

[REDACTED] SITE SURVEY REPORT
(ABBREVIATED)

LORAN C STATION CAROLINA BEACH, N.C.

FIFTH COAST GUARD DISTRICT

cc Loran Sta Carolina Beach

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UNITED STATES COAST GUARD

~~SECRET~~

ADDRESS REPLY TO:
COMMANDER
5TH COAST GUARD DISTRICT
FEDERAL BUILDING
301 CRAWFORD STREET
PORTSMOUTH, VIRGINIA



dcs
G08/A9
28 July 1961

FIRST ENDORSEMENT on Fifth District LORAN C Site Survey Party
ltr G08/A9 of 26 July 1961

From: Commander, Fifth Coast Guard District
To: Commandant (CCS)

Subj: Carolina Beach LORAN C Station Abbreviated Site Survey Report

1. Forwarded.
2. The condition of the present Operations Building is such that considerable modifications will have to be made to bring it up to acceptable standards for Loran-C operations. The primary modifications are summarized as follows:
 - a. Renew all electrical wiring throughout.
 - b. Remove improperly bonded and grounded metal lathe ceiling and replace with sheetrock or plywood.
 - c. Renew lighting fixtures throughout.
 - d. Construct an addition to the present building, size 36' x 32'.
 - e. Relocate the underground tank and fueling system outside the electromagnetic field and ground system. A small 24 hour capacity day tank would be installed adjacent to the present building.
 - f. Relocate vehicle parking lot to the new by-pass area outside the antenna umbrella.
3. The cost of the necessary modifications to the existing building size 80' x 32' is estimated at \$7.00 per square foot or \$17,920. The cost of the construction of the 36' x 32' addition is estimated at \$10.00 per square foot or \$11,520. In addition, it is recommended that a 10' x 10' hurricane structure and paint locker be built outside the shadow of the 625 foot antenna tower. The cost of construction for this shelter is estimated at \$15.00 per square foot or \$1,500. Total costs including modifications to existing structure, addition to this building and construction of the hurricane shelter are estimated at \$30,940.

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4. The construction of a completely new structure located outside the shadow of the 625' antenna should be considered. This structure, size 32' x 116', could be constructed for an estimated cost of \$15.00 per square foot or \$55,740. This proposed new structure would be of masonry construction throughout, with a flat concrete slab roof, which would obviate the necessity for a separate hurricane shelter.

5. Therefore, it is strongly recommended that a completely new Operations Building be constructed outside the ground system near the by-pass area on the access road.



T. J. FABIK
Chief of Staff

UNITED STATES COAST GUARD

ADDRESS REPLY TO:
COMMANDER
5TH COAST GUARD DISTRICT
FEDERAL BUILDING
301 CRAWFORD STREET
PORTSMOUTH, VIRGINIA



Encl: (1) Reference (a)
(2) Reference (b)
(3) Site Survey Report

G08/A9
26 July 1961

From: Fifth District LORAN C Site Survey Party
To: Commander (CCS)
Via: Commander, Fifth Coast Guard District

Subj: Carolina Beach LORAN C Station Abbreviated Site Survey Report

Ref: (a) COMDT Msg 061322Z July 1961
(b) COMDT Msg 201304Z July 1961

1. An abbreviated site survey report covering the proposed continued operation of the LORAN C Station at Carolina Beach, North Carolina, is submitted herewith.
2. The survey party met with representatives of the Commandant, both in the District office and at the site, on 10, 11, and 12 July 1961.
3. In accordance with references (a) and (b), this report is abbreviated and consists primarily of outline recommendations for action to be taken or made effective for the expanded operation of the existing unit.
4. Under the guide lines of references (a) and (b), certain assumptions were drawn, or agreed upon by the survey party, which form the basis of this report. These basic assumptions are:
 - a. The Carolina Beach site for the East Coast Master LORAN C Station is "temporary" but that relocation is presently programmed as an "indefinite future" project.
 - b. The Carolina Beach Station will, upon completion of approved changes, become a fully operational LORAN Station of the Fifth Coast Guard District, vice the "Experimental Station" status of the past.
 - c. The existing "Operations Building" will be retained and modified for reasons of assumption (subparagraph 4.a. above), but being in the shadow of the 625 ft. antenna tower, evacuation of the building will be permitted for safety of personnel when necessary and under authority and conditions yet to be promulgated.

D. B. Permar
D. B. PERMAR, CDR, USCG

E. B. Kopp
E. B. KOPP, LCDR, USCG

V. Koll
V. KOLL, LT, USCG

Encl: (1) Reference (a)
(2) Reference (b)
(3) Site Survey Report, Carolina Beach LORAN Station

ADDRESS ONLY TO:
COMMANDER
5TH COAST GUARD
FEDERAL BUILDING
301 CRAWFORD STREET
PORTSMOUTH, VIRGINIA



Distribution:
COMDT (12)
CCGDFIVE (4)
LORSTA C-II, Carolina Beach (1)

From: Fifth District LORAN C Site Survey Report
To: Commander (CGS)
Via: Commander, Fifth Coast Guard District

Subject: Carolina Beach LORAN C Station Abbreviated Site Survey Report

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D. P. BROWN, CDR, USCG

E. F. HOFF, LTJG, USCG

V. KILL, LT, USCG

Ref: (a) COMDT msg 061322Z of Jul 1961

TO CCGD FIVE
INFO CCGD ONE
CCGD SEVEN

BT

UNCLAS

CCS TO DCS

CAROLINA BEACH LOR-C STATION

A. MY 221431Z

1. FIRM PLANS FOR PERMANENT EAST COAST LORAN-C CHAIN
AS FOLLOWS:

A. NO CHANGE TO EXISTING PLANS FOR NANTUCKET OR JUPITER
LORAN A/C

B. PLAN TO RELOCATE CAROLINE BEACH TO CAPE HATTERAS REMAINS
LONG RANGE GOAL BUT IS DEFERRED FOR AN INDEFINITE PERIOD.
INSTRUCTIONS RELATIVE LAND ACQUISITION CAPE HATTERAS
WILL BE SUBJECT OF SEPARATE CORRESPONDENCE.

C. RETAIN EXISTING CAROLINA BEACH LORAN-C STATION AS MASTER
STATION WITH MODIFICATIONS FOR INSTALLATION NEW
ELECTRONIC EQUIPMENT

2. CONDUCT ABBREVIATED SITE SURVEY CAROLINA BEACH LORAN-C
STATION TO DETERMINE NECESSARY MODIFICATIONS. FOLLOWING
ARE GUIDELINES:

A. OPERATION OF EXISTING STATION DURING CONSTRUCTION AND
INSTALLATION NEW EQUIPMENT REQUIRED.

B. USE EXISTING ANTENNA WITH INSULATOR MODIFICATION

C. CONSTRUCT NEW TRANSMITTER BUILDING AT BASE OF ANTENNA
SUITABLE FOR 10-YEAR OCCUPANCY

D. USE EXISTING BUILDING FOR ALL OTHER FUNCTIONS

E. PRESENT PLAN IS FOR STATION TO REMAIN SUBSAND QUARTERS

F. CONCEPTS FOR RATING STRUCTURE REMAINS ABOUT AS PRESENT.
HOUSE-KEEPING PERSONNEL TO BE LIMITED. INCREASE OF TECHNICAL
PERSONNEL ABOVE THAT NORMALLY ASSIGNED A LORAN-C
STATION SHOULD BE CONSIDERED IN VIEW TIMING PROJECT

3. SITE SURVEY IS A DISTRICT RESPONSIBILITY. PROVIDED
DATE IS SUITABLE FOLLOWING PERSONNEL WILL ARRIVE DISTRICT
OFFICE MORNING 10 JULY FOR BRIEFING AND TO ASSIST IN
SURVEY:

LCDR E M LIPSEY - EEE

LCDR T E HAWKINS - OAN

LTJG C J ALTON - ECV

4. FOR PLANNING PURPOSES TARGET ON-AIR DATE FOR PERMANENT
SYSTEM REMAINS 1 JANUARY 1962, WITH REALIZATION THAT SOME
SLIPPAGE MAY BE UNAVOIDABLE

Enclosure (1)

Ref: (b) COMDT msg 201304Z of Jul 1961

TO CCGDFIVE

BT

UNCLAS

FROM CCS

CAPE FEAR SITE SURVEY

1. THIS MESSAGE WILL CONFIRM HQ REPRESENTATIVE COMMENTS FOR NEW CONSTRUCTION AT CAPE FEAR.
 2. THE FOLLOWING MAJOR CHANGES SHOULD BE INCORPORATED IN SITE SURVEY REPORT
 - A. CONSTRUCTION OF NEW TRANSMITTER BUILDING UNDER TOWER TO HOUSE FPN 42 TRANSMITTERS.
 - B. EXTENSION OF PRESENT BUILDING TO END OF PRESENT GENERATOR CFN 1. 2. 42 ROOM EXTENSION TO HOUSE TWO NEW 200 KW GENERATORS. REMOVE PRESENT GENERATOR
 - C. REMOVE ALL PRESENTLY INSTALLED LORAN-C EQUIPMENT ON SCHEDULE WHICH WILL PERMIT MAXIMUM ON-AIR TIME AND REMODEL PRESENT BUILDING TO HOUSE FPN 41 TIMERS AND URT 17 COMMUNICATIONS EQUIPMENT.
 - D. REINSULATE AND PAINT PRESENT TOWER AS NECESSARY TO MEET NEW POWER REQUIREMENTS.
 - E. REMOVE ALL OTHER ANTENNAS TO BEYOND GROUND SYSTEM OF 625 FT TOWER. REMOVE CHAIN LINK FENCE. BREAK UP BARBED WIRE FENCE.
 - F. EIGHTEEN PERSONNEL
 3. PLANS AND SPECIFICATIONS FOR TRANSMITTER BLDG WILL BE FORWARDED DISTRICT.
 4. REQUEST ABBREVIATED REPORT EARLIEST.
- BT

Enclosure (2)

201304Z
COMDT

LORAN TRANSMITTING STATION, C-II
CAROLINA BEACH
ABBREVIATED SITE SURVEY REPORT

A. OPERATIONS REPORT

1. Site Description and Ownership

The site is located on 210 acres, about two miles north of Carolina Beach, North Carolina. By Department of the Air Force letter of 16 June 1959 to SEC TREAS, the Department of the Air Force transferred jurisdiction, custody and control of this property, together with improvements thereon, without reimbursement, to the Coast Guard in accordance with authority contained in 10 USC 2571.

2. Accessibility

The site is adjacent to and accessible from U. S. Highway 421. However, the present access road into the station buildings is frequently impassable during rainy weather. It is recommended that the present dirt road and station apron be paved.

3. Quarters and Subsistence

Personnel attached are currently under orders which provide for Basic Allowance for Quarters and Basic Allowance for Subsistence. The survey party inquired into the practicability of "S&Q" for this station. Continuation of this arrangement, based on observation and interview with personnel, appears to be the most satisfactory arrangement possible. Financial problems sometimes arise with lower rated personnel due to lack of public transportation to and from site and when delay in initial receipt of "S&Q" allowance is experienced. It is strongly recommended that limited emergency quarters be provided for a minimum of two men.

4. Vehicles

This unit is currently authorized one 4 x 4 type vehicle (Jeep) which is needed primarily for inspection, antenna maintenance, etc., over the 210 acres of sandy land. A carry-all type vehicle is also needed to transport personnel, mail and equipment to and from the station. Carolina Beach is within the Raleigh, North Carolina, GSA motor pool area from which a vehicle of this type could be obtained.

5. Personnel Allowance

<u>Present</u>	<u>Typical</u>	<u>Recommended</u>
LTJG 1	LCDR/LT 1	LCDR 1
RELE 1	CHRELE 1	CHRELE 1
ETC 1	ETCS 1	ETCS 1
ET1 2	ET1 2	ET1 3
ET2 3	ET2 3	ET2 3
ET3 4	ET3 4	ET3 3
SN 2	SN 5	SN 2
	CS1 1	YN2 1
	BMC 1	
EN1	EN1 1	EN1 2
	EN3 1	RM1 1
	FN 1	RM2 2
	HM 1	RM3 1
	DC2 1	
<hr/>		
2 OFF	2 OFF	2 OFF
13 ENL	23 ENL	18 ENL
<hr/>		
15 TOTAL	25 TOTAL	20 TOTAL

6. Security

Small arms - 2 - automatic 45-caliber pistols and related appurtenances are recommended.

7. Recreation

There are no recreational facilities available. It is necessary to provide suitable space in the existing building for general day-room use of personnel assigned.

8. Operation

It is proposed that the Commanding Officer of Carolina Beach Loran Transmitting Station retain operational control of the East Coast Loran-C Chain under direct cognizance of the Fifth Coast Guard District. In this connection, the Commanding Officer should schedule periodic visits to other stations in the chain to provide for optimum control procedures and discussion of technical matters.

ELECTRONICS ENGINEERING REPORT

1. GENERAL

Inasmuch as this report covers modernization of an operating station in which the existing Loran transmitting and receiving antennas will not be moved from their present locations, no paired station, signal strength, signal-to-noise ratio or propagation data are included in this report.

2. INSTALLATION OF NEW EQUIPMENT

On completion of the new transmitter building at the base of the tower and installation of AN/FPN-42 transmitters (2), and associated equipment, connection to and operation of the new transmitters from the existing timing equipment is possible. The transmitter, power supply, work benches, etc., in the north end of the signal building, will be removed concurrently with construction of the new transmitter building. The prefabricated shielded room will be assembled in this space and two AN/FPN-41 timer-synchronizers and associated equipment installed. When these have been tested and are satisfactorily controlling the new transmitters, the existing timers, screened room and second transmitter can be removed. The existing tuning unit house at the base of the antenna tower will also be removed.

3. COMMUNICATIONS

This station will be the communications net control station of the East Coast Loran-C Chain. It is recommended that single sideband voice and radio teletype should be the primary means of communication between all units in the chain. Commercial landline service to the Carolina Beach area receives low priority with commercial users in the metropolitan and industrial areas, service has therefore been undependable, especially during hurricanes and storm periods. Further, it is considered a "hot line" type of voice circuit is more necessary to the efficient operation of this chain than a straight teletype circuit, and radio will provide the most efficient and dependable method of communication.

It is proposed to install two AN/URT-17 transmitters (with FSK and SSB converters), two R-840/URR receivers (with FSK and SSB converters), and two model 28 teletypes with a standard operator's console in the space now occupied by the communications equipment

and the screened room as shown on the enclosed building plan. Two HF antenna systems, each consisting of a 35-foot vertical antenna and AN/URA-27 RF tuner mounted on a 35-foot pole with a 125-foot radius ground system, will be installed outside the main ground system as shown on the enclosed plot plan. Coaxial feed lines and control cables will be run under the radials of the main ground system. The WWV receiving antennae will be moved to a new location outside the main ground system.

Installation of communications antenna systems and the WWV receiving antenna will require clearing of trees and underbrush.

LORAN C STATION
CAROLINA BEACH, NORTH CAROLINA

CIVIL ENGINEERING REPORT

PROPERTY DESCRIPTION

The presently Coast Guard occupied 210 acres are considered adequate for the continued operation of high power LORAN C Station.

ANTENNA TOWER

The existing 625 ft. guyed antenna tower and foundation is suitable for continued use, subject to changes in insulator base, top loading elements, etc., which changes are known to Commandant's staff. New concrete anchors are required for all top loading elements to replace screw anchors (some of which moved during Hurricane Donna). The contract for the antenna tower work should include repainting of the entire tower at this time.

COMMUNICATION & RECEIVING ANTENNA

Two (2) communications antennas and a "WWV" receiving antenna will be required, as shown on the plot plan. These areas will have to be cleared of trees and underbrush. Standard antennae construction for sand locations, plus anchors and ground system will be required.

ANTENNA GROUND SYSTEM

The existing main antenna ground system is in satisfactory condition subject to any repairs required incidental to construction and contractors activity.

Enclosure (3)

The prime contractor should be required to cut and destroy all growth and bushes over the existing ground system. Burning on the Coast Guard property, off the ground system, would be satisfactory, subject to approval of local authorities.

GENERAL SITE CONDITIONS

The terrain is generally flat and sandy. Scrub growth and bushes have taken hold over the ground system. The area outside the ground system is generally covered with tall trees and undergrowth.

The site is sufficiently protected and remote from the ocean so that salt spray, wind blown sand, or high tide flooding is not a problem. However, this site is in the "Hurricane Belt". Strong prevailing winds from the Southwest are common during the winter season.

WEATHER DATA

This station is subject to typical North Carolina Atlantic Coast storms with hurricanes a frequent occurrence.

Air conditioning and heating should be based on the following criteria:

High Temperature - 100° F.

Low Temperature - +15° F.

Long periods of high humidity.

TRANSMITTER BUILDING

A complete new Transmitter Building located at the base of the tower, in accordance with Headquarters standard design is recommended. Building can be located between foundation pads of

former tower legs. These pads, while somewhat unsightly, are massive and present no real reason for removal.

Building should be air conditioned and heated, as required, for protection of transmitter equipment, and comfort of maintenance personnel.

Building should have protected entrances to prevent winds and wind-driven rains from damaging outward swinging doors and water damage inside building.

TIMER-OPERATIONS BUILDING

The existing building is on a concrete slab foundation, with concrete block bearing walls, and wood truss and shingle roof. All are in good condition.

This building can be satisfactorily renovated to provide for the bulk of the needs for a new and fully operational LORAN Station.

The recommended floor plan for utilization of this building plus a 36 ft. addition is submitted herewith on Drawing No. ND-2307.

A partial outline of recommended work is as follows:

a. Remove all existing facilities in the way and construct an addition to the existing building, as shown on the attached Drawing No. ND-2307. The extension shown is considered a minimum requirement to provide necessary facilities for an operating unit of the District.

b. Remove interior partitions not needed; seal up openings not required with glass block; fur strip, insulate and panel the interior of all outside walls.

- c. Remove all wiring and rewire with new fixtures to suit new floor plan.
- d. Remove existing heating unit and replace with combination heating/air conditioning unit to meet needs of new building. Existing heating plant (Chrysler "Air-Temp" Model A-103, part of original pre-Coast Guard occupancy) reportedly is in need of major repairs on parts replacement.
- e. Fill in unneeded floor trenches and recover entire building floor area with suitable floor tile.
- f. Patch existing plaster ceiling, or cover with ceiling block tile.
- g. Construct new interior partitions, as required.
- h. Refinish and repaint entire interior of structure.

OUTSIDE SERVICES

SEWAGE DISPOSAL

The existing septic tank installation is giving satisfactory service and will require no changes due to continued operation on "S & Q" basis.

WATER SUPPLY

The existing driven well and pump satisfactorily serve the domestic and drinking water needs of the station and its continued operation on an "S & Q" basis.

The installation of a water fire protection system is not recommended. The automatic CO₂ system for the Transmitter Building is

adequate and an ample allowance of Hand Type or Portable Dry and CO₂ Fire Extinguishers is considered the most effective means of controlling a fire in the Operations Building. A volunteer fire force with tank trucks is available from the community of Carolina Beach.

ELECTRIC POWER

The North Carolina Light and Power Company runs a 13,200 Volt primary overhead power line to the Southwest corner of the Coast Guard property. An elevated government-owned 175 KVA Transformers bank steps down this power to 2400 Volt for underground run to a second Transformer bank (also 175 KVA) near the Timer Building (see photograph). This power cable was renewed in 1959 and can be continued in service if power supply is carried at 5000 Volts or less. Additional or new transformer will be required to give increase in capacity and desired voltage.

The reason for the increased load and high voltage generators (600 Volts) being used for LORAN C Station operation, installation of two (2) each 200 KW standby generators is recommended for fully reliable operation. Additional space for this installation is shown on the attached Drawing No. ND-2307.

The District has need and will take custody of all transformers and the existing 100 KVA standby generator which are not used in this project.

FENCING

The existing chain link security fence which encloses the 625 ft. antenna and Timer Building must be removed. This fence arcs at times with the ground system and is not now necessary as a security measure.

The property fence is now a 3-strand, rusted, barb-wire on wood posts with top strand approximately 3½ ft. above ground. The wire is continuous and not grounded. It is recommended this rusted wire be removed and "No Trespassing" and "High Voltage" signs only be used to mark the government property boundary.

ROAD PAVING AND ENTRANCE GATE

The access road to the buildings from the main road requires paving. The existing sand road has proven unstable and unsatisfactory under frequent traffic of both government and watchstander vehicles. Outline of required paving is shown on the attached drawing. Natural drainage in the sand is good and road construction specifications need only require:

- (a) shaping of road base,
- (b) base course (crushed stone, crushed "Marl" or coarse plant mix asphaltic concrete), and
- (c) wearing course of fine graded plant mix asphaltic concrete.

A new entrance gate with approximately 20 ft. wing walls is recommended at the main road entrance. During the evening and late night, when only watch standards are on board the station, it is necessary to prevent access to nuisance traffic in this tourist location.

HURRICANE SHELTER

Construction of a small (approximately 10' X 10') hurricane shelter near the main gate and outside the shadow of the 625 ft. antennae tower was given due consideration. The need for this shelter is based on the premise that when the Operations Building is evacuated, some personnel (particularly bachelors) would remain at the site for immediate return to the operating equipment when the winds subsided. With such a shelter on the station grounds, their return would not be hampered by fallen trees, flood conditions, etc.

The construction of a hurricane shelter can therefore only be justified on the basis of a potential few hours less "off air" time during a major storm condition. This information is outlined in this report for guidance in making the necessary administrative decision on this item.

EXISTING CONSTRUCTION DETAILS

Prints of Fifth District Drawings showing existing building construction and facilities have been furnished Commandant (ECV) via LT(jg) C. J. ALTON for reference in preparing design and contract details. Additional prints are therefore not included in this abbreviated report.

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