

AD-A182 693

SURVEY OF THE EAST COAST AIR COMBAT MANEUVERING RANGE

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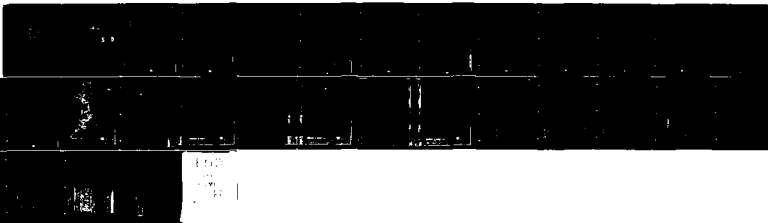
(U) BROWN AND ROOT DEVELOPMENT INC HOUSTON TX

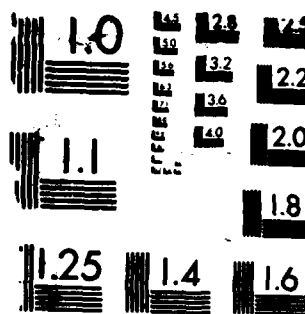
18 OCT 77 CHES/NAUFAC-FPO-7741 N62477-78-C-0180

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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

PHOTOGRAPH THIS SHEET

INVENTORY

AD-A182 693

DTIC ACCESSION NUMBER

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18 OCT 77

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AD-A182 693

FPO
7741

SURVEY OF
THE EAST COAST
AIR COMBAT MANEUVERING RANGE
FOR
THE DEPARTMENT OF THE NAVY
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N62477-78-C-0180

BROWN & ROOT, INC.
ELECTRONIC SURVEY OPERATIONS
HOUSTON, TEXAS

18 OCTOBER 1977



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FPO 7741

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Brown & Root, Inc.

6b. OFFICE SYM

7a. NAME OF MONITORING ORGANIZATION

Ocean Engineering &
Construction Project Office
CHESNAVFACENGCOM

6c. ADDRESS (City, State & Zip)

Houston, TX

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Bldg. 212, Washington Navy Yard
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19. ABSTRACT (Continue on reverse if necessary & identify by block number)

This survey was performed to accurately establish the locations of the four
Air Combat Maneuvering Range (ACMR) platforms constructed by Brown & Root,
Inc. in the Atlantic Ocean offshore of Kitty Hawk, N.C. during the summer
1977.

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Jaqueline B. Riley

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SURVEY OF
THE EAST COAST
AIR COMBAT MANEUVERING RANGE
FOR
THE DEPARTMENT OF THE NAVY
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

CONTRACT NO. N62477-78-C-0180
18 OCTOBER 1977

PURPOSE OF SURVEY

This survey was performed to accurately establish the locations of the four Air Combat Maneuvering Range (ACMR) platforms constructed by Brown & Root, Inc. in the Atlantic Ocean offshore of Kitty Hawk, N.C. during the summer of 1977.

CONTROL SURVEY

Prior to performing the ACMR Tower location survey onshore control points with sufficient elevation for the long shots to the offshore sites had to be located. It was found that the U.S.C.&G. monuments "Wright" located atop the Wright Memorial Monument at elevation 144 ft. and "Bodie Island Lighthouse" at elevation 156 ft. met the criteria for elevation.

The monument on Bodie Island Lighthouse could not be directly occupied as it was located at the center of the lighthouse, and the monument at Wright was situated such that a clear line of sight to Bodie Island Lighthouse was not possible. For the above reasons, a control survey was performed to locate offset points for the monuments at Wright and Bodie Island Lighthouse. These offset points will hereinafter be referred to as "WT. #2" for the offset point at Wright and "B.L. #3" for the offset point at Bodie Island Lighthouse.

Offset point B.L. #3 was located by using the U.S.C.&G. monuments "Bodie Island South Base" and "Park". Offset point WT. #2 was located by using the U.S.C.&G. monuments "Kitty" and "Devil". A traverse was run between B.L. #3, WT. #2 and an arbitrary point set on top of the Ramada Inn at Nags Head, N.C. The ends of this traverse were tied back to the U.S.C.&G. monuments mentioned above. A further check was made by comparing the calculated distances B.L. #3 to Bodie Island Lighthouse and WT. #2 to Wright with the measured distances.



The theoretical precision of this control survey was calculated to be greater than 1:300 000.

LOCATION SURVEY

The location survey consisted of measuring the sides and angles of the five triangles formed by the four ACMR platforms and two control stations onshore, Bodie Light No. 3 (B.L. #3) and Wright No. 2 (WT. #2).

The measured distances were used to calculate the coordinate positions of the offshore platforms using the method of trilateration. The angles and distances were used to determine the coordinate positions using the traverse method.

Several traverses were run starting from different control stations and running through the offshore stations in differing sequence. The strongest traverses were selected and the coordinates derived were averaged along with the trilateration derived coordinates to produce the final coordinate position for each of the ACMR platforms.

The theoretical precision of the location survey was calculated to be greater than 1:125 000. The accuracy of the final calculated position of each offshore structure is within the 0.9 meter tolerance.

FIELD PRACTICES

The distances were measured using a K & E Rangemaster II laser distance measuring instrument and the angles were observed with a Wild T2 one second theodolite.

All angles were turned using four zero settings on the horizontal and with upright and inverted telescope. The mean of the eight readings was then taken as the observed angle.

Distances were measured by taking multiple readings, in one direction only, using the K & E Rangemaster and averaging the readings.



Temperature and barometric pressure were recorded at the time that each set of readings was taken and the appropriate correction was set into the instrument to compensate for refractivity. Ten distance measurements were averaged for most of the lines. However, due to adverse atmospheric conditions only three readings were taken for two of the lines. This was not considered to be detrimental to the accuracy of the survey since the greatest difference in readings on any of the lines measured was only a few hundredths of a meter.

The distance from Bodie Light to ACMR #4 was not measured.

COMPUTATION

Most of the calculations were performed by computers using proven software. The automatic data processing was broken at certain points to allow critical decisions to be made and reviewed by engineering personnel.

The slope distances measured in the field were first reduced to spherical distances and then to U.T.M. grid distances. Spherical excess and other corrections were calculated for the field angles. Since the magnitudes of the angular corrections were very much less than the magnitudes of the anticipated error in the measured angles, the corrections were not applied and the adjusted field angles were used. All subsequent calculations were then performed as plain grid calculations and the U.T.M. coordinates derived. The U.T.M. coordinates were used to calculate the grid distances and azimuths and the geographic positions, distances, and azimuths. The traverse calculations were run by the computer and adjusted by compass rule.



EAST COAST AIR COMBAT MANEUVERING RANGE

ACMR PLATFORM LOCATIONS

	<u>GEOGRAPHIC</u>	<u>U.T.M.</u>	<u>N.C. STATE</u>
ACMR 1	N 35 56 59.5646 W 75 15 58.1461	N 3 978 221.727 E 475 996.616	X 3 104 922.448 Y 821 413.558
ACMR 2	N 36 13 35.4728 W 75 15 01.1123	N 4 008 901.268 E 477 504.380	X 3 105 805.429 Y 922 223.264
ACMR 3	N 36 03 53.2239 W 74 58 59.3154	N 3 990 933.505 E 501 518.059	X 3 186 934.355 Y 866 475.872
ACMR 4	N 35 47 11.2302 W 75 05 42.1955	N 3 960 067.671 E 491 409.740	X 3 157 867.525 Y 763 921.184

Geographic Coordinates Referenced to Clarke's Spheroid of 1866.

U.T.M. Coordinates are Universal Transverse Mercator Grid Coordinates Referenced to Clarke's Spheroid of 1866 in Meters, Zone 18, Central Meridian 75 Degrees West.

N.C. State is State Plane Coordinate Grid System in Feet, Zone 3200.

Datum is National Geodetic Vertical Datum (NGVD) 1929.

18 OCTOBER 1977



STATION AT ACMR TOWER NO. 1

STATION IS A SMALL TRIANGLE OF WHITE PAINT WITH A PUNCH HOLE LOCATED IN THE CENTER OF THE UPPERMOST DECK OF THE PLATFORM.

	GEOGRAPHICAL			U.T.M. GRID		
	-----			-----		
COORDINATES	LAT.	35	56	59.5646	N 3	978 221.727
AT ACMR #1	LONG.	75	15	58.1461	E	475 996.616
DIST. TO ACMR #2			30	728.654		30 716.569
N.AZ. TO ACMR #2		2	39	24.5		2 48 48.9
DIST. TO ACMR #3			28	523.333		28 511.986
N.AZ. TO ACMR #3		63	21	59.5		63 31 22.5
DIST. TO ACMR #4			23	824.026		23 814.578
N.AZ. TO ACMR #4		139	30	43.7		139 40 05.3
DIST. TO B.L. #3			30	570.331		30 558.656
N.AZ. TO B.L. #3		241	34	52.2		241 44 13.5
DIST. TO WT. #2			36	960.477		36 946.551
N.AZ. TO WT. #2		281	14	21.9		281 23 45.1
N.AZ. TO N. LEG OF ACMR #1		0	43	50		0 53 13

NOTES:

ALL DISTANCES SHOWN ARE IN METERS.

ALL AZIMUTHS SHOWN ARE IN DEGREES, MINUTES, AND SECONDS MEASURED CLOCKWISE FROM NORTH.

U.T.M. GRID IS UNIVERSAL TRANSVERSE MERCATOR GRID REFERENCED TO CLARKE'S SPHEROID OF 1866 IN METERS.

U.T.M. GRID ZONE IS ZONE 18, CENTRAL MERIDIAN 75 DEG. W.

18 OCTOBER 1977



STATION AT ACMR TOWER NO. 2

STATION IS A SMALL TRIANGLE OF WHITE PAINT WITH A PUNCH HOLE LOCATED IN THE CENTER OF THE UPPERMOST DECK OF THE PLATFORM.

	<u>GEOGRAPHICAL</u>			<u>U.T.M. GRID</u>		
COORDINATES	LAT.	36	13	35.4728	N 4	008 901.268
AT ACMR #2	LONG.	75	15	01.1123	E	477 504.380
DIST. TO ACMR #1				30 728.654		30 716.569
N.AZ. TO ACMR #1		182	39	58.1	182	48 48.9
DIST. TO ACMR #3				30 003.561		29 991.620
N.AZ. TO ACMR #3		126	39	25.9	126	48 17.8
DIST. TO WT. #2				44 399.662		44 382.900
N.AZ. TO WT. #2		238	03	55.6	238	12 46.1
N.AZ. TO N. LEG OF ACMR #2		356	06	29	356	15 22

NOTES:

ALL DISTANCES SHOWN ARE IN METERS.

ALL AZIMUTHS SHOWN ARE IN DEGREES, MINUTES, AND SECONDS MEASURED CLOCKWISE FROM NORTH.

U.T.M. GRID IS UNIVERSAL TRANSVERSE MERCATOR GRID REFERENCED TO CLARKE'S SPHEROID OF 1866 IN METERS.

U.T.M. GRID ZONE IS ZONE 18, CENTRAL MERIDIAN 75 DEG. W.

18 OCTOBER 1977



STATION AT ACRM TOWER NO. 3

STATION IS A SMALL TRIANGLE OF WHITE PAINT WITH A PUNCH HOLE LOCATED IN THE CENTER OF THE UPPERMOST DECK OF THE PLATFORM.

	GEOGRAPHICAL			U.T.M. GRID		
	-----			-----		
COORDINATES AT ACRM #3	LAT.	36	03 53.2239	N 3	990	933.505
	LONG.	74	58 59.3154	E	501	518.059
DIST. TO ACRM #1			28 523.333		28	511.986
N.AZ. TO ACRM #1	243	31	58.5	243	31	22.5
DIST. TO ACRM #2			30 003.561		29	991.620
N.AZ. TO ACRM #2	306	48	53.2	306	48	17.8
DIST. TO ACRM #4			32 491.873		32	478.883
N.AZ. TO ACRM #4	198	08	35.4	198	07	59.6
N.AZ. TO N. LEG OF ACRM #3	359	20	36	359	20	00

NOTES:

ALL DISTANCES SHOWN ARE IN METERS.

ALL AZIMUTHS SHOWN ARE IN DEGREES, MINUTES, AND SECONDS MEASURED CLOCKWISE FROM NORTH.

U.T.M. GRID IS UNIVERSAL TRANSVERSE MERCATOR GRID REFERENCED TO CLARKE'S SPHEROID OF 1866 IN METERS.

U.T.M. GRID ZONE IS ZONE 18, CENTRAL MERIDIAN 75 DEG. W.

18 OCTOBER 1977



STATION AT ACMR TOWER NO. 4

STATION IS A SMALL TRIANGLE OF WHITE PAINT WITH A PUNCH HOLE LOCATED IN THE CENTER OF THE UPPERMOST DECK OF THE PLATFORM.

	<u>GEOGRAPHICAL</u>			<u>U.T.M. GRID</u>		
COORDINATES AT ACMR #4	LAT.	35 47 11.2302		N 3 960 067.671		
	LONG.	75 05 42.1955		E 491 409.740		
DIST. TO ACMR #1		23 824.026		23 814.578		
N.AZ. TO ACMR #1	319	36 44.6		319 40 05.3		
DIST. TO ACMR #3		32 491.873		32 478.883		
N.AZ. TO ACMR #3	18 04	39.1		18 07 59.6		
DIST. TO B.L. #3		42 505.167		42 488.707		
N.AZ. TO B.L. #3	274 55	06.3		274 58 26.6		
N.AZ. TO N. LEG OF ACMR #4	0 46	14		0 49 34		

NOTES:

ALL DISTANCES SHOWN ARE IN METERS.

ALL AZIMUTHS SHOWN ARE IN DEGREES, MINUTES, AND SECONDS MEASURED CLOCKWISE FROM NORTH.

U.T.M. GRID IS UNIVERSAL TRANSVERSE MERCATOR GRID REFERENCED TO CLARKE'S SPHEROID OF 1866 IN METERS.

U.T.M. GRID ZONE IS ZONE 18, CENTRAL MERIDIAN 75 DEG. W.

18 OCTOBER 1977



STATION AT BODIE LIGHT NO. 3 (B.L. #3)

STATION IS A SMALL TRIANGLE OF WHITE PAINT WITH A PUNCH HOLE LOCATED ON THE LOWER OF TWO CATWALKS AT THE TOP OF THE BODIE ISLAND LIGHTHOUSE, 2.56 FT. EAST OF THE WALL OF OF THE LIGHTHOUSE.

	GEOGRAPHICAL			U.T.M. GRID		
	-----			-----		
COORDINATES	LAT.	35	49	06.1868	N 3	963 751.642
AT B.L. #3	LONG.	75	33	49.1733	E	449 081.043
DIST. TO ACRM #1				30	570.331	30 558.656
N.AZ. TO ACRM #1		61	24	24.4	61	44 13.5
DIST. TO ACRM #4				42	505.167	42 488.707
N.AZ. TO ACRM #4		94	38	39.4	94	58 26.6
DIST. TO WT. #2				23	683.053	23 674.484
N.AZ. TO WT. #2		336	31	54.8	336	51 45.4

NOTES:

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ALL AZIMUTHS SHOWN ARE IN DEGREES, MINUTES, AND SECONDS MEASURED CLOCKWISE FROM NORTH.

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U.T.M. GRID ZONE IS ZONE 18, CENTRAL MERIDIAN 75 DEG. W.

18 OCTOBER 1977



STATION AT WRIGHT NO. 2 (WT. #2)

STATION IS ON STONE STEP 0.96 FT. EAST OF USC&G MONUMENT WRIGHT.

	GEOGRAPHICAL			U.T.M. GRID		
	-----			-----		
COORDINATES	LAT.	36	00	50.8745	N 3	985 521.873
AT WT. #2	LONG.	75	40	05.8062	E	439 778.451
DIST. TO ACMR #1				36	960.477	36 946.551
N.AZ. TO ACMR #1	101	00	11.4	101	23	45.1
DIST. TO ACMR #2				44	399.662	44 382.900
N.AZ. TO ACMR #2	57	49	08.7	58	12	46.1
DIST. TO B.L. #3				23	683.053	23 674.484
N.AZ. TO B.L. #3	156	28	13.9	156	51	45.4

NOTES:

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MEASURED CLOCKWISE FROM NORTH.

U.T.M. GRID IS UNIVERSAL TRANSVERSE MERCATOR GRID
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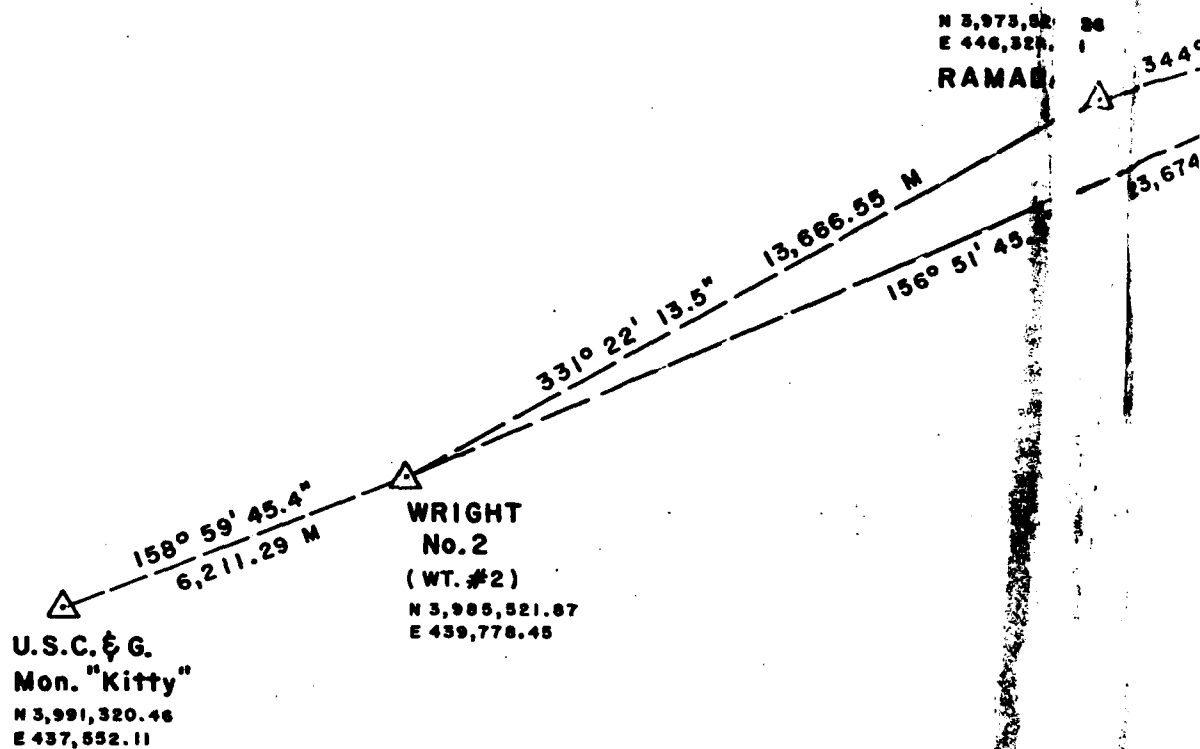
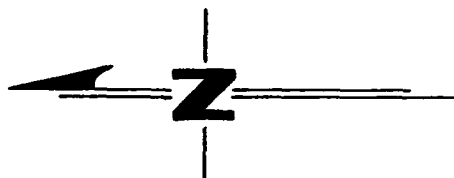
U.T.M. GRID ZONE IS ZONE 18, CENTRAL MERIDIAN 75 DEG. W.

18 OCTOBER 1977





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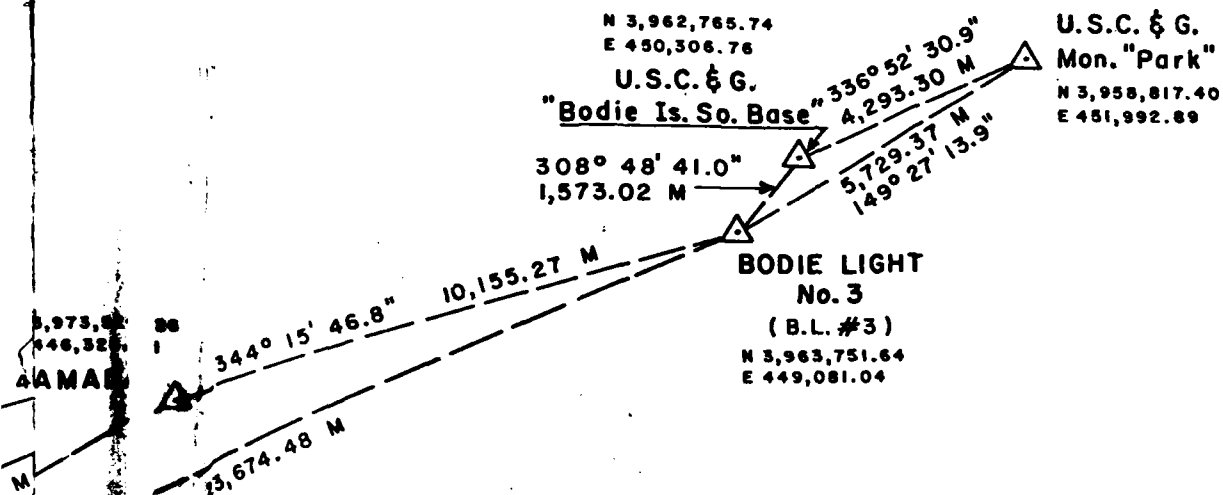


NOTES

SURVEY PERFORMED 20 AUGUST - 3 SEPTEMBER 1977.

REVISIONS

DATE

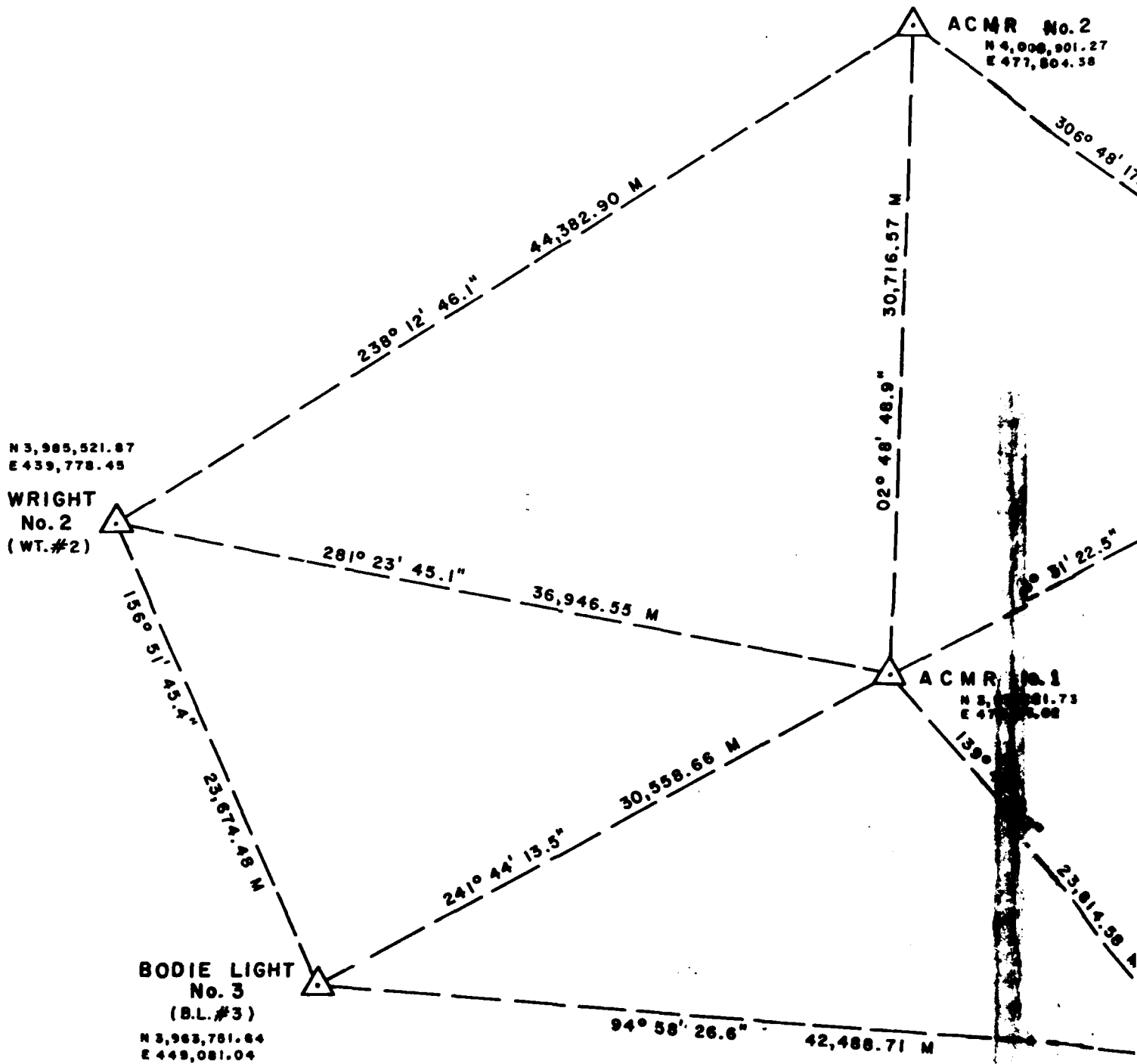


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SCALE = 1:120,000

DATE	BROWN & ROOT Inc. HOUSTON, TEXAS		CONT. No.
			29-5119-010
	CONTROL SURVEY — EAST COAST AIR COMBAT MANEUVERING RANGE — DEPT. OF THE NAVY CHESDIVNAVFACENGCOM N62477-76-C-0180		DWG. No. KH-101-00
	DRAWN BY <u>efr</u> CHECKED <u>pat</u> APPROVED <u>LSC</u>	DATE 17 Oct. 77	SHT _____ OF _____



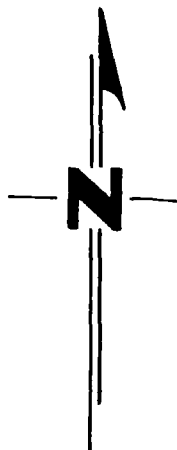
NOTES

SURVEY PERFORMED 20 AUGUST — 3 SEPTEMBER 1977.

REVISIONS

DATE	BY

ACMR No. 2
N 4,000,901.27
E 477,804.38



306° 48' 17.6"

29,991.62 M

ACMR No. 3
N 3,990,933.51
E 501,518.06

28,511.99 M

31° 22.5"

32,478.88 M

CMR No. 1
N 3,990,933.51
E 477,804.38

23,814.58 M

18° 07' 59.6"

ACMR No. 4
N 3,980,067.87
E 491,409.74

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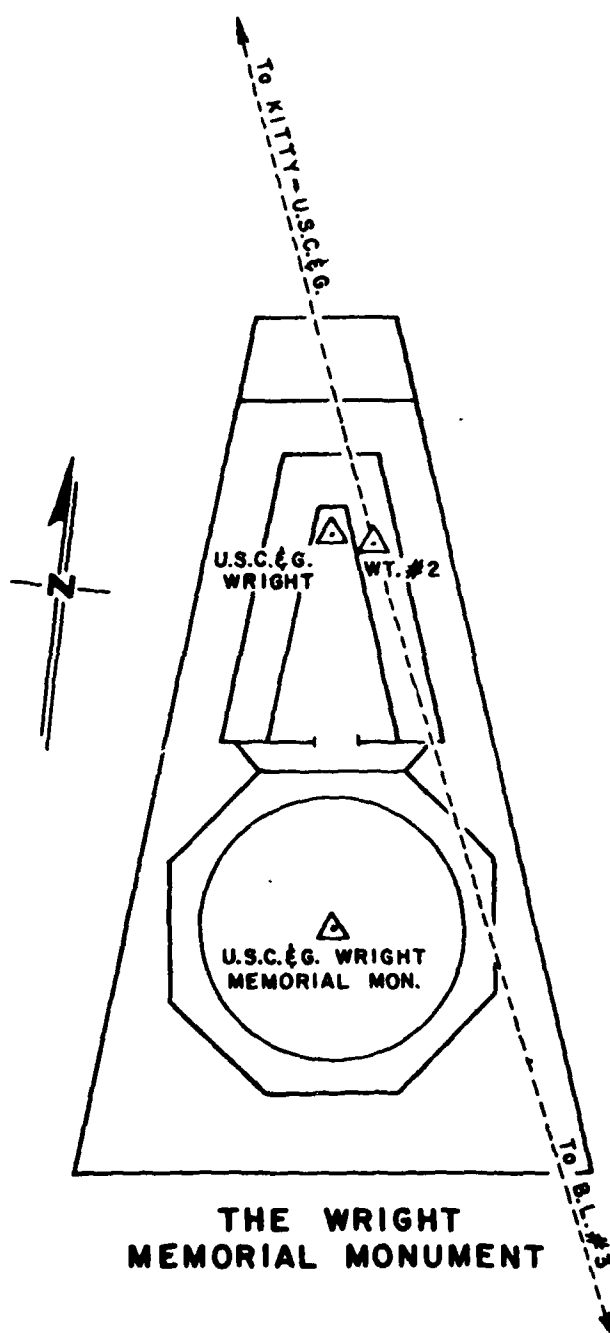
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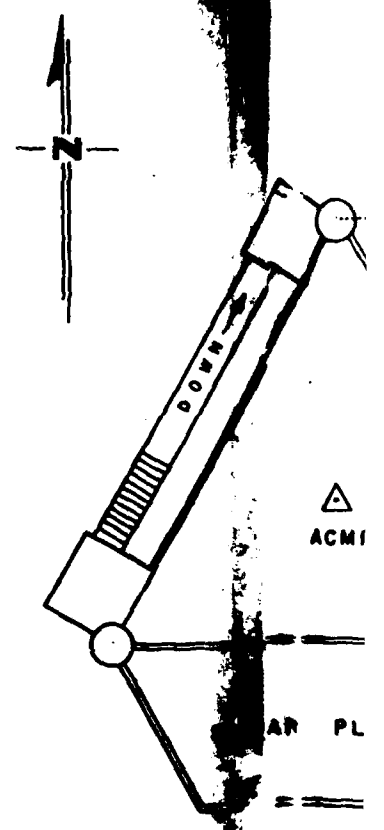
BROWN & ROOT Inc. HOUSTON, TEXAS



CONT. No.
29-5119-010



THE WRIGHT
MEMORIAL MONUMENT

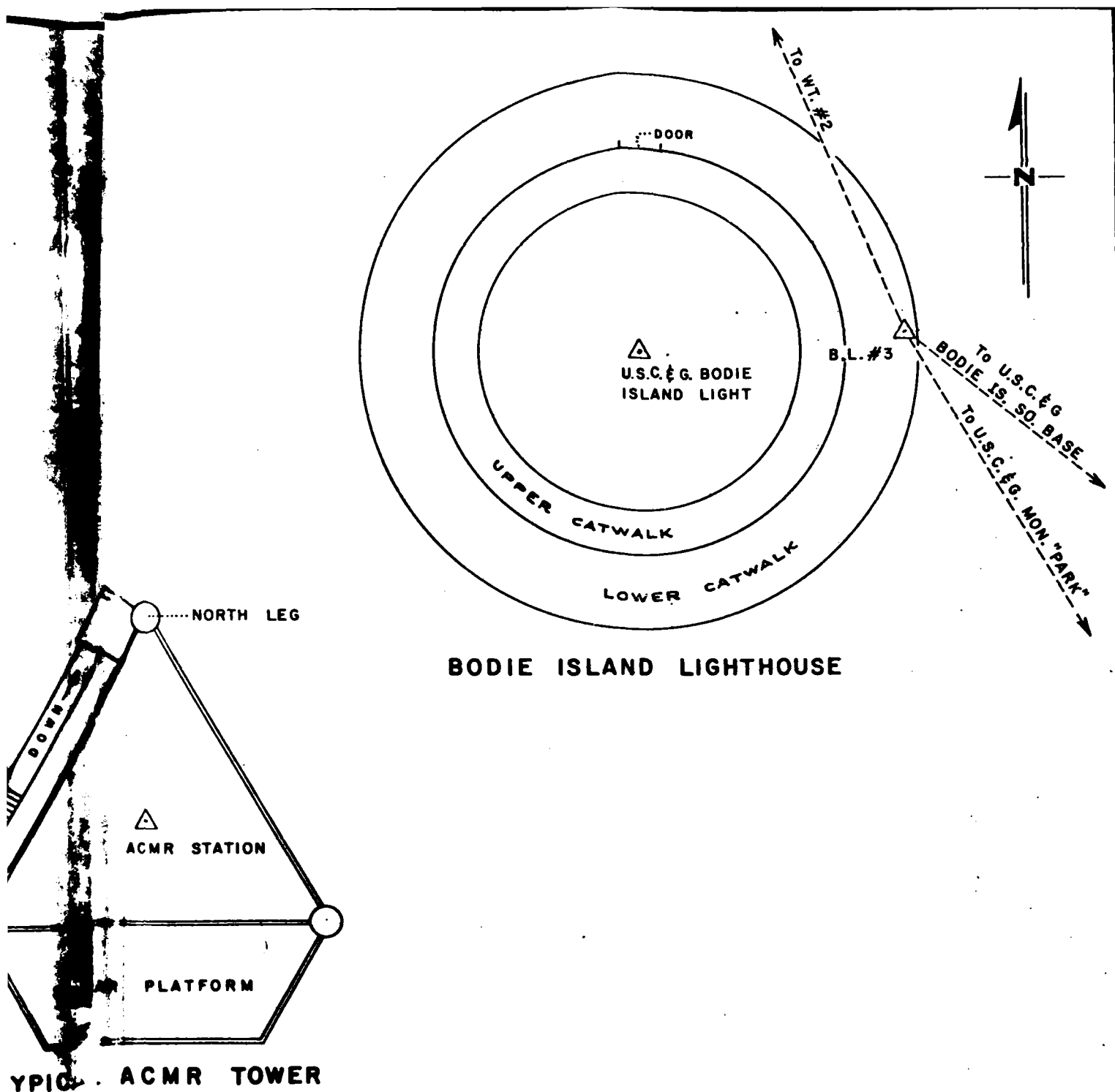


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NOTES

REVISIONS

NO.	DATE



(NOT TO SCALE)

DATE	BROWN & ROOT Inc. HOUSTON, TEXAS		CONT. No. 29-5119-010
	STATION LOCATION DIAGRAMS - EAST COAST AIR COMBAT MANEUVERING RANGE - DEPT. OF THE NAVY CHESDI VNAV FACENGCOM N62477-76-C-0180		DWG. No. KH-103-00
	DRAWN BY <u>ela</u> CHECKED <u>USA</u> APPROVED <u>phc</u>	DATE 18 Oct. 77	SMT _____ OF _____

HORIZONTAL CONTROL DATA

QUAD 350754 STATION 1060
 NC 35°30' 10 36°00'
 LATITUDE 75°30' 10 76°00'
 LONGITUDE
 DIAGRAM NI 18-2 MANTEO

by the
 NATIONAL GEODESIC SURVEY
 NORTH AMERICAN 1927 DATUM

R

SEP 1976
 U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL GEODESIC SURVEY
 PARK (continued)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION PARK
 ESTABLISHED BY S.C. Miller YEAR 1962 TRANSFERRED NORTH CAROLINA ALCO ☐
 ACQUIRED BY E.A. Beuchamp YEAR 1975 COUNTY Dare
 ACTION REQUIRED AND DIRECTION FROM PRESENT TIME

Detailed comments as to the status of the original triangulation including marker found, comparisons, changes made, and other pertinent facts

All marks were recovered and they were all found to be in good condition.

To reach the station from the south end of the concrete bridge over the Oregon Inlet, go southeasterly following State Road 12 for 0.4 mile to a side road on the left, turn left and go northeasterly following a paved road for 0.35 mile to the Oregon Inlet U S Coast Guard Station on the left. Continue on northeasterly following the paved road for 0.45 mile to the old Perry Landing, turn right and go north following a paved road for 0.2 mile to the station site on the left as described in 1962.

W. B. Bunting

U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL GEODESIC SURVEY

FORM CG-50-50 (Rev. 1-64)
 PREPARED BY

SEP 1976

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

HORIZONTAL CONTROL DATA

by the
National Geodetic Survey
NORTH AMERICAN 1927 DATUM

Bodie Island Lighthouse (Dare County, A. D. Beache, 1876; 1887).—On Bodie Island. Station is center of lighthouse, which is conical tower with alternate white and black horizontal bands above granite base, with black ironwork housing light. 166 feet above mean water level.

RECOVERY NOTE, TRIANGULATION STATION

Established by: A. D. Beache Year: 1875 State: North Carolina County: Dare
Reoccupied by: E. A. Beuchamp Year: 1975

Recovery notes as to the status of the original description:

Station recovered in good condition.

Description adequate and correct except for the following additions:
Located about 2.0 miles north of the Ferry Landing on north side of Oregon Inlet.

U.S. DEPARTMENT OF COMMERCE - OCEAN AND COAST GUARD
RECOVERY NOTE, TRIANGULATION STATION

Name of station: **RODIE ISLAND LIGHTHOUSE**
Established by: A. D. Beache Year: 1875 State: North Carolina
Reoccupied by: J. O. Ellerbe Year: 1962 County: Dare

Detailed statement as to the status of the original description: including marks found, descriptions, changes made, and other pertinent facts:
The station was recovered as described.

The station was observed eccentric. The eccentric point is located on the lower one of two set walls of the lighthouse, over the front window, between the fourth and fifth guard rail post from the rear approaching the station. 2.34 feet west of the east edge of the actual, 2.34 feet west of the fifth post from the rear, 2.01 feet east-north-east of the east edge of the actual and 2.01 feet southeast of the fourth post from the rear. The eccentric point was a 1-inch triangle situated in the wall with a punch hole. The point observed on and measured to was the sharp point at the apex of the hole in the corner of the roof of the lighthouse, the distance being 3.005 meters.

U.S. DEPARTMENT OF COMMERCE - OCEAN AND COAST GUARD
RECOVERY NOTE, TRIANGULATION STATION

Name of station: **RODIE ISLAND LIGHTHOUSE**
Established by: A. D. Beache Year: 1875 State: North Carolina
Reoccupied by: V. R. Schuchman Year: 1962 County: Dare

Detailed statement as to the status of the original description: including marks found, descriptions, changes made, and other pertinent facts:
Apparently unchanged except for electrification and automation since built according to the data on globe of the necessary house at the western foot of the lighthouse tower in 1872.

RECOVERY NOTE, TRIANGULATION STATION

Name of station: **RODIE ISLAND LIGHTHOUSE**
Established by: A. D. Beache Year: 1875 State: North Carolina County: Dare
Reoccupied by: E. A. Beuchamp Year: 1975

Recovery notes as to the status of the original description: including marks found, descriptions, changes made, and other pertinent facts:

Station was recovered as stated in the previous descriptions and recovery notes, in good condition.

A key is needed to get to the top of this lighthouse, key can be gotten from the Officer in charge, at the Oregon Inlet U S Coast Guard Station, located about 3.5 miles south of the lighthouse on the south side of the Oregon Inlet as per signs COAST GUARD STATION.

To reach the station site from the north end of the concrete bridge over the Oregon Inlet, go northerly following State Road 12 for 2.6 miles to crossroads, turn left and follow the paved road southeast and southerly for 0.95 mile to the lighthouse and the station site as described in the previous descriptions.

QUAD 350754 STATION 1010
NC
LATITUDE 35° 30' TO 36° 00'
LONGITUDE 75° 30' TO 76° 00'
DIAGRAM NI 18-2 MANTEO

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **RODIE ISLAND LIGHTHOUSE**

STATE: **NORTH CAROLINA** YEAR: **1875**

SECOND

SOURCE: **G-2031**

GEODETIC LATITUDE	35° 49' 06.17854	SCHEID	1
GEODETIC LONGITUDE	75° 33' 49.29767		

STATE COORDINATES (FATH)			
STATE & ZONE	CODE	X	Y
NC	3200	3,018,566.84	770,398.08
			1° 59' 00"

PLANE ALTIMUTH HAS BEEN COMPUTED BY THE 8-10-11 FORMULA REDUCED TO THE SECOND TERM			
TO STATION OR OBJECT	GEODETIC ALTIMUTH (Feet from sea)	PLANE ALTIMUTH (Feet from sea)	CODE

HORIZONTAL CONTROL DATA

QUAD 350754 STATION 1013
NC
LATITUDE 35° 30' TO 36° 00'
LONGITUDE 75° 30' TO 76° 00'
DIAGRAM NI 18-2 NANTEO

by the
National Geodetic Survey
NORTH AMERICAN 1987 DATUM

BODIE ISLAND SOUTH BASE (Dare County, N.C., A.D.B., 1849; 1937) - Near the south-
east end of Bodie Island, about 1 mile southeast of lighthouse, about 0.75
mile west of Atlantic shore, 120 meters (394 feet) west of telephone line,
in range with lighthouse and Broad Creek Point. Underground mark is a
copper nail in top of 4-inch red-cedar stake driven down through a hollow
glazed stoneware marker shaped as frustum of pyramid, top of which is 3
feet below surface of ground. A 5-foot square platform made of 3-inch
planks laid crosswise and bolted together, with 18-inch diameter hole at
center, was placed with center of hole over and 8 inches above the stake.
On this is placed surface mark, which is small drill hole in copper bolt.
placed at center of stone monument 3.3 feet square by 2.8 feet high. This
stone is set on the platform and its top is about flush with surface of
ground. Over surface mark is placed a capstone 3 feet high and 2 feet on
each side, with top in the form of a pyramid about 8 inches high. Cap-
stone bears following inscriptions: On north face, U.S. COAST SURVEY;
on east face, 1849; on south face, BASE No. 4; and on west face,
A.D.B. Supt. Two subsidiary stone monuments 2.02 feet long by about 1
foot square were placed at the east and west extremities of knoll on
which station is located and nearly on same level as station, on a line
nearly at right angles to base line passing through station. These stones
are flush with ground and each has a copper bolt with drill hole and cross
lines on top. Distance from station to west monument is 25.44 meters (83.5
feet) and to east monument 21.66 meters (71.1 feet). In 1903 the east
subsidiary stone could not be found. In 1933 the capstone was recovered
as described, and it is presumed that the other parts of station are as
described. Reference marks were not recovered. Azimuth from station to
Bodie Island Lighthouse is 128° 24' 41.5".

BODIE ISLAND SOUTH BASE (Dare County, N.C., A.D.B., 1849;
R.E.P., 1937) - This cap

stone as described was recovered and found in excellent condition.
The description should be amended to read: Near the southerly
end of Bodie Island, 7/8 mile southeast of Bodie Island Light-
house, 1/5 mile west of Atlantic shore, about 120 meters west of
telephone line, at the junction of the two sand roads from the
inlet.

It is assumed that the other parts of the mark are as describ-
ed. No reference marks were found; however, no definite search
was made for them since they are covered with several feet of
sand.

U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
RECOVERY NOTE, TRIANGULATION STATION

Name of Station: **BODIE ISLAND SOUTH BASE**
Recoveryman: A. D. Beale Year: 1949 Name: North Carolina
Recoveryman: W. V. J. Schellert Year: 1942 County: Dare

Detailed statement as to the status of the original description: including marks found, obstructions, changes made, and other pertinent facts:
Recovered the toppled and some 2 or 3 yards removed about 2-foot square granite post
about 3 feet long with identifying limited lettering was found southwest of the station.
An object that resembled a granite when struck with a shovel and subsequently level and about
the described 3.3-foot square dimensions was recovered about 3 feet S of a steel witness
post, that was topped and back reported by engineers of the National Park Service as set
recently by Mr. C. G. River of the Coast Survey. Underlaid failed to shovel and
water feet enough to cover actually view the granite block which is supposedly the under-
laid station.
About 7.8 miles S by the 1001 paved highway from the junction of Nos. 64, 264,
and 128 N. S. Highway at Manteo or the southern part of the village of Manteo, about
0.4 mile S along the sand road from Oregon 202, about 50 yards S of center line of the
road pavement, 27 feet in diameter bearing S 80° E from No. 260 oriented telephone pole,
about 7 feet lower than the wire in the pole number, 3 feet S of steel witness post, and
about 2 feet below the present sand surface or about one foot below the water table.

TABLE FORM NO. 2
11-1-52

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: BODIE ISLAND SOUTH BASE

STATE: NORTH CAROLINA YEAR: 1849

INDEX: G- 2031

GEODETIC LATITUDE:	35° 48' 34.41290	ELEVATION:	0.8
GEODETIC LONGITUDE:	75 33 00.10833		3
			FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	U.S.M.D. or A.M.L.
NC	3200	3,022,726.91	767,328.74	+ 1° 59' 28"

PLANE AZIMUTH HAS BEEN COMPUTED BY THE U.S.M.D. or FORMULA SELECTING THE SECOND TERM			
TO STATION OR OBJECT	GEODETIC AZIMUTH (Feet)	PLANE AZIMUTH (Feet)	CODE

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC

6043 340733 STATION 1049
 NC
 LATITUDE 36° 00' 70 36° 30'
 LONGITUDE 75° 30' 70 76° 00'
 BARBAR NJ 18-8, 11 EASTVILLE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF SLAVE	STATE	YEAR	SECOND	THIRD
DEWE	NORTH CAROLINA	1962		
9-13959				FIELD MASTER

[illegible]

1. The number of employees who work for the company is 100. The number of employees who work for the company is 100.

BRIGHT MEMORIAL MONUMENT

53	1200
----	------

97 356

RESEARCH DESIGN

DESCRIPTION OF THE MEASUREMENT STATIONS

NAME OF STATION	MS72	STATION'S CORRELATION NUMBER DATE
NAME OF BOAT	A.C. Miller	MADE IN M.O.C.

[illegible]

Station is located on the west edge of the village of Mill Devil Mills, about 0.3 mile west of the ocean beach, 1.4 miles north of the intersection of U.S. Highway 128 Bypass and the entrance to the Wright Memorial Monument and in the southeast angle of the intersection of U.S. Highway 128 Bypass and Durham Street. Station is 70 feet west of the center line of the highway, 30.4 feet south of the center line of Durham Street, 31 feet south of power line pole # 115-16 and 2.1 feet north-northeast of a metal witness post and sign. The mark is a standard disk, set in the top of a 12x12 inch concrete monument projecting 6 inches and is stamped HWY 128 20 1942.

To reach from the intersection of U.S. Highway 128 Bypass and the entrance to the Wright Memorial Monument and Durham, go northward on U.S. Highway 128 Bypass for 1.4 miles to cross road and station on left.

Reference Mark No. 1 is 70.5 feet west of the center line of the highway, 30.7 feet north of power pole # 115-16, 71.4 feet north of Durham Street and 21 feet west of the center line of a narrow concrete service road. The mark is a standard disk, set in the top of a 12x12 inch concrete monument projecting 6 inches and is stamped HWY 128 20 1942.

Reference Mark No. 2 is 72.7 feet southeast of power pole # 115-16, 71.5 feet west of the actual witness post and sign and 40 feet south of the center line of Durham Street. The mark is a standard disk, set in the top of a 12x12 inch concrete monument projecting 6 inches and is stamped HWY 128 20 1942.

Arkansas Mark is 1.7 miles south of the station and about 0.5 mile west of U.S. Highway 128 Bypass. It is the center of the dome of the Wright Memorial Monument.

RECOVERY NOTE, TRANSLATION STATION

NAME OF SYSTEM
ESTABLISHED BY
RECEIVED BY
NAME OF SYSTEM
ESTABLISHED BY
RECEIVED BY

S.O. MILLER
A.J. POTWELL

TRAIL 1968
TRAIL 1969

North
South Carolina
County Data

Mill Devil Mills

2

Statia was recovered as described and all marks were found to be in good condition. The original description is adequate except the station mark is now in the form of a new cottage. Mark 1 is 30 feet east of the north-east corner of cottage and 15 feet north of the centerline of driveway. Reference Mark No. 2 is 12 feet north of the northwest corner of cottage.

(also give us Penn; 400)

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QUAD 360753 STATION 1049
 NC
 LATITUDE 36°00' 10 36°30'
 LONGITUDE 75°30' 10 76°00'
 DIAGRAM NJ 18-8,11 EASTVILLE

HORIZONTAL CONTROL DATA

By the
 NATIONAL GEODETIC SURVEY
 NORTH AMERICAN 1927 DATUM

SEP 1976
 U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY
 DEVIIL (Continued)

REPORT ON CONDITION OF SURVEY MARK

Form Approved
 Budget Form No. 1-1-1975

NAME OF DESIGNATION: DEVIIL Year Established: 1962

State: North Carolina County: Dare Organization Established by: USCLOS

Location and direction from nearest town: In Kill Devil Hills

Description published in: (Name, book, or geographic number)
None J. D. Barbours, Division of Geodetic Survey

Mark searched for at recovered by: Dept. Natural & Economic Resources

Organization: Raleigh, N. C. 27611

Date of report: 1-16-74

Condition of marker: Line towers and anchors found damaged in last year last mark.

Mark	Year	Condition
DEVIIL RM 1	1962	Good
DEVIIL RM 2	1962	Good

Remarks: 30.0' S of RR #160-17 with aluminum ref. tag

Mark accessible? ☒ Yes ☐ No Property owner contacted? ☐ Yes ☒ No

Please report on the changeability of the mark in case a mark was not recovered, suggested changes in description, and for repairing or moving the mark, or other pertinent items.

R

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: DEVIIL Year: 1962 State: North Carolina County: Dare

Location: 30.0' S of RR #160-17 with aluminum ref. tag

Mark accessible? ☒ Yes ☐ No Property owner contacted? ☐ Yes ☒ No

Please report on the changeability of the mark in case a mark was not recovered, suggested changes in description, and for repairing or moving the mark, or other pertinent items.

Detailed description of the station: (including marker found, condition, shape, size, and other pertinent facts)

Station mark was recovered and it was found to be in good condition. Mark is 32 feet northwesterly of the northeast corner of a house, 14 feet west of the west edge of a concrete side walk and is flush with the ground.

Reference mark No 2 was recovered in good condition. It is 13 feet north of the northwest corner of a house and is flush with the ground.

Reference mark NO 1 was recovered and it was found to be in good condition. It now has been painted white and it projects about 1 foot.

The 1962 description is adequate to reach.

Signature
 U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL GEODETIC SURVEY

SEP 1976
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY - NATIONAL GEOPHYC SURVEY

by the
National Geodetic Survey
NORTH AMERICAN 1987 DATUM

ADJUSTED HORIZONTAL CONTROL DATA

DECEMBER 27, 1900.

Station is located on the south shore of Oregon Inlet, about 0.8 mile north of the Oregon Inlet U.S. Coast Lifeboat Station and 0.2 mile north of the Oregon Inlet Ferry docks. Station is about 300 feet south of shore because to 50 feet southwest of the southeast corner of a paved parking area, 101 feet west of the center line of a paved road leading from the ferry docks to a beach camping area and 55 feet west of a metal witness post and sign. The station is a standard disk clamped to the top of a copper weld rod which is driven through a 2 inch galvanized pipe to a depth of 24 feet. The disk projects 4 inches and is stamped 4-10-1962.

Reference Mark No. 1 is 77 feet west of centerline of road, 50.5 feet west-southwest of the southwest corner of paved parking area and 51.6 feet north of a metal witness post and sign. The mark is a standard disk, clamped to the top of a copper weld rod which is driven through a 2 1/2 inch galvanized pipe to a depth of 2 1/2 feet. The disk projects 6 inches and is stamped PMK NO 1 1962.

Reference Mark No. 2 is 87.5 feet southeast of the metal witness post and sign. The mark is a standard disk, clamped to the top of a copper weld rod which is driven through a 2 1/2 inch galvanized pipe to a depth of 2 1/2 feet. The disk projects 6 inches and is stamped PMK NO 2 1962.

NAME OF PERSON DECLARED BY	NAME	YEAR	STATE	DATE	Birth	DEATH
DECLARED BY	S.O. Miller	1962	North Carolina			
DECLARED BY	A.L. Powell	1969	North Carolina			

Provisional requirement as to the fitness of the original designations including make brand, envelope, change made, and other pertinent facts: Recovered as described. A bridge has been built over Oregon Inlet and the Perry Boats are no longer in use but still easily recoverable.

NAME OF STUDENT	PAGE	
STUDYING AT	S.C.H.	YEAR 1962
LIVING ON	S.B. THIRDS	YEAR 1978
		CONTRACTS
		W - Monthly CONTRACTS MADE ALSO
		☐

Serialized document is in the files of the original descriptions including master hand, composite, change mark, and other pertinent items. The station mark was recovered in fair condition. The tint has been fully restored. Reference marks 1 and 2 were recovered in good condition. The original description is adequate.

(continued on next page)

SEP 1976
U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODESIC SURVEY

SALS 34-0753
 NC
 LATITUDE 34° 00' TO 34° 30'
 LONGITUDE 75° 30' TO 76° 00'
 MAGNAM NJ 14-0.11 EASTVILLE
 STATION 1079

RECEPTION OF TRANSLATION STATION

NAME OF STATION	STATE	CITY	COUNTRY	DAYS
STATION WFO <td>FLA.</td> <td>MILWAUKEE</td> <td>USA</td> <td>MONDAY</td>	FLA.	MILWAUKEE	USA	MONDAY
STATION WFO	FLA.	MILWAUKEE	USA	TUESDAY
STATION WFO	FLA.	MILWAUKEE	USA	WEDNESDAY
STATION WFO	FLA.	MILWAUKEE	USA	THURSDAY
STATION WFO	FLA.	MILWAUKEE	USA	FRIDAY
STATION WFO	FLA.	MILWAUKEE	USA	SATURDAY
STATION WFO	FLA.	MILWAUKEE	USA	SUNDAY

ADJUSTED HORIZONTAL CONTROL DATA

[illegible]

Station is located about 0.65 mile west of the Post Office in Kittery, Maine. A standard disk set in a 12x12 inch concrete monument and stamped KIRBY 1948 is 12 feet east-southwest of the intersection, 17 feet east of a pylonlike pole and 2.7 feet northeast of a metal witness post with plate. The mark is flush with the ground.

20 Feet from the Post Office in the Village of Elly Mard, 80 yards
on surfaced road for 0.65 mile to U.S. Highway No. 139 1/2 miles and Station
as described.

Reference Mark No. 1 a standard disk set in a 12x12 inch concrete
monument and stamped Elly M 1963 is 29 feet north of the approximate
centerline of surfaced road, 77.7 feet east of the approximate
centerline of unsurfaced road, 10 feet west of the approximate
east of a highway right-of-way line, and 3 feet
east of a highway right-of-way line. This mark is 3 inches
Reference Mark No. 2 a standard disk set in a 12x12 inch concrete
monument and stamped Elly M 1963 is 22 feet north of the approximate
centerline of surfaced road, 196.3 feet west-northwest of a utility pole
and 11 feet east of a highway right-of-way marker. The mark projects
1 inch.

Alameda Mark, a standard disk set in a lowly brick concrete monument and stamped KIRBY 1942 is 59 feet northeast of a highway right-of-way marker, 30 feet west of the approximate centerline of the highway and 1-2 street southeast of an aluminum witness post with a metal sign. The mark projects 4 inches.

To reach Alameda Mark from Station, go south on U.S. Highway No. 159 by-pass for 0.25 mile to mark on right (west) side of highway.

COLLECTOR	LOCALITY	DATE	TIME	NUMBER
W. L. BROWN	near Smith's Mark	1911	12.1	00 00 00.0
W. L. BROWN	near Smith's Mark	1911	12.1	01 27 12.1

RECOVERY NOTE, TRIANGULATION STATION

NAME OF PRISON	CITY	YEAR	STATE	MADE MAPS ALSO
RECEIVED AT	NEW YORK	1962	N.Y.	☐
RECEIVED AT	NEW YORK	1965	N.Y.	☐

Shaded amounts are in the lower 10 percent including mortgage interest, charges made, and other services listed.

Station was recovered in good condition.

A large billboard has been erected about 10 feet south of the station, which obstructs the line of sight to the Asimuth Mark.

RECOVERY NOTE, TRANSLATION STATION

NAMES OF MEMBERS **LIST**
 MEMBERS OF S.O. MILLER YEAR 1969 NORTH
 MEMBERS OF A.S. JOHNSON YEAR 1969 SOUTH
 MEMBERS OF SOUTHERN FARMERS UNION OF 1969 NORTH

It is noted that the above information was obtained from a confidential source who has provided reliable information in the past. It is noted that the above information was obtained from a confidential source who has provided reliable information in the past.

[illegible]

SEP 1976

U.S. DEPARTMENT OF COMMERCE
NATIONAL SYSTEM OF SURVEYING
NATIONAL GEODETIC SURVEY, NATIONAL GEODETIC SURVEY
KITTY (Continued)

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
NORTH AMERICAN 1957 DATUM

QUAS 360753 STATION 1079
LATITUDE 36°00' TO 36°30'
LONGITUDE 75°30' TO 76°00'
DIAGRAM NJ 18-8,11 EASTVILLE

REPORT ON CONDITION OF SURVEY MARK

Name of Designation: KITTY Year Established: 1963
State: North Carolina County: None Date: UNCLAS
Name and address from source: Kitzy High
Description published in: None Date: None or coordinate marking

Mark described for or received by: None Name: J. B. Barbour, Division of Geodesic Survey
Organization: None Address: Halifax, North Carolina 27611
Date of report: 1-16-74

Condition of mark: Line Inscribed and numbers found: None (see note on each mark)

Mark number	KITTY 1963	Condition	Good
KITTY No. 1	1963	Good	
KITTY No. 2	1963	Good	
KITTY AL.	1963	Good	

Mark described: ☐ No. ☐ Yes. Property owner contacted: ☐ Yes ☐ No
Please report on the condition of the mark, its location, its use, its history, its description, and its
reliability or marking the mark, or other pertinent facts.

KITTY 1963 is in the SE quadrant of intersection of US 130 Bypass and SR 1205.
7.9' NW of sign above post with alum. tag and witness sign, 117.0' SW of PP with
alum. ref. tag. Station is 12 inches below the ground.

KITTY No. 1 1963 is 47.0' E of PP with aluminum ref. tag, and is 6 inches below ground.

KITTY No. 2 1963 is south of SR 1205 instead of north as described, 72.5' SW of
PP with aluminum ref. tag, and 6 inches below the ground.

KITTY AL. is 117.0' W of PP with aluminum ref. tag, and 12 inches below the ground.