

# 8294 WIRE DRAG

Diag. Cht. Nos. 1251-2 & 1252-2, 1351-2

Form 504

U. S. DEPARTMENT OF COMMERCE

COAST AND GEODETIC SURVEY

## DESCRIPTIVE REPORT

Type of Survey WIRE DRAG - Field Investigation

H-8294 W.D.

Field No. HY-1256WD

Office No. H-8294 WD

### LOCALITY

State Florida

General locality Key West

Locality South West Channel

1956

CHIEF OF PARTY  
J. C. Partington  
Walter J. Chovan

LIBRARY & ARCHIVES

AUG 20 1956

DATE

COMM-DC 61300

8294  
WIRE DRAG

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.

REGISTER No. ....

Field No. HY-1256D

State Florida

General locality Key West

Locality South West Channel

Scale 1:10,000 Date of survey 16 April - 12 July 1956

Instructions dated 29 December 1955 and 1 March 1956 - Project 13280

Vessel HYDROGRAPHER

Chief of party J. C. Partington & Walter J. Chovan

Surveyed by J. E. Waugh, E. K. McCaffrey, R. J. Black

Soundings taken by ~~W. J. Chovan~~, graphic recorder, hand lead, ~~W. J. Chovan~~

Fathograms scaled by E. T. Harmon, J. J. Curley, L. C. Smith

Fathograms checked by R. J. Black, E. K. McCaffrey

Protracted by L. W. Heilmann

Soundings penciled by L. W. Heilmann, A. M. Cook

Soundings in <sup>and groundings</sup> ~~10/10/56~~ feet at MLW MAAN

REMARKS: .....

.....

.....

.....

.....

.....

DESCRIPTIVE REPORT

To Accompany

Hydrographic Survey H- (Field No. HY-1256WD)

Scale: 1:10,000

Chiefs of Party: J. C. Partington  
Walter J. Ghovan

A. PROJECT:

This survey was a part of Project 13280. The original instructions for this project were issued in 20 March 1952; 22/MEK, S-2-HY.

The wire drag was accomplished under Paragraph 6 and 7, Supplemental Instructions - Project 13280, dated 29 December 1955, 222/MEK, S-2-HY.

The hydrographic and wire drag examination in the approximate area of Northwest Channel Buoys 30 and 31 was accomplished under Paragraph 8, Supplemental Instructions - Project 13280, dated 1 March 1956, 22/MEK, S-2-HY. Please refer also to the Commanding Officer's letter dated 21 March 1956 and the Director's reply dated 27 March 1956; *attached* 22/MEK, S-1-HY.

B. SURVEY LIMITS AND DATES:

The wire drag part of this survey extends from the junction of Southwest Channel and the Main Channel at Key West in a southwesterly direction to approximate Latitude  $24^{\circ} 30' .4$ , Longitude  $81^{\circ} 52' .5$ . The field work was begun on 16 April 1956 and was completed on 12 July 1956. The wire drag survey makes a junction on the southwest with Survey H- (HY-1356) 1956, Scale 1:10,000. This survey does not join any other contemporary surveys.

*not in K.O. 9/20/56 IM 2*

The progress on the wire drag part of this survey was slow and tedious. It was necessary to do the work with misfit launches. The only launch obtainable from the Navy as per instructions was too large, poorly arranged for our purpose, and was hard to handle.

The hydrography accomplished was a field examination of the 18 foot shoals as outlined in the project instructions. No junction was made with any contemporary survey.

C. VESSEL AND EQUIPMENT:

The party operated in launches from the Ship HYDROGRAPHER. Launch CS-114 was used as the guide launch on A-Day and the end

launch for the remainder of the survey. Launch CS-117 was used as the end launch on A-Day and the guide launch for the remainder of the survey. The tender was on loan from the Navy. On A-Day it was a LCPR - 36 feet long. For B-Day thru E-Day it was a 38 foot picket boat. An 18 foot dinghy was used as a tender on F-Day.

Due to the size of the ships launches it was impossible to rig them for satisfactorily handling of the drag. Necessarily the drag was set-out and taken-in from the ship and towed, sometimes several miles, to the working grounds. Whenever the drag grounded on coral formation, considerable time was lost freeing the drag. The hangs encountered were numerous each time the drag was stopped in the coral and the damage to the ground wire and uprights were excessive. Although some repairs were made on the working grounds usually it was necessary to return the drag to the ship for any major repairs.

The hydrographic investigation of the hangs were made from the tender with lead line and/or from the guide launch, acting as a tender, with the graphic recorder.

The hydrographic investigation of the 18 foot shoals were made using Launch CS-117. A type 808 depth recorder, No. 153SPX, calibrated for a speed of 820 fms/sec was used for sounding in all depths. Bar checks were taken throughout the depths sounded.

D. TIDE AND CURRENT STATIONS:

A tide gage at Key West, Florida was used for the reduction of the data. It was at the same location as the standard tide station at Key West. The MLW on the staff was determined by reference to the bench marks for the standard station. A time correction of 1 hour was applied west of longitude  $81^{\circ} 51' 1''$ . (See letter from the Director dated 3/16/56; 36-122-982h). This division has been indicated on the sheet.

Data was obtained aboard the Ship HYDROGRAPHER for one Current Station. Only surface current, using a line and pole, was observed. It was in Latitude  $24^{\circ} 30' 10''$ , Longitude  $81^{\circ} 52' 10''$ .

E. SMOOTH SHEET:

The projection for the smooth sheet was made in the Washington Office on the ruling machine. The shoran distance arcs for Station EPIG were plotted in the Office. The arcs from Station KEY were plotted in the field by ship's personnel.

The topography in the vicinity of the U. S. Naval Base was transferred from a film positive of Survey T-5546 (1938) enlarged to a 1:10,000 scale. It was not verified in the field. This sheet was inadvertently prepared as a second boat sheet. The soundings shown in green are from Chart 584, Scale 1:30,000, print date 5/3/54. No attempt was made to remove these soundings from the smooth sheet.

*Removed during verification.*

F. CONTROL STATIONS:

A-Day of the survey was controlled by shoran distance arcs from an eccentric position of Triangulation Station SAND KEY LIGHTHOUSE, 1853, J. T., Chief of Party; and from Triangulation Station EPIG, 1954, L. S. Hubbard, Chief of Party.

The remainder of the survey was controlled by three point sextant fixes on Triangulation Stations.

The positions are found under the schemes listed:

<u>Chief of Party</u>	<u>Year</u>
W. B. F.	1917
E. R. McCarthy & Walter H. Bainbridge	1934
J. C. Partington & Walter J. Chovan	1956

G. SHORELINE AND TOPOGRAPHY:

The shoreline in the vicinity of Key West is from Topographic Survey T-5546, (1938). Two high points on a small island south of Crawfish Key and at the edge of the shoal water were cut in by triangulation. They are identified on Photograph C&GS, 26 March 1955, W-5400 and should be applied to the chart.

*PI Review*

H. SOUNDINGS:

The soundings for hydrography were obtained with a portable type 808 depth recorder No. 153PX. All soundings were taken on "A" scale. The soundings at the floating aids to navigation were taken with a lead line and depth recorder No. 105 or No. 153.

I. CONTROL:

A-Day was controlled by shoran distance arcs from two triangulation stations. The corrections applied have been discussed under a separate report. The remainder of the work was controlled by three point sextant fixes taken on triangulation stations.

On Positions 1-17, A-Day, the shoran set on the end launch was inoperative. The single control method for wire drag was used.

J. ADEQUACY OF SURVEY:

The wire drag survey was made to determine a 200 yard channel clear to 23 feet in the area known as SOUTHWEST CHANNEL. A channel

2430 yds  
294° from KW Main chamber Lt

576  
584  
1251  
3261

Not in W.D. 9/20/56 IMZ

clear to 23 feet can be had on an azimuth of 236° from Key West Lighthouse. A satisfactory junction is obtained with Survey No. H- (HY-1356WD) on the Southwest. The groundings along the edge of the drag strip have not necessarily been cleared to a lesser depth. The additional work necessary to accomplish this was not believed warranted as the desired channel was found.

The hydrography accomplished was to investigate the existence of the 18 foot shoals in the vicinity of Northwest Channel Buoys 30 and 31. The 18 foot sounding in Latitude 24° 32' 3.3, Longitude 81° 48' 4 was removed from the charts (N.M 52, dated 24 December 1955). See also correspondence attached. No indication of this sounding was found. A 17 foot sounding in Latitude 24° 32' 8.1, Longitude 81° 49' 6.3, was found. The drag hung at 16 feet in the vicinity of this sounding. It was cleared to 14 feet. The 18 foot sounding marked by Buoy 31 was not found although a 19 foot sounding was found 25 meters <sup>40</sup> <sub>SW</sub> of it.

~~The drag length between positions 28 and 29, A-Day, plots approximately 100 feet longer than the actual drag length of 1000 feet.~~

On position 9, B-Day, Latitude 24° 32' 4.2, Longitude 81° 49' 3.9, the drag grounded with an effective drag depth of 24 feet. This spot was apparently cleared on position 14-15, C-Day, again with an effective depth of 24 feet. However, the hang position (1b') lies just 10 meters inside the Far buoy track on C-Day. It is very probable that the drag strip on C-Day did not pass over this hang. cleared by 22 ft.

L. & M. COMPARISON WITH PRIOR SURVEYS AND CHART:

No disagreement was found with any of the surveys of this area. A detail comparison was made with the Chart No. 584, Scale 1:30,000, print date 5/3/54 and Chart No. 576, Scale 1:10,000, print date 7/12/54. P 5 & 6  
Review

N. DANGERS AND SHOALS:

The obstructions found and recommended for charting are listed:

Depth	Position	Latitude	Longitude	Remarks
✓ 16.5 <sup>0</sup>	(hang) 8F	24° 32' 8.2	81° 49' 6.3	Cleared to 14'. Pos. 9-12 F. Least depth found by investigation 17.2, See pos. 1-2 f'
✓ 19.0	(7d 4-22-ft)	24° 32' 0.6	81° 49' 9.0	{ (hang 23 ft, 26-27 D) Obstructions cleared to 19 ft.
✓ 19.0	3E	24° 32' 0.4	81° 50' 0.8	4E through 10E (21 ft. hang) cleared by 19 ft.
✓ 22.0	10C	24° 32' 5.3	81° 49' 0.9	Obstruction cleared to 22 ft. 4-9D
✓ 22.0	9B	24° 32' 4.2	81° 49' 3.9	{ Cleared to 22 ft. 19-21 D 24 ft. hang
✓ 23.0	47-49 A	24° 32' 0.2	81° 49' 9.4	{ cleared to 23 ft (50-52 A) 25 ft. hang.
✓ 24.0	23-24E	24° 31' 6.6	81° 50' 5.8	{ cleared to 21 ft (25-30 E) 23 ft. hang

Not checked  
AK

All charted dangers and shoals were found as charted, or shoaler depths were found except for those listed in L, M, and N above.

O. COAST PILOT INFORMATION:

It is recommended the channel be laid on an azimuth of 236° T from Key West Lighthouse. In approaching the Main Ship Channel from the southwest after the Key West Harbor Range (bearing 024°) has been crossed the vessel can be brought into the Main Ship Channel approximately midway between Key West Main Channel Buoys 9 and 11.

Two spoil banks immediately south of Crawfish Key (located during this project) are prominently observed from the middle reaches of Southwest Channel.

P. AIDS TO NAVIGATION:

The position of the fixed aids to navigation determined at this time were forwarded under separate cover.

Floating aids to navigation located on this survey are as follows:

<u>Name of Aid</u>	<u>Lat. and Longitude</u>	<u>Depth of Water</u>	<u>Pos. No.</u>	<u>Date of Location</u>
Southwest Channel Lighted Buoy 6	24° 30' 01" ✓ 81° 52' 81" 2	44.5 ft.	1a'	16 April 1956
Southwest Channel Lighted Buoy 7	24° 30' 23" 81° 53' 10" 08	41.8 ft.	2a'	16 April 1956
Southwest Channel Buoy 7A	24° 30' 83" ✓ 81° 52' 15" ✓	—	11,13, 14,15A	18 April 1956
Southwest Channel Buoy 7B	24° 31' 16" ✓ 81° 51' 64" ✓	—	20,22- 25A	18 April 1956
Southwest Channel Buoy 7C	24° 31' 43" 6 81° 50' 78" ✓	29.5 ft.	8a'	16 April 1956
Southwest Channel Buoy 9	24° 31' 74" 7 81° 50' 23" ✓	28.0 ft.	7a'	16 April 1956
Southwest Channel Lighted Buoy 10	24° 30' 70" 82 81° 50' 70" 82	35.0 ft.	9a'	16 April 1956
Kingfish Shoal Lighted Buoy 31	24° 32' 75" 7 81° 49' 39" ✓	22.8 ft.	5a'	16 April 1956



Key West Main Channel Lighted Buoy 10	24° 32' 87"	81° 48' 87"	29.8 ft.	3a'	16 April 1956
Key West, Main Channel Buoy 11	24° 32' 85.7"	81° 48' 96"	29.8 ft.	4a'	16 April 1956
Mooring Buoy F2	24° 32' 41.5"	81° 49' 38.40"	28.8 ft.	6a'	16 April 1956

Q. LANDMARKS FOR CHARTS:

New landmarks for charts are submitted on form 567 under separate cover. The following landmarks are recommended:

NEW- Key West Naval Station Tank (Elevated)  
White Bluff No. 1 (South of Crawfish Key)

Now Charted-  
Key West Courthouse, Water Tank, 1943  
Three Radio Mast at U. S. Naval Station

R. GEOGRAPHIC NAMES:

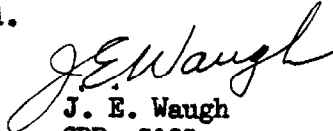
There are no changes in geographic names to report.

U. MISCELLANEOUS:

The guide launch used blue day letters; the end launch, green day letters. Capital letters in alphabetical order were used for wire drag. On days when either launch supplemented the wire drag with tender operations, small case prime day letters were used. Such letters corresponded to the wire drag day letter. When either launch did hydrographic investigation independent of wire drag, small case letters in alphabetical order were used.

Z. TABULATION OF APPLICABLE DATA:

1. Letters Relative to Shoal Soundings dated 7/6/56 and 7/13/56.
2. Landmarks to Charts dated 7/29/56.
3. Fixed Aids to Navigation dated 7/29/56.
4. Photogrammetric Identification dated 8/6/56.
5. Summary of Bar Checks attached.
6. Report on Shore Corrections - to be forwarded, summary attached.
7. Tide Marigrams to be forwarded.

  
J. E. Waugh  
CDR, C&GS

STATISTICS FOR SURVEY HY-1256

<u>Date</u>	<u>Day Letter</u>	<u>Volume Number</u>	<u>Number Positions</u>	<u>Statute Miles</u>
WIRE DRAG - Guide Launch				
18 April	A	1	52	4.6
20 May	B	1	9	0.9
21 May	C	1	17	1.2
22 May	D	1	27	2.9
23 May	E	1	35	2.3
11 July	F	1	13	1.5
Total:			153	13.4

- Tenders

16 April	a <sup>t</sup>	4	9
20 May	b <sup>t</sup>	4	1
21 May	c <sup>t</sup>	4	2
22 May	d <sup>t</sup>	4	8
23 May	e <sup>t</sup>	4	5
11 July	f <sup>t</sup>	4	3
12 July	g <sup>t</sup>	4	5
Total:			33

Area Surveyed: 1.4 sq. st. mi.

FIELD INVESTIGATION - HYDROGRAPHY

12 May	a	3	90	9.4
21 May	b	3	21	2.2
22 May	c	3	19	1.7
23 May	d	3	30	2.6
Total:			160	15.9

Area Surveyed: 0.3 sq. st. mi.

TIDE NOTE To Accompany

Hydrographic Survey H- (HY-1256WD)

Tide Station: Key West, Florida  
Latitude:  $24^{\circ} 33'.2$  N  
Longitude:  $81^{\circ} 48'.5$  W  
Plane of Reference: MLW = 3.1 ft. on staff  
(Directors letter 36-159-982H of 13 April 1956)  
Area Covered: Limits of wire drag.  
Time Correction: None east of longitude  $81^{\circ} 51'.1$  W  
- (minus) one hour west of  $81^{\circ} 51'.1$  W  
Height Correction: None

This station was established 5 April 1956 and discontinued 19 July 1956. Except for F-Day, 11 July 1956, heights from the gage were used to reduce all drag depths and soundings taken during this survey. For F-Day the hourly heights for the standard gage, as furnished by the Washington Office, was used.

SHIP HYDROGRAPHER  
c/o General Delivery  
Key West, Florida

7 April 1956

To: The Director  
Coast and Geodetic Survey  
Washington, D. C.

Subject: Tide Gage - Key West

Reference: Supplemental Instructions for Project 1328 dtd  
1/26/56, 3/1/56 and 3/16/56.

The operation of the standard tide gage at Key West was checked with the Public Works Department at the Naval Station. It is and has been operating satisfactorily since the annual inspection by Lt. Tucker in February.

In order to expedite the processing of the field records for the several special surveys in the area it is planned to operate a portable gage at this station also. The MLW on the staff for this portable gage has been determined to be 3.1 feet by levels from existing bench marks. Please verify this value.

Please also advise the height of MLW on the staff of the standard gage.

/s/ J. C. Partington  
J. C. Partington  
CAPT, C&GS  
Comdg., Ship HYDROGRAPHER

DEPARTMENT OF COMMERCE  
Coast and Geodetic Survey  
Washington 25

36-159-982H

13 April 1956

To:           Commanding Officer  
              USC&GSS HYDROGRAPHER  
              c/o General Delivery  
              Key West, Florida

Subject:       Tide Gage, Key West

Reference is made to your letter of 7 April 1956.

The value of mean low water on the staff of the portable tide gage has been verified.

Mean low water on the staff of the standard tide gage corresponds to a reading of 5.9 feet.

/s/ Robert W. Knox

Acting Director

SHIP HYDROGRAPHER  
P.O. Box 1259  
St. Petersburg, Fla.

21 March 1956

To: The Director  
Coast and Geodetic Survey  
Washington, D. C.

Subject: Project 1328

Reference: (a) Supplemental Instructions dated 3/1/56;  
22/MEK, S-2-HY.

Your attention is invited to Paragraph 5936, Notice to Mariners, Part 1, No. 52, dated 24 December 1955. Paragraph 8, Reference (a), specifically names the shoal in the vicinity of Northwest Channel Buoy 30 for investigation. Please advise if this investigation is to substantiate the information furnished for the removal of this sounding from the charts.

*Pg 4  
Descript Rpt*

/s/ J. C. Partington  
J. C. Partington  
CAPT, C&GS  
Comdg., Ship HYDROGRAPHER

DEPARTMENT OF COMMERCE  
Coast and Geodetic Survey  
Washington 25

22/MEK  
S-1-HY

27 March 1956

To: Commanding Officer  
USC&GSS HYDROGRAPHER  
P.O. Box 1259  
St. Petersburg 1, Florida

Subject: Project 1328

The Notice to Mariners referred to in your letter of 21 March 1956 concerned a third 18-foot shoal in the vicinity of North West Channel buoys 30 and 31. The development called for in paragraph eight of project instructions is necessary to prove, or disprove, the existence of and determine the least depth on the two remaining 18-foot shoals shown on the chart.

*Pg. 4  
Descriptive  
Report*

/s/ Robert W. Knox

Acting Director

cc. Tampa District Officer  
Chart Division (83)





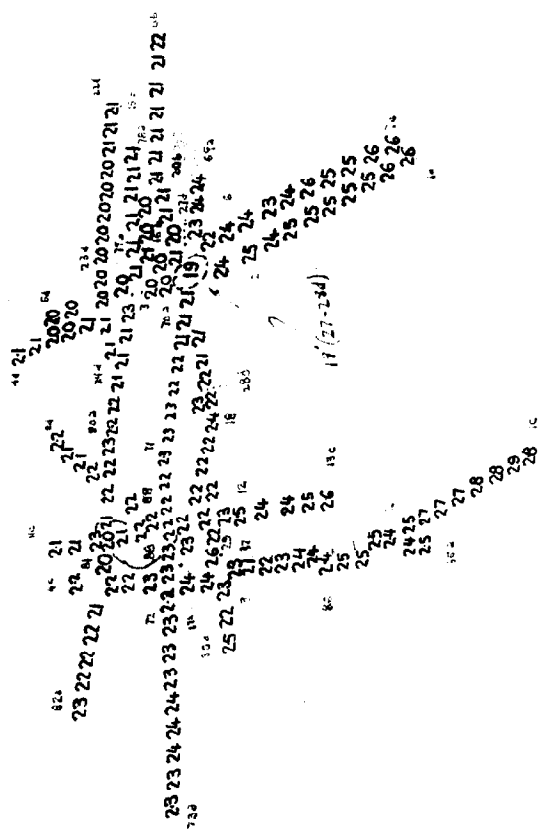
24° 33'

32' 30"

Overlay to accompany  
H-8294 (1956)  
SUPPLEMENTAL INVESTIGATION Para B  
PROJECT INSTR.  
(S.W. channel, Key West, Fla.)

49' 30"

41° 50'



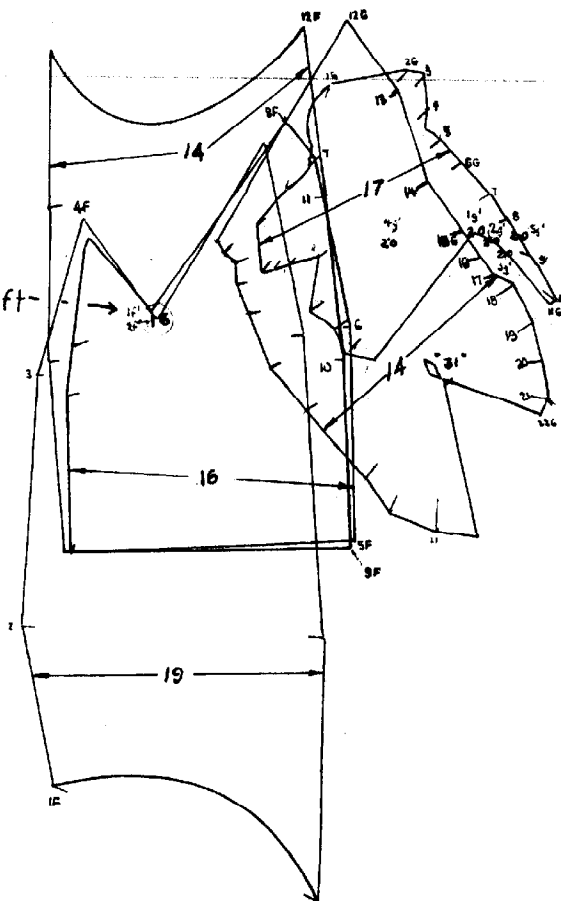
ПРОЦЕДУРА ДИСКУССІОННОГО

81°-50'

24°-33'

81°-49'

cleared by 14 ft.  
actual sounding 17ft-



PROJECT 1328  
WIRE DRAG INVESTIGATION  
SHIP HYDROGRAPHER - W. J. CHOVAN, CMDR  
SUPPLEMENTAL INSTRUCTIONS DATED 1 MARCH 1956  
11-12 JULY 1956  
TRACED FROM CHART BOAT SHEET No. 576

LIST OF DIRECTIONS

Station SAND KEY LIGHTHOUSE, <sup>1853</sup> Fla. State Florida

Chief of party J. C. Partington Date 4/13/56

Computed by J. E. W.

Observer H. W. Keith Instrument No. 35082

Checked by HWK

U. S. GOVERNMENT PRINTING OFFICE: 1931 11-9503

OBSERVED STATION	Observed direction ° ' "	Eccentric reduction " "	Sea level reduction*	Corrected direction with zero initial			Adjusted direction*	
				°	'	"	'	"
EAST TRIANGLE LIGHT 1934	0 00 00.00	- 01		0	00	00.00		
SAND KEY LIGHTHOUSE (center) - 2.865 meters	100 45							
Key (shore antenna) 9.356 meters	209 34	+16°51'		226	26'			

\* 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 Δ 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	00.45	
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						

Ken eccentric  
3.469m  
140° 50'

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 supplement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

REDUCTION TO CENTER

Eccentric Station: Sand Key Lighthouse Log d = 0.45712

Colog sin 1" = 5.31443

d = 2.865 meters

Sum = 5.77155

16-19440

STATION	a	Log sin a'	Log s (s in meters)	Log (sin a / s)	LOGARITHM OF REDUCTION IN SECONDS	REDUCTION = c
Center	0 00					"
<del>Key (dist = 9.356m)</del>	<del>108 49</del>	<del>9.976 15</del>	<del>0.971 09</del>	<del>9.005 06</del>	<del>7.776 61</del>	<del>+5978.7</del>
East Triangle Lt.	259 15	9.992 31	3.987 45	6.004 86	1.776 41	-59.76

*USC value computed below*

$$\sin \angle \text{Key} = \frac{2.865 \times \sin \angle \text{ecc set up}}{9.356}$$

$$\log \sin \angle \text{Key} = \log 2.865 = 0.45712$$

$$\log \sin 108^{\circ}49' = 9.97615$$

$$\text{Sum} = 0.43327$$

$$\log 9.356 = 0.97109$$

$$= \text{difference} = 9.46218$$

$$\angle \text{Key} = 16^{\circ}51'$$

## INSTRUCTIONS

The required reduction to center is, in seconds,  $c = \frac{d \sin a}{s \sin 1''}$ , 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 reduction 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.

### 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  $\log \frac{d}{\sin 1''}$  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.

### REDUCTION TO CENTER

*Eccentric Station:* Chase.

$$\begin{aligned} \text{Log } d &= 1.04088 \\ \text{Colog } \sin 1'' &= 5.31443 \\ \text{Sum} &= 6.35531 \end{aligned}$$

$d = 10.987$  meters

STATION	$a$	Log sin $a$	Log $s$ ( $s$ in meters)	Log $\left(\frac{\sin a}{s}\right)$	LOGARITHM OF REDUCTION IN SECONDS	REDUCTION = $c$
	° /					"
Center.....	0 00					
Bossing.....	179 18	8.08696	4.49198	3.59498	9.95029	+ 0.89
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

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

$\alpha$	2 Sand Key	to 8 E. Triangle Pt.	230	38	30	3	to 2
$2^d L$		&	+226	26			
$\alpha$	2	to 1	97	04	30	3	to 1
$\Delta\alpha$							
$\alpha'$	1	to 2	180	00	00.0	1	to 3

FIRST ANGLE OF TRIANGLE

$\phi$	24	27	12.5332	81	52	39.736	3
$\Delta\phi$		+	0.037	+	00	0.330	
$\phi'$	24	27	12.5701	81	52	40.066	1

$s$	0.971 090	386.74	Values in seconds
$\text{Cos } \alpha$	0.990 500	(1459.30)	Logarithms
$B$	0.511 920	1846.02	Values in seconds
$h$	0.573 510	0.037	Logarithms
$s^2$	0.9429	0.037	Values in seconds
$\text{Sin}^2 \alpha$	0.993 3	0.037	Logarithms
$C$	1.0637	0.037	Values in seconds
$h^2$	3.0092	0.037	Logarithms
$D$	7.147	0.037	Values in seconds
$9.$	-20	0.037	Logarithms

9.959 184  
0.040810

SUMMARY OF SHORAN CORRECTORS

Launch 114  
Set No. 2

Zero Set:                      Rate Station                      Drift Station  
   KEY                                      EPI G  
   99.770                                      99.820

Distances and corrections in statute miles

Date: 16 April 1956

Rate Station		Drift Station	
KEY		EPI G	
Dist.	Corrn.	Dist.	Corrn.
4.1 - 4.9	/ 0.024	0.0 - 0.6	- 0.002
4.9 - 5.5	/ 0.022	0.8 - 1.8	- 0.004
5.5 - 6.3	/ 0.020	1.8 - 2.8	- 0.006
6.3 - 6.9	/ 0.018	2.8 - 3.8	- 0.008
6.9 - 7.6	/ 0.016		
7.6 - 8.2	/ 0.014		

Date: 18 April 1956

2.1 - 3.2	/ 0.020	1.4 - 2.5	- 0.002
3.2 - 4.3	/ 0.018	2.5 - 3.8	- 0.004
4.3 - 5.3	/ 0.016	3.8 - 5.0	- 0.006
5.3 - 6.3	/ 0.014	5.0 - 6.2	- 0.008
6.3 - 7.3	/ 0.012	6.2 - 7.5	- 0.010

Launch 117  
Set No. 3

Zero Set:                      Rate Station                      Drift Station  
   KEY                                      EPI G  
   99.770                                      99.820

Date: 18 April 1956

Distances and corrections in statute miles

Rate Station		Drift Station	
KEY		EPI G	
Dist.	Corrn.	Dist.	Corrn.
3.6 - 5.3	/ 0.010	0.5 - 1.3	0.000
5.3 - 7.1	/ 0.008	1.3 - 2.1	- 0.002
		2.1 - 2.9	- 0.004
		2.9 - 3.7	- 0.006
		3.7 - 4.6	- 0.008
		4.6 - 5.3	- 0.010



SUMMARY OF VELOCITY CORRECTIONS

Survey HY-1256 -- Depth Recorder 153 SPK

Date	Day	Depth (Feet)	Corrn. (Feet)
12 May	a	to 12	/ 0.4
		12.2 - 27.5	/ 0.6
		27.6 - 30.0	/ 0.8
13 May	b	20 - 21.5	/ 0.6
14 May	c	21.6 - 23.0	/ 0.8
		23.1	/ 1.0
23 May	d	use 0.0 for all depths	

APPROVAL

smooth sheet (H-8294WD)  
The records and boat sheets for Survey HY-1256 are approved as submitted. Prior to my assuming Command on 1 June the survey was directed by Captain J. C. Partington. All work after that came under my personal supervision. The boat sheet was examined each day and the sounding and wire drag volumes and fathograms were inspected frequently. The survey is complete and adequate for its purpose as outlined in the instructions.



Walter J. Chovan  
CAPT, C&GS  
Commanding Officer  
Ship HYDROGRAPHER

GEOGRAPHIC NAMES

Survey No. ~~H~~ 8294 W.D.

Name on Survey	A	B	C	D	E	F	G	H	K	
										1
										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 5294 Wire Drag

Records accompanying survey:

Boat sheets .2...; sounding vols. ...2; wire drag vols. ...2...;  
 bomb vols. ....; graphic recorder rolls 4-Envelopes  
 special reports, etc. 1-Descriptive report, 3-Boat sheets Chart  
 576 and 6-Overlays, 1-Smooth sheet, A-D Diagram, and 3-Overlays.  
 .....

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

	Sdgs	W.D
Number of positions on sheet	160	153
Number of positions checked	14	56
Number of positions revised	2	*
Number of soundings revised (refers to depth only)	2	0
Number of soundings erroneously spaced	-	0
Number of signals erroneously plotted or transferred	-	0
Topographic details	Time	1
Junctions	Time	2
Verification of soundings from graphic record	Time	1 hr
Verification by <i>W.P. Ingersoll</i> <i>Soundings; E.E. Thomas</i>	<i>20</i> Time <i>13</i> Sounding A&D overlay	<i>33</i> hrs Date 9-28-56
Total time	85	9-20-56
Reviewed by <i>Ingersoll</i>	Time 28	Date 9-27-56

\* A number of signs of fixes indicating directions of angles between end buoys and signals were reversed in the sounding volumes.

L 553(50)  
L 575(50)

THE UNITED STATES OF AMERICA

DEPARTMENT OF JUSTICE

WASHINGTON, D. C. 20535

INVESTIGATION OF THE ACTS OF VIOLENCE

PERPETRATED BY THE BLACK PANTHER PARTY

IN CONNECTION WITH THE MURDER OF

DR. MARTIN LUTHER KING, JR.

ON APRIL 4, 1968, IN MEMPHIS, TENNESSEE

AND IN CONNECTION WITH THE

MURDER OF

REVEREND JAMES EARL RAY

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REVEREND JAMES EARL RAY

ON APRIL 4, 1968, IN MEMPHIS, TENNESSEE

DIVISION OF CHARTS  
REVIEW SECTION - NAUTICAL CHART BRANCH  
REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-8294WD

FIELD NO. HY-1256WD

Florida, Key West, Southwest Channel

Project No. 13280

Surveyed - April - July, 1956

Scale 1:10,000

Soundings:

Control:

808 Fathometer

Shoran  
Sextant fixes on  
shore signals

Chief of Party - J. C. Partington and W. J. Chovan  
Surveyed by - J. E. Waugh, E. K. McCaffrey and R. J. Black  
Protracted by - L. W. Heilman  
Soundings plotted by - L. W. Heilman and A. M. Cook  
Verified and inked by - Soundings - E. Thomas  
Wire-drag - I. M. Zeskind  
Reviewed by - I. M. Zeskind 9-27-56  
Inspected by - R. H. Carstens

1. Shoreline and Control

The shoreline originates with air-photographic survey T-5546 (1938) and Chart 576, dated 7-12-54.

The source of the control is described in the Descriptive Report.

2. Adjoining Surveys

There are no conflicts between the present wire-drag survey and the soundings on the prior wire-drag surveys H-2873WD (1907), H-2932WD (1907-14) and H-2933WD (1908-15) in the area of the overlap. Since the purpose of the present wire-drag survey was to provide a maximum effective depth of only 23 ft. in the Southwest Channel the prior wire-drag effective depths have not been combined with the present survey effective depths. The project survey on the southwest has not yet been received in the Washington Office.

3. Comparison with Hydrographic Surveys

A comparison will be made with the project survey showing contemporary hydrography when it is received in the Washington Office.

4. Comparison with Chart 576 (Latest print date 7-12-54)  
Chart 584 (Latest print date 5-3-54)A. Hydrography

No conflicts were noted between the charted soundings and the effective wire-drag depths of the present survey.

Charted depths over groundings listed in paragraph N of the Descriptive Report were applied to the charts through chart letter 553 (1956), except as follows:

<u>Cleared depth - feet .</u>	<u>Latitude</u>	<u>Longitude</u>
23 <sup>✓</sup>	24°32.02'	81°49.94'
19 <sup>✓</sup>	24°32.04'	81°50.05'
21 <sup>(Not charted)</sup>	24°31.66'	81°50.58'
22 <sup>✓</sup>	24°32.48'	81°49.28'

B. Aids to Navigation

The present survey positions of aids to navigation are in substantial agreement with the charted positions and adequately mark the features intended, except for lighted buoy (QKFL R) "10", charted in lat. 24°30.79', long. 81°50.78', which falls about 80 meters to the northwestward on the present survey.

5. Condition of Survey

a. The Descriptive Report is complete and comprehensive.

b. The information recorded in the sounding volumes is adequate, except for the following:

(1) The lift of the drag was not recorded on G day.

(2) Signs indicating the direction of the angles between the signals and the end buoys were reversed in a number of fixes. Because of the foregoing one drag strip which was erroneously smooth-plotted had to be replotted during verification of the survey.

c. The survey was neatly smooth-plotted, however, the following procedures were not in accord with the Washington Office practice or with the instructions in the wire-drag manual:

(1) Actual soundings obtained at groundings and depths to which the groundings were cleared, were not noted on the A and D sheet.

(2) Groundings were not encircled on either the smooth sheet or the A and D sheet.


6. Project Instructions


The survey covers the area specified in the Project Instructions.


7. Additional Field Work Recommended

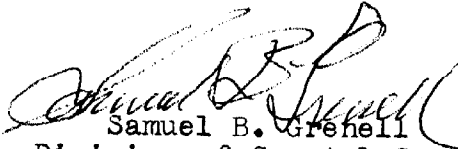
No additional field work is recommended.

Examined and Approved:

  
H. R. Edmonston  
Chief, Nautical Chart Branch

  
Charles A. Schanck  
Chief, Chart Division

  
J. C. Bull  
Chief, Hydrography Branch

  
Samuel B. Grenell  
Chief, Division of Coastal Surveys



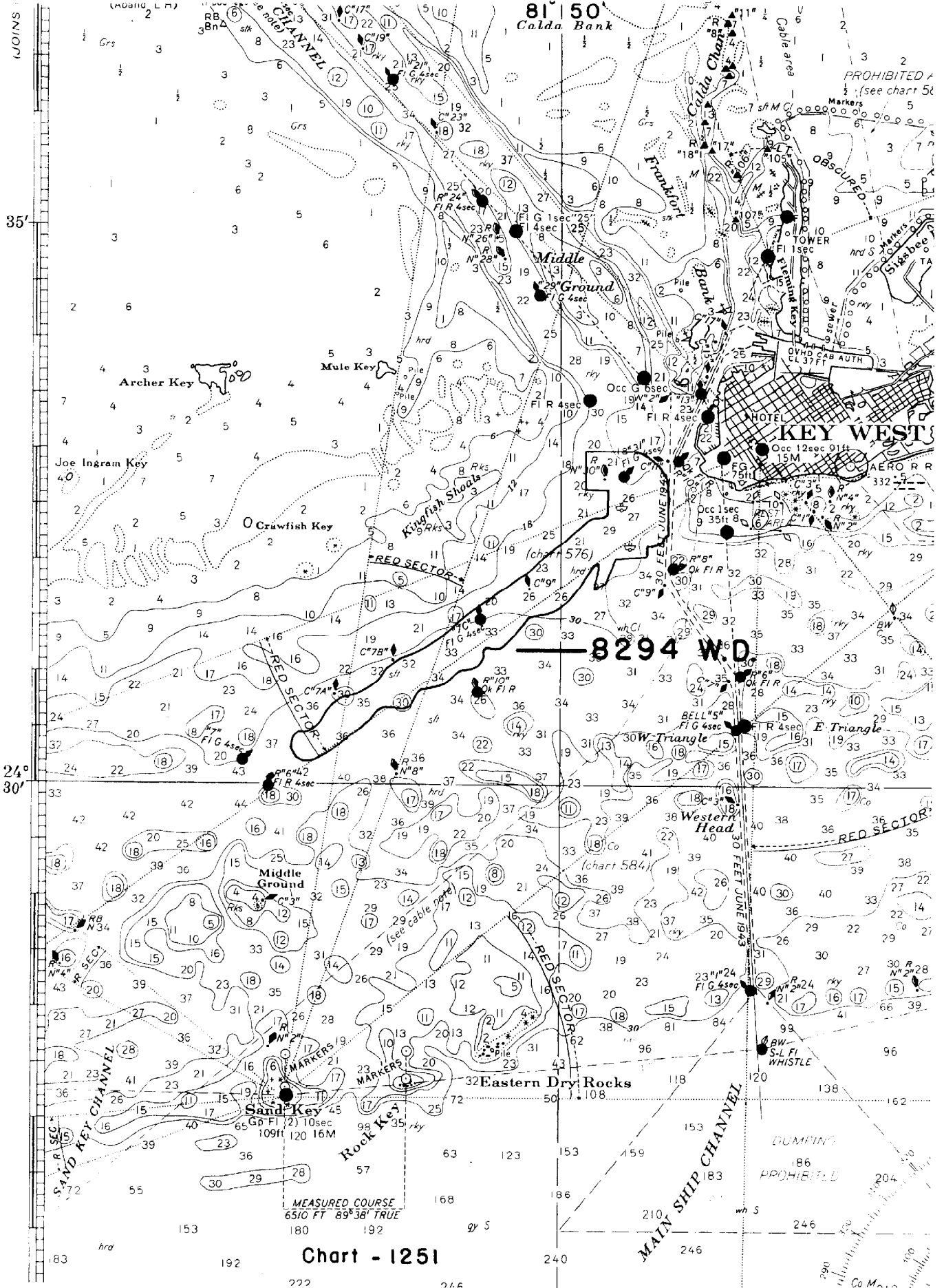


Chart - 1251

RHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~DIVISION OF Coastal Surveys~~

29 August 1956

Division of Charts: R. H. Carstens:

Plane of reference approved in

4 volumes of ~~sounding records~~ wire drag records for

HYDROGRAPHIC SHEET 8294

Locality Key West, Florida

Chief of Party: J. C. Partington in 1956

Plane of reference is mean low water, reading

4.3 ft. on tide staff at Key West

8.8 ft. below B. M. 29 (1923)

Height of mean high water above plane of reference is

1.3 feet.

Condition of records satisfactory except as noted below:



Branch

Chief, ~~Division of Tides and Currents~~

# NAUTICAL CHARTS BRANCH

SURVEY NO. H-9294 WD

## Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
8/23/52	576	C.R. Wetmann	Before <del>After</del> Verification and Review <i>Partially</i>
1/7/57	1251	F.P. McGinnis	<del>Before</del> After Verification and Review <i>Completely applied</i>
3/28/57	584	M. Rogers	Before After Verification and Review <i>fully appld.</i>
4-10-57	1351	R.K. de Lawder	<del>Before</del> After Verification and Review <i>Then Ch 1251</i>
13 May '57	576	H. MacEwen	<del>Before</del> After Verification and Review <i>Fully applied.</i>
7 Aug '57	1252	H. MacEwen	<del>Before</del> After Verification and Review <i>no cor.</i>
6/10/58	854	J.P. Allen	<del>Before</del> After Verification and Review <i>Fully applied then Ch 584</i>
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
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			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.