

5303a,b,c

U. S. COAST & GEODETIC SURVEY
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Ed. June, 1928

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

R. S. Patton Director

South Atlantic Coast
State: & Gulf of Mexico

DESCRIPTIVE REPORT

Topographic } 5303a,b,c
Hydrographic } Sheet No. 1, 2, 3, 4 & 5.

LOCALITY

Hydrography Accomplished by

Ship OCEANOGRAPHER on Trip from

Norfolk, Virginia, to Port Arthur,

Texas, and Return.

Project No. H T 124

1933

CHIEF OF PARTY

H. A. Seran

5303a,b,c

*Work on field sheets 1 and 4
has been transferred to field
sheets 2, 3 and 5 in the office.
Therefore field sheets 1 and 4 have
DESCRIPTIVE REPORT been eliminated.*

To Accompany Plotting Sheets Nos. 1, 2, 3, 4 and 5.

Hydrography Accomplished by Ship OCEANOGRAPHER
On Trip from Norfolk, Virginia, to Port Arthur,
Texas, and return.

March 3 to May 3, 1933.

INSTRUCTIONS:

Dated January 24, 1933, Project No. H.T.124. Radio-
gram March 3, 1933 concerning sounding line across Gulf of Mexico.

LIMITS:

This report includes all hydrography run from Norfolk,
Virginia, to Port Arthur, Texas, and return; also a line run from
the working grounds near Sabine Bank southward to the 2000 fathom
curve for fathometer comparisons. This line was run for calibra-
tion purposes after changes had been made in our new fathometer.

Hydrography is smooth plotted on five plotting sheets as
follows:

Sheet No. 1, latitude $31^{\circ} 43'$, longitude $77^{\circ} 15'$ southward
to latitude 30° .

Sheet No. 2, continuation of line begun on Sheet No. 1, south-
ward to Elbow Key Light. The line run from Sabine Bank southward
to 2000 fathoms is also shown on this sheet.

Sheet No. 3, line across Gulf of Mexico from Dry Tortugas
Light to Sabine Bank Light.

Sheet No. 4, line run across Gulf of Mexico from Buoy K to
Dry Tortugas Light. Line from Elbow Key Light northward to lat-
itude 30° .

Sheet No. 5, continuation of line begun on Sheet No. 4 north-
ward from latitude 30° to Diamond Shoal Light Ship.

SURVEY METHODS:

Except for the beginnings and ends of the sounding lines
the control for this work was entirely from astronomic fixes, Sumner
lines of which are shown in blue on the plotting sheets.

On the trip south, from Norfolk to Port Arthur, practically
all sights, computations and plotting were made by Lieut. T.B. Reed
as navigating officer. Sights, computations and plotting of the line
run south from Sabine Bank to 2000 fathoms and return, and the line
run from Port Arthur to Norfolk were done by or under the direction
of Lieut. B.H. Rigg as navigating officer. In general three astro-
nomic fixes were obtained each day, morning star sights, local
apparent noon and evening star sights. All sights are recorded and

computed in the dead reckoning log accompanying.

Diamond Shoal to Elbow Key Light

The sounding line was started southward from Diamond Shoal Light Ship but weather conditions were so bad that no adequate control could be obtained until 8:00 a.m. March 3rd. No attempt was made to plot the line run before this time.

A fix was obtained at local apparent noon March 3rd (between positions 26 and 27B) and the section of line back to 18B back-plotted from this fix. The next fix was at position 40B and adjustment made to this position. The line then continued throughout the night to a fix at 6:15 a.m. March 4th (between positions 13 and 14C), to which fix the dead reckoning from position 40B was adjusted. From the fix at 6:15 a.m. the line was then adjusted to position 19C when abeam of Elbow Key Light where the line was ended.

Dry Tortugas to Sabine Bank

Sounding line was begun 7 miles south of Dry Tortugas Light (position 1D). The line from 1D was then adjusted to a fix at local apparent noon 11:46 (between positions 10D and 11D). The next fix was at 18:20 between positions 25D and 26D and the dead reckoning was adjusted between 11:46 and 18:20. Morning star sights were then obtained and a fix plotted at 5:46 (between positions 12 and 13E), to which position the line run throughout the night was adjusted. From 5:46 the line was then adjusted to a fix at local apparent noon (12:04) and then adjusted to evening star sights at 18:36 (position 40E). From position 40E the line was adjusted to position 26F which was fixed by a three point fix on two buoys and Sabine Bank Light.

No soundings were obtained between positions 17E and 26E as no echo could be heard.

Line run Southward in Gulf of Mexico to 2000 fathom curve and return

This line was begun with position 1G at Buoy I (position of buoys I and K from 40,000 scale sheet surveyed by OCEANOGRAPHER while at Fort Arthur), and run southward to a morning star fix at 5:22 a.m. The ship was stopped at 5:40 and buoy R was planted (position 13G). This buoy was located from the star fix at 5:22 a.m. and was planted to serve as a tie-in for the return line. The sounding line then continued southward to position 10H where an astronomic fix was obtained. From position 10H the ship ran eastward 4 miles to position 11H and then ran on a north course, the line from 10H being adjusted to a fix at local apparent noon between positions 17 and 18H. From the noon position the line was adjusted to evening star sights at 19:06 (between positions 31 and 32H). The line then continued on to position 40H where

the ship was anchored to await daylight for finding buoy R.

The line was resumed at 6:58 a.m. (position 1J) and tied in to buoy R at position 13J, the line being adjusted back to the evening star fix between positions 31 and 32H. From position 14J at buoy R the line was then continued to position 26J at buoy K and was adjusted accordingly.

Sabine Bank to Dry Tortugas

Dead reckoning was begun at buoy K and run southward to position 1K where the sounding line was started. A fix was obtained at local apparent noon, 12:06 (between positions 11 and 12K), and the line adjusted accordingly. The sounding line was then adjusted to evening star sights between positions 28 and 29K. The next fix was morning star sights at 9L to which the line run during the night was adjusted. The line then continued to evening star sights at 18:37 (between positions 33 and 34L) with an adjustment between local apparent noon at 11:49. No morning star sights could be obtained on April 28th and the dead reckoning was adjusted to local apparent noon at 11:19, and from there to position 34M which was fixed by angles on Dry Tortugas Light, Old Tower and the black and white buoy.

Elbow Key Light to Diamond Shoals Light Ship

The sounding line was begun abeam of the Elbow Key Light and adjusted to morning star sights at 4:55 a.m. (between positions 13 and 14P). The dead reckoning was then adjusted to a fix at local apparent noon, 12:03 (between positions 37 and 38P), and from there to evening star sights at 19:10 (between positions 60 and 61P). Morning star sights were obtained and the line run throughout the night adjusted to the fix at 4:50 a.m. (between positions 13 and 14Q). The line was then adjusted to local apparent noon at 12:00 and from there to the end of the line at Diamond Shoals Light Ship (position 45Q).

REDUCTION OF SOUNDINGS:

Norfolk to Port Arthur

Corrections to fathometer soundings were made by comparison with vertical casts obtained while enroute (see graph accompanying). All soundings deeper than 50 fathoms were multiplied by a factor of 1.087 which was the best value obtainable. Soundings shoaler than 50 fathoms were corrected directly from comparisons made in shoal water. One complete serial temperature observation was taken and is recorded on page 25, Sounding Record No.1.

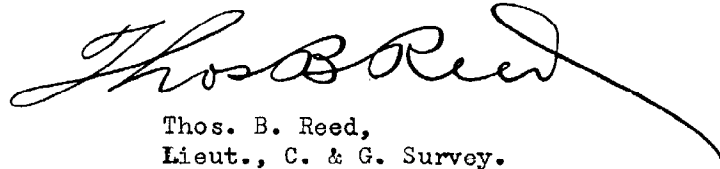
After reaching Port Arthur several changes were made in the fathometer, including a change in the governor, so that fathometer corrections on the lines run between Norfolk and Port Arthur are not comparable with corrections to soundings on the return trip.

Lines Run from Port Arthur to Norfolk and
South of Sabine Bank to 2000 Fathoms

Corrections to all fathometer soundings in the Gulf of Mexico were made by comparison between vertical casts and fathometer. A mean graph was made up, plotting differences between wire and fathometer against depth and the corrections taken from the curve.

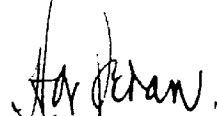
For the sounding line run between Elbow Key Light and Diamond Shoals only comparisons at the beginning and end of the line were available. From these comparisons it was decided to apply a fathometer correction of +100 fathoms to all soundings on this line, except the shoaler soundings at the north end of the line while running in to tie-in to Diamond Shoals Light Ship. It is believed that there is considerable error in soundings on this line due to slope, as the bottom along this section is quite steep in the vicinity of the 1000 fathom curve. However, no data was available for making slope corrections to the soundings.

Respectfully submitted,



Thos. B. Reed,
Lieut., C. & G. Survey.

Approved and forwarded:

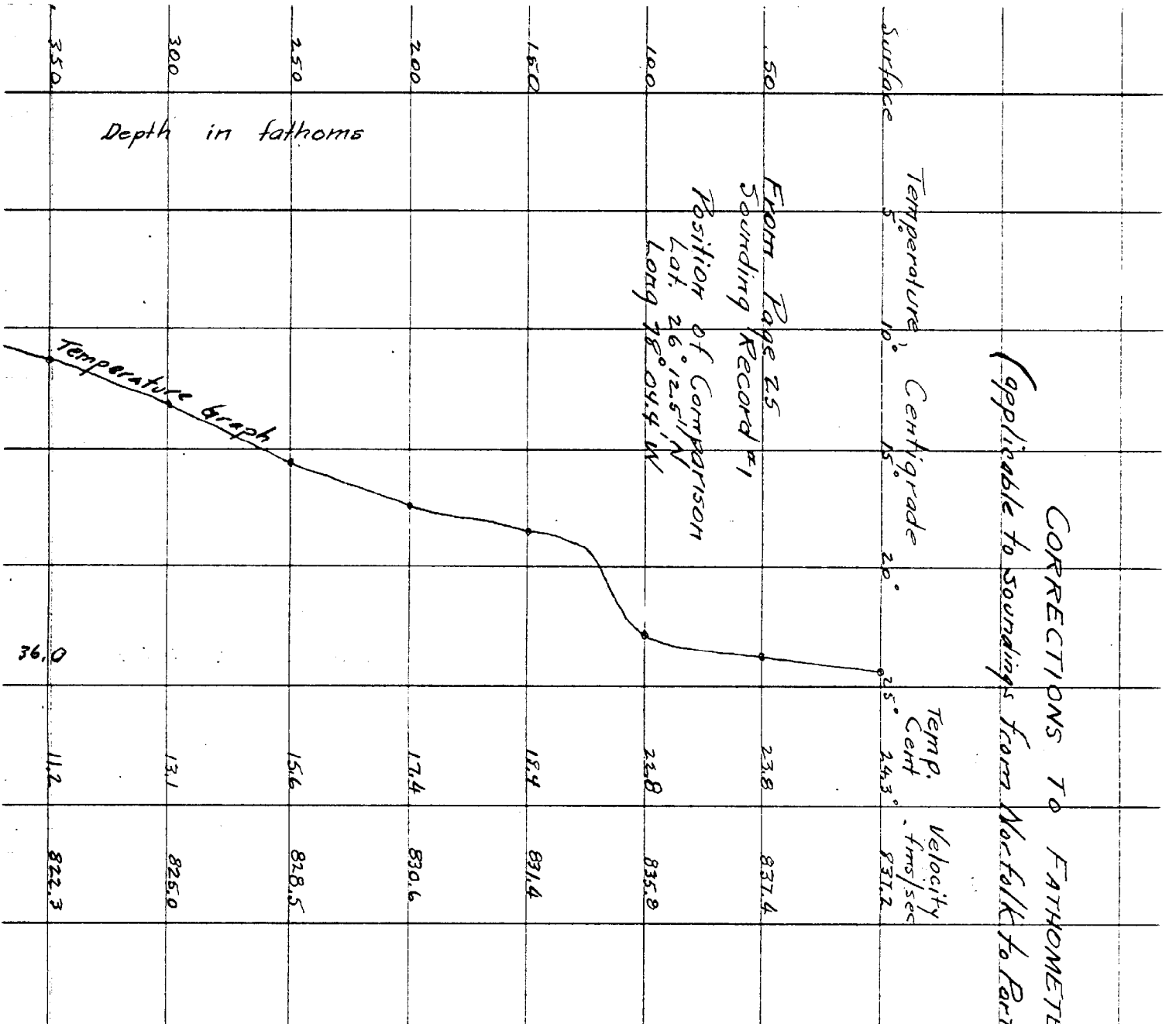


H.A. Seran, Comdr., C&GS.,
Commanding Ship OCEANOGRAPHER.

STATISTICS

Day	Plotting Sheets Nos. 1, 2, 3, 4 and 5.		
	Number of Positions	Number of Soundings	Statute Miles
B	35	194	238
C	19	93	130
D	37	523	190
E	51	237	336
F	26	730	172
G	51	753	251
H	40	267	274
J	26	445	104
K	40	760	223
L	45	59	288
M	34	426	160
P	53	74	335
Q	45	92	278
Total	<u>502</u>	<u>4653</u>	<u>2979</u>

CORRECTIONS TO FATHOMETER SIS
(Applicable to soundings from Norfolk to Port Arthur only)



Correction to fathometer SIS by comparison with wire sounding.

Fathometer calibrated for speed of 810 fms. per sec.

Mean fathometer sounding, 614 fms. Wire sounding, 679 fms.

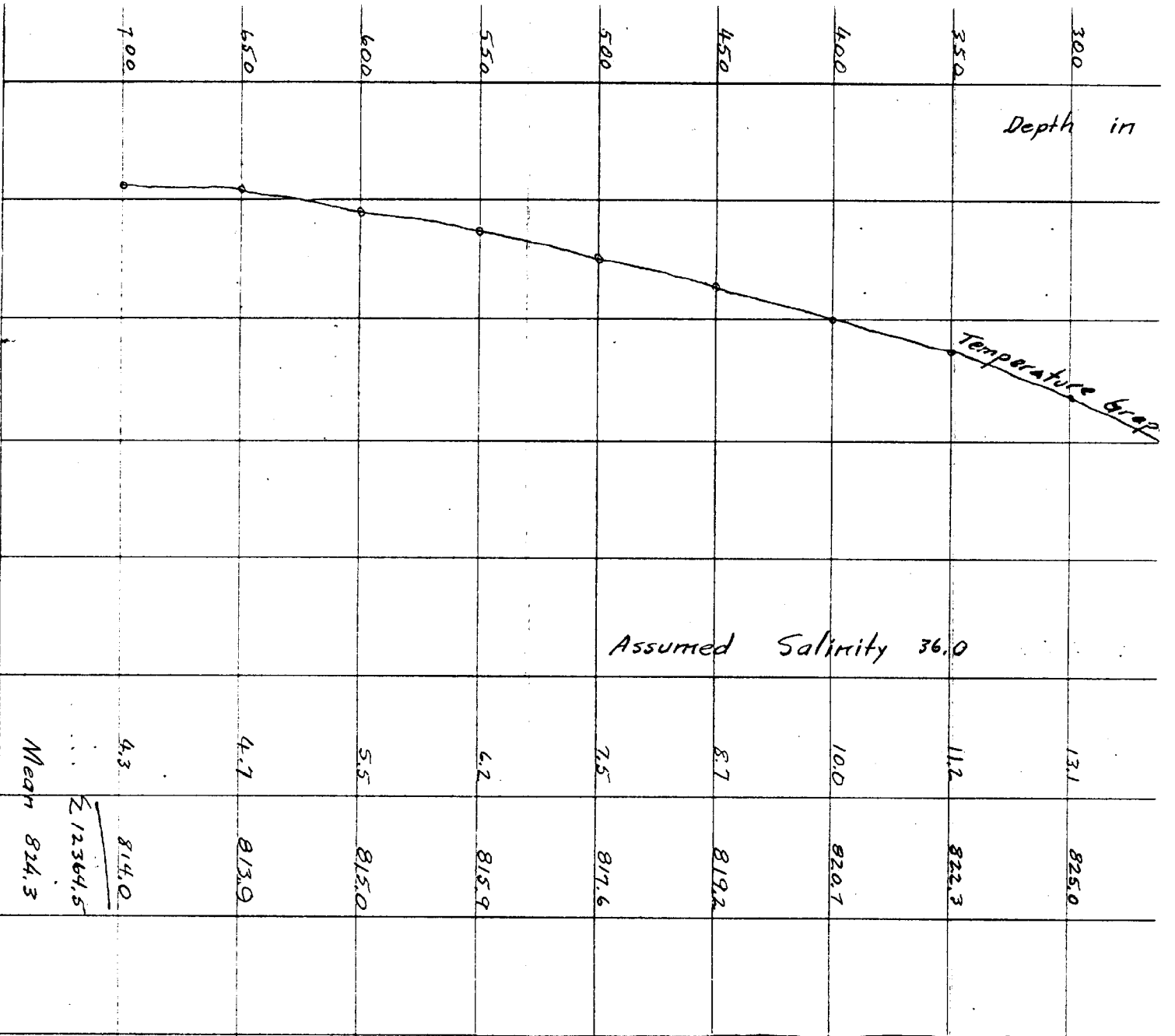
$$\frac{679}{624.8} = 1.087 \text{ (Fath. Factor)}$$

COMPARISONS TAKEN IN GULF OF MEXICO

Lat. 21°-22.1 Long. 89°-01.5'
(from page 49, sounding record # 1)
Wire sounding 1085-5 = 1080 fms.
Fath. sounding 990 fms

$$\frac{1080}{990} = 1.090 \text{ (Fath. Factor)}$$

Lat. 27°-40.5' Long. 89°-52.9'
(from page 50, sounding record # 1)



Assumed Salinity 36.0

13.1	825.0
11.2	822.3
10.0	820.7
8.7	819.2
7.5	817.6
6.2	815.9
5.5	815.0
4.7	813.9
4.3	814.0
Mean	814.3

RECORD # 1)
 Wire sounding 1085-6 = 1080 fms
 Fath. sounding 990 fms
 $\frac{1080}{990} = 1.090$ (Fath. factor)
 No. 33 E

Lat. 27° 48.5' Long. 89° 52.9'
 (from page 50, sounding
 record 1)
 Wire sounding 543 fms
 Fath. sounding 494 fms

$\frac{543}{494} = 1.10$ (Fath. Factor)

All fathometer soundings
 on lines run between
 Diamond Shoal L.S. and
 Sabine Bank L.H.
 corrected by multiplying
 by factor 1.087

200

October 11, 1933.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
4 volumes of sounding records for

HYDROGRAPHIC SHEET 5303 (a to e)

Locality Southward from Cape Hatteras, N. C. to Sabine Bank, Gulf of Mexico

Chief of Party: H. A. Seran in 1933

Plane of reference is
ft. on tide staff at
ft. below B. M.

Since soundings under 100 fathoms are not to be used for permanent record
no tide reducers are necessary.

Condition of records satisfactory except as noted below:


Acting Chief, Division of Tides and Currents

SECTION OF FIELD RECORDS
Review of Hydrographic Sheets Nos. 5303 a, b & c.
Hydrography Accomplished by Ship OCEANOGRAPHER
On trip from Norfolk, Va., to Port Arthur, Tex. and return.

Surveyed in 1933
Instructions dated Jan. 24, 1933 (Oceanographer)
Radiogram March 3, 1933 concerning sounding line across
Gulf of Mexico.

Chief of party - H. A. Seran.
Surveyed by - H. A. Seran.
Plotted by - B. H. Rigg, T. B. Reed, R. H. Tryon.
Soundings in pencil - T. B. R., R. H. T.
Inked by - L. S. Straw, S. E. Perkins.

In view of the fact that a new type fathometer was used on the cruise from Norfolk, Va. to Sabine Bank and return and because there was little opportunity for calibrating it properly before the start of the voyage it has been decided to classify the lines on these sheets as reconnaissance. It is probable that the soundings taken on the return trip are more reliable than those obtained on the trip down.

Office plotting - The lines as plotted by the field party were submitted on five different sheets. When it was found that two of these sheets covered practically the same areas as two other sheets, they were combined. There are now three sheets, each of which shows all the lines which were run in the area which it covers. The field plotting of astronomical fixes were accepted as plotted and were not checked in the office.

Fathometer Corrections - After a study of fathometer comparisons with vertical casts it was concluded that the fathometer corrections used by the field party should be accepted as the office was not in a position to make any change in them.

Discrepancies - There is a marked difference between the two lines run across the Gulf of Mexico, shown on H. 5303c. On the most northerly line, from Dry Tortugas Light to Sabine Bank Light, a constant factor of plus 1.087 was used for fathometer correction of all soundings larger than fifty fathoms. This factor is based on comparisons with three wire soundings at pos. 12D, pos. 30E and pos. 40E.


On the return, southerly line, the soundings are consistently shoaler for the greater part of the run. No constant factor was used on this line, the fathometer corrections being based on comparison with fairly frequent vertical casts. The differences between the wire and fathometer soundings varied considerably on these comparisons. One difference of 105 fathoms at pos. 6M was ignored in computing the fathometer corrections which were never as large as those used on the northerly line. As it is probable a change was made in the adjustment of the fathometer between the running of the two lines, the corrections were accepted as submitted.

H. 5303 a, b & c. - 2.

In view of the uniform difference between these lines, cross lines should be run across them when opportunity affords, and the depths on these lines be omitted from charting until a check is obtained.

Other than the two lines just described, there are no serious discrepancies between the sounding lines.

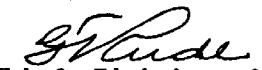
Reviewed by - R. L. Johnston.


L. O. Colbert,
Chief, Section of Field Records.


Chief, Section of Field Work.

Examined and approved:


Chief, Division of Charts.


Chief, Division of H. & T.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5303a

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. 1 & 5

REGISTER NO. 5303a

State.....

General locality..... ATLANTIC OCEAN.....

Locality...Diamond Shoal to North Latitude 30°
1:949,685.

Scale 1:898,524..... Date of survey March, 3 - May, 3, 1933/~~1934~~

Vessel...OCEANOGRAPHER.....

Chief of Party...H.A.Seran.....

Surveyed by.....H.A.S.....

Protracted by...B.H.Rigg;T.B.Read;R.H.Tryon.....

Soundings penciled by.....T.B.R. & R.H.T.....

Soundings in fathoms ~~XXXXX~~

Plane of reference.....No tide reducers applied.....

Subdivision of wire dragged areas by.....

Inked by.....Leo S.Straw and S.E.Perkins.....

Verified by.....L.S.S.....

Instructions dated.....January 24, 1933.....~~XXXX~~

Remarks:.....

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5303b

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. 2 & 4

REGISTER NO. 5303b

State -----

General locality ATLANTIC OCEAN

Locality North Latitude 30° to Elbow Key.

1:1,001,516

Scale: 949,685. Date of survey March 3 - May 3, 1933, ~~1932~~

Vessel OCEANOGRAPHER

Chief of Party H.A.Seran.

Surveyed by H.A.S.

Protracted by B.H.Rigg, T.B.Reed; R.H.Tryon.

Soundings penciled by T.B.R., R.H.T.

Soundings in fathoms XXXXX

Plane of reference No tide reducers applied

Subdivision of wire dragged areas by -----

Inked by Leo S. Strew and S.E.Perkins.

Verified by L.S.S.

Instructions dated January 24, 1933 XXXXX

Remarks: -----

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5303c

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. 3,4,&5.

REGISTER NO. 5303c

State -----

General locality GULF OF MEXICO

Locality Dry Tortugas to Sabine Bank and Southward.
1:1,001,516

Scale 1:249,685. Date of survey Mar. 3 - May, 3, 1933 ~~1932~~

Vessel OCEANOGRAPHER

Chief of Party H.A. Saran.

Surveyed by H.A.S.

Protracted by B.H. Rigg, T.B. Reed, R.H. Tryon.

Soundings penciled by T.B.R. & R.H.T.

Soundings in fathoms ~~XXXXX~~

Plane of reference No tide reducers applied.

Subdivision of wire dragged areas by

Inked by Leo S. Straw and S.E. Perkins.

Verified by I.S.S.

Instructions dated Jan. 24, 1933. ~~1932~~

Remarks:

Applied to drawing of chart no. 1001.
Oct. 4, 1934
g. H. S.

5303 ^{a+b} applied to ^{drawings of} Charts 1002 + 1007
5303 ^c applied, in part, to ^{drawings of} Charts 1116, 1002, + 1007
C.H.S., Oct. 15/34