	°	'	D. P. METERS		
Rave	37	35	1100	75	36	1061	NA-1927	Topographic cuts	Charts 1109-1221
	"Aids to Navigation"							
Beacon, Fl.white	37	34	1320	75	36	1172	NA-1927	Topographic cuts	Charts 1109-1221

A list of objects which are of sufficient prominence for use on the charts, together with a description of the same, must be furnished in a special report on this form, and a copy of such report must be attached by the Chief of Party to his descriptive report. The selection, determination, and description of these points are of primary importance.

The description of each object should be short, but such as will identify it; for example, standpipe, water tower, church spire, tank, tall stack, red chimney, radio mast, etc. Generally, flagstaffs and like objects are not sufficiently permanent to chart.

U. S. GOVERNMENT PRINTING OFFICE: 1931

Forth- Order

Triangulation

MENT OF COMMERCE
ST AND GEODETIC SURVEY
Form 28 B

Field Computation

GEOGRAPHIC POSITIONS

Accession No. of Computation: ____________

Locality Wachapreague Inlet and Vicinity — Datum North American - 1927 — State Virginia

U. S. GOVERNMENT PRINTING OFFICE: 1936 11—10288

STATION	LATITUDE AND LONGITUDE ° ′ ″	SECONDS IN METERS	AZIMUTH ° ′ ″	BACK AZIMUTH ° ′ ″	TO STATION	DISTANCE LOGARITHM (METERS)	DISTANCE METERS	DISTANCE FEET
(Tall Hydrographic Signal	37 33 24.44	753.7	55 34 33.9	235 30 53.5	Sand, 1933	4.032347	10773.3	35345
End Parramore Id.) 1934	75 36 27.60	677.5	111 39 35.0	291 37 38.7	Brand, 1933	3.702225	5037.6	16528
n.d. n.m.			139 56 33.9	319 54 32.0	Haulover 2, 1909-33	3.947810	8867.7	29093

Fourth-Order

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24-A
Rev. Oct., 1932

4915

LIST OF DIRECTIONS

Fourth Order location of ⊙ JIM

Station Brand - 1933 State Virginia

Chief of party H. A. Seran Date 7/25/34 Computed by J.E.W.

Observer M. B. Moore Instrument 7" Berger No. 255 Checked by M.B.M.

11—9503

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Haulover No. 2 - 1909	0 00 00.00			0 00 00.00	
O Jim - [Tall Signal]	123°-23'-52"0 ✓				

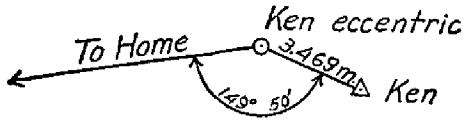
* These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 21A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station Wachapreague-No.4-1934 State Virginia

Chief of party H.A. Seran Date 7/24/34 – 8/8/34 Computed by J.E.W.

Observer M.B.Moore and J.E.Waugh Instrument 7" Berger - No.255 Checked by M.B.M.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Haulover-No.2-1909	0 00 00.00			0 00 00.00	
O Jim [Tall Signal]	234-21-15.4 ✓				
S.E.Corner of boat house Wachapreague Coast Guard distance 10.75m	238-38-~~22.5~~ 20"				
Black Rock Beacon	326-08-11.7 ✓				
Finney Creek Beacon	359-10-16.5 ✓				

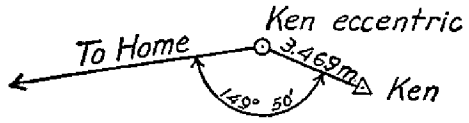
*These columns are for office use and should be left blank in the field

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulco	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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The directions at only one station should be placed on a page.

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Choose as an initial for Form 24a some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24-A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station Haulover #2-1909 State Virginia

Chief of party H.A. Seran Date 7/25/34 Computed by J.E.W.

Observer M.B. Moore Instrument 7" Berger #255 Checked by M.B.M.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Wachapreague #4-1934	0 00 00.00			0 00 00.00	
O Jim [Tall signal]	21-10-12"9 ✓				

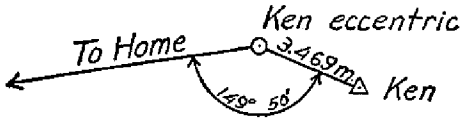
*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station Sand - 1933 State Virginia

Chief of party H.A Seran Date 7/28/34 Computed by J.E.W.

Observer J. E. Waugh Instrument 7" Berger No. 255 Checked by M.B.M.

11—0503

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Hog Island Light	0 00 00.00			0 00 00.00	
O Jim [Tall signal]	238-49-56.9 ✓				

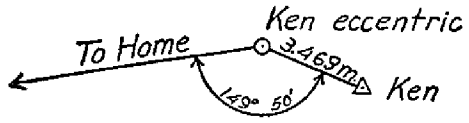
*These columns are for office use and should be left blank in the field.

Station: Ken *State:* Maryland

Chief of party: C. V. H. *Date:* 1917 *Computed by:* O. P. S.

Observer: C. V. H. *Instrument:* No. 168 *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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

COMPUTATION OF TRIANGLES

11—9121

State: Virginia

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						3.701890 ✓
	1 Jim	(28°-17'-18".9) ✓		18".9	0.1	18.8	0.324 302 ✓
	2 Brand	123-23-52.0 ✓		52.0	-	52.0	9.921 618 ✓
	3 Haulover No 2	28-18-49.2 ✓		49.2	-	49.2	9.676 052 ✓
	1-3	00.1				00.0	3.947810 ✓
	1-2						3.702244 ✓
	2-3						3.953908 ✓
	1 Jim	(56-05-01.1)		01".1	0.1	01.0	0.080999 ✓
	2 Sand	27-42-03.2		03.2	-	03.2	9.667318 ✓
	3 Brand	96-12-55.8		55.8	-	55.8	9.997440 ✓
	1-3	00.1				00.0	3.702225 ✓
	1-2						4.032 347 ✓
	2-3						3.776250 ✓
	1 Jim	(33°-11'-02".5)		—	-	02.5	0.261 751 ✓
	2 Haulover No 2	21°-10'-12".9 ✓		—	-	12.9	9.557 676 ✓
	3 Wachapreague No 4	125-38-44.6		—	-	44.6	9.909 896 ✓
	1-3	00.0				00.0	3.595 677 ✓
	1-2						3.947 897 ✓
	2-3						
	1						
	2						
	3						
	1-3						Comp. E.S.T.
	1-2						Ck. JEW
							Copy JEW

Do not write in this margin

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 662
Rev. April, 1931

INVERSE POSITION COMPUTATION

$$s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_1 \cos\phi_m}{A_m}$$

$$s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_1 \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which $\log \Delta\lambda_1=\log(\lambda'-\lambda)-$correction for arc to sin*; $\log \Delta\phi_1=\log(\phi'-\phi)-$correction for arc to sin*; and $\log s=\log s_1+$ correction for arc to sin*.

	NAME OF STATION			NAME OF STATION	
1. ϕ	37 23 46.57	Hog Island Light	λ	75 42 01.77	
2. ϕ'	37 30 06.73	Sand	λ'	75 42 29.39	
$\Delta\phi\ (=\phi'-\phi)$	+ 06 - 20.16		$\Delta\lambda\ (=\lambda'-\lambda)$	+ 00 27.62	
$\frac{\Delta\phi}{2}$	+ 03 - 10.08		$\frac{\Delta\lambda}{2}$	+ 00 13.81	
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	37 26 56.65				
$\Delta\phi$ (secs.)	+ 380.16		$\Delta\lambda$ (secs.)	+ 27.62	
$\log \Delta\phi$	2.579966		$\log \Delta\lambda$	1.441224	
cor. arc−sin	−		cor. arc−sin	−	
$\log \Delta\phi_1$			$\log \Delta\lambda_1$		
$\log \cos\frac{\Delta\lambda}{2}$			$\log \cos\phi_m$	9.899763	
$\operatorname{colog} B_m$	1.488956		$\operatorname{colog} A_m$	1.490818	
$\log\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	4.068922 n.	(opposite in sign to $\Delta\phi$)	$\log\left\{s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.831805	
			$\log\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	4.068922	
$\log \Delta\lambda$	1.441224	3 log $\Delta\lambda$	$\log \tan\left(\alpha+\frac{\Delta\alpha}{2}\right)$	8.762883	
$\log \sin\phi_m$	9.783944	log F	$\alpha+\frac{\Delta\alpha}{2}$	176 41 05.0	
$\log \sec\frac{\Delta\phi}{2}$		log b	$\log \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)$	8.762155	
			$\log \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.999273	
$\log a$	1.225168		$\log s_1$	4.069650	
a			cor. arc−sin	+	
b			$\log s$		
$-\Delta\alpha$ (secs.)	+ 16.80				
$\frac{\Delta\alpha}{2}$	+ 08.40				
	+ 08.40				
$\alpha+\frac{\Delta\alpha}{2}$	176 41 05.0				
α (1 to 2)	176 41 13.4				
$\Delta\alpha$	− 00 16.8				
	180				
α' (2 to 1)	356 40 56.6				

*Use the table on the back of this form for correction of arc to sin.

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ck. MBM & FJK
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" ✓ ... FJ.

NOTE.—For log s up to 4.52 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 10′, omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 6 decimal places. 11—9810

U. S. GOVERNMENT PRINTING OFFICE: 1931

Table of arc-sin corrections for inverse position computations

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
4. 177	1	2. 686	5. 223	124	3. 732	5. 525	497	4. 034
4. 327	2	2. 836	5. 234	130	3. 743	5. 530	508	4. 039
4. 415	3	2. 924	5. 243	136	3. 752	5. 534	519	4. 043
4. 478	4	2. 987	5. 253	142	3. 762	5. 539	530	4. 048
4. 526	5	3. 035	5. 260	147	3. 769	5. 543	541	4. 052
4. 566	6	3. 075	5. 269	153	3. 778	5. 548	553	4. 057
4. 599	7	3. 108	5. 279	160	3. 788	5. 553	565	4. 062
4. 628	8	3. 137	5. 287	166	3. 796	5. 557	577	4. 066
4. 654	9	3. 163	5. 294	172	3. 803	5. 561	588	4. 070
4. 677	10	3. 186	5. 303	179	3. 812	5. 566	600	4. 075
4. 697	11	3. 206	5. 311	186	3. 820	5. 570	613	4. 079
4. 716	12	3. 225	5. 318	192	3. 827	5. 575	625	4. 084
4. 734	13	3. 243	5. 326	199	3. 835	5. 579	637	4. 088
4. 750	14	3. 259	5. 334	206	3. 843	5. 583	650	4. 092
4. 765	15	3. 274	5. 341	213	3. 850	5. 587	663	4. 096
4. 779	16	3. 288	5. 349	221	3. 858	5. 591	674	4. 100
4. 792	17	3. 301	5. 356	228	3. 865	5. 595	687	4. 104
4. 804	18	3. 313	5. 363	236	3. 872	5. 600	702	4. 109
4. 827	20	3. 336	5. 369	243	3. 878	5. 604	716	4. 113
4. 857	23	3. 366	5. 376	251	3. 885	5. 608	729	4. 117
4. 876	25	3. 385	5. 383	259	3. 892	5. 612	743	4. 121
4. 892	27	3. 401	5. 390	267	3. 899	5. 616	757	4. 125
4. 915	30	3. 424	5. 396	275	3. 905	5. 620	771	4. 129
4. 936	33	3. 445	5. 403	284	3. 912	5. 624	785	4. 133
4. 955	36	3. 464	5. 409	292	3. 918	5. 628	800	4. 137
4. 972	39	3. 481	5. 415	300	3. 924	5. 632	814	4. 141
4. 988	42	3. 497	5. 422	309	3. 931	5. 636	829	4. 145
5. 003	45	3. 512	5. 428	318	3. 937	5. 640	845	4. 149
5. 017	48	3. 526	5. 434	327	3. 943	5. 644	861	4. 153
5. 035	52	3. 544	5. 440	336	3. 949	5. 648	877	4. 157
5. 051	56	3. 560	5. 446	345	3. 955	5. 652	893	4. 161
5. 062	59	3. 571	5. 451	354	3. 960	5. 656	909	4. 165
5. 076	63	3. 585	5. 457	364	3. 966	5. 660	925	4. 169
5. 090	67	3. 599	5. 462	373	3. 971	5. 663	941	4. 172
5. 102	71	3. 611	5. 468	383	3. 977	5. 667	957	4. 176
5. 114	75	3. 623	5. 473	392	3. 982	5. 671	973	4. 180
5. 128	80	3. 637	5. 479	402	3. 988	5. 674	989	4. 183
5. 139	84	3. 648	5. 484	412	3. 993	5. 678	1005	4. 187
5. 151	89	3. 660	5. 489	422	3. 998			
5. 163	94	3. 672	5. 495	433	4. 004			
5. 172	98	3. 681	5. 500	443	4. 009			
5. 183	103	3. 692	5. 505	453	4. 014			
5. 193	108	3. 702	5. 510	464	4. 019			
5. 205	114	3. 714	5. 515	474	4. 024			
5. 214	119	3. 723	5. 520	486	4. 029			

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 662
Rev. April, 1931

INVERSE POSITION COMPUTATION

$$s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_1 \cos\phi_m}{A_m}$$

$$s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_1 \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which $\log \Delta\lambda_1=\log(\lambda'-\lambda)-$correction for arc to sin*; $\log \Delta\phi_1=\log(\phi'-\phi)-$correction for arc to sin*; and $\log s=\log s_1+$ correction for arc to sin*.

	NAME OF STATION				NAME OF STATION		
1. ϕ	37° 30' 06.73"	Sand		λ	75° 42' 29.39"		
2. ϕ'	37 34 24.70	Brand		λ'	75 39 38.39		
$\Delta\phi\ (=\phi'-\phi)$	+ 04 17.97			$\Delta\lambda\ (=\lambda'-\lambda)$	- 02 51.00		
$\frac{\Delta\phi}{2}$	+ 02 08.98			$\frac{\Delta\lambda}{2}$	- 01 25.50		
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	37 32 15.71						
$\Delta\phi$ (secs.)	+ 257.97"			$\Delta\lambda$ (secs.)	- 171.00"		
log $\Delta\phi$	2.411569			**log** $\Delta\lambda$	2.232996 n		
cor. arc—sin	—			cor. arc—sin	—		
log $\Delta\phi_1$				log $\Delta\lambda_1$			
log cos $\frac{\Delta\lambda}{2}$				**log cos** ϕ_m	9.899247		
colog B_m	1.488963			**colog** A_m	1.490820		
log $\left[s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right]$	3.900532 — (opposite in sign to $\Delta\phi$)			**log** $\left[s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)\right]$	3.623063 n		
				log $\left[s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right]$	3.900532 n		
log $\Delta\lambda$	2.232996 n	3 log $\Delta\lambda$		**log tan** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.722531 n		
log sin ϕ_m	9.784819	log F		$\alpha+\frac{\Delta\alpha}{2}$	207° 49' 42.4"		
log sec $\frac{\Delta\phi}{2}$		log b		**log sin** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.669155 n		
log a	2.017815 n			**log cos** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.946624 n		
a	- 104.2			**log** s_1	3.953908		
b				cor. arc—sin	+		
$-\Delta\alpha$ (secs.)	- 104.2"			log s			
$-\frac{\Delta\alpha}{2}$	-52.1"						
	° ' " - 52.1						
$\alpha+\frac{\Delta\alpha}{2}$	207 49 42.4						
α (1 to 2)	207 48 50.3						
$\Delta\alpha$	+ 01 44.2						
	180						
α' (2 to 1)	27 50 34.5						

*Use the table on the back of this form for correction of arc to sin.

Comp J.E.W.

Ck MBM - F.J.K. - F.S.T.

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F.J.T.

NOTE.—For log s up to 4.52 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 10', omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 6 decimal places. 11—9810

U. S. GOVERNMENT PRINTING OFFICE: 1931

Table of arc-sin corrections for inverse position computations

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
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4. 628	8	3. 137	5. 287	166	3. 796	5. 557	577	4. 066
4. 654	9	3. 163	5. 294	172	3. 803	5. 561	588	4. 070
4. 677	10	3. 186	5. 303	179	3. 812	5. 566	600	4. 075
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5. 139	84	3. 648	5. 484	412	3. 993	5. 678	1005	4. 187
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5. 205	114	3. 714	5. 515	474	4. 024			
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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1929

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		°	′	″
α	2 Sand, 1933 to 3 Brand, 1933	207	48	50.3′
2d ∠	Brand, 1933 & Jim, 1934	+ 27	42	03.2′
α	2 Sand, 1933 to 1 Jim, 1934	235	30	53.5′
Δα		+	03	40.4′
		180	00	00.0
α′	1 Jim, 1934 to 2 Sand, 1933	55	34	33.9′
		56	05	01.1′

		°	′	″
α	3 Brand, 1933 to 2 Sand, 1933	27	50	34.5′
3d ∠	Sand, 1933 & Jim, 1934	− 96	12	55.8′
α	3 Brand, 1933 to 1 Jim, 1934	291	37	38.7′
Δα		+	01	56.3′
		180	00	00.0
α′	1 Jim, 1934 to 3 Brand, 1933	111	39	35.0′

First Angle of Triangle

	°	′	″			°	′	″
φ	37	30	06.73′	2 Sand, 1933	λ	75	42	29.39′
Δφ	+	03	17.71′		Δλ	−	06	01.79′
φ′	37	33	24.44′	1 Jim, 1934	λ′	75	36	27.60′

	Logarithms	Values in seconds
s	4.032347′	
Cos α	9.752964′	
B	8.511040′	
h	2.296351′	1st term − 197.867′
s²	8.0647′	
Sin² α	9.8321′	
C	1.2898′	
	9.1866′	2d term + 0.154′
h³		
D		
		3d term +
		−Δφ − 197.713′

	°	′	″
½(φ+φ′)	37	31	45.6′

	Logarithms	Values in seconds
s	4.032347′	
Sin α	9.916071′	
A′	8.509179′	
Sec φ′	0.100864′	
Δλ	2.558461′	−361.794′
Sin ½(φ+φ′)	9.784737′	
−Δα	2.343198′	−220.39′

	Logarithms	Values in seconds
s	3.702225′	
Cos α	9.566519′	
B	8.511035′	
h	1.779779′	1st term 60.225″
s²	7.4044′	
Sin² α	9.9366′	
C	1.2909′	
	8.6319′	2d term + 0.043″
h³		
D		
		3d term +
		−Δφ 60.268″

	°	′	″
½(φ+φ′)	37	33	54.6′

	Logarithms	Values in seconds
s	3.702225′	
Sin α	9.968296′	
A′	8.509179′	
Sec φ′	0.100864′	
Δλ	2.280564′	−190.794″
Sin ½(φ+φ′)	9.785090′	
−Δα	2.065654′	−116.32′

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M ✓ 9.5.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1929

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		°	'	"
α	2 Brand, 1933 to 3 Haulover No.2, 1909	168	13	46.7
2d ∠	Haulover No2, 1909 & J:m, 1934	+ 123	23	52.0
α	2 Brand, 1933 to 1 J:m, 1934	291	37	38.7
Δα			01	56.3
		180	00	00.0
α'	1 J:m, 1934 to 2 Brand, 1933	111	39	35.0
	First Angle of Triangle	28	17	18.9

		°	'	"
α	3 Haulover No.2, 1909 to 2 Brand, 1933	348	13	21.2
3d ∠	Brand, 1934 & J:m, 1934	− 28	18	49.2
α	3 Haulover No.2, 1909 to 1 J:m, 1934	319	54	32.0
Δα		+	02	21.9
		180	00	00.0
α'	1 J:m, 1934 to 3 Haulover No.2, 1909	139	56	53.9

	°	'	"			°	'	"			°	'	"
φ	37	34	24.70	2 Brand, 1933	λ	75	39	38.39	φ	37	37	04.54	3 Haulover No2, 1909	λ	75	40	20.26
Δφ	−	01	00.27		Δλ	−	03	10.80	Δφ	−	03	40.11		Δλ	−	03	52.67
φ'	37°	33	24.43	1 J:m, 1934	λ'	75	36	27.59	φ'	37	33	24.43	1 J:m, 1934	λ'	75	36	27.59

	Logarithms	Values in seconds
s	3.702244	
Cos α	9.566519	
B	8.511035	
h	1.779798	1st term 60".23
s²	7.4045	
Sin²α	9.9366	
C	1.2909	
	8.6320	2d term + 0.04
h³		
D		
		3d term +
		−Δφ + 60.27

	°	'	"
½(φ+φ')	37	33	54.6

	Logarithms	Values in seconds
s	3.702244	
Sin α	9.968296	
A'	8.509180	
Sec φ'	0.100864	
Δλ	2.280584	−190".80
Sin ½(φ+φ')	9.785093	
−Δα	2.065677	−116.3

	Logarithms	Values in seconds
s	3.947810	
Cos α	9.883674	
B	8.511031	
h	2.342515	1st term 220".05
s²	7.8956	
Sin²α	9.6178	
C	1.2916	
	8.8050	2d term + 0.06
h³		
D		
		3d term +
		−Δφ +220.11

	°	'	"
½(φ+φ')	37	35	14.5

	Logarithms	Values in seconds
s	3.947810	
Sin α	9.808892	
A'	8.509180	
Sec φ'	0.100864	
Δλ	2.366743	−232".67
Sin ½(φ+φ')	9.785309	
−Δα	2.152052	−141.9

Comp by JH

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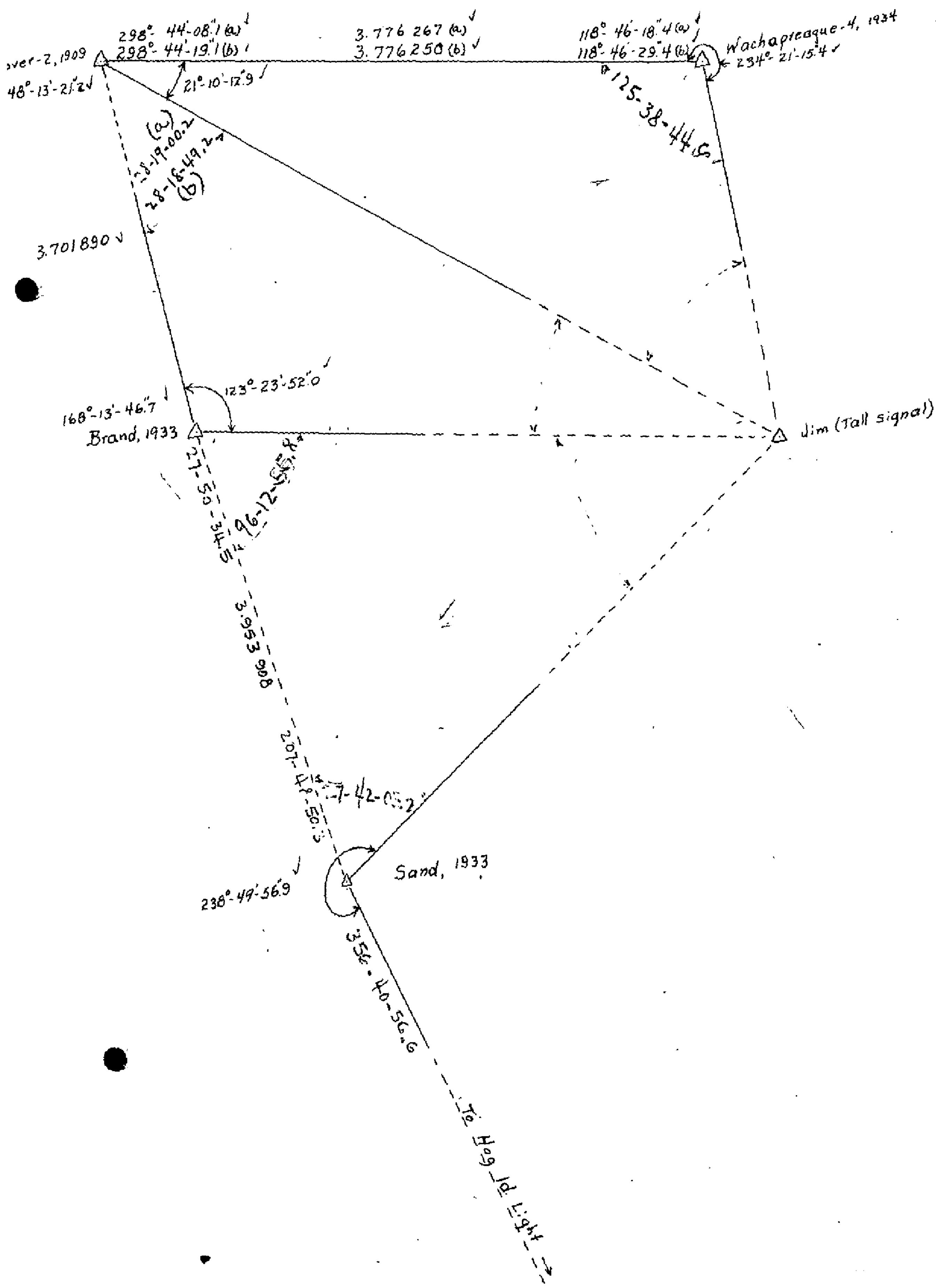

over-2, 1909
48°-13'-21.2"
298° 44'-08.1" (a)
298° 44'-19.1" (b)
21°-10'-12.9"
3.776 267 (a)
3.776 250 (b)
118° 46'-18.4" (a)
118° 46'-29.4" (b)
Wachapreague-4, 1934
234° 21'-15.4"
125-38-44.9
(a)
28-19-00.2
28-18-49.2
(b)
3.701 890
123°-23'-52.0
168°-13'-46.7
Brand, 1933
Jim (Tall signal)
27-50-34.5
96-12-55.8
3.953 908
207-49-50.3
27-42-05.2
Sand, 1933
238°-49'-56.9
356-40-56.6
To Hog Id Light