9174
WIRE DRAG

Diag. Cht. No. 1239-2.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey WIRE DRAG

Field No. RH 80/20-1-69WD Office No. H-9174

LOCALITY

State SOUTH CAROLINA

General locality CHARLESTON

Locality APPROACHES TO CHARLESTON HARBOR

19 69

CHIEF OF PARTY

LCDR CHRISTIAN ANDREASEN

USCOMM-DC 37022-P66

Cht.
491
1239
1239 distr. forward till review of report See ...
1110
1007
1111
1001

9174 WIRE DRAG

DESCRIPTIVE REPORT

To
Accompany

Wire Drag & Hydrographic Investigations

PROJECT OPR-436

C H A R L E S T O N, S O U T H C A R O L I N A

1969

- -

Ships RUDE & HECK

LCDR Christian Andreasen - Chief of Party

- -

A. PROJECT:

Revised instructions are dated 27 March 1967 for PROJECT OPR-436. Amended instructions dated 18 March 1968. Amended instructions dated 31 May 1968. On 5 September 1969, radio message from Atlantic Marine Center stated, "NOT necessary to wire drag Item 7 further, Item 6 cancelled."

B. AREA SURVEYED & DATES:

The area surveyed includes the coastal area off the entrance to Charleston harbor, Charleston, S. C., covered by C&GS Chart 1239. Wire drag and hydrographic investigations in the project area were concerned with specific items and did not include any extensive area coverage. Items were investigated as per the instructions and detailed notes. Generally the area covered with the drag was a mile radius around each item.

The Ships RUDE & HECK began working on PROJECT OPR-436 on 9 April 1968. Operations on OPR-436 were terminated 19 June 1968, so the RUDE & HECK could shift to emergency Project AMC SP-6-68 in Wilmington, N.C.

During the 1968 RUDE & HECK operation on OPR-436 in Charleston, S. C., A thru D days were recorded using a combination of Sea-fix and visual fixes for control at Item 4. Of this recorded data,

FORM C&GS-537 (5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

H-9174

INSTRUCTIONS - 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.

RH 80/20-1-69WD

State SOUTH CAROLINA

General locality CHARLESTON

Locality APPROACHES TO CHARLESTON HARBOR

Scale 1:40,000 Date of survey Mar. 13 to Sept. 6, 1969

Instructions dated 27 Mar. 1967; 18 Mar. 1968 Project No. OPR-436

Vessel RUDE-HECK

Chief of party CHRISTIAN ANDREASEN

Surveyed by SHIPS OFFICERS

Soundings taken by echo sounder, hand lead, pole

Graphic record scaled by SHIP PERSONNEL

Graphic record checked by SHIP PERSONNEL

Protracted by BILLY JOE STEPHENSON Automated plot by

Drag strips inked by:
~~Soundings~~ by BILLY JOE STEPHENSON

Soundings in ~~XXXXX~~ feet at MLW ~~XXXX~~

REMARKS: Verification was limited to soundings, groundings, and hangs only This information was inked and appropriately annotated on the smooth and A+D sheets. The smooth plotted positions of some groundings were revised during the present processing, however, it was not considered necessary to revise the affected effective depth strips. Accordingly, the cleared depths on the A+D sheet, especially in the immediate vicinity of groundings and hangs, should not be regarded as fully verified and are to be used for reference purposes only. No further processing of this survey is planned.

K.W.W. 12-11-75

Plotted Ruth Carstens (2/11/75

The Record Of Application To Charts form is in error. This survey is not formally verified thus contradicting the entries on the applications form indicating application to the charts "... After Verification...". K.W.W. 12-11-75

Survey now considered to be in Cat. 1. Ruth Carstens 9/13/79

Applied to Stds. 6/30/71

USCOMM-DC 37009-P

APPROVAL SHEET

The attached report, records, and plotting sheets have been inspected by me and are approved.

Christian Andreasen

Christian Andreasen
LCDR USESSA
Commanding OFFICER
USC&GSS RUDE & HECK

Note: Smooth processing of records for this project is incomplete at this writing, January 1970. Because of the short winter layup, processing could not be completed prior to sailing for the 1970 field season. All data are being transferred to the Atlantic Marine Center, as per their instructions, for completion of the smooth processing.

Smooth processing is complete except the smooth plot of items 3 & 7 and the final Area and Depth sheet based on smooth data.

Processing was completed and all smooth
plotting done by Verification Branch, AMC

A and D days were rejected because they were short strips (7 & 8 fixes respectively) with very little area covered due to toppled buoys throughout the strips. B day had been reduced, but had no lifts below 4 feet. The strip ran in a NW direction and did adequately cover the 1-mile circle. C day had 3 feet of lift throughout the strip. This strip started after the drag had entered the 1-mile circle and ran aground about 2/3 of the distance across it.

All data from the 1968 field season, A thru D days, was rejected prior to the 1969 field season and item 4 was redragged. This also eliminates the need to plot Sea-fix arcs on the smooth sheet.

The 1969 field season began on 26 February 1969 and PROJECT OPR-436 was completed on 8 Sept. 1969, except that Item 7 was only wire dragged in one direction and Item 6 was cancelled as per instructions from the Atlantic Marine Center.

It should be noted that Items 1 thru 4 were worked on sporadically with no apparent organization. This was necessary so wire drag operations and Naval minesweeping operations would not conflict.

C. VESSELS AND EQUIPMENT:

The Ship RUDE & HECK acted as end and guide launches respectively during the offshore wire drag. The RUDE & HECK launches RU-1 and HE-1, equipped with DE-723 fathometers, were alternated as the drag tender. During inshore drag operations, a launch and one ship or two launches were used as towing vessels. When two launches were used as towing vessels, then either the RUDE or HECK skiff was used to tend the drag.

VESSEL	COLOR	
HECK	red	Ship
RUDE	blue	Ship
HE-3	green	Launch
RU-3	purple	Launch
HE-1	brown	Skiff
RU-1	orange	Skiff

Hydrography was done by the Ship RUDE while the ship HECK was undergoing repairs to the Dodge clutches.

The Ships RUDE & HECK are equipped with gyro systems. During ship drags, cuts to the end buoy and opposite vessel were made by gyro repeater.

Standard wire drag equipment was used throughout the survey, except that all toggles were weighted with one, one-half inch shackle. This was done to attain the same buoyancy as was used on

the Hilgard-Wainwright drag gear. Early experiences with the drag had shown a tendency towards excessive lift. Calculations then were made, which showed that the new drag had a net one-half pound of positive buoyancy per 100 feet unit. Thus the shackle was added to each toggle to compensate for this difference.

SOUNDING EQUIPMENT:

RUDE	DE-723	s/n	1275
HECK	DE-723	s/n	1273
RU-3	DE-723	s/n	1271
HE-3	DE-723	s/n	1283

D. SMOOTH SHEET: → Plotted by verification Branch, PMC

A 1:20,000 boat sheet and two mylar copies were made on the Pacific Marine Center plotter at the request of this command. The ship's force completed the sheets by connecting the Lat.-Long. marks, labelling the control stations, and adding the Raydist arcs.

In accordance with instructions, the largest scale chart of the area, C&GS 1239, was used as a boat sheet for items that did not fall on the 1:20,000 sheet. The ship's force constructed Raydist arcs on three C&GS 1239's. 491(11523).

A copy of each boat sheet was used during the actual field operation, with the actual plotting being done on overlays. When the field work was complete the overlays were transferred to the master boat sheet.

Upon arrival at the Atlantic Marine Center in September 1969, this command was told to construct the smooth sheet. Although the master boat sheet was done at smooth sheet accuracy, it did not clearly depict the deepest strips obtained in each area. The master boat sheet is a plot of all strips obtained, excepting those that were rejected because of high lift or lack of tests.

E. CONTROL:

Both visual and electronic control procedures were utilized in different areas of the project.

Visual control utilized the standard three-point fix method. Standard dual vessel control methods were used where visual control was available. Cuts to the end buoy and to the opposite vessel were taken immediately after the fix. Whenever possible, the ships took cuts by the port or starboard gyro repeaters. When the repeaters were inoperative or not available, such as launch drag, then cuts were taken to a fixed object. Cuts to a fixed object were labelled

plus (+) if the object was to the right of the signal used, and minus (-) if the object was to the left.

During times when one ship's Raydist navigator was inoperative, single vessel control was used as per the Wire Drag Manual (Pub. 20-1) Section 3-5. One ship's position was controlled by Raydist with the other ship's position being computed from the measured angles "A" and "S" along with the known towline as a base. Towline length was increased to 1,000 feet to give a better baseline. Although this method is rather awkward and can only be used on drags up to 6,000 feet, it does provide a means of operating even though one shipboard unit is down. Note that if the vessels are operating beyond the range of visual signals and the gyro is inoperative, that the measurement of angle "S" of the single vessel control will give a cut to the end buoy.

When visual control was not available, the Raydist DR-S system of electronic control was used. A separate Raydist report is attached, see attachment No. 4.

A listing of all signals (visual and electronic) used is given in attachment No. 3.

F. SHORELINE:

The majority of the project was plotted on C&GS Chart 1239. Wire drag item 4, and hydrographic investigations 5 and 6 were to be investigated at the 1:20,000 scale. No shoreline was added to the 1:20,000 sheets, since all of the areas involved were offshore items.

G. TIDAL REDUCERS:

Preliminary reduction of each day's data was made using predicted tides for the Standard Tide gage at Customhouse Warf, Charleston, S.C.

Actual Tidal data was furnished by the Rockville Office for the Standard Tide gage at Customhouse Warf, Charleston, S.C.

All data was corrected, HW and LW -0^h17^m and 0.0 feet.

Actual tides were entered in the volumes.

No portable gages were installed.

H. CROSSLINES:

A system of crosslines for Item 5 was planned by extending the required percentage of lines in Item 6. On short notice, Item 6 was cancelled and orders to sail received. No crosslines for Item 5 exist.

I. JUNCTIONS:

The items investigated formed no junctions with other surveys.

J. SPLITS:

All wire drag areas were covered without splits, except Item 7 which was not completed in both directions. Item 5 was covered sufficiently, however, three minor splits remain exceeding the required spacing by 26, 20, and 10 meters. > refers to [illegible] on Appendix I from F.S.

K. GROUNDINGS AND SHOALS:

See Attachment No. 5, List of Investigations.

L. DISCREPANCIES AND COMPARISON WITH PRIOR SURVEYS AND CHARTS:

See Attachment No. 5, List of Investigations.

M. CURRENTS:

Drag strips were planned with the use of Table 5 - Rotary Tidal Currents of the Coast and Geodetic Tidal Current Tables. Items 3 and 4 were dragged from NE towards SW with no problem. The drag time matched the direction of current. Attempts to drag from SW towards NE gave excessive lift. Drags were set on several days at various stages of tide, but none were successful. Since too much time was lost with no success, those items were redragged in a north-south direction. There is apparently a trend for a south-westerly current in this area. Whether the current is a bottom current or a wind-driven current is not known.

It was found that a record of direction of successful drag versus the tide curve was extremely helpful for planning future drag strips.

N. ADEQUACY OF SURVEY:

This survey is considered adequate with respect to the wire drag requested. See discussion under Attachment No. 5 of Item 7.

O. AIDS TO NAVIGATION:

Aids to navigation both floating and fixed are adequate for the area.

1. Bull Breakers Offshore Drill Rig Lighted Buoy "B" [illegible] Lat: 32°44.46' North Long: 79°34.47' West. Charted Posn Lat 32°44.40' North Long 79°34.30' West.

A discrepancy between the plotted position of buoy R8 at the fish haven and its actual location was found. Its actual location was such that items of junk making up the fish haven with a least depth of 16.0 feet were not properly watched by the buoy. A notice to mariners was issued and the Charleston Coast Guard command advised of the situation. Buoy R8 was relocated to the position plotted on C&GS Chart 1239.

FORM C&GS-712
(10-67)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

April 30, 1971

~~Marine Chart Division~~: Atlantic Marine Center

Plane of reference approved in
10 volumes of sounding records for

HYDROGRAPHIC SHEET H9174

Locality: Charleston, S.C.

Year:
~~Chief of Party~~: 1969

Plane of reference is mean low water

Tide Station Used (Form C&GS-681):

Charleston, S.C.

Height of Mean High Water above Plane of Reference is as follows:

5.2 feet

Remarks Tide reducers have been revised in red and verified as follows:

Vol.	Pos.
XI	Ax 39-49

J. M. Symons
Chief, Tides and Currents Branch

USCOMM-DC 50117-P67

STOCK NO. 37
(4-30-57)
COMM-DC 28424

OPR-436
1969

	DATE	DAY LETTER	VOL. NO.	NAUTICAL MILES	RUDE&HECK NO. OF POSITIONS	TENDER SOUNDINGS	TENDER POSITIONS	
	13 Mar.	A	I	1.5	42	1	1	
	15 Mar.	B	I	1.3	42	1	1	
	16 Mar.	C	I	2.0	104			
	27 Mar.	D	I	0.5	40			
	28 Mar.	E	II	2.6	56	1	1	
	29 Mar.	F	II	2.5	78			
	30 Mar.	G	II	2.6	134			
	2 Apr.	H	II	1.8	80			
	25 Apr.	N	III	2.5	48			
	26 Apr.	P	III	3.0	80	2	2	
	27 Apr.	Q	III	3.0	90			
	7 May	R	III	2.5	74			
	8 May	S	IV	1.8	50			
	12 May	T	IV	2.9	60			
	13 May	U	IV	2.5	50			
	20 May	W	IV	2.7	62			
	21 May	X	IV	2.7	54			
	24 May	Y	V	2.4	58			
	25 May	Z	V	4.5	110			
	3 June	AA	V	2.9	112			
	5 June	AB	VI	2.7	86			
	7 June	AC	VI	2.4	54			
	8 June	AD	VI	2.5	100	1	1	
	11 June	AE	VII	2.7	144			
	18 June	AF	VII	3.5	82			
	22 June	AG	VII	1.7	44			
	24 June	AH	VIII	1.1	94			
	25 June	AJ	VIII	0.6	12			
	1 July	AK	VIII	3.4	94			
	2 July	AL	IX	2.9	68			
	3 July	AM	IX	1.9	94	1	1	
	5 July	AN	IX	5.0	102	3	3	
	6 July	AP	IX	1.0	35	1	1	
	8 July	AR	IX	1.9	60	1	1	
	10 July	AS	X	2.1	50	1	1	
	17 July	AT	X	5.1	106			
	18 July	AU	X	0.6	18	1	1	
	19 July	AV	X	2.7	88			
	22 July	AW	X	2.6	48			

STOCK NO. 37
(4-30-57)
COMM-DC 28424

	DATE	DAY LETTER	VOL. NO.	NAUTICAL MILES	RUDE&HECK NO. OF POSITIONS	TENDER SOUNDINGS	TENDER POSITIONS		
	30 July	AX	XI	2.7	98				
	2 Aug.	AY	XI	3.5	96				
	3 Aug.	AZ	XI	3.2	96				
	6 Aug.	BA	XI	2.6	68	1	1		
	7 Aug.	BB	XII	0.5	18	1	10		
	12 Aug.	BC	XII	4.3	116				
	16 Aug.	BD	XII	5.3	124				
	17 Aug.	BE	XII	4.8	102	1	1	**	
	18 Aug.	BF	XII	3.7	96	1	1		
	19 Aug.	BG	XIII	0.4	8	1	1	**	
	26 Aug.	BH	XIII	1.5	62				
	27 Aug.	BJ	XIII	0.8	14				
	1 Sept.	BK	XIII	1.2	52	1	1	**	
	4 Sept.	BL	XIII	3.1	70				
	5 Sept.	BM	XIV	1.7	44				
*	6 Sept	Numbered 2az	XIV	–	0	1			
	Note:								
	7 July	aq	Rude launch	–	3	~~1~~ 2	~~1~~ 3	Divers out to area by launch to investigate buoyed wreck.	
	TOTALS	54	14	133.9	3,765	22	22		

AREA 42.2 ~~Square Nautical Miles~~

* On Sept 6 1969 two launches went out to item #7 [illegible] obtained a leadline on obstruction [illegible] that area. They found the obstruction by setting a short drag between them and [illegible] without any control except they knew about where to find [illegible] since it was in the area of the Nav Buoy "R8". A leadline of 19ft was obtained on hang of obstruction [illegible] on the day on position #23 Strip #1. Actual tide for the time that Leadline was taken was 2.0ft 19ft − 2ft = 17.0ft J.V.M.

** Unable to find tender soundings or positions.

ATTACHMENT II

TIDE NOTE

Hourly tide heights were supplied by the Washington Office (Chief, Tidal Section C-3312) as observed at Charleston Harbor Entrance, Standard Tide Gage - corrected by subtracting 17 minutes from each hourly height. (75th Time Meridian)

The tide gage was leveled prior to commencement of field work and upon completion of the project.

ATTACHMENT III

NAME		SOURCE		
BEACH	△	~~Folly~~ Beach, 1965	G 13578	1965
CHAR	△	Charleston Light ~~House~~ 1963	G 13361	1963
CHIM		Established 1969 Isle of Palms		
LITE	△	CHARLESTON ~~Abandon~~ Light House, 1890, 1963	G 1669	1963
LOOK	△	Dewees Island Coast Artillery Tower, 1963	G 13361	1963
LOR	△	Folly Beach Coast Guard Loran Mast, 1956-63	G 13361 G 11117	1963
NAN	△	Sullivans Island Township Comm. Water Tank, 1963	G 13361	
NEW	△	Fort Moultrie New Tank, 1942-63	G 13361 G 5492	1963
PAL	△	Isle of Palms MUNICIPAL ~~Mun.~~ Water Tank, 1963	G 13361	1963
RAY		Raydist Site Established 1969		
TAN	△	Folly Beach Water Tank	G 13361 G 11117	1963

RAYDIST REPORT

GENERAL

The Ships Rude & Heck operate under the unique situation of dual party operation where the mobile units frequently are required to be within close proximity of one another. The ships are normally docked outboard of one another or within one shiplength of each other. Dockside calibration was attempted with data being recorded as shown in Fig. #1. Experience thus far has shown that dockside calibration is useful, but unreliable as a calibration method for the field work. It has been observed that the Raydist will often either gain or lose whole lanes when maneuvering within 50 feet of one another. Thus, when the outboard vessel maneuvers to dock or undock, lanes may be lost or gained. The only way of assuring a true calibration of the field work is to calibrate by sextant fix, fixed aid, or buoy calibrate. Since dock space is usually some distance from the working grounds and in areas of electrical noise, it has been normal procedure to calibrate in the working grounds by one of the other methods with the ships separated by a satisfactory distance.

Observation of the Raydist aboard the docked vessel with the second vessel making an approach has been made. At a distance of 1/2 to 3/4 mile, the docked vessel experienced .01 or .02 lane shift. The shift did not approach 0.10 lane until the vessels were between 50 and 200 feet apart, which is still insignificant since whole lanes are not affected. As the vessels move to within 50 feet of one another, there is a sudden shift of 0.7+ lane, which often rolls enough to cause a one or two lane shift. This shift has only affected the dockside calibrations and has in no way hampered field work. During the past season, there were no instances of lane loss or gain due to close proximity of the vessels. It is normal practice for the second vessel to hookup to the double toggles after the first vessel has payed out 300+ feet of wire, thus maintaining sufficient separation of the vessels.

During the entire 1969 field season, the Heck frequency was 3300.400 kc; and the Rude frequency, 3300.425 kc. This separation of 25 cycles was quite small. The stations would occasionally drift and interfer with one another. This occurred twice on the Charleston project. Between the 1969 and 1970 field seasons, it was agreed between Hastings' Raydist and this Command that the Rude's frequency would be shifted to 3300.465 kc in an attempt to improve overall operation of the system with a 65 cycle separation.

Overall operation of the Raydist during the 1969 field season was quite satisfactory, with only 54 hours of "down time" attributed to the Raydist during the entire season. Some of this down time was not actually lost because the vessels shifted to visually controlled items during these times. It should be noted that on a number of occasions one vessel's navigator would be inoperative and the vessels were forced to use single vessel control as per the Wire Drag Manual. This was not considered "down time" because the vessels continued to wire drag, but this did affect efficiency since drags are limited to a maximum length of 6,000 feet when single vessel control is used.

EQUIPMENT

Ship HECK	navigator	s/n	48
Ship HECK	transmitter	s/n	28
Ship RUDE	navigator	s/n	49
Ship RUDE	transmitter	s/n	25
Red station		s/n	34
Green station		s/n	35
Hastings Green station (loan)		s/n	50

Hastings Green station used from 6 August thru 26 August, 1969.

ITEM 1

Much local interest existed concerning this item. The general consensus was that a World War II German Submarine had sunk there. Background information led us to the belief that the item would be found. However on ~~12~~ 8 May, the item was cleared to an effective depth of ~~45~~ 51 feet. In addition to the dragline, a sonar search using the HECK's profiles, sea scaner, and fathometer was made. The search results were negative.

On 16 July, the USCGC CAPE MORGAN accompanied the RUDE & HECK to the site of Item 1 to determine if the LORAN position would agree with the Raydist location. A local fishing vessel claimed to have crossed the item and found it as charted using loran. LORAN and Raydist agreed to within .15 miles. The item is clear one mile in all directions. The obstruction should be removed from charts of the area. Concur

ITEM 2

Work commenced on this item in March. It was hung ~~twice~~ once at 37 ft at position 32°36.~~3~~ 0'N, 79+40.1~~6~~'W. Item 2 was cleared to 35 feet effective depth based on actual tides. Charts of the area plot the wreck at 36 feet. Charts should be corrected to indicate 35 feet cleared by wire drag. Concur

ITEM 3

Item 3 was completed on 24 July. The obstruction reported was not disproved by wire drag. ~~in both directions for a distance of one mile.~~ It should not be removed from charts of the area.
Cleared to 30 ft. but existence not disproved. ✓
DRE 8-23-72

ITEM 4

Cleared by 32 ft on AD day

Item 4, a 20foot obstruction, was disproved by completing wire drag in both direction for a distance of one mile in all directions. Item 4 should be removed from charts of the area. Concur

ITEM 5

Hydrography on 30 meters line spacing was completed except for crosslines which were planned for by extending several lines from Item 6. Item 6 was cancelled and sailing orders prevented additional work on Item 5. Three splits remained exceeding 30 meters by 26, 20, and 10 meters. Depths of 33 feet and less are reduced by actual tides and plotted on the boat sheet. No change to charts of the area is recommended. Concur (See overlay for this item bound elsewhere in this D.R.)

ITEM 6

Item 6 was cancelled by AMC msg. 051635Z September 1969.

ITEM 7

An obstruction was located on Item 7 with a least depth of ~~16~~ 17 feet, verified by lead line and divers, at 32°44.4~~0~~'N latitude, 79°34.5~~4~~'W longitude. This obstruction should be added to charts of the area ~~with a note indicating that additional junk will be added to the reef from time to time.~~ 17 ft sounding not cleared

It is also recommended that the semicircular area, previously shown as a practice mine field, continue to be shown because the objects that make up the fishing reef are widely scattered. This area should show the wire drag effective depth and date of survey. Since this is an active dumping area, no guarantee can be made that the wire drag effective depth obtained will remain thusly in the future. The Charleston Chamber of Commerce is responsible for and in charge of the construction of the reef.

ITEM 8

Two obstructions were located in the vicinity of Item 8. One at latitude 32°45.7~~8~~'N, longitude 79°44.~~83~~'W had a least depth of 9.~~0~~ feet; the other at latitude 32°45.~~81~~'N, longitude 79°44.~~81~~'W ~~had a least~~ hung at a depth of 1~~2~~.0 feet. Both obstructions were verified by lead line and divers. The obstructions were loaded stone barges sunk to foil Civil War blockade runners. These obstructions should be added to charts of the area cleared by wire drag. A notice to mariners was issued on this item. The records do not contain any reference to diving activity on these hangs. The charts should be revised to agree with the present survey.

All that remains at these two points are large stones (6 to 8 feet across), thus it is recommended that the chart show an obstruction symbol rather than a wreck symbol.

ITEM 9

Item 9 (sunken wreck PD) was located at latitude 32°46.~~4~~'N, longitude 79°43.~~7~~'W with a least depth of 1~~7~~.0 feet and verified by lead line and divers. The (wreck PD) should be removed and a wreck cleared by wire drag, plotted on charts of the area. Concur to an effective depth of 14 ft.,

ITEM 10

This is a new item consisting of two Civil War blockade runners, the Mary Bowers and the Georgian, both at the same general location. The least depth of ~~9~~.0 feet is at latitude 32°46.80'N, longitude 79°45.6~~1~~'W. These wrecks were being excavated by a local marine

ITEM 10 (Cont'd.)

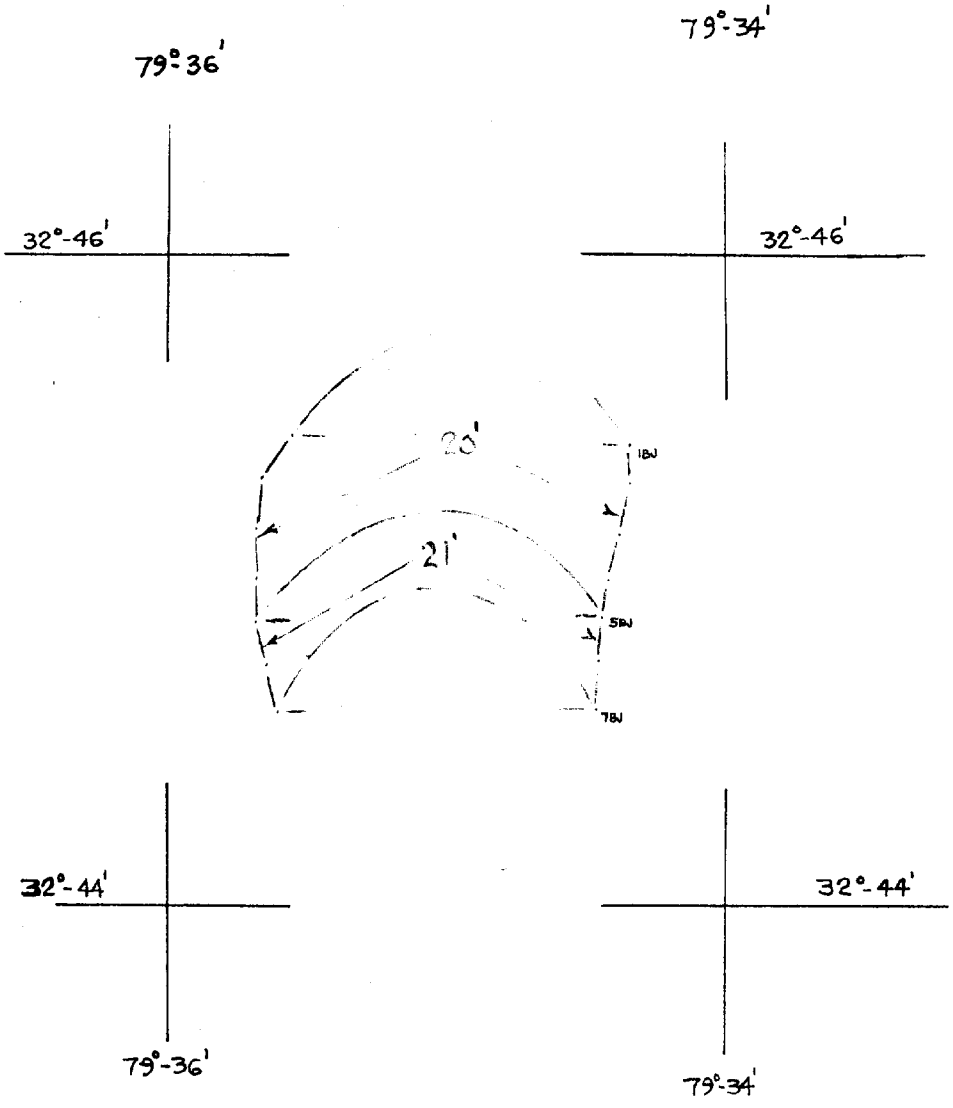
archeologist E. Lee Spence making it impossible to drag the area by wire. However, the least depth was obtained by lead line and divers after consultation with divers working the area as to the highest point on the wrecks. Charts of the area should be corrected to show the wrecks and the least depth obtained, 69 feet. A notice to mariners was issued on this item. Concur

ITEM 11

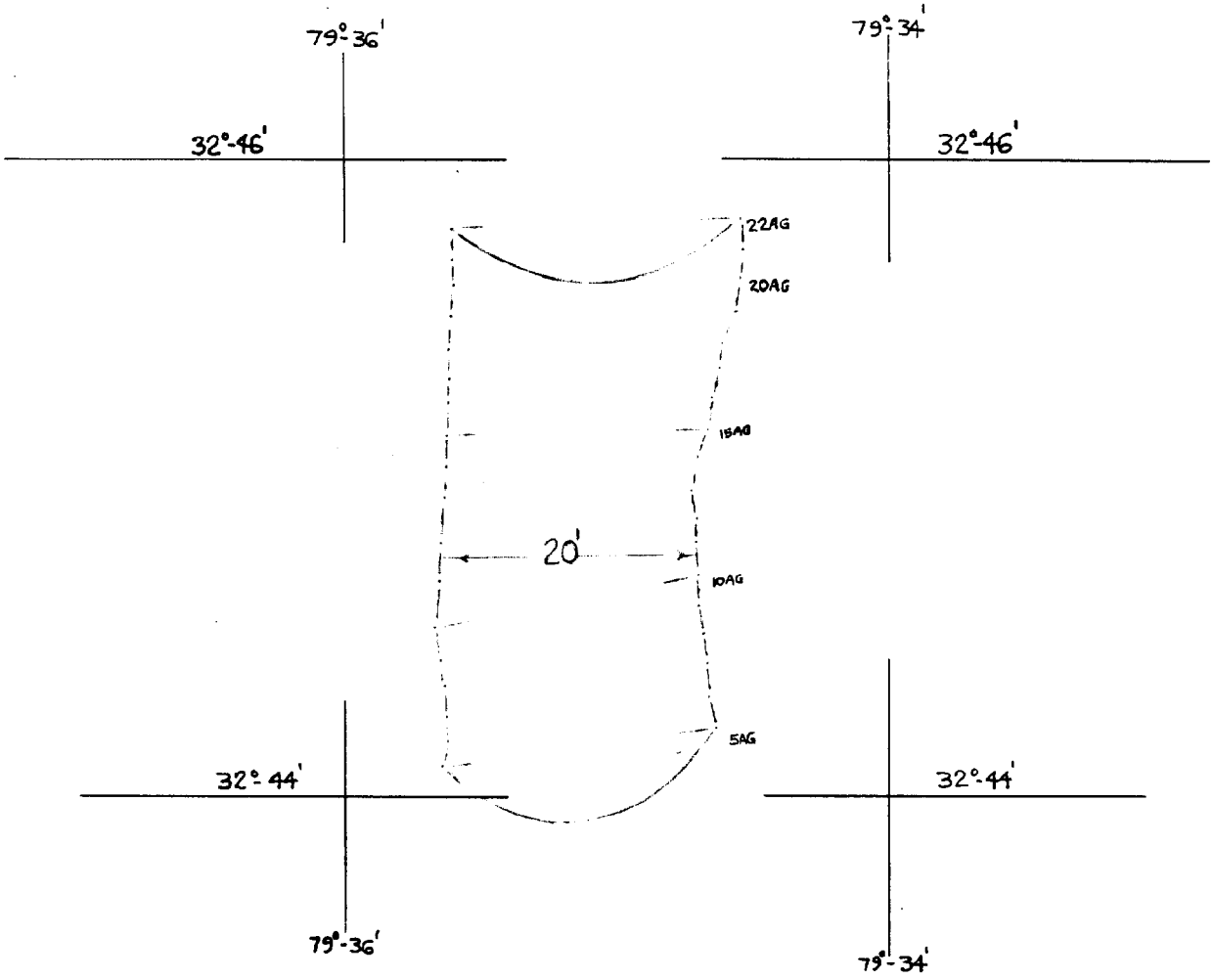
The Civil War blockade runner, Constance, was a new item located by wire drag at latitude 32°46.52'N, longitude 79°45.65'W, least depth 45.5 feet as verified by lead line and divers. Charts of the area should be changed to show the wreck and least depth obtained. Concur The high point of the wreck was hung in opposite directions to prove this to be the shoalest point. ~~Note: On 6 August, this same wreck was hung and a least depth of 9.3 feet was obtained.~~ A notice to mariners was issued on this item.

NOTE: On items 3 and 4, the drag was to be set so as never to pass within 5 feet of the bottom because of the possibility of unexploded ordinance.

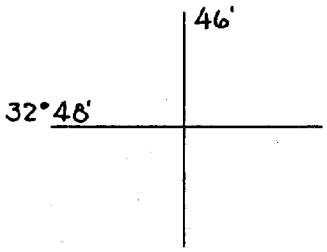
note: both wreck sites "Georgiana" & "Mary Bowers" and the "Constance" were discovered by E. Lee Spence of Sullivan's Island, S.C. 29482 (P.O. Box 211)

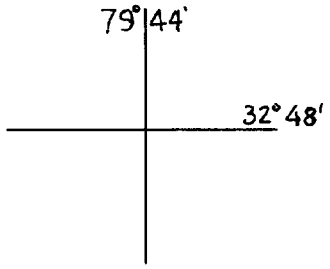


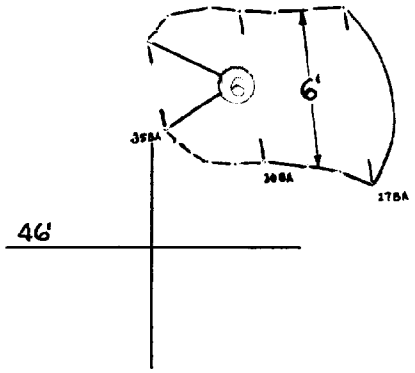
ITEM NO. 7
Line 1 to 7AU

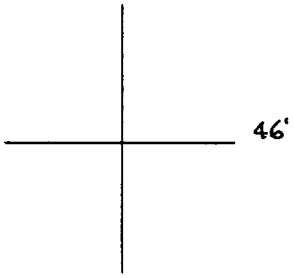


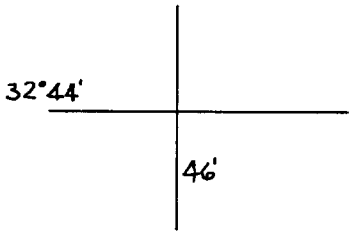
ITEM NO. 7
Line 5 to 22AG

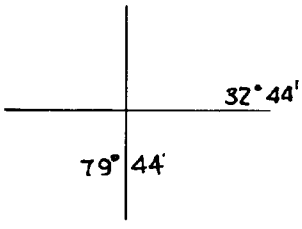




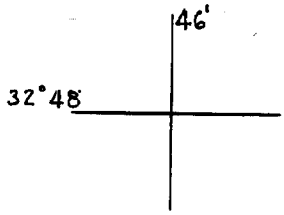


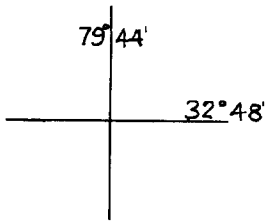


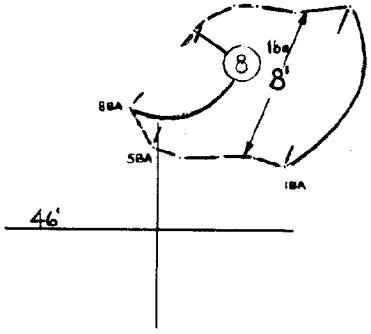


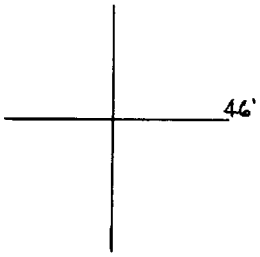


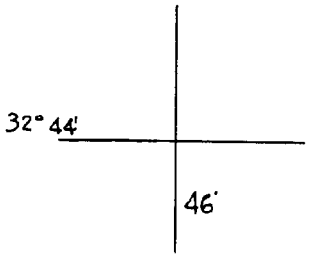
ITEM NO. 11
Line 27 to 35BA

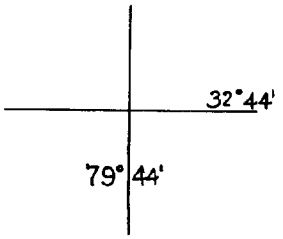




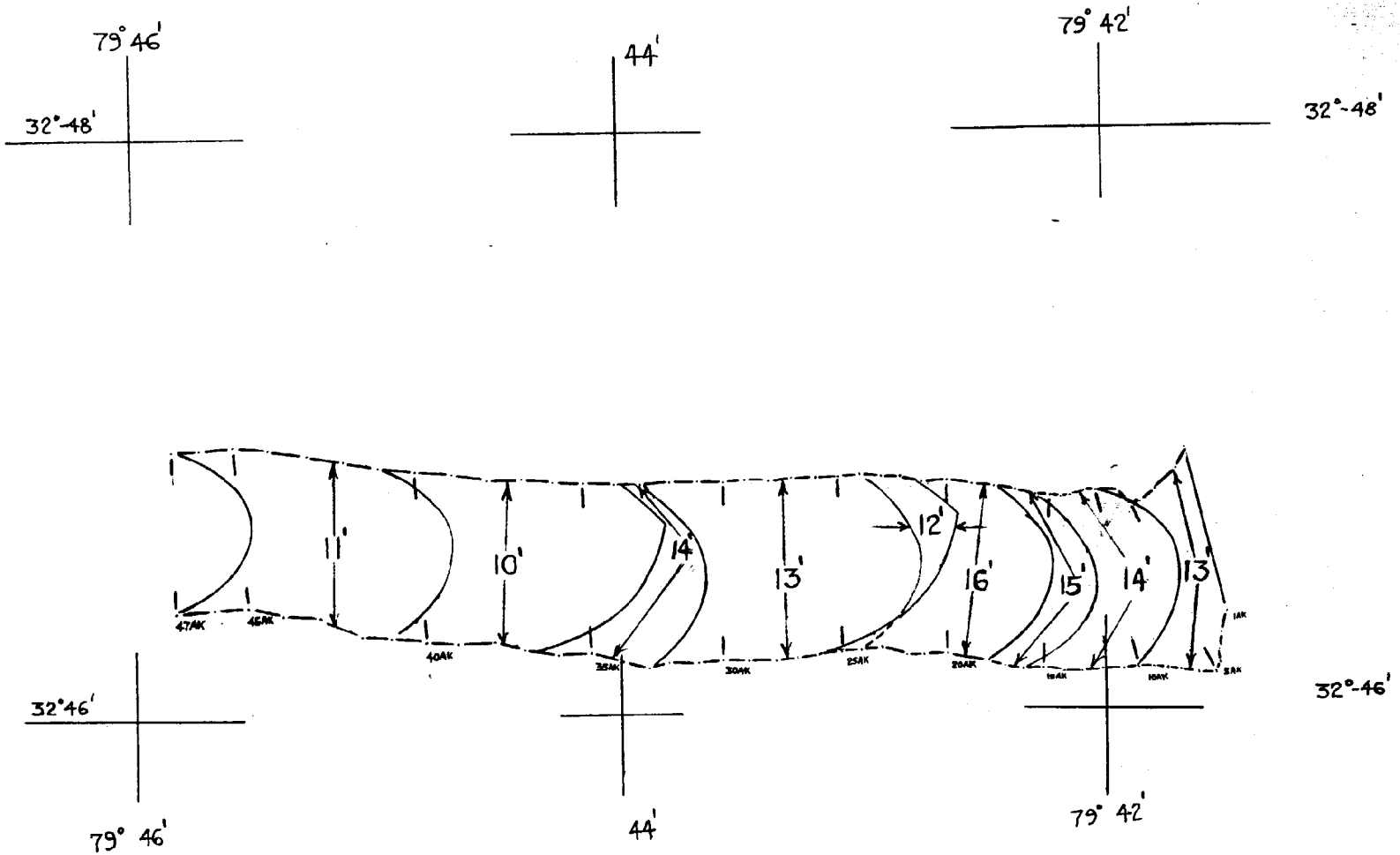




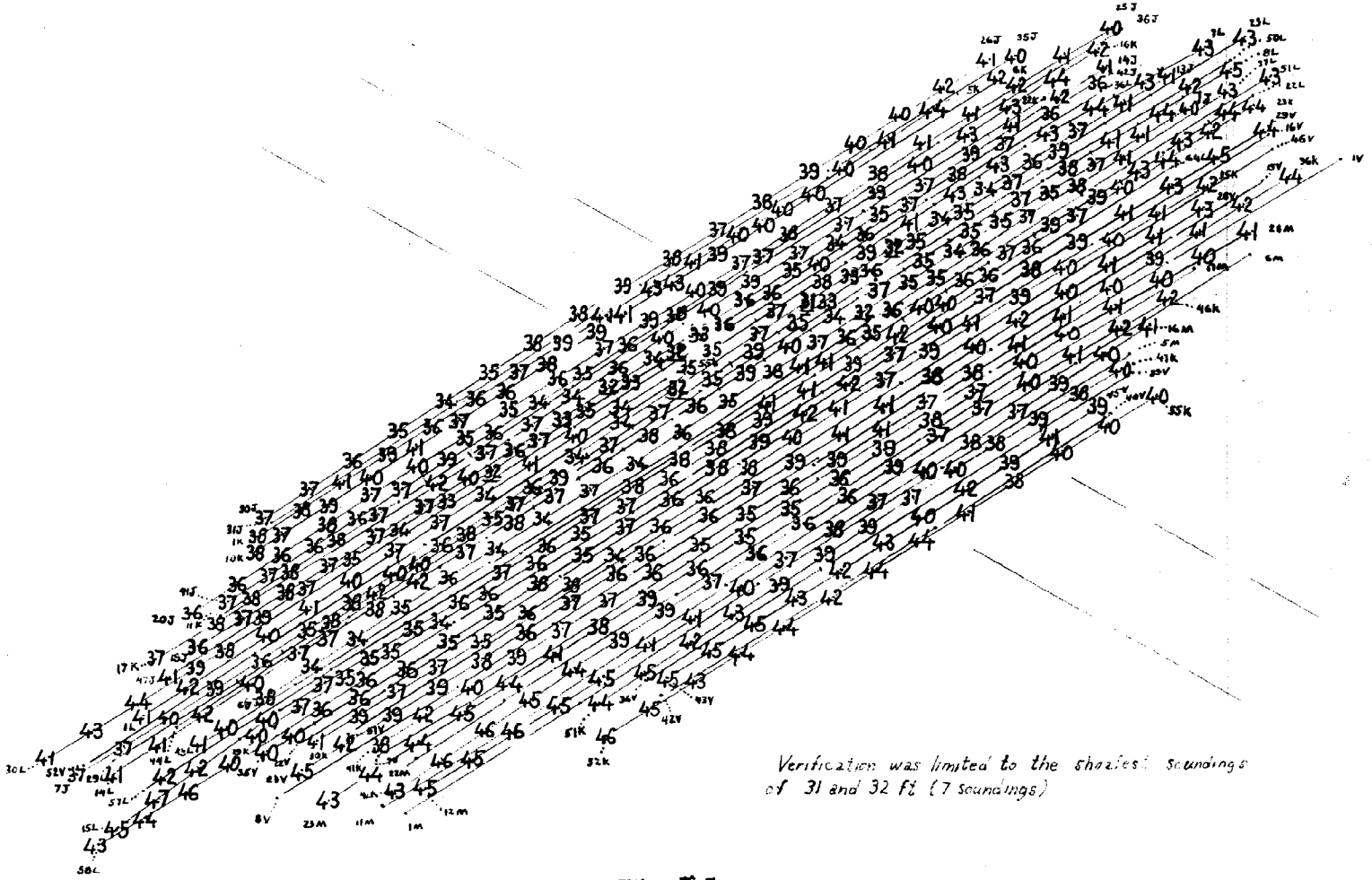




ITEM NO. 11
Line 1 to 8 BA



ITEM No. 9
Line 1 to 47AK



Verification was limited to the shallest soundings of 31 and 32 ft (7 soundings)

ITEM # 5

OVERLAY TO ACCOMPANY H-9174 (CRH-80/20-1-69 WD)

SCALE 1:20,000 Pos. 1-47 J
1-55 K
1-64 L
1-28 M
1-55

GROUNDINGS & SHOALS

	DAY	LAT & LONG		CLEARED DEPTH	LEAST DEPTH
1.	A 13 Mar. 69	32°36.05'N 79°39.55'W	F buoy topple. Insufficient tests to declare drag depth.	Not cleared See B day below Found item	
2.	B 15 Mar. 69 Strip 1 ~~& 2~~	32°36.05'N 79°40.10'W	Hang - Item #2 at 37 ft	35' (~~2~~ 1 direction)	
3.	E Vicinity of 28 Mar. 69	32°30.20'N 79°38.25'W	Buoys 9 and F ~~F buoy~~ topple. Drag too deep for 55-foot shoal	~~53+~~ Not cleared	
4.	P 26 Apr. 69	32°38.60'N 79°45.70'W	Temporary hang @ 34' - ~~cleared in two directions~~	NF 30' ~~28+/29+~~ (~~AB~~day/AEday)	
5.	AM 3 Jul. 69	32°46.00'N 79°44.60'W	#8 buoy topple. Drag too deep for 11-foot shoal at 13 ft.	10 ft. ~~Not cleared~~ ~~Found item~~	
6.	AN Vicinity of 5 Jul. 69 Strips 1 and 2	32°45.10'N 79°44.10'W	N buoy topple. Drag too deep for shoal aground at 16 ft.	~~Not cleared~~ ~~Found item~~ 13 ft	
~~7.~~	~~AN~~ Stet ~~5 Jul. 69~~ ~~Strip 2~~ 1	~~32°45.10'N~~ ~~79°44.10'W~~ 32° 45.58' 79° 43.30'	~~#1 buoy topple. Drag too deep for shoal~~ N buoy aground at 18 ft.	~~Not cleared~~ ~~Found item~~ 13 ft.	
8.	~~AQ~~ aq 7 Jul. 69	32°46.80'N 79°45.61'W	Wreck ~~buoyed~~	Not cleared	~~4.5'~~ 6 ft.
~~9.~~	~~AR~~ See AS day ~~8 Jul. 69~~ below	~~32°45.78'N~~ ~~79°44.83'W~~	~~Hang - Item #8~~	~~7'(E to W)~~ ~~9'(W to E)~~	~~10.0'~~
10.	AS 10 Jul. 69 Strip 1	32°45.81'N 79°44.81'W	Hang - Item #8	7' (E to W) 9' (W to E)	~~11.5'~~ 9 ft (Pos 3aq)
11.	AZ 3 Aug. 69	32°44.43'N 79°34.60'W	(Item #7) at 22 ft Hang near buoy R8-Obstruction located by divers	Not Cleared	17 ft. ~~17.0'~~
12.	ba 6 Aug. 69 Strips 1,2, 3 & 4	32°46.51'N 79°45.65'W	Hang - Item #11 at 5 ft (Strip 2)	Not Cleared	~~5.0'~~ 4 ft (Pos 1bb)

GROUNDINGS & SHOALS (CONT'D.)

DAY	LAT & LONG		CLEARED DEPTH	LEAST DEPTH
~~13. bb~~ ~~7 Aug. 69~~	~~32°46.51'N~~ ~~79°45.65'W~~	~~Hang - Item #11~~		~~4.5'~~
14. be 17 Aug. 69 Strip 1	32°46.90' (7 46)N 79°45.65' (3 45)W	F buoy topple. ~~Drag too deep.~~ aground at 12 ft.	7 ft.	
15. be 17 Aug. 69 Strip 2	Vicinity of 32°46.80' (7 08')N 79°45.61' (4 04')W	Buoys N and 1 aground at ~~Hang - Item #10~~ 12 ft.	7 ft.	~~6.0'~~
16. be 17 Aug. 69 Strip 3	32°46.90' (7 12)N 79°45.60' (4 22)W	Buoys 1 and 2 aground at 13 ft N buoy topple. Pulled off drag too deep.	7 ft.	
17. bf 18 Aug. 69 Strip 2	32°46.40' (1)N 79°43.71' (69)W	Hang - Item #9	14'(E to W) ~~13'(W to E)~~	14 ft.(Bs. lbf) ~~14.5'~~
~~18. BG~~ ~~19 Aug. 69~~	~~32°46.40'N~~ ~~79°43.71'W~~	~~Hang - Item #9~~	~~14'(E to W)~~ 13'(W to E)	~~14.5'~~
19. BK 1 Sept. 69	32°44.40' (3)N 79°34.54' (9)W	Hang - Item #7 See entry 11 AZ day		17.0'
20. BM 5 Sept. 69	32°44.43' (4)N 79°~~34.60'~~ (44')W	Hang ~~near~~ buoy R8. ~~Obstruction located by divers~~ Located by D.P. laz	Not cleared	~~17.0'~~
21. AD 8 June 69	Vicinity of 32° 40.25' 79° 46.10'	Buoys 7 and 8 Aground at 25 ft. (Position 3)	Not cleared	
22. BF 18 Aug 69	32° 46.96' 79° 43.48'	Aground at 14 ft. (F buoy)	13 ft.	
23. be 17 Aug. 69	32° 47.70' 79° 43.78'	Aground at 7 ft (F buoy)	Not cleared	

Thermoelectric Generators

Supplemental Report

USC&GS Ships RUDE & HECK

OPR-436, Wire Drag, Charleston, South Carolina

Christian Andreasen, LCDR, Comdg

1969 Field Season

GENERAL

The Ships RUDE & HECK are Class IV vessels with a complement of two officers and eight crew members per vessel. Each vessel carries only one electronic technician, thus it is extremely difficult to maintain manned shore stations.

With the Texas Sea Lanes Project pending and no shore power available at numerous isolated stations, three thermoelectric generators were purchased. Subsequently, the 1969 operating area was shifted from the Texas Sea Lanes to item investigation off the coast of Charleston, South Carolina.

At Charleston, the area to be surveyed required that the shore stations be located at ~~Folley~~ Beach (where shore power was available) and Isle of Palms (where shore power could not be obtained).

As a test of the thermoelectric generators under warranty, it was decided that the units would alternately be operated at Isle of Palms as a source of supply power to the Raydist DR-S system.

OPR-436, CHARLESTON, SOUTH CAROLINA

On 2 March 1969, three Telan T9P generators were received at Charleston, South Carolina. Two of the three were tested under a 50 watt load prior to field use. Neither of these units functioned properly, and the factory was contacted in order to determine if the units were hooked up correctly. Consultations showed that all three generators were inoperative. On 4 March, all three units were returned to General Instrument for repairs. On 12 March, the units were received in operating condition.

One unit was set up to supply power at the Isle of Palms DR-S Raydist station. The thermoelectric generator was used to supply 150 Ah batteries floated in line with the DR-S system. At the end of twelve days the batteries began losing charge for some unknown reason. New 80 Ah batteries were connected in place of the 150 Ah batteries and this gave satisfactory operation so far as support of the Raydist is concerned.

Batteries were floated "in line" during the entire season, but it is now felt that there is no need to continue using batteries. The generator output appears to be stable enough to directly support the Raydist. During the past season the generator was connected directly to the Raydist for short periods of time with no ill side effects.

SYSTEM DESCRIPTION AND FEATURES

The Thermoelectric Division of General Instrument Corporation can provide a wide range of generators to meet power levels between 1 and 300 watts. In order to meet the power requirements of the DR-S Raydist system (approximately 50 watts), Telan generator model T9P was selected with a dc-dc converter. This unit supplies 65 watts of converted power at 24 volts, 2.7 amps. The size is 17"x23"x45" and weighs 144 pounds.

Catalytic burning of propane, butane or natural gas provides heat which is converted into electricity by thermoelectric means. The unit can be operated in high gusty winds as there is no flame, thus flameout problems are eliminated. Telan states that fuel or air flow can be interrupted for three minutes and combustion will continue spontaneously when the system is restored. The units were subjected to gale force winds during the project and no problems were encountered with burning. Since fuel flow can be interrupted for a short time with heat being maintained within the unit, the gas bottles can be changed without shutdown or loss of power, provided personnel work quickly.

Thermoelectric generators have no moving parts, thus maintenance is minimal and allows unmanned shore stations. This makes the system desirable for isolated stations with no shore power. The saving of manpower and shore party support costs warrants the use of this system in our particular case. The Telan T9P costs approximately $3000 per unit with options.

The Telan can be ignited by either a match or by electric ignition, which is optional. Experience has shown that electric ignition is a desirable option because in 20 knot plus winds the unit is extremely difficult to start. Once started and the generator has operated for one or two hours, the heat built up will keep the unit operating even in severe weather conditions.

The units are completely weatherproof and require no extra housing under normal conditions. Since the unit dissipates heat, additional housing is actually undesirable. The company recommends that in hot climates, 100°F plus, the unit should be shaded from the sun. In Charleston, satisfactory operation was obtained without a sunshade, but it is planned to use shades along the Texas coast.

Optional items obtained were the dc-dc converter and the variable voltage limiter. This allows adjustable voltage output from 22 volts to 30 volts which insures the make-up of any line losses and provides flexibility for any future needs.

The voltmeter and ammeter installation is also optional, but is desirable for ease in monitoring the units.

PROBLEMS ENCOUNTERED

1. Units inoperative on arrival from factory

Prior to hookup of a new or repaired unit with gas, a preliminary measurement of the cold resistance should be made to determine any open circuit or grounded burners. The units were returned to the factory for repair.

2. Wind erosion

100-lb bottles of propane were used on station. On one occasion, wind erosion caused the gas bottles to fall over, resulting in loss of gas supply. When the batteries reached a higher potential than the generator, the discharge through the voltage limiter by the batteries damaged the voltage limiter.

Care must be taken to assure that no part of the setup can be upset.

3. Vandalism

On one occasion vandals shut down the gas bottles. This again damaged the voltage limiter due to the higher battery potential.

Possibly the gas bottles could be locked open, but vandalism is difficult to protect against.

4. Inadequate gas supply

On another occasion the gas supply ran out and again the higher potential of the batteries damaged the voltage limiter.

A protective diode had to be installed between the generator and the batteries. This is expected to result in a slightly less efficient unit, but should eliminate damage to the voltage limiter.

5. Gas consumption

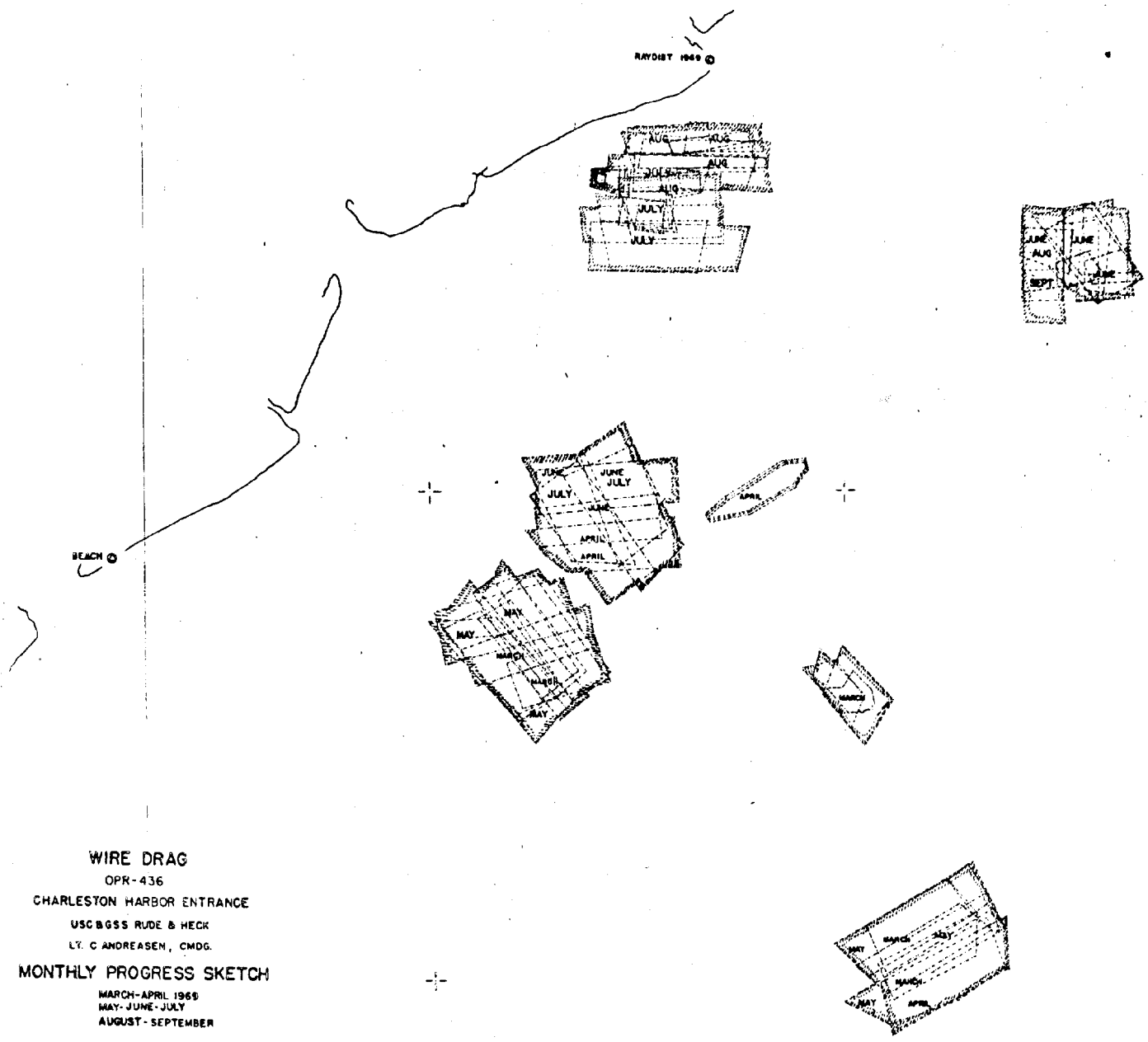
Gas consumption was abnormal with all three units. The units were less than 50 percent of the contracted efficiency. At the end of the season, all units were returned for check out and repair. The factory has recommended that the holes in the plenum chamber just below the heat rejection fins be taped closed. It is their belief that gas is being blown away from the venturi. This will be tried during the next season, and may be the simple answer to our problems.

CONCLUSIONS

The thermoelectric generators fulfilled the need for unmanned shore stations with a minimum of maintenance. Because the units did not operate at contracted efficiency, cost became excessive and handling the additional quantities of gas became a problem. The cost of operation during the season was $75 per month per station with the units burning 200 lbs of propane per six day period.

Obviously, shore power is the most desirable method of support for a Raydist station. When shore power is unavailable or the cost of running power lines is prohibitive, then either banks of batteries or a thermoelectric generator must be used. Batteries have the advantage of lower operating cost, but the disadvantage of handling numerous heavy batteries when the station is to be left unattended for any length of time. In our particular case, manpower is critical to our operations. One man can handle maintenance of a shore station with gas bottles, whereas this is difficult with batteries. If the efficiency can be improved to that originally contracted, one week per 100 lbs., then the thermoelectric generator will be a most desirable source of power.

ATTACHMENT VI
Progress Sketch



WIRE DRAG

OPR-436

CHARLESTON HARBOR ENTRANCE

USCGSS RUDE & HECK

LT. C ANDREASEN, CMDG.

MONTHLY PROGRESS SKETCH

MARCH-APRIL 1969
MAY-JUNE-JULY
AUGUST-SEPTEMBER

SCALE : C&GS 1239

KEY:

WIRE DRAG ONE DIRECTION

WIRE DRAG ITEM COMPLETE

HYDROGRAPHY

VERIFICATION BRANCH, AMC
ADDENDUM
To Accompany

WIRE DRAG SURVEY H-9174 (RH 80/20-1-69WD)

GENERAL

Field work on this survey was done on conventional 1:20,000 boat sheets and on 1:80,000 charts number 1239.

The smooth plot of the hydrographic investigation on Item 5 was made on tracing velum using the 1:20,000 boat sheet as a plotting medium. The tracing is included in this report. For convenience, and in order to show details at a larger scale, the remaining wire drag Items were plotted on a 1:40,000 smooth sheet.

Approximately 72 drag strips were run on this survey. Many of them were not needed as they contributed little to the investigation; however, it was necessary for this office to plot all lines on rough plotting overlays so that each strip could be properly evaluated. These rough overlays contain notes by the smooth plotter listing the problems encountered and explaining the methods used to resolve them. Some of the lines were rejected, others were plotted on smooth overlays and attached to this report, and the remainder were plotted on the smooth sheet. This plot was part of a wire drag training program and more lines were plotted on the smooth sheet than were actually needed to show complete data on hangs.

DISCREPANCIES

All Items appear to have been adequately disposed of except for numbers 3A and 7.

On Item 4 a 34-foot hang occurred about one mile southwest of the charted position. Because of choppy seas and the length of drag, it appears the Guide Launch was not aware of the hang. It was noted during the smooth plot because a series of cuts intersected near the end of line 1 - 44P. Line 1 - 72AE clears the hang at 30 feet, ~~but the margin of overlap is so small there is some doubt that the hang was covered.~~ Position of grounding plotted in accordance with remarks in drag volume for P day

On Item 7 a 17-foot sounding was not cleared by wire drag, and a small split exists between it and navigation buoy 8. (See note by LTJG J. J. Morley on page 2, Attachment 1, concerning diver activities in this area.)

Hugh L. Proffitt
Chief, Verification Branch, AMC

Norfolk, Va.
June 15, 1971

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-9174 W.D.

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
Atlantic Ocean										1
Isle of Palms										2
Rattlesnake Shoal										3
South Carolina										4
										5
										6
										7
				PREPARED: 7-12-71						8
				J. W. Pickett						9
				Cartographic Technician						10
										11
				APPROVED: 7-12-71						12
				A. J. Wraight						13
				Chief Geographer						14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

FORM C&GS-946
(REV. 11-65)
(PRESC. BY HYDROGRAPHIC MANUAL 20-2, 6-94, 7-13)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS

HYDROGRAPHIC SURVEY NO. 9174 W.D.

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET & A&P Sheet	1	BOAT SHEETS	2
DESCRIPTIVE REPORT		OVERLAYS & Tracings	2-Envelopes

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	1					
VOLUMES	33					
BOXES						2

T-SHEET PRINTS *(List)*
2 Charts 1239, Launch Boat Sheets.

SPECIAL REPORTS *(List)*

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				
POSITIONS CHECKED	28			
POSITIONS REVISED	6			
DEPTH SOUNDINGS REVISED				
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS	0			
JUNCTIONS	0			
VERIFICATION OF SOUNDINGS FROM ~~GRAPHIC~~ WIRE DRAG RECORDS	25			
SPECIAL ADJUSTMENTS				
ALL OTHER WORK	34			
TOTALS	59			

	BEGINNING DATE	ENDING DATE
PRE-VERIFICATION BY See note on the title page of this D. R. Kenneth W. Wellman	11-28-75	12-11-75
VERIFICATION BY		
REVIEW BY		

USCOMM-DC 36271-P65

FORM C&GS-946A
(REV. 11-65)
(PRES. BY HYDROGRAPHIC MANUAL, 6-94)

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VERIFIER'S REPORT

HYDROGRAPHIC SURVEY, H-9174 W.D.

INSTRUCTIONS - This form serves to identify items of a check list in verification together with items which are separately reported to the Reviewer. The form is not to be forwarded to the Reviewer. A report, which is prepared for the Reviewer, should identify items by number and letter and will be filed in the Descriptive Report until the survey is reviewed.

CL - Check List Items: should be checked as having been completed during the verification processes.

R - Report Item: This column refers to those items reported to the reviewer and is used to indicate the items discussed.

Part I - DESCRIPTIVE REPORT	CL	R
Note: The verifier should first read the Descriptive Report for general information and problems.		
1. The Descriptive Report was consulted, paragraphs checked if found satisfactory, and notations were made in soft black pencil regarding action taken. Remarks Required: -- None		
2. Soundings originating with the survey and mentioned in the Descriptive Report have been verified and checked in soft black pencil, including latitude and longitude, together with position identification. Remarks Required: --None		
3. All reference to survey sheets mentioned in the Descriptive Report should include registry number and year. Remarks Required: -- None		
Part II - SHORELINE AND SIGNALS		
4. Source of shoreline signals. Remarks Required: -- List all surveys a. Give earliest and latest dates of photographs b. Field inspection date c. Field Edit date d. Reviewed-Unreviewed		
5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences.		
6. The plotting of all triangulation stations, topographic stations and hydrographic signals has been checked and noted in processing stamp No. 42 on the smooth sheet. Remarks Required: -- None		
7. Objects on which signals are located and which fall outside of the high-water line have been described on the sheet. Remarks Required: -- List those signals still unidentified.		
Part III - JUNCTIONS		
Note: Make a cursory comparison preliminary to inking soundings in area of overlap.		
8. All junctions of contemporary or overlapping sheets were transferred in colored ink and overlapping curves were made identical. Remarks Required: -- None		
9. The notation in slanted lettering "JOINS H---- (19)" was added in colored ink for all verified contemporary adjoining or overlapping sheets. Those not verified are shown in pencil. Remarks Required: -- None		

Part III - JUNCTIONS (Continued)	CL	R
10. Junctions with contemporary surveys were satisfactory except as follows: Remarks Required: -- Consider conditions after adjustments have been made; note adjustments made. Make special notes of **Butt** junctions and areas which are **SUPERSEDED.**		
Part IV - VOLUMES		
11. All items affecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken and exceptions noted in the volumes. Remarks Required: -- None		
12. Condition of sounding records was satisfactory except as follows: Remarks Required: -- Mention deficiencies in completeness of notes or actions for the following: (a) rocks (b) line turns (c) position values of beginning and ending of lines (d) bar check or velocity correctors (e) time recording (f) notes or markings on fathograms (g) was reduction of soundings accurately done? (h) was scanning accurate? (i) were peaks at uneven intervals missed? (j) were stamps completed? (k) references to adjacent features		
Part V - PROTRACTING		
13. All positions verified instrumentally were check marked in color in the sounding records, and verifier initialed the processing stamp. Remarks Required: -- None		
14. The protracting and plotting of all unsatisfactory crossings were verified. Remarks Required: -- None		
15. All detached positions locating critical soundings, rocks, buoys, breakers, obstructions, kelp, etc., were verified and the position numbers are legible. Remarks Required: -- None		

USCOMM-DC 36272-P65

Part V - PROTRACTING (Continued)	CL	R
16. The protracting was satisfactory except as follows: Remarks Required: -- Refers to protracting in general except for specific faults repeated often, or faults in control information, which required considerable replotting or adjustments.		
17. The protractor has been checked within the last three months. Remarks Required: -- Date of check, type of protractor and number.		
Part VI - SOUNDINGS		
18. All soundings are clear and legible, and critical soundings are a little larger than adjacent soundings. Remarks Required: -- None		
19. Sounding line crossings were satisfactory except as follows: Remarks Required: -- Discuss adjustments.		
20. The spacing of soundings as recorded in the records was closely followed; Remarks Required: -- None		
21. The scanning, reduction, spacing, plotting of questionable soundings have been verified. Remarks Required: -- None		
22. The smooth plotting of soundings was satisfactory except as follows: Remarks Required: — Refer to legibility, errors in spacing, and errors in numbers - but not to errors in scanning.		
Part VII - CURVES		
23. The depth curves have been inspected **before** inking. Remarks Required: -- By whom was the penciled curves inspected.		
24. The low-water line and delineation of shoal areas have been properly shown in accordance with the following: a. From T-Sheet in dotted black lines b. From soundings in orange c. Approximate position of sketched curve is dashed orange d. Approximate position of shoal area **not sounded** in black dashed Remarks Required: -- None		
25. Depth curves were satisfactory except as follows: (This statement should not refer to the manner in which the curves were drawn). Remarks Required: -- Indicate areas where curves could not be drawn completely because of lack of soundings. For some inshore areas a general statement is sufficient.		

Part VIII - AIDS TO NAVIGATION	CL	R
26. All fixed aids located together with those on the contemporary topographic sheets, have been shown on the survey. Remarks Required: -- Conflicts of any nature listed.		
27. All floating aids listed in the Descriptive Report should be verified and checked in soft black pencil, including latitude and longitude and position identification. Remarks Required: -- None		
Part IX - BOATSHEET		
28. The boat sheet was constantly compared with the smooth sheet with reference to notes, position of sounding lines and supplemental information. Remarks Required: -- None		
29. Heights of rocks awash were correctly reduced and compared with topographic information. Remarks Required: -- Note excessive conflicts with topographic information.		
Part X - GENERAL		
30. All information on the sheet is shown in accordance with figures 82 and 83 in the Hydrographic Manual (Pub. 20-2). Remarks Required: -- None		
31. Unnecessary pencil notes have been removed from the sheet. Remarks Required: -- None		
32. Degree, minute values and symbols have been checked; also electronic distance arcs have been properly identified and checked on the smooth sheet. Remarks Required: — None		
33. The bottom characteristics are adequately shown. Remarks Required: -- None		
Part XI - NOTES TO THE REVIEWER		
34. Unresolved discrepancies and questionable soundings.		
35. Notation of discrepancies with photogrammetric survey inserted in report of unreviewed photogrammetric survey or on copy.		
36. Supplemental information.		

Verified by Pre-Verification By K. W. Wellman

Date 12-11-75

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9174 W.D.

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
1001	9-2-71	C. E. Harrington	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. Consider fully applied - Falls within area of omitted detail.
1007	11-15-71	S. Mc Keller	~~Full Part~~ ~~Before~~ After Verification ~~Review Inspection~~ Signed Via
			Drawing No. 41 Consider fully applied. - Falls within area of omitted detail.
1110	12-14-71	G Moon	~~Full~~ Part Before ~~After Verification~~ Review Inspection Signed Via
			Drawing No. Part appld thru L-1027/70, PMB #29. Full application Pending review & INSP.
1239	2-4-72	C Harrington	~~Full~~ Part Before ~~After~~ ~~Verification~~ Review Inspection Signed Via
			Drawing No.
1111	7-10-72	R. A. Lillie	~~Full~~ Part ~~Before~~ After Verification Before Review Inspection Signed Via
			Drawing No. ~~No Corrections~~
1239	8-24-72	J. M. O'Connor	Full ~~Part Before~~ After Verification before Review Inspection Signed Via
			Drawing No. 26
1111	8-27-72	J. M. O'Connor	Full ~~Part Before~~ After Verification before Review Inspection Signed Via
			Drawing No. 24
1110	11/13/73	J. Sherman	Full ~~Part Before~~ After Verification before Review Inspection ~~Signed~~ Via
			Drawing No. Consider Fully appld thru Chrt 1239
1238	11/20/73	J. Sherman	Full ~~Part Before~~ After Verification before Review Inspection Signed Via
			Drawing No. Fully appl'd thru Chrt 1239
(11521) 1239	9/13/79	Stephen J. Merry	~~Adequately~~ Pre-verification
			~~Full Part Before~~ After ~~Verification~~ ~~Review Inspection~~ Signed Via
			Drawing No. 30
(11523) 491	9/10/80	Allen Dyke	Adequately applied - Drawing No 26
11521			
(1239)	10/9/80	Allen Dyke	Adequately applied - Drawing No 31
11531	10/16/80	Allen Dyke	Adequately applied thru 11521 - Drawing No 23
(1238)			
11480	2-18-81	Allen Dyke	Adequately applied - Drawing No 32
11520	10/13/82	Mark Price	Adequately appld thru Chart 11521, 11531 & 11480

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975. USCOMM-DC 8558-P63

* Continued on Next Page

(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9174 W.D.

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~Full Part Before After Verification Review Inspection Signed Via~~ BOF
			~~Drawing No. 17~~
			Adequate
~~11260~~	~~2-12-83~~	~~[illegible]~~	~~Full Part Before After Verification Review Inspection Signed~~ Via
			Drawing No. 19
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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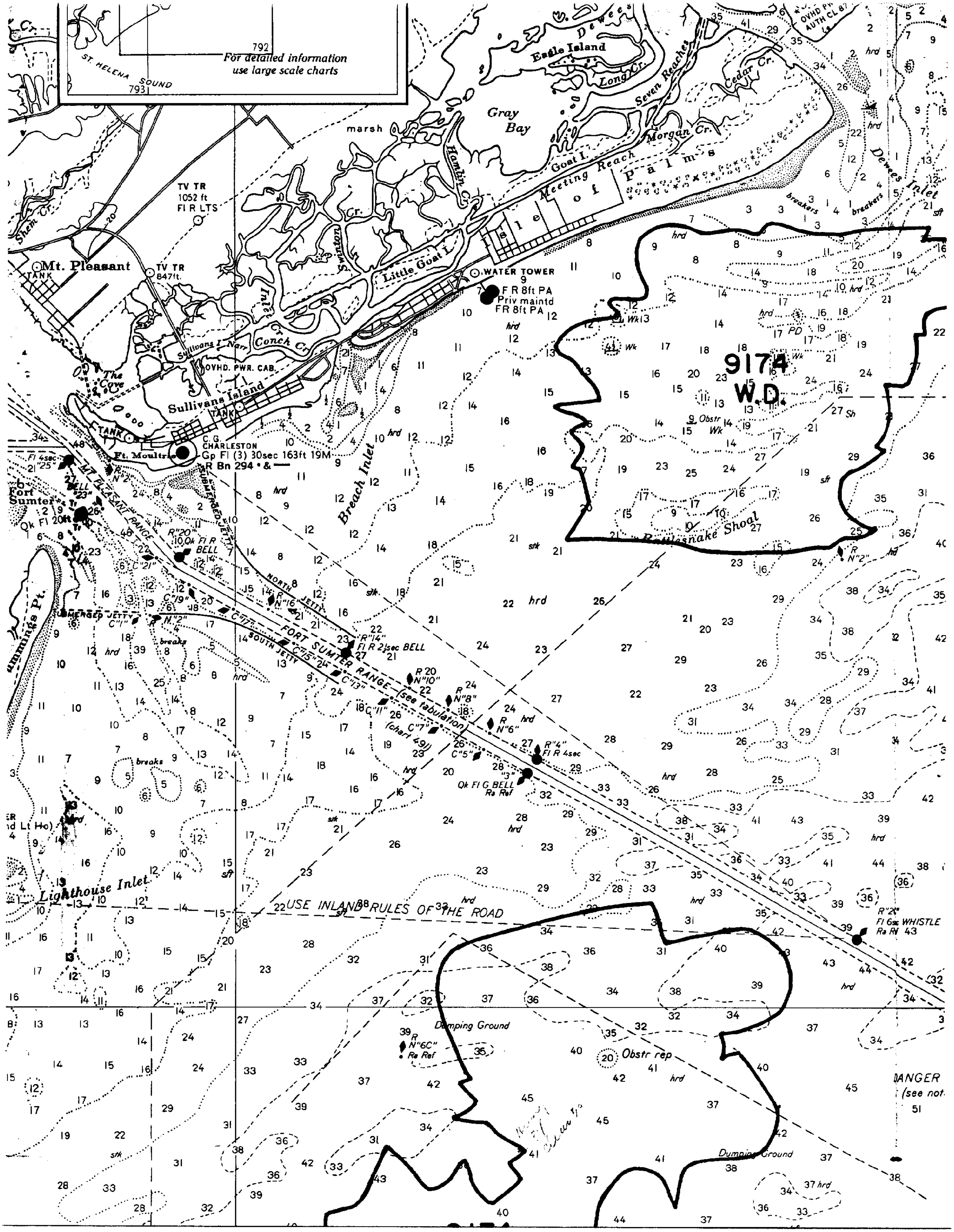
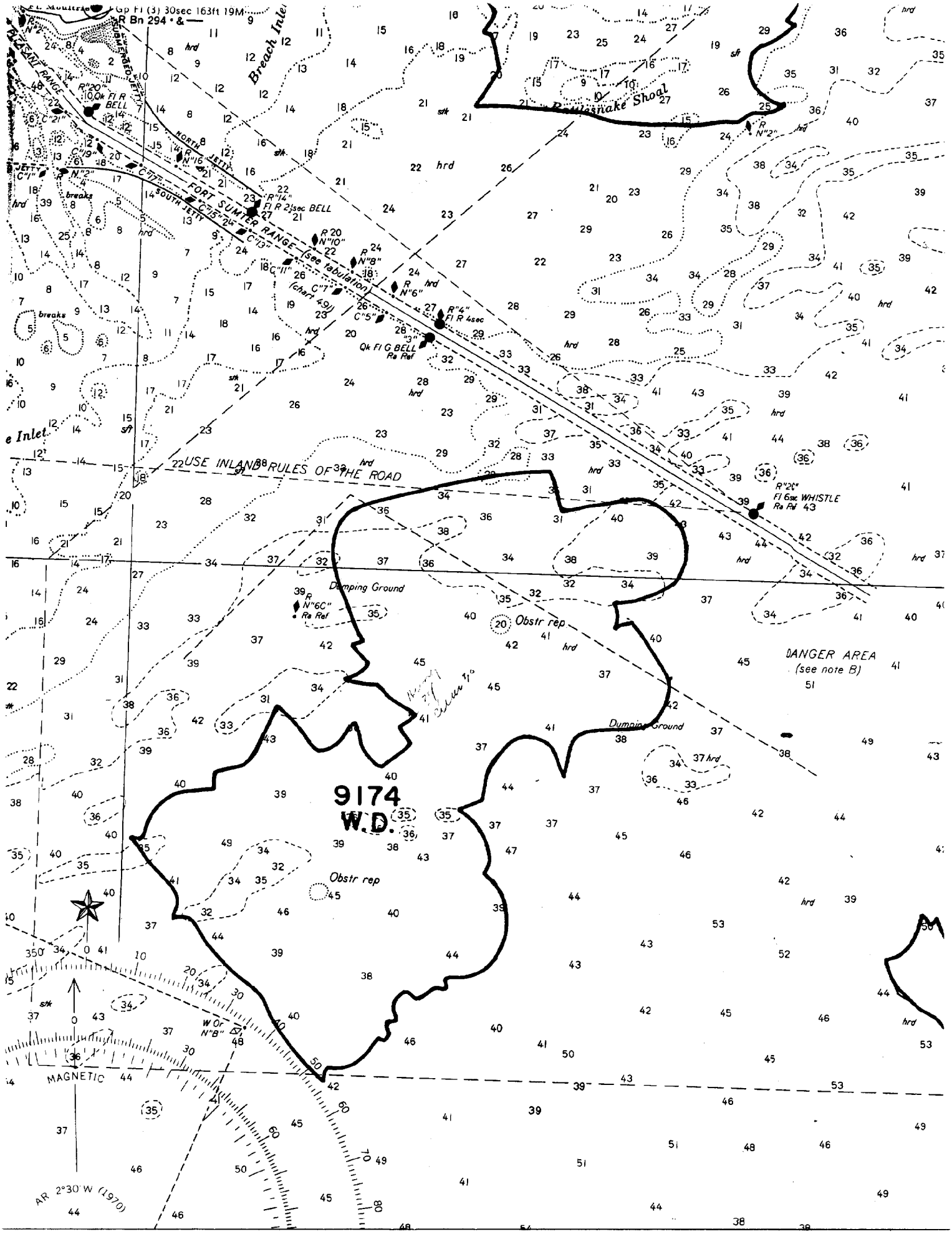
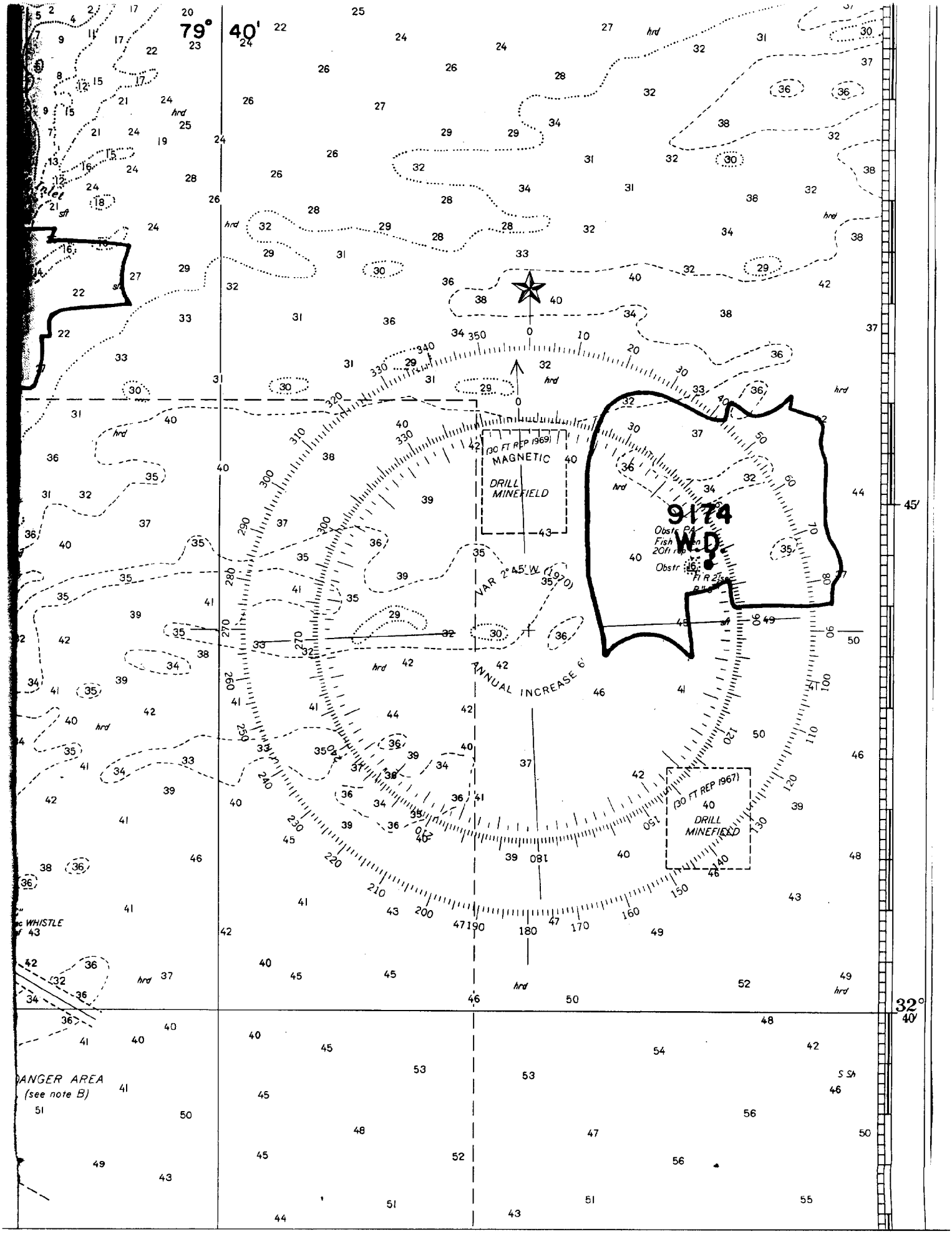
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

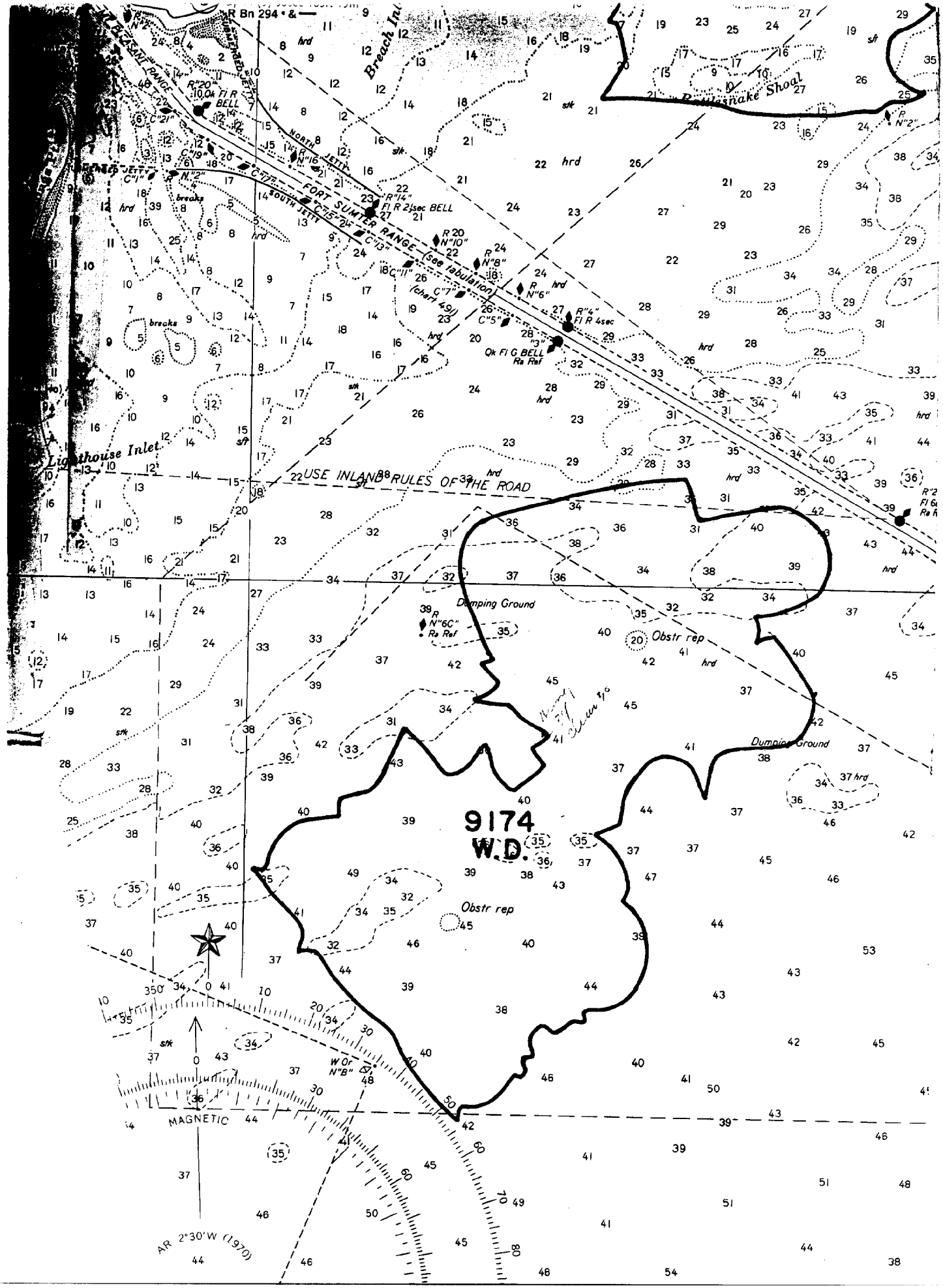
FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-978.

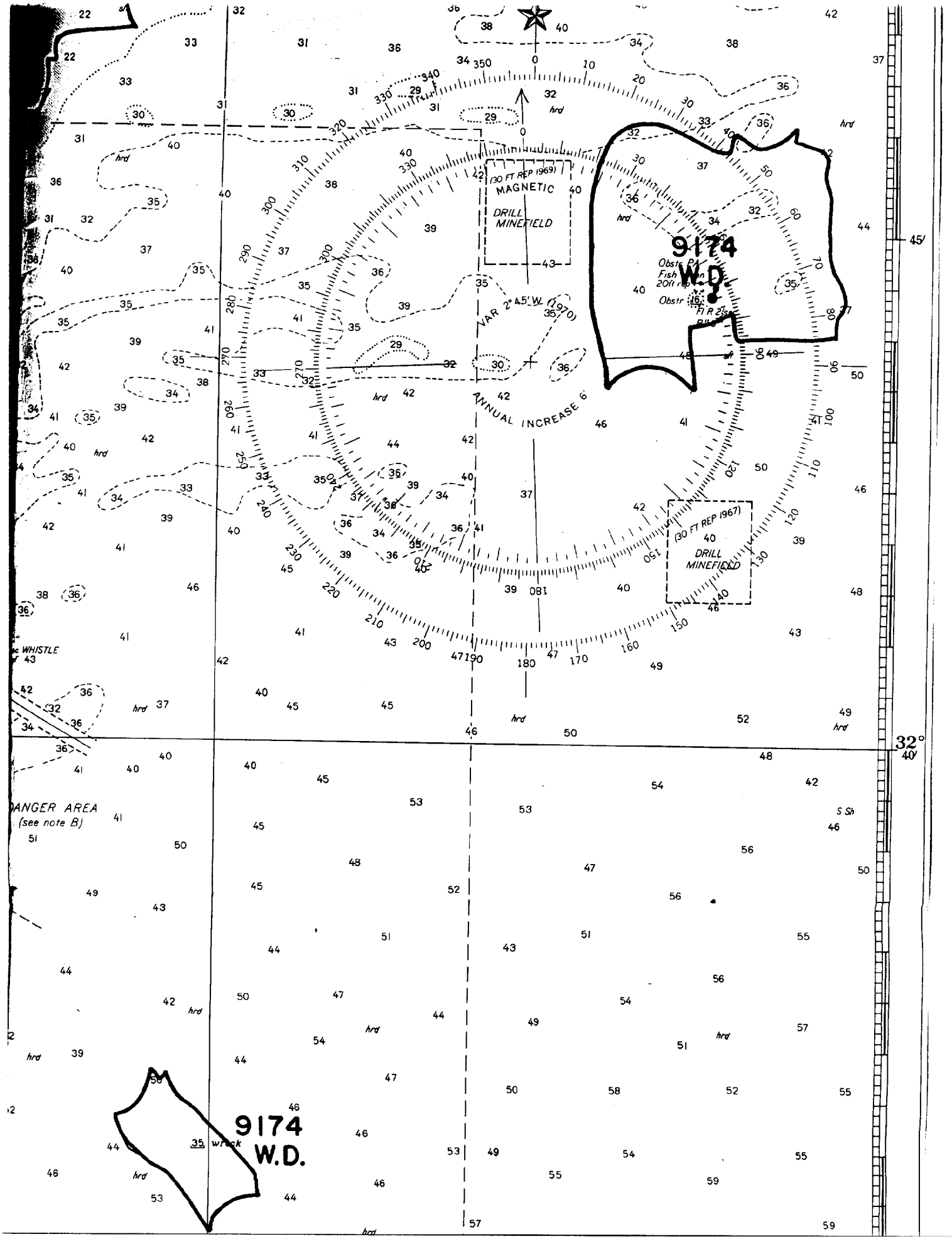
USCOMM-DC

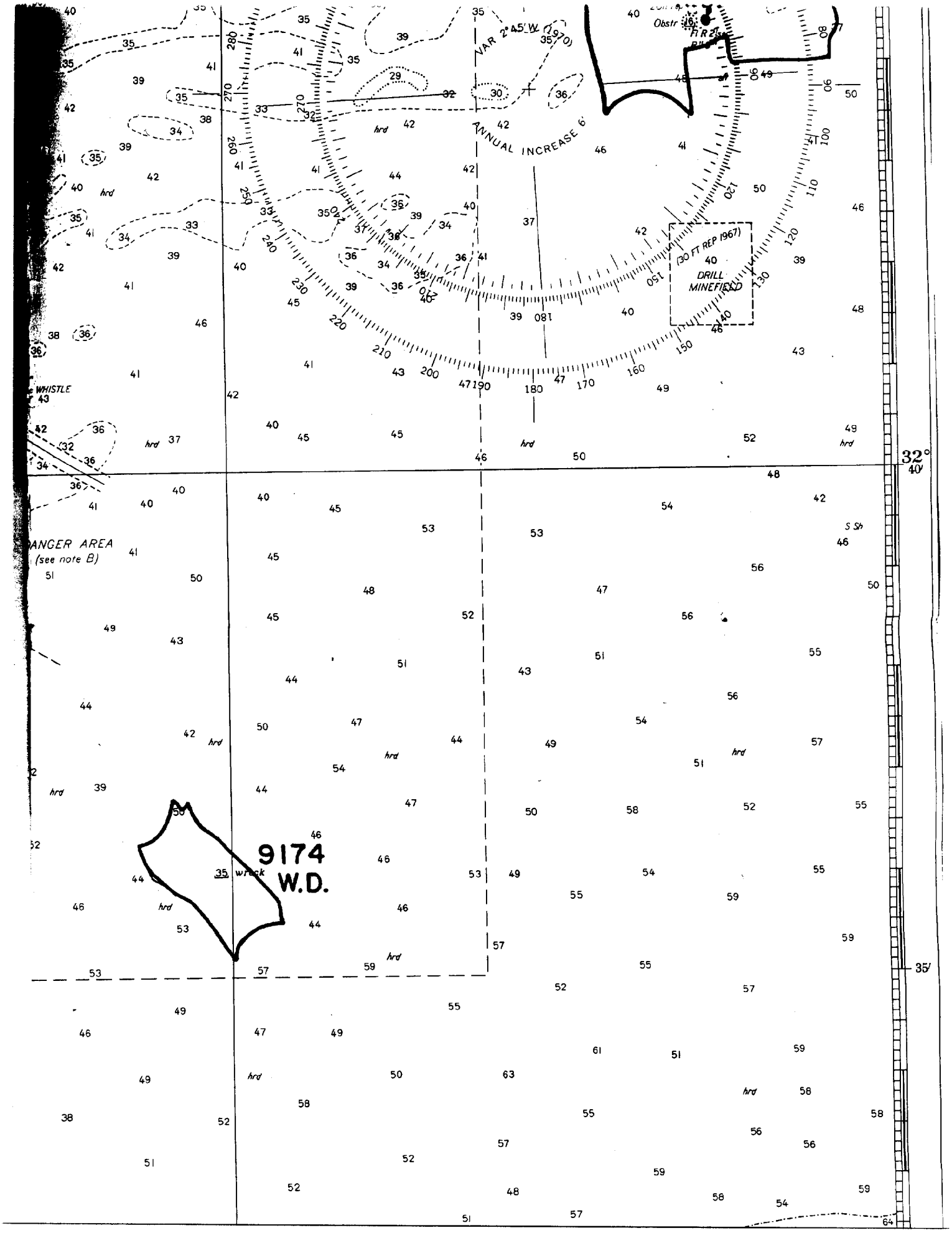

For detailed information
use large scale charts
ST. HELENA SOUND
Eagle Island
Dewees
Long Cr.
Seven Reaches
Cedar Cr.
Gray Bay
marsh
Hamlin Cr.
Morgan Cr.
Goat I.
Meeting Reach
Isle of Palms
Dewees Inlet
breakers
TV TR
1052 ft
Fl R LTS
Shem Cr.
Mt. Pleasant
TANK
TV TR
847ft.
Swinton Cr.
Little Goat I.
WATER TOWER
F R 8ft PA
Priv maintd
FR 8ft PA
Inlet Cr.
Conch Cr.
Sullivans I. Narr.
OVHD. PWR. CAB.
The Cove
Sullivans Island
C.G.
CHARLESTON
Gp Fl (3) 30sec 163ft 19M
R Bn 294
Ft. Moultrie
Fort Sumter
Breach Inlet
9174
W.D.
Obstr
Wk
Rattlesnake Shoal
MT. PLEASANT RANGE
SUBMERGED JETTY
NORTH JETTY
SOUTH JETTY
FORT SUMTER RANGE (see tabulation) (chart 491)
R "14"
Fl R 2½sec BELL
R "4"
Fl R 4sec
"3"
Qk Fl G BELL
Ra Ref
Lighthouse Inlet
Cummings Pt.
USE INLAND RULES OF THE ROAD
R "2"
Fl 6sec WHISTLE
Ra Ref
Dumping Ground
Obstr rep
R
N "6C"
Ra Ref
DANGER
(see note)

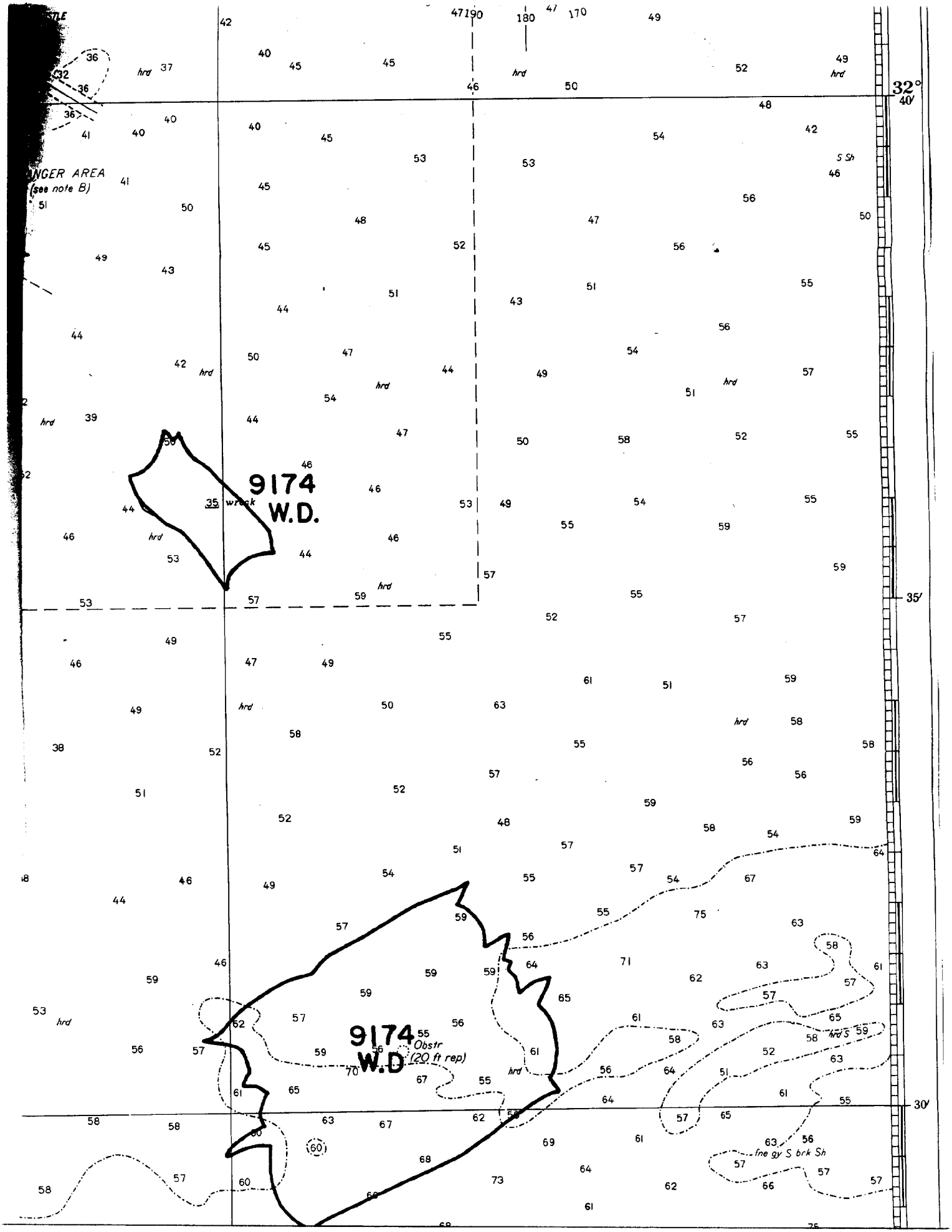

Gp Fl (3) 30sec 163ft 19M
R Bn 294 ° &
Breach Inlet
Rattlesnake Shoal
FORT SUMTER RANGE
(See tabulation)
(chart 491)
NORTH JETTY
SOUTH JETTY
R"20"
10ft Ok Fl R BELL
R"14"
Fl R 2½sec BELL
R 20
N"10"
R
N"8"
R
N"6"
R"4"
Fl R 4sec
Ok Fl G BELL
Re Ref
R"2"
Fl 6sec WHISTLE
Re Ref
USE INLAND RULES OF THE ROAD
Dumping Ground
R
N"6C"
Re Ref
Obstr rep
DANGER AREA
(see note B)
9174
W.D.
Obstr rep
W Or
N"B"
MAGNETIC
AR 2°30'W (1970)


79° 40'
45'
32° 40'
(30 FT REP 1969)
MAGNETIC
DRILL
MINEFIELD
VAR 2° 45' W (1970)
ANNUAL INCREASE 6'
9174
WD
(30 FT REP 1967)
DRILL
MINEFIELD
WHISTLE
DANGER AREA
(see note B)


9174
W.D.
Lighthouse Inlet
USE INLAND RULES OF THE ROAD
Dumping Ground
Obstr rep
Rattlesnake Shoal
Breach Inl
FORT SUMTER RANGE
(see tabulation)
(chart 499)
MAGNETIC
AR 2°30'W (1970)


9174
W.D.
(30 FT REP 1969)
MAGNETIC
DRILL
MINEFIELD
VAR 2° 45' W (1970)
ANNUAL INCREASE 6'
(30 FT REP 1967)
DRILL
MINEFIELD
DANGER AREA
(see note B)
WHISTLE
9174
W.D.
wreck
32°
40'
45'


VAR 2°45'W (1970)
ANNUAL INCREASE 6'
(30 FT REP 1967)
DRILL
MINEFIELD
Obstr
WHISTLE
ANGER AREA
(see note B)
9174
W.D.
35 wreck
32°
40'
35'


9174
W.D.
35 wreck
9174
W.D
Obstr
(20 ft rep)
fne gy S brk Sh
NGER AREA
(see note B)
32°
40'
35'
30'