3374

Diag. Cht. No. 1234-2

Department of Commerce and Labor
COAST AND GEODETIC SURVEY

Superintendent.

State: _N.C._

DESCRIPTIVE REPORT.

Hyd. Sheet No. _3374_

LOCALITY:

Cape Lookout

West Shore

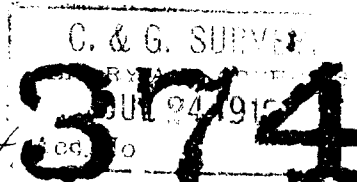_Cape to _____ Light_

1912

CHIEF OF PARTY:

H. C. Graves

11—4645

Descriptive Report.

Topographic and Hydrographic Sheet No. 3 [...]

Cape Lookout, N. C.

The projection furnished by the office contained Cape Lookout lighthouse, and a cut from△ Shak to the life-saving station at Cape Lookout. Shak △ was not found, but a signal was built at New Macon △ , and this station was occupied, and a cut taken to the life-saving station at Cape Lookout as a check. The life-saving station at Cape Lookout was located by occupying Cape Lookout ⋈ lighthouse with a theodolite, using New Macon as the initial, and cutting in the station on the line on the sheet. The lighthouse and life-saving station were then used as the base for locating the other signals.

The high-water line, indicated by the solid black lines on the sheet, was located with sextant angles, the original data for which is contained in sounding book No. 1. The low-water line is shown on the sheet by a dotted line, and was located with sextant at or near low water. Where its position might be altered somewhat by the hydrography, it has been left uninked.

The southwesterly shore of Lookout Bight consists of sand flats, mostly uncovered shortly after high water, so that the low water line is important as showing the real extent of the land. The high water mark is indefinite, a small variation in the height of high water producing a large change in its position. The entire spit, for a distance of nearly 1 mile southward of Brown ⊙ , also that terminating in Spit ⊙ , have an elevation of possibly 2 feet above high water.

The hydrography was done with the ship in the open water , and with the whaleboat, and launch towing the dinghy, at other places. We had but a part of one day when the sea was smooth enough to sound over the shoal area on the outside of the spit forming the bight. The work done there will probably be found to be in sufficient detail for charting purposes, expecially as further changes may be expected with every gale. The first line run with the whaleboat,

positions 1a to 8a, indicated that the shoals extend farther than charted off

the western side of the point of Cape Lookout.   To determine the knuckle of

the shoal in this locality, a few lines were run southward to abreast New ⊙ ,

and the depths in connection with the remarks in the sounding book, angles 37,

38, 100, and 101 of B day, pp. 20, 21, and 31, may be useful.

Tides were observed, while hydrographic work was in progress, by means of a

staff attached to the second pile from the southwest end of the boathouse (House ⊙)
was determined by
in Lookout Bight.   Mean low water read 2.15 on the staff, and leveling to the

U. S. Engineers benchmark at Cape Lookout lighthouse (see House document No. 25,

55th Congress, 2d session, page 4).

The following are objects determined by the survey that should be shown on

the chart.

       Brown ⊙ which is Wreck Point light.
       Wreck ⊙ which is the wreck of schooner that shows above the water, and
is sufficiently protected to remain for some years.
       House ⊙ the north gable of boathouse on piles.
       Life ⊙ life saving station.
       Hut ⊙ shanty which may be useful on account os its location.
       New ⊙ smoke stack of large tramp steamer.   The vessel shows well,
and parts of her are liable to remain as a mark for years,   She was lost by mis-
taking Cape Lookout lighthouse for the lightvessel.

The survey was in progress on July 12, 13, 15, and 16, 1912.   The topography

on the sheet and the hydrographic positions were plotted and inked by F. S. Borden,

Aid.

The following is a table of the objects used as signals:

	Lat.	d.m.	Long	d.p.	Remarks.
Tramp steamer "New"	34 33	784	76 31	970	Smokestack
Small watch house "Hut"	34 35	445	76 32	15	Center
Life-saving station "Life"	34 36	345	76 32	425	Tower
boat house "House"	34 36	1295	76 32	134	North gable
private beacon "Spit"	34 36	1208	76 32	355	
Wreck Point light "Brown"	34 37	123	76 32	978	
Old flag pole "First"	34 37	1548	76 31	1423	
Small house "Dune "	34 38	444	76 32	462	SE gable
Cape Lookout Light House "Light"	34 37	670.5	76 31	745.1	

Respectfully yours,

Herbert C. Graves,

Nautical Expert, C.& G.Survey,
Commanding.

Sextant angles

State: North Carolina

Department of Commerce and Labor
COAST AND GEODETIC SURVEY
FORM 24A

Beaufort entrance
Station beacon (black)   Computed by _____

Beaufort entrance
Station beacon   Acc. No. Computed by _____

Observer E. Y. M.   Checked by _____

Observer E. Y. M.   Checked by _____

11—768

C. & G. SURVEY,
LIST OF DIRECTIONS
JUL 24 1912

STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT		FINAL SECONDS	STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT		FINAL SECONDS
	°	′ ″	″		°	′ ″	″
△ Methodist Church	00	00		△ Methodist Church	00	00	
Outer rear beacon	52	28		stack	12	56	
Inner " "	55	49		white tower	42	55	
Inner front "	75	03		inner rear beacon	52	11	
outer front "	78	25		outer rear "	63	11	
H. S. Buoy	82	30		inner front "	84	04	
Buoy 4	83	18		outer " "	91	36	
Buoy 1	87	25		Buoy 4	92	16	
Beaufort entrance beacon (red)	104	05		buoy 1	106	54	
△ New Macon	107	12		△ NEW MACON	140	25	
Life saving station	111	40		Life S.S.	148	53	
Buoy 6	120	51		Buoy 6	186	38	
H.S. Buoy	199	22		small	282	36	
Buoy 3	199	43		buoy 3	254	44	
Standpipe	213	57		standpipe	260	20	
water tank	332	39		Beauft entrance bea. black	313	46	
School	348	50		water tower	336	31	
Cupola (CCH.)	354	10		school	350	48	
Small	358	06		court	358	07	

Station Chase   Computed by A. T. M.

Observer A. T. M.   Checked by A. R. L.

This form, properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed.*

It is to be used for observations with repeating theodolites, as well as direction theodolites.

Start each new station at the head of a new column.

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.

Stations Observed	Directions After Local Adjustment			Final Seconds
	°	′	″	″
Central	0	00	00.00	
White church spire, 8 miles	6	28	56.4	
Chase M. E. church, white spire	18	10	11.9	
Little River	18	20	10.78	
Lyons, salt works, center hoist	24	33	53.0	
Lyons, white spire, short	27	19	39.7	
Lyons, courthouse	27	55	34.2	
Lyons, white spire, slim	28	02	54.2	
Gilmore	53	32	33.44	
Savage	83	59	57.32	
Reference mark distant 66.65 meters.	171	34		
Section 3, T. 20, R. 10 W., NW. corner stone, distant 252.6 meters.	290	37	36	
Bossing	314	52	23.61	

(Final Seconds column note, written vertically: Do not write in this column. It is for Office computation only.)

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting directions at the center. If the reduction is not made for some directions, they should be entered in pencil, with a footnote to that effect.

Directions in the main scheme should be entered to hundredths of seconds in primary triangulation; otherwise, to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in primary and secondary triangulation, and in tertiary triangulation to even seconds only. 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.

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Department of Commerce and Labor
COAST AND GEODETIC SURVEY
FORM 24A

Inner front

State: North Carolina

Station: beacon (Red)

Observer: F.S.B.

11—768

Computed by _____   Station_____   Computed by _____

Checked by_____   Observer_____   Checked by_____

STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT		FINAL SECONDS	STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT			FINAL SECONDS
	° ′ ″		″		°	′	″	″
Methodist Church	00 00							
Court House Cupola	01 29							
Inner rear beacon	14 06							
stack	18 31							
white tower	54 58							
outer rear beacon	76 37							
buoy N	117 38							
outer front beacon	139 38							
N5 buoy N	187 31							
black can C1	200 48							
△ NEW MACON	258 20							
buoy N4	280 46							
buoy N6	283 03							
stand pipe	298 14							
middle ground C	300 00							
Beaufort entrance beacon red	300 51							
" " " black	321 37							
Biol. Laores (west)	340 57							
" " (east)	341 55 29							
* wireless	342 24							
School belfry	353 35							
Small church	358 38							
Methodist church	360 00							
* water tank	341 55							

Station Chase
Observer A. T. M.

Computed by A. T. M.
Checked by A. R. L.

This form, properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed.*

It is to be used for observations with repeating theodolites, as well as direction theodolites.

Start each new station at the head of a new column.

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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.

STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT			FINAL SECONDS
	°	′	″	″
Central	0	00	00.00	
White church spire, 8 miles	6	28	56.4	
Chase M. E. church, white spire	18	10	11.9	
Little River	18	20	10.78	
Lyons, salt works, center hoist	24	33	53.0	
Lyons, white spire, short	27	19	39.7	
Lyons, courthouse	27	55	34.2	
Lyons, white spire, slim	28	02	54.2	
Gilmore	53	32	33.44	
Savage	83	59	57.32	
Reference mark distant 66.65 meters.	171	34		
Section 3, T. 20, R. 10 W., NW. corner stone, distant 252.6 meters.	290	37	36	
Bossing	314	52	23.61	

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11—768

LIST OF DIRECTIONS

State: *North Carolina*

Station *New Macon* Computed by *F.S.B.* Station *Lookout Light Ho* (Eccentric) Computed by *F.S.B.*
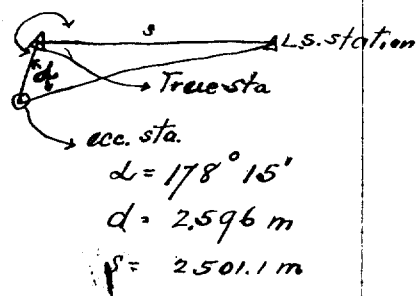
Observer *F.S.B.* Checked by ____ Observer *F.S.B.* Checked by ____

STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT			FINAL SECONDS	STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT			FINAL SECONDS
	°	′	″	″		°	′	″	″
△ Lookout Light Ho.	00	00	00		△ Life Saving Sta.	0	00	00	
△ Life Saving Station #1	08	40	27.1		⊙ House	07	47	39	
Life-Saving Station #2	123	58	12.6		⊙ Spit	28	58	24	
Buoy C3	195	24	08		⊙ Wreck	40	05	20	
Middle Ground C H.S	204	30	54		⊙ Brown	43	35	52	
F Beacon #1 (Beaufort entrance black)	239	53	57		Water tank (Beaufort)	90	25	39	
F Beacon #2 ("red")	243	17	28		△ New Macon	90	57	25.8	
Biol. Station (west tower)	253	12	50		Stand Pipe (M.City)	93	53	00	
Water Tank (Beaufort)	253	46	40		Smoke stack (Beaufort)	102	20	23	
Biol. Station (East tower)	253	48	12		⊙ Dune	113	15	16	
Wireless	255	09	47		⊙ First	113	05	26	
Episcopal School Belfry	263	57	51		⊙ New (new wreck)	332	39	37	
Small Church spire	269	05	49						
Tower Court House	269	53	06						
△ METHODIST CHURCH	270	22	51.9						
Smoke stack (tallest)	282	28	27						
inner Beacon Rear Range #1	299	56	17						
white tower Rear Beacon #2	309	12	11						
Buoy N 4	312	44	58						
outer Rear Beacon #3	323	32	17						
Front Beacon #5 (inner front)	324	27	26						
Buoy N (Middle ground)	346	28	02						
Buoy N	348	36	36						
Beacon #4 (outer front)	351	23	27						
Buoy C1	357	46	01						

△ L.S. station
True sta
ecc. sta.

$\alpha = 178° 15'$

$d = 2.596 \text{ m}$

$\gamma = 2501.1 \text{ m}$

Do not write in this margin.

Station Chase   Computed by A. T. M.

Observer A. T. M.   Checked by A. R. L.

STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT			FINAL SECONDS
	°	′	″	″
Central _____	0	00	00.00	
White church spire, 8 miles_____	6	28	56.4	
Chase M. E. church, white spire____	18	10	11.9	
Little River _____	18	20	10.78	
Lyons, salt works, center hoist_____	24	33	53.0	
Lyons, white spire, short_____	27	19	39.7	
Lyons, courthouse_____	27	55	34.2	
Lyons, white spire, slim_____	28	02	54.2	
Gilmore_____	53	32	33.44	
Savage _____	83	59	57.32	
Reference mark distant 66.65 meters.	171	34		
Section 3, T. 20, R. 10 W., NW. corner stone, distant 252.6 meters.	290	37	36	
Bossing _____	314	52	23.61	

(Final Seconds column header note, read vertically: "Do not write in this column. It is for Office computation only.")

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REDUCTION TO CENTER

Eccentric Station:

$d = 2.596^{m.}$

$\text{Log } d = 0.41430$

$\text{Colog sin } 1'' = \underline{5.31443}$

$\text{Sum} = 5.72873$

STATIONS	a	Log sin a	Log s	Log $\dfrac{\sin a}{s}$	LOGARITHM OF REDUCTION IN SECONDS	REDUCTION $= c$
	° ′					″
Center	0 00	— — —	— — —	— — —	— — —	— — —
∆ Life Saving Sta.	178 15	8.48485	3.39776	5.08709	0.81582	+06.5″
∆ New Macon	272 42	9.99952	4.21926	5.78026	1.50899	-32.3″

11-084

The required reduction to center is, in seconds, $c = \dfrac{d \sin a}{s \sin 1''}$, in which d is the distance from the eccentric station to the true station, and s is the length in meters of the line between the true stations involved, and, therefore, log s is taken directly from the computation of triangle sides. a is the direction of the distant station involved, reckoned in a clockwise direction as usual, but referred to the direction from the eccentric to the true station, or center, taken as zero. This definition of a is true for the case in which the object pointed upon is eccentric, as well as for the case in which the instrument is eccentric.

Carry a to minutes only and all logarithms to five decimal places only. Do not in any case carry the derived reductions to more than two decimal places. There is no advantage in carrying them to more decimal places than the directions to which they are to be applied are carried on Form 24 A.

The preceding paragraph fixed the maximum number of decimal places to be used. In some cases a smaller number may be used as indicated in the following table:

IF LOGARITHM OF SHORTEST LINE CONCERNED IS MORE THAN—	AND d IS LESS THAN VALUE STATED BELOW IN METERS—			
	USE LOGARITHMS TO FOUR DECIMAL PLACES AND a TO MINUTES		USE LOGARITHMS TO THREE DECIMAL PLACES AND a TO DEGREES	
	Primary Triangulation	Secondary or Tertiary Triangulation	Primary Triangulation	Secondary or Tertiary Triangulation
2.5		0.6		0.02
3.0		2		0.06
3.5	0.6	6	0.02	0.2
4.0	2	20	0.06	0.6
4.5	6		0.2	2
5.0	20		0.6	6

REDUCTIONS FOR AN ECCENTRIC INSTRUMENT.

If the instrument is eccentric the first column of this form should contain the names of the stations observed from that eccentric position of the instrument.

The values in the fifth column are derived by subtracting those in the fourth column from those in the third. The values in the fourth column may need to be derived by successive approximations from the triangle side computations if the eccentric reductions are large. The values in the sixth column are obtained from those in the fifth by adding log $\dfrac{d}{\sin 1''}$ derived as indicated in the heading of the form, if d is expressed in meters. If d is expressed in feet, to the other two logarithms add also 9.48402 to convert to meters. To obtain a direction as shown on Form 24 A, subtract the reduction c for the station which is the initial on Form 24 A from the reduction c for the required direction and apply the difference to the observed direction. Similarly, the correction to any angle is the difference of the reductions on this form to the two directions involved in that angle.

REDUCTIONS FOR AN ECCENTRIC OBJECT OBSERVED.

If the object observed is eccentric the heading "Eccentric Station ——" should be changed to "Eccentric Observed Object at Station ——," the first column should contain the names of the stations from which this eccentric object was observed, and in each case a is the direction from the eccentric object to the distant station involved, reckoned in a clockwise direction as usual, but referred to the direction from the eccentric object to the true station, or center, taken as zero. (No distinction need be made between the direction from the eccentric object to the distant station and the direction from the true station to the distant station except when the eccentric reduction is more than one minute.) The remainder of the computation on this form is made in the manner indicated above with reference to an eccentric instrument. The reductions to directions are, however, to be applied to observed directions, at the stations named in the first column, to the eccentric object at the station named in the heading. The directions to which these reductions are to be applied are therefore found in various of the lists of directions on Form 24 A, not all in one list as is the case when the instrument is eccentric.

Compare the following example with that given on Form 24 A.

REDUCTION TO CENTER.

Eccentric Station: Chase.

Log d = 1.04088
Colog sin $1''$ = 5.31443
Sum   6.35531

d = 10.987 meters.

STATIONS	a ° '	LOG SIN a	LOG s	LOG $\dfrac{\text{SIN } a}{s}$	LOGARITHMS OF REDUCTION IN SECONDS	REDUCTION = c ''
Center	0 00					
Central	224 27	9.84528	4.40254	5.44274	1.79805	− 62.81
Little River	242 47	9.94904	4.51928	5.42976	1.78507	− 60.96
Lyons, salt works	249 02	9.97025	4.30616	5.66409	2.01940	−104.57
Bossing	179 18	8.08696	4.49198	3.59498	9.95029	+ 0.89

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Department of Commerce and Labor
COAST AND GEODETIC SURVEY
FORM 24A

State: _____

Station _____ Computed by _____ Station _____ Computed by _____

Observer _____ Checked by _____ Observer _____ Checked by _____

11—768

	STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT	FINAL SECONDS	STATIONS OBSERVED	DIRECTIONS AFTER LOCAL ADJUSTMENT	FINAL SECONDS
		° ′ ″	″		° ′ ″	″

Do not write in this margin.

Station Chase

Computed by A. T. M.

Observer A. T. M.

Checked by A. R. L.

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Reference mark distant 66.65 meters.	171	34		
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(right margin, vertical: It is for Office computation only. Do not write in this column.)

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HYDROGRAPHIC SHEET 3374.

Vicinity of Cape Lookout, North Carolina,

by H. C. Graves, Nautical Expert, in 1912.

TIDES.

	Lookout Bight ft.
Mean low water, or plane of reference on staff	2.2
Lowest tide observed " "	1.4
Highest " " " "	7.7
Mean range of tide	3.7